

# *Chromatographic Specialties Inc.*

2008/09



# CHROMATOGRAPHIC SPECIALTIES INC.

To Our Valued Clients:

Welcome to Chromatographic Specialties Inc.'s 2008/09 catalogue.

Since 1963, Chromatographic Specialties has provided innovative chromatography products, technical expertise and unparalleled customer service to the Canadian Scientific community. Initially a manufacturer and distributor of packed GC columns, our product offering now includes a vast array of consumables and analytical instrumentation for GC, HPLC and Sample Preparation applications.

Our product offering continues to expand, as does our association with well-respected global suppliers. We have recently formed partnerships with Macherey-Nagel, 3M, SCAT and J-KEM, each a leader in their respective fields (see the What's New section on pages 2-5 for additional details about these companies). We continue to add products to the CHROMSPEC™ brand which offer quality at affordable prices.



Throughout this catalogue you will find many new products that will help you to improve productivity by achieving more reliable and accurate analyses. You may notice that some of the technical resource materials that have resided in previous versions of our catalogue are now missing; in an attempt to create a comprehensive application and reference repository, we have moved most of this material to the redesigned Technical portion of our web site. Visit us on-line at [www.chromspec.com](http://www.chromspec.com); we're expecting that this will become a valuable resource for our customers. Our bilingual Technical Support and Sales Teams are always available to answer any questions that you may have on our products including application support or troubleshooting, simply contact them using our toll free number, 1-800-267-8103. We maintain an extensive and dynamic in-house inventory to ensure quick delivery of the products that you need.

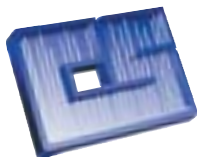
Chromatographic Specialties is located in Brockville, Ontario; along the shores of the St. Lawrence River at the foot of the majestic 1000 Islands. Sprinkled through this catalogue are a number of photographs of the area, taken by a local island owner, photographer and pilot, Ian Coristine. Ian has combined his three passions and is renowned for his stunning photographs, artwork and books detailing the beauty that abounds in this region. He has published three bestselling volumes of photography of the Thousand Islands and was chosen by DxO Labs in Paris as a DxO Image Master. His fourth work, a booklet titled "1000 Islands" was the recipient of a PIA "Benny" Award in the graphic arts industry's largest and most prestigious worldwide competition. We hope that you find these images to be both inspirational and awe-inspiring. To learn more about Ian and his books, see page 350.

From everyone at Chromatographic Specialties Inc. we thank you for your support and patronage and we look forward to serving your analytical needs well into the future.

Sincerely,

*Your Friends at Chromatographic Specialties Inc.*

***Chromatographic Specialties Inc. — Your Source For Peak Performance***



**CHROMATOGRAPHIC  
SPECIALTIES INC.**

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My Customer Identification Number is:



## What's New

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- CHROMSPEC Product Line Overview
- Listing of CSI Suppliers

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- Packed Columns and Column Packings
- GC Accessories
- GC Replacement Parts
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- Syringe Replacement Parts

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- Automated Sample Concentrator
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- Preparative HPLC System
- Pyrolysis Systems

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- Petrochemical Standards
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- QuEChERS
- Disk Based SPE
- Membrane filters and Filtration Products

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- Index by Product Description
- Free Literature
- Ordering Information



# WHAT'S NEW

## TECHNICAL TRAINING SESSIONS AND PRODUCT DEMONSTRATIONS — We make house calls...

- Chromatographic Specialties Inc. Technical Support Staff and / or our suppliers' Technical Staffs are available for technical presentations or one-on-one consultation.
- Half or full day on-site visits.
- Information and support can be tailored to your specific laboratory's needs.
- Non-sales, technical focus which can include a discussion of your chromatographic issues, and touch on new literature, products and services of relevance to your work.
- Set-up can be in a lunch or conference room, so lab work need not be interrupted.
- We do the set-up, take-down and clean-up.

Opportunities are limited, for more information call your local Chromatographic Specialties Inc. Sales Representative or email [sales@chromspec.com](mailto:sales@chromspec.com).



## SUPPLIER NEWS AND NEW SUPPLIERS

### Expanded offering of CHROMSPEC™ Products — Pages 6-7

We continue to expand our offering of CHROMSPEC™ products as we uncover lines that combine exceptional quality at an affordable price. We will continue to inform our customers as we add to this popular line.

### Horizon Technologies — Pages 208-210

Be friendlier to your environment! Replace those solvent hungry liquid/liquid extractions with automated solid phase extraction. The Horizon SPE-DEX 4790® reduces solvent consumption by up to 90%. Procedures have been developed for many EPA methods including 1664 Oil & Grease.



A DryVap® automated sample concentration system in conjunction with a Reclaimer™ Solvent Recovery System condenses and captures approximately 85 - 95% of the solvent vapour during dry down. Condensed solvents can then be properly disposed of, or re-used.

### Agilent Chromatography Genomics and Proteomics Products

Chromatographic Specialties Inc. is an authorized Agilent Chromatography Consumables and Supplies Dealer. Now MJS BioLynx Inc., our sister company, is proud to offer you genuine Agilent Genomics and Proteomics products. Contact us for details, including part numbers, delivery and pricing in Canadian dollars.



### HPLC Solvent Safety Products from SCAT — Pages 142-143

SCAT Europe GmbH is an ISO9001 certified manufacturer of environmental and solvent safety products. Their products are well regarded in Europe, and Chromatographic Specialties Inc. is delighted to introduce the SCAT line to Canada.

SCAT Safety Caps and Safety Waste Caps keep your lab environment healthier and your solvents cleaner. By sealing solvent vapours in the bottle, SCAT caps reduce organic vapours in lab air by approximately 73%, and prevent differential evaporation of mixed solvents.



## SUPPLIER NEWS AND NEW SUPPLIERS (cont'd)

**Macherey-Nagel's Products are now available from Chromatographic Specialties Inc.**

### NUCLEODUR® for HPLC — Pages 128-129

NUCLEODUR®, Macherey-Nagel's newest line of HPLC columns feature ultra high purity silica, with low trace metals and low acidity. NUCLEODUR® phases are densely bonded for inertness and chemical resistance. NUCLEODUR® columns are packed with particles from 1.8µm to 8µm to suit all your HPLC needs. If you know Nucleosil...you'll love NUCLEODUR®

### OPTIMA High Performance Capillary GC Columns — Page 51

High thermal stability  
Reduced column bleed  
Higher inertness due to optimized deactivation



### BOC BASELINE® and REDLINE® Gas Regulators — Page 72

#### Single and dual stage high purity gas regulators

**BASELINE®** - Brass body, stainless steel diaphragm for high-purity non-corrosive gasses

**REDLINE®** - Chrome plated brass or stainless steel body, Hastelloy® diaphragm for high purity corrosive gasses and ultra-high purity gasses



### Chromatographic Specialties Inc. — Your Choice for United Chemical Technologies (UCT) Products in Canada — Pages 272-283

We are proud to be a distributor of UCT's SPE and derivatization products in Canada.

UCT's SPE products are ideal for systematically extracting multiple classes of analyte from complex matrices - such as the analysis of drugs and metabolites in bodily fluids.



### 3M Personal Air Sampling Badges

For Industrial Hygiene monitoring of solvent exposure.  
Stop guessing about what you and your staff are breathing!  
Call our Technical Team at 1-800-267-8103 for more details.



## WHAT'S NEW IN GC

### CHROMSPEC™ GC Ferrules — Pages 94-95

Compact Ferrules for Agilent GCs  
Universal Graphite Ferrules  
Universal Graphite/Vespel Ferrules  
Universal Vespel Ferrules  
Universal Teflon Ferrules



### Restek's New Rxi™ GC Columns — Pages 12-13

Restek Chemists have designed a new line of GC columns with one thought in mind - to be the best columns available! These columns feature exceptional inertness, ultra-low bleed, and reproducible retention and selectivity. In addition to outstanding performance, this combination of column characteristics assures Rxi™ columns will have long lifetimes.



### Agilent's New GS-OxyPLOT Columns — Page 33

GS-OxyPLOT columns provide the ultimate solution for the chemical and petrochemical industries to analyze trace levels of oxygenates (ethers, alcohols, aldehydes, and ketones) in complex matrices such as gaseous hydrocarbons, motor fuels and crude oil.

**Expanded Offering of Genuine Agilent Parts and Supplies**

**GC/MS Replacement Parts — Page 105**

**Purge and Trap Supplies — Page 106**

sales  
tech  
instrum  
**@chromspec.com**

**www.chromspec.com**

## WHAT'S NEW IN HPLC



### CHROMSPEC™ Deuterium Lamps — Page 156

Individually matched to your instrument  
Cold-aligned for best signal-to-noise ratio  
All lamps include a Certificate of Analysis  
Selected models available in 3 packs for even greater savings



### Optimize Technologies Green HPLC Piston Seals

Combine the chemical resistance of ITB™ with the physical durability of Opti-Seal® UHMW-PE piston seals. Call our Technical Support Department for details.



### OPTI-SOLV EXP™ — Protect your investment in UHPLC

New from Optimize Technologies in-line filter / guard column holder for UHPLC 20,000 psi (1,400 bar) pressure rating, with the ease of finger-tight fittings!

For more details on what the Opti-Solv EXP™ can do for you, contact our Technical Support Department at 1-800-267-8103 or tech@chromspec.com.



### Agilent Quiet Cover II — Page 146

Accommodates BOC Edwards rough pumps which are used not only on Agilent LC/MS and ICP-MS systems, but by many other manufacturers too.

- Sound absorbing cabinet and cushioned pump mount - reduce lab noise and vibration.
- Built in lift and tilt lever - eliminate manual lifting and tilting of the pump for easier oil changes.
- Easy-open, no tool access - convenient for routine checks and maintenance.
- Integrated fans and audible / visible alarm - keeps pump cool, warns of overheating before damage occurs.



### Agilent 600 Bar Rapid Resolution High Throughput (RRHT) Columns — Page 123

Agilent's new 600 Bar RRHT columns extend the ZORBAX column family to cover ultra-high resolution HPLC at high speed. The engineered particle distribution in RRHT columns provides the same speed and resolution with 30% less back pressure than other manufacturers' sub-2µm columns.



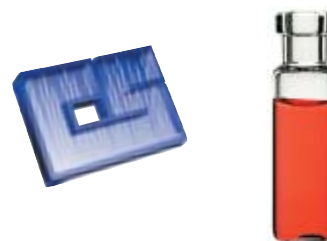
### Restek HPLC Columns — Pages 132-135

Restek's general purpose HPLC line of Pinnacle, Ultra, and Allure® columns are now expanded by the introduction of their new Pinnacle UHPLC columns for ultra-fast analysis, Viva™ columns for biomolecule separations, and pHidelity columns for durability at extreme pH's. Restek also continues to add specialty environmental columns to their line-up.

## WHAT'S NEW IN SAMPLE PREPARATION

### CHROMSPEC™ Autosampler Vials — Pages 305-306

- High quality vials, caps, seals and inserts at an affordable price
- Versatile 12x32mm, 2mL nominal volume
- USP Type 1 borosilicate glass
- Wide opening vials - 40% more surface area for reliable autosampler operation
- Crimp, snap or screw cap closures and vials
- Non-bonded, bonded, ultra-low bleed and pre-slit septa



### Standards for Canadian Environmental Methods — Pages 231 - 242

- From AccuStandard, ISO7001 certified production
- MISA
- Quebec Ministry of the Environment
- CCME



More Canadian methods are being added - if you don't see yours, call us!

### Improved Electronic Crimpers and Decappers — Page 335

Black & Decker's decision to discontinue VersaPak® batteries has resulted in a redesign of the popular electronic crimpers and decappers available from many suppliers. The VersaPak® batteries have been replaced with an onboard battery and plug in smart charger.

**33% increase in battery voltage** — Crimp more vials per charge, stronger crimping action for 20mm vials

**Faster recharge time** — Older versions could take 8-12 hours; these new units typically charge in less than 2.5 hours

**Greater battery life** — 500 charge cycles instead of 300

**Improved housing and electronics** — Tougher components for greater reliability



### HR-X SPE

- State-of-the-art spherical hydrophobic polystyrene-divinylbenzene phase
- pH stable 1-14
- High loadability, low solvent consumption
- High lot-lot reproducibility
- Recommended applications: pharmaceuticals from complex matrices, pesticides, herbicides, phenols, PAHs and PCBs from water

Call our Technical Support Group at 1-800-267-8103 or email tech@chromspec.com for more information.



### Lukova Flash Chromatography Columns

- Versatile Flash Chromatography Columns
- Compatible with ISCO, Analogix, Biotage™, RediSep™, SuperFlash™, and other Closed-Top Flash Cartridges

Call our Technical Support Group at 1-800-267-8103 or email tech@chromspec.com for more information.



### VICI Precision Sampling Hollow Plunger Syringes

- Hollow, flow-through plunger with integrated 3-way valve
- Push button on/off valve at needle
- For liquids and gases
- Introduce viscous samples through the plunger instead of the needle
- Eliminate carry-over by rinsing the syringe through the plunger
- Continuous sampling without withdrawing the needle
- Less plunger manipulation than with a standard syringe, save time and reduce plunger wear



Call our Technical Team at 1-800-267-8103 for additional information, including part numbers and pricing.

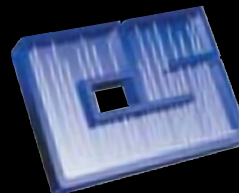


# CHROMSPEC™...The Name for Affordable Quality

Chromatographic Specialties Inc. has been supplying innovative chromatography products to the Canadian scientific community since 1963. Developments in separations technology have expanded our product offering from packed GC columns to include capillary GC columns and accessories, HPLC columns and accessories, analytical standards, sample preparation and filtration products, glassware and analytical instrumentation. Occasionally we come across affordably priced products of exceptional quality, these we market under the CHROMSPEC™ banner.

## The CHROMSPEC™ Advantages

- Chromatographic Specialties Inc. stocks a large inventory of CHROMSPEC™ products for quick delivery
- Competitively priced
- Superior quality, guaranteed product performance
- Free access to our technical expertise



Included in this catalogue are the newest additions to the CHROMSPEC™ product line: chromatographic grade tubing, GC ferrules, and autosampler vials. We encourage you to compare these products to your present source, you're sure to be attracted by both the quality and the price.



### CHROMSPEC™ Autosampler Vials . . . . . See pages 305-306

- Versatile 12x32mm wide opening vials
- USP Type 1 borosilicate glass
- 2 mL nominal volume
- Crimp, snap or screw caps and vials
- Non-bonded, bonded, ultra-low bleed and pre-slit septa



More Choices!

### CHROMSPEC™ GC Septa . . . . . See page 85

- Long life septa, formulated to low bleed specifications
- Exceptional needle penetration and sealing characteristics
- Reduced injection port sticking
- Samples available



Updated line!

### CHROMSPEC™ HPLC Lamps . . . . . See page 156

- A complete range of competitively priced durable replacement lamps for most manufacturer's HPLC detectors, spectrophotometers and plate readers
- Specific model matching for best life
- OEM quality alignment for highest signal/noise
- Deuterium and xenon lamps available
- 1,000 or 2,000 hour pro-rated warranty



### CHROMSPEC™ Syringe Filters . . . . . See page 261

- Ultra clean disposable syringe filters in 4, 13 and 25 mm diameters for all your filtration needs
- Minimal hold-up volume and large filter surface area provide maximum sample recovery



### CHROMSPEC™ GC Ferrules . . . . . See pages 94-95

- Graphite, 40/60 Graphite/Vespel®, Vespel®, Teflon
- 1/16" to 1/2" ferrules
- Reducing ferrules for capillaries from 0.3mm OD and up
- Standard and compact ferrules



## CHROMSPEC™ Membrane Filters . . . . . See page 264

- Optimized for HPLC media prep, pharmaceuticals and cold sterilization
- Conveniently packaged for easy removal of individual membrane filters
- Samples available



## CHROMSPEC™ Glass Connectors . . . . . See page 81

- Available in defined and universal formats
- Unions, reducing unions, Y-splitters
- Manufactured borosilicate glass
- Deactivated for enhanced inertness
- Easy to install for leak free connections for joining capillary columns, guard columns and transfer lines



## CHROMSPEC™ Gas Traps. . . . . See pages 76-78

- Economical alternative to expensive OEM gas traps
- Oxygen, moisture, hydrocarbon, CO<sub>2</sub> and mass spec specific traps
- Choice of capacities and fitting sizes
- Refill kits available for selected traps
- Easy to install



## CHROMSPEC™ Packed Columns . . . . . See pages 54-58

- Custom packed, in-house, to your specifications
- Wide selection of liquid phases, solid supports and packing materials in stock
- Glass, teflon and metal columns for many popular GCs
- Quick delivery



## CHROMSPEC™ Injection Port Liners . . . . . See page 88

- Liners for Agilent and Varian GCs
- Designed with stringent specifications for dimensional accuracy and inertness for demanding applications



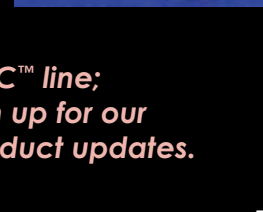
## CHROMSPEC™ Chromatographic Tubing . . . . . See page 65

- Stainless steel, nickel, copper, aluminum, Teflon lined stainless steel, and Teflon
- 1/16" OD to 1/4" OD
- Chromatographic grade cleaning
- Specialized cleaning on request



## CHROMSPEC™ Fused Silica Cutting Stones . . . . . See page 81

- Lightweight and easy to use!



**We are continuously adding innovative products to our CHROMSPEC™ line; we encourage you to visit our website at [www.chromspec.com](http://www.chromspec.com) or sign up for our electronic newsletter, the Chromspec e-Chronicle to receive periodic product updates.**

# Chromatographic Specialties Inc. is proud to represent the following companies in Canada...



- Analytical Reference Materials



- Scientific Glassware



- GC Chromatography Columns and Accessories
- ZORBAX HPLC Columns and Accessories
- GC and HPLC Instrument Replacement Parts



- Pyrolysis, Headspace and Thermal Desorption



- Autosampler Vials



- Genesis and APEX LC Columns
- Column Heaters • Solvent Degassers



- Syringes • Pipettes • PRP HPLC Columns



- Automated Sample Preparation Systems
- DryVap Sample Concentrator
- Oil and Grease Consumables



- Solvent Evaporation Systems
- Digital Temperature Controllers
- Precision Vacuum and Pressure Regulators



- HPLC Systems, Pumps, Detectors
- Data Acquisition Software
- Instrument Control Software



- Multimode Autosamplers
- GC / GC-MS



- High Performance Extraction Disks, Cartridges and Plates



- Nucleosil® and Nucleodur® HPLC Columns
- SPE Columns and Accessories



- Autosampler Vials • Target Syringes
- Target Syringe Filters



- HPLC Fittings and Accessories
- HPLC Replacement Parts
- Velocity Quick Connect HPLC Columns



- Gas Generators • Fittings



- Derivatization Reagents



- Rtx and MXT GC Capillary Columns
- Pinnacle, Allure and Ultra HPLC Columns
- GC and HPLC Replacement Parts and Accessories
- Air Monitoring Products
- Analytical Reference Materials



- Safety Caps for Solvent and Waste Containers
- Waste Containers and Accessories



- EPA Sampling Vials
- Pre-cleaned Sampling Containers



- Replacement HPLC Lamps



- HPLC Autosamplers and Automated SPE



- Low Cost Standard and Portable GCs
- Standalone Detectors, Data Acquisition Systems



- Autosampler Vials and Dissolution Accessories



- SPE columns (XTRACK-T, CLEAN SCREEN and CLEAN-UP)
- Vacuum Manifolds and Accessories
- 48 and 96-Well Plates
- Ultra-Flash Chromatography Columns



- GC and LC Valves
- Precision Sampling Syringes
- ValcoBond GC Columns



- Jour HPLC Fittings and Accessories



- TLC Plates, Chromatography and Filter Paper
- Partisil and Partisphere HPLC Columns
- Uniprep Vials, GDX Syringe Filters
- 96-Well Filtration Plates
- Schleicher & Schuell Products



- Vials and Laboratory Glassware



- Zirconia Based HPLC Columns



In addition to representing these fine companies' products to the Canadian Laboratory marketplace, our sister company, MJS BioLynx Inc., has access to a host of world-renowned manufacturers of Lifescience products. For information on their product offerings please access their website at [www.biolynx.ca](http://www.biolynx.ca) or contact Chromatographic Specialties Inc. and request a copy of their newest catalogue (ask for literature code BL01).



# GC PRODUCTS

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For GC Applications, please visit our website at [www.chromspec.com](http://www.chromspec.com) or contact our Technical Support Group.

## 1-800-267-8103







Since 1963, Chromatographic Specialties Inc. has endeavoured to provide the finest chromatographic products, accessories and services to the Canadian Scientist. We continue to add new and innovative products to our product line. Our commitment to providing the widest possible range of top quality products, backed by expert technical support has led us to be THE source of Restek products in Canada.

For those that are familiar with and have used Restek columns and accessories, the products that you have grown to trust and depend on are available directly in Canada, many from stock. As always, our Technical Support Staff is available to help you with your analytical problems. They can be reached using our Toll Free Number 1-800-267-8103, or by email at [tech@chromspec.com](mailto:tech@chromspec.com).

Here are some of the reasons why we at Chromatographic Specialties Inc. chose to offer Restek products:

**Complete Customer Satisfaction** – Restek was the first chromatography company to offer a 100% Satisfaction Guarantee and they want nothing less than satisfied customers; a philosophy that we share.

**R&D Innovations** – Restek's R&D group is constantly striving to improve the stability of the polymers used in their columns, with the goal of increasing the maximum operating temperature and minimizing column bleed. They continue to engineer new phases and products to further improve your chromatography.

**Customer Feedback** – Restek encourages your comments and suggestions to improve existing products and develop new ones.

**Free Knowledgeable Technical Support** – Is always available to our Canadian Customers. Contact our Technical Support Department toll free at 1-800-267-8103, if they can't answer your questions they have the support of Restek's knowledge and experience.

**Training** – Restek technical personnel regularly visit Canadian customers with our Sales Representatives. Short training sessions are often available during these visits (column selection, troubleshooting, new developments, to name a few). Contact your local CSI Sales Representative to discuss having a Restek technical specialist visit your lab.

**Free Technical Literature** – Capillary technology is changing rapidly. Restek keeps analysts updated with an annual catalogue, their regularly published Restek Advantage and numerous product bulletins. Some material is even available in French. These are available through Chromatographic Specialties Inc; contact our Technical Support Group to review the literature that is pertinent to your work.

**On-time Deliveries** – In most cases delivery will be made from stock in Brockville, but every effort will be made to fill orders for specials and non-inventory items as quickly as possible.

**The Future** – Restek is committed to protecting the environment by using recycled packing materials and reclaiming solvents to reduce waste.

**The Promise** – Restek promises to continue to listen to customer needs and challenge technology. Chromatographic Specialties Inc. endeavours to help them meet these goals.

Restek products complement other columns and products and include phases not available elsewhere, they even make columns of special lengths, film thicknesses and can even use your proprietary polymers. It would be impossible to condense their entire product line into a few pages, for a complete listing of their products request a copy of their catalogue by calling us at 1-800-267-8103 and requesting literature piece RK01. We will continue to keep you up-to-date on new advances by including products in our bulletins and by target mailing literature that is relevant to your work.

The following pages contain a summary of Restek products. They include:

- Fused silica capillary columns
- MXT Silcosteel capillary columns
- Glass and metal inlet sleeves and liners
- Replacement parts for Agilent and other GCs
- Analytical standards
- Method development software
- Full range of capillary accessories
- HPLC columns
- SPE products
- Steel and glass passivation technologies
- Huge selection of applications and chromatograms

## RESTEK GC COLUMN SELECTION

### Stationary Phase Selectivity

When purchasing a new column, the most important consideration is the stationary phase. There are many different interactions that occur between the analytes and the functional groups of the stationary phase. These interactions contribute more to the overall results of the analysis than any other factor in the column. That is why it is important to understand as much about your column and sample as possible.

The non-polar Rtx®-1 phase will preferentially retain non-polar compounds compared to polar compounds. As non-polar methyl units are substituted with polar functionalities such as phenyl and cyanopropyl units, the selectivity of the column shifts towards more polar compounds. In turn, non-polar compounds are retained less as there are less overall methyl units for the non-polar compounds to interact with. The Rtx®-200 stationary phase contains trifluoropropyl units which provide high selectivity for analytes containing lone pair electrons, such as nitro and carbonyl groups. Polyethylene glycol columns, such as Stabilwax® and Rtx®/MXT®-WAX, are polar and are highly selective towards polar compounds such as alcohols.

### Internal Diameter (ID)

When selecting an internal diameter, sample concentration and instrumentation must be considered. If the concentration of the sample exceeds the column's capacity, loss of resolution, poor reproducibility, and peak distortion will result. Table 1 (below) shows typical column characteristics. Note the limited capacity of narrow bore columns (0.18 mm ID < 50 ng) versus the high capacity of 0.53 mm ID columns (2000 ng). Also, 0.53 mm ID columns are recommended in high flow situations, such as with a purge and trap unit. Conversely, narrow bore columns can be installed directly into a MSD because of the limited flow at optimum linear velocity.

Table 1: Typical Column Characteristics

Column ID	0.18 mm	0.25 mm	0.32 mm	0.53 mm
Typical Splitless Purge Times	2 min.	1 min.	0.75 min.	0.5 min.
Column OD (Ferrule ID)	0.4 mm	0.4 mm	0.5 mm	0.8 mm
Column Flow Rate (He @ 20 cm/sec.)	0.3 cc/min.	0.7 cc/min.	1.0 cc/min.	2.6 cc/min.
Column Flow Rate (H <sub>2</sub> @ 40 cm/sec.)	0.6 cc/min.	1.4 cc/min.	2.0 mm/min.	5.2 cc/min.
Approximate Sample Capacity	<50 ng	50-100 ng	400-500 ng	1000-2000 ng
Typical Trennzahl Values	40	30	25	15
Typical Theoretical Plates/m (80% CE)	5,300	3,800	3,000	1,800
Typical Effective Plates/m (80% CE)	3,700	2,700	2,100	1,300

### Film Thickness (df)

Film thickness has a direct effect on the retention and elution temperature for each sample compound. Thicker films retain compounds longer by maximizing the amount of time the compounds spend in the stationary phase. Thinner films retain compounds less by minimizing the amount of time the compounds spend in the stationary phase. Therefore, very volatile compounds should be analyzed on thick filmed columns to increase the time the compounds spend in the column and to allow them to separate. High molecular weight compounds such as triglycerides must be analyzed on a thin film column. This minimizes the amount of time the analytes stay in the column and provides low bleed at elevated temperatures which are required when analyzing high molecular weight compounds.

### Length

Longer columns provide more resolving power, increase analysis times, and cost more. Often an analyst must determine whether the amount of resolution increase is worth the extra time and expense. The benefits of using longer columns differ depending on whether isothermal or temperature programmed analyses are being performed. For an isothermal analysis, retention time is dependent on the length of the column. If the column length is doubled, the analysis time will double as well. However, the increase in resolution is only approximately 40% since resolution is a function of the square root of the length.

In the case of temperature programmed analyses, retention times are more dependent on temperature than column length. The increase in resolution is the same as an isothermal run, but there is only a marginal increase in analysis time.

Length Effects	
Length affects resolution and speed of analysis.	
$\text{Resolution} = \frac{1}{4} \sqrt{\frac{L}{h}} \times \frac{k}{k+1} \times \frac{\alpha-1}{\alpha}$	<b>Legend</b> L = length h = HETP k = capacity factor α = selectivity

## Free Literature



The Restek 2007 Catalogue contains the following products:

- GC columns
- PLOT columns
- Packed columns
- HPLC products
- Sample prep
- Silcosteel products
- Air monitoring
- Analytical reference materials
- Syringes
- Instrument supplies
- Educational materials
- And much more!

Contact our Customer Service Department at 1-800-267-8103 to receive your copy today!

## Column Materials

Both fused silica and stainless steel MXT® columns offer a high degree of inertness and excellent flexibility. While the two column materials can service many of the same needs, the advent of MXT® columns has expanded the utility of capillary columns. They are resistant to abrasion and scratches and show little risk of spontaneous breakage at any GC operating temperature. They can also be coiled into a smaller diameter to fit into portable field equipment. Under harsh operating conditions, stainless steel MXT® columns are the best choice. When breakage is less of a concern (stationary bench top equipment) and it is advantageous to be able to identify non-volatile contamination inside the column, fused silica is the best choice.

MXT Columns - See pages 30-31

## Free Literature

### Restek's New Rxi™ Columns



- Unsurpassed inertness
- Ultra-low bleed
- Guaranteed reproducibility
- Unmatched performance

For further information on Rxi™ GC columns please contact [tech@chromspec.com](mailto:tech@chromspec.com) and request literature code **RK18**.

### Restek Vu2 Union



A Vu2 Union™ connector combines the simplicity of a Press-Tight® union with the strength of a metal union to reliably couple a column to a transfer line, a guard column, or another analytical column. The connection will not break if the connector is bumped, vibrated, or repeatedly cycled to temperatures as high as 400°C. The open design allows visual confirmation of the primary seal between the column and the union.

For further information, please contact [tech@chromspec.com](mailto:tech@chromspec.com) and request literature code **RK34**.

### Rxi™-1ms (fused silica)



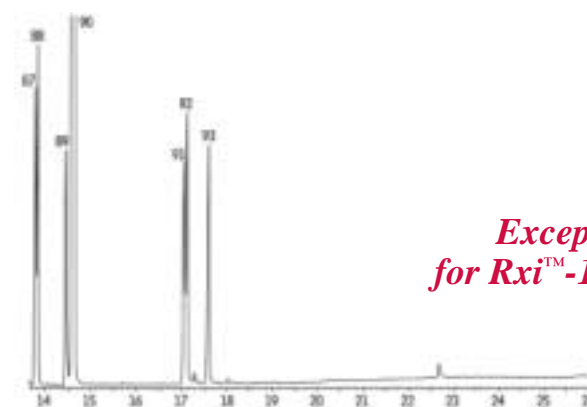
## The Ultimate High Performance Fused Silica Capillary Columns!

- Ultra-low bleed with temperature range: -60°C to 330/350°C (bleed tested temperature/maximum operating temperature)
- Equivalent to USP G2 (Crossbond® 100% dimethyl polysiloxane)

Restek chemists have designed the new Rxi™-1ms GC columns to be the best columns on the market; they offer a combination of exceptional inertness, ultra-low bleed, and reproducible retention and selectivity. In addition to outstanding performance, this combination of column characteristics assures Rxi™ columns will have exceptionally long lifetimes.

Rxi™-1ms are general purpose columns for drugs of abuse, essential oils, hydrocarbons, pesticides, PCB congeners / Aroclor® mixes, sulfur compounds, amines, solvent impurities, simulated distillations, oxygenates, gasoline range organics (GRO), and refinery gases.

### Semivolatiles US EPA Method 8270D



**Exceptionally low bleed  
for Rxi™-1ms columns at 330 °C**

Column: Rxi™-1ms, 30m x 0.25mm, 0.25 µm (RK13323)  
 Sample: US EPA Method 8270D mix.; 8270 MegaMix™ (RK31850), Benzoic Acid Standard (RK31879), Benzidine Standard (RK31852), Acid Surrogate Mix (RK31025), B/N Surrogate Standard Mix (RK31887), 1,4-Dioxane (RK31853)  
 Instrument: Agilent 6890  
 Injection: 1.0 µL, 5 µg/mL each component (5ng on column) (internal standards at 50 µg/mL / 50ng), split (10:1), 4mm Drilled Uniliner®, hole in bottom (RK20771)  
 Inj. Temp.: 250°C  
 Carrier Gas: Helium, constant flow  
 Flow Rate: 1.2 mL/min.  
 Oven Temp.: 50°C (0.5 min.) to 245°C @ 25°C/min., to 330°C @ 6°C/min. (5 min.)  
 Detector: Agilent 5973 MS  
 Interface Line Temp.: 280°C  
 Scan Range: 35-260 amu  
 Solvent Delay: 2 min.  
 Tune: DFTPP  
 Ionization: EI

Product Number	Description	Price
RK13302	Rxi™-1ms 20m x 0.18mm ID x 0.18 µm	\$460.60
RK13320	Rxi™-1ms 15m x 0.25mm ID x 0.25 µm	323.10
RK13323	Rxi™-1ms 30m x 0.25mm ID x 0.25 µm	538.50
RK13326	Rxi™-1ms 60m x 0.25mm ID x 0.25 µm	930.60
RK13338	Rxi™-1ms 30m x 0.25mm ID x 0.50 µm	538.50
RK13353	Rxi™-1ms 30m x 0.25mm ID x 1.0 µm	538.50
RK13324	Rxi™-1ms 30m x 0.32mm ID x 0.25 µm	568.30
RK13339	Rxi™-1ms 30m x 0.32mm ID x 0.50 µm	568.30
RK13340	Rxi™-1ms 30m x 0.53mm ID x 0.50 µm	640.20
RK13355	Rxi™-1ms 30m x 0.53mm ID x 1.0 µm	640.20

This is only a sampling of some of the more common Rxi™ column dimensions; many others are available. Please contact [tech@chromspec.com](mailto:tech@chromspec.com) to determine the column best suited to your application!



## Rxi™-5ms (fused silica)

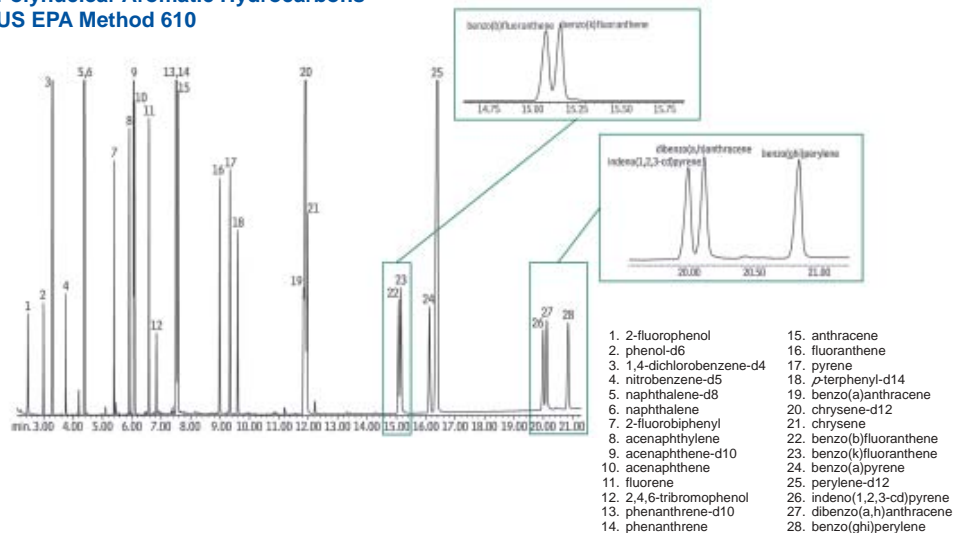
### The Ultimate High Performance Fused Silica Capillary Columns!

- Temperature range: -60°C to 330/350°C (bleed tested temperature/maximum operating temperature)
- Equivalent to USP G27 (Crossbond® 5% diphenyl / 95% dimethyl polysiloxane)

Rxi™-5ms columns have excellent sensitivity and symmetry for difficult compounds. They exhibit the lowest bleed in the industry, simplifying trace-level analysis with mass spectrometric detectors (MSD, ion trap, etc.), electron capture detection (ECD), nitrogen-phosphorus detection (NPD), or other sensitive detection methods.

Typical Applications include: Alcohols, amines, aromatic hydrocarbons, bile acids, drugs, US EPA methods, esters, fatty acid methyl esters (FAMES), flavours and aromas, glycerides, halogenated hydrocarbons, herbicides, hydrocarbons, organic acids, oxygenates, polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides, phenols, polymers, solvents, steroids, sugars, sulfur compounds.

#### Polynuclear Aromatic Hydrocarbons US EPA Method 610



Column: Rxi™-5ms, 30m x 0.25mm, 0.25 µm (RK13423)  
Sample: SV Calibration Mix #5 / 610 PAH Mix (RK31011),  
Acid Surrogate Mix (4/89 SOW) (RK31025),  
B/N Surrogate Mix (4/89 SOW) (RK31024),  
SV Internal Standard Mix (RK31206)  
Injection: 1.0 µL, 10ppm each analyte (10ng on column;  
40ng each internal standard), splitless (hold 0.1 min.),  
4mm Drilled Uniliner® Inlet Liner (hole at bottom) (RK20771)  
Instrument: Agilent 6890  
Inj. Temp.: 275°C

Carrier Gas: Helium, constant flow  
Flow Rate: 1.2 mL/min.  
Oven Temp.: 75°C (hold 0.5 min.) to 245°C  
@ 25°C/min., to 330°C @  
4°C/min. (hold 1 min.)  
Detector: Agilent 5973 GC/MS  
Transfer Line Temp.: 280°C  
Scan Range: 35-550 amu  
Solvent Delay: 2 min.  
Tune: DFTPP  
Ionization: EI

Product Number	Description	Price
RK13402	Rxi™-5ms 20m x 0.18mm ID x 0.18 µm	\$460.60
RK13420	Rxi™-5ms 15m x 0.25mm ID x 0.25 µm	323.10
RK13423	Rxi™-5ms 30m x 0.25mm ID x 0.25 µm	580.30
RK13426	Rxi™-5ms 60m x 0.25mm ID x 0.25 µm	930.60
RK13438	Rxi™-5ms 30m x 0.25mm ID x 0.50 µm	538.50
RK13453	Rxi™-5ms 30m x 0.25mm ID x 1.0 µm	538.50
RK13424	Rxi™-5ms 30m x 0.32mm ID x 0.25 µm	568.30
RK13439	Rxi™-5ms 30m x 0.32mm ID x 0.50 µm	568.30
RK13425	Rxi™-5ms 30m x 0.53mm ID x 0.25 µm	640.20
RK13440	Rxi™-5ms 30m x 0.53mm ID x 0.50 µm	640.20

Many other column dimensions are available. Please contact tech@chromspec.com!

sales  
tech  
instrum

@chromspec.com

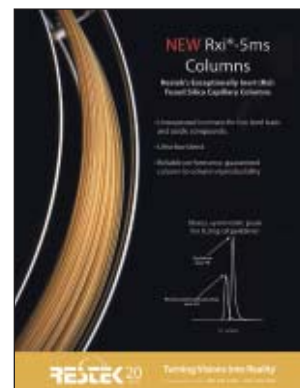
www.chromspec.com

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## Free Literature

### Rxi™-5ms Columns Brochure



Reliable performance, guaranteed column-to-column reproducibility!

To obtain a copy, please contact our Technical Support Group and request literature code RK55.

### GC Essentials Brochure

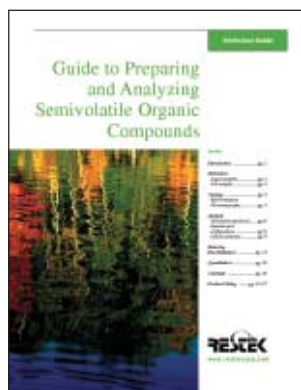


All of the most important products to keep your GC running in top condition!

- Ferrules
- Liners
- O-rings
- Septa
- Connectors
- Tools and more....

To obtain a copy, please contact our Technical Support Group and request literature code RK40.

## Free Literature



Analyses of semivolatile organic compounds in environmental samples hold many challenges, particularly during sample preparation and injection onto the capillary GC column. This 28-page guide offers valuable information across the entire scope of the analysis: sample extraction and cleanup, column selection, GC analysis (including hints for reducing discrimination in the injection port), and quantification.

Please request Literature Code **RK89**.

## Restek Analytical Reference Materials

- Quotations supplied quickly
- Mixtures made to your exact specifications

Restek offers a wide variety of semivolatile organic mixes, surrogates and internal standards from stock. Custom mixes as also available.

Please contact our Technical Support Group at 1-800-267-8103 or e-mail [tech@chromspec.com](mailto:tech@chromspec.com) to discuss your analytical reference material requirements.

## Rt-PAH

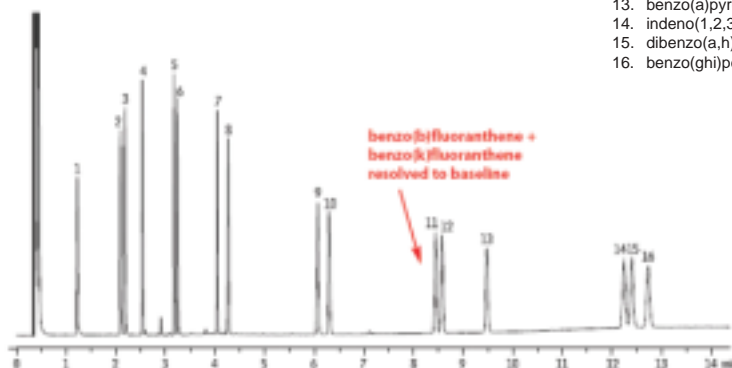
- Low bleed at 285°C
- Temperature range: 80°C to 285°C
- Polar, proprietary liquid crystalline phase

Specially designed for analyses of polycyclic aromatic hydrocarbons listed in US EPA methods 610 and 8100, Rt-PAH columns resolve problematic benzo(b)fluoranthene and benzo(k)fluoranthene to the baseline.

### 16 regulated polycyclic aromatic hydrocarbons separated in less than 13 minutes on an Rt-PAH column

Column: Rt-PAH 12m x 0.2mm ID, 0.15µm (RK19733)  
 Sample: 20ng/µL each component in dichloromethane  
 Inj.: 1.0µL split (split ratio 10:1)  
 Inj. temp.: 225°C  
 Carrier gas: Helium, 110kPa column head pressure  
 Oven temp.: 80°C to 220°C @ 40°C/min., to 285°C @ 8°C/min. (hold 5 min.)  
 Detector: FID @ 290°C

1. naphthalene
2. acenaphthylene
3. acenaphthene
4. fluorene
5. phenanthrene
6. anthracene
7. fluoranthene
8. pyrene
9. benzo(a)anthracene
10. chrysene
11. benzo(b)fluoranthene
12. benzo(k)fluoranthene
13. benzo(a)pyrene
14. indeno(1,2,3-c,d)pyrene
15. dibenzo(a,h)anthracene
16. benzo(ghi)perylene



Product Number	Description	Price
RK19733	Rt-PAH, 12m x 0.25mm ID x 0.15µm	\$532.90

**Need GC Ferrules? See pages 93-97**

## Rt-LC50

- Polar, dimethyl (50% liquid crystal) polysiloxane
- Low bleed at 270°C
- Temperature range: 100°C to 270°C

The unique liquid crystalline Rt-LC50 stationary phase resolves compounds of similar structure and boiling point. It has proven effective for resolving many polycyclic aromatic hydrocarbons; other applications include dioxin, furan, or PCB congeners.

RK19736	Rt-LC50, 10m x 0.10mm ID x 0.10µm	\$1,355.20
RK19735	Rt-LC50, 10m x 0.18mm ID x 0.10µm	927.60
RK19734	Rt-LC50, 20m x 0.25mm ID x 0.10µm	1,026.30

# RESTEK CAPILLARY GC COLUMNS

COLUMN	PAGE	COLUMN	PAGE	COLUMN	PAGE	COLUMN	PAGE
FAMEWAX™ . . . . .	23	Rtx®-65TG . . . . .	22	Rtx®-VRX . . . . .	26	<b>MXT® COLUMNS</b>	
Rt-2560 . . . . .	25	Rtx®-225 . . . . .	22	Rtx®-Volatiles. . . . .	27	MXT®-1 . . . . .	30
Rt-CW20M F&F . . . . .	24	Rtx®-440 . . . . .	25	Rtx®-WAX . . . . .	23	MXT®-1701 . . . . .	31
Rtx®-1 . . . . .	15	Rtx®-502.2 . . . . .	26	Rtx®-XLB . . . . .	19	MXT®-5 . . . . .	30
Rtx®-1MS . . . . .	16	Rtx®-624 . . . . .	27	ShinCarbon ST. . . . .	31	MXT®-2887 . . . . .	30
Rtx®-1PONA . . . . .	16	Rtx®-1301 . . . . .	18	Stabilwax® . . . . .	23	MXT®-WAX . . . . .	31
Rtx®-5 . . . . .	16	Rtx®-1701 . . . . .	19	Stabilwax®-DA . . . . .	24		
Rtx®-5 Amine . . . . .	17	Rtx®-2330 . . . . .	24	Stabilwax®-DB . . . . .	24	<b>CHIRAL COLUMNS</b>	
Rtx®-5MS . . . . .	17	Rtx®-2887 . . . . .	16	Stx-500 . . . . .	28	Cyclosil . . . . .	118
Rtx®-5Sil MS . . . . .	17	Rtx®-BAC 1/2 . . . . .	28			Hydrodex . . . . .	117
Rtx®-20 . . . . .	18	Rtx®-CLPesticides . . . . .	25	<b>PLOT COLUMNS</b>		Lipodex . . . . .	117
Rtx®-35 . . . . .	20	Rtx®-CLPesticides2 . . . . .	25	Rt-Msieve™ 5A . . . . .	29	PermaBond . . . . .	117
Rtx®-35 Amine . . . . .	20	Rtx®-G27 (with 5m Integra Guard) . . . . .	28	Rt-QPLOT™ . . . . .	29	Rt-BDEXcst™ . . . . .	118
Rtx®-35MS . . . . .	20	Rtx®-PCB . . . . .	25	Rt-SPLIT™ . . . . .	29	Rt-BDEXm™ . . . . .	118
Rtx®-50 . . . . .	21	Rtx®-TNT . . . . .	27	Rt-UPLIT™ . . . . .	29	Rt-BDEXsa™ . . . . .	118
Rtx®-200 . . . . .	21	Rtx®-TNT 2 . . . . .	27			Rt-BDEXse™ . . . . .	118
Rtx®-200MS . . . . .	22	Rtx®-VMS . . . . .	26			Rt-BDEXsm™ . . . . .	118
Rtx®-65 . . . . .	22	Rtx®-VGC . . . . .	26			Rt-BDEXsp™ . . . . .	118
						Rt-yDEXsa™ . . . . .	118

## RESTEK FUSED SILICA COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Rtx®-1 (Fused Silica)		(Crossbond® 100% dimethyl polysiloxane) Polymer stable to 360°C Applications: solvents, petroleum products, pharmaceutical samples, waxes, fuel oils.									
ID (mm)	df (µm)	Temp. Range °C*		10m		20m		40m			
0.10	0.10	-60	330/350	RK41101	\$341.00	RK41102	\$556.40				
	0.40	-60	320/340	RK41103	341.00	RK41104	556.40				
0.18	0.20	-60	330/350	RK40101	281.20	RK40102	430.80	RK40103	\$801.70		
	0.40	-60	320/340	RK40110	281.20	RK40111	430.80	RK40112	801.70		
				15m		30m		60m		105m	
0.25	0.10	-60	330/350	RK10105	289.90	RK10108	488.80	RK10111	818.20	RK10114	\$994.30
	0.25	-60	330/350	RK10120	284.20	RK10123	477.40	RK10126	818.20	RK10129	994.30
	0.50	-60	330/350	RK10135	278.50	RK10138	477.40	RK10141	818.20	RK10144	994.30
	1.00	-60	330/350	RK10150	278.50	RK10153	477.40	RK10156	818.20	RK10159	994.30
0.32	0.10	-60	330/350	RK10106	312.60	RK10109	522.90	RK10112	884.10	RK10115	1,133.00
	0.25	-60	330/350	RK10121	301.30	RK10124	511.60	RK10127	884.10	RK10130	1,133.00
	0.50	-60	330/350	RK10136	301.30	RK10139	511.60	RK10142	884.10	RK10145	1,133.00
	1.00	-60	320/340	RK10151	301.30	RK10154	511.60	RK10157	884.10	RK10160	1,133.00
	1.50	-60	310/330	RK10166	301.30	RK10169	511.60	RK10172	884.10	RK10175	1,133.00
	3.00	-60	280/300	RK10181	301.30	RK10184	511.60	RK10187	884.10	RK10190	1,133.00
	4.00	-60	280/300			RK10198	539.90				
	5.00	-60	260/280	RK10176	318.30	RK10178	511.60	RK10180	884.10		
								75m			
0.45	2.55	-60	270/290					RK10992	1,127.20		
				15m		30m		60m		105m	
0.53	0.10	-60	320/340	RK10107	329.70	RK10110	579.70	RK10113	917.10		
	0.25	-60	320/340	RK10122	318.30	RK10125	579.70	RK10128	917.10		
	0.50	-60	310/330	RK10137	318.30	RK10140	579.70	RK10143	917.10		
	1.00	-60	310/330	RK10152	318.30	RK10155	579.70	RK10158	917.10		
	1.50	-60	310/330	RK10167	318.30	RK10170	579.70	RK10173	917.10		
	3.00	-60	270/290	RK10182	329.70	RK10185	579.70	RK10188	917.10	RK10189	1,242.80
	5.00	-60	270/290	RK10177	335.30	RK10179	579.70	RK10183	917.10	RK10194	1,242.80
	7.00	-60	240/260	RK10191	335.30	RK10192	579.70	RK10193	917.10		

*Chromatographic Specialties Inc. — The Column People!*



# RESTEK CAPILLARY GC COLUMNS

## RESTEK FUSED SILICA COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Rtx®-1MS (Fused Silica)		(Crossbond® 100% dimethyl polysiloxane) Polymer stable to 360°C Applications: lower bleed alternative to Rtx-1.					
ID (mm)	df (µm)	Temp. Range °C*		15m		30m	
0.25	0.10	-60	330/350	RK11605	\$347.00	RK11608	\$545.70
	0.25	-60	330/350	RK11620	335.00	RK11623	534.20
	0.50	-60	330/350	RK11635	335.00	RK11638	534.20
	1.00	-60	325/350	RK11650	335.00	RK11653	534.20
0.32	0.10	-60	330/350	RK11606	370.90	RK11609	568.40
	0.25	-60	330/350	RK11621	359.00	RK11624	562.70
	0.50	-60	330/350	RK11636	359.00	RK11639	562.70
	1.00	-60	325/350	RK11651	359.00	RK11654	562.70
0.53	0.50	-60	320/340	RK11637	365.00	RK11640	630.90
	1.00	-60	320/340	RK11652	365.00	RK11655	630.90
	1.50	-60	310/330	RK11667	365.00	RK11670	630.90

Rtx®-1PONA (Fused Silica)		(Crossbond® 100% dimethyl polysiloxane - optimized for hydrocarbon analysis) Polymer stable to 300°C Applications: detailed hydrocarbon analysis.					
ID (mm)	df (µm)	Temp. Range °C*				100m	
0.25	0.50	-60	300/320			RK10195	\$971.20

Rtx®-2887 (Fused Silica)		(Crossbond® 100% dimethyl polysiloxane - for Sim Dist) Polymer stable to 360°C Applications: simulated distillation.					
ID (mm)	df (µm)	Temp. Range °C*		10m			
0.53	2.65	-60	360	RK10199	\$257.30		

Rtx®-5** (Fused Silica)		(Crossbond® 95% dimethyl - 5% diphenyl polysiloxane) Polymer stable to 360°C Applications: pesticides, PCBs, aromatic hydrocarbons, environmental samples, essential oils.							
ID (mm)	df (µm)	Temp. Range °C*		10m		20m		40m	
0.10	0.10	-60	330/350	RK41201	\$341.00	RK41202	\$556.40		
	0.40	-60	320/340	RK41203	341.00	RK41204	556.40		
0.18	0.20	-60	325/340	RK40201	281.20	RK40202	430.80	RK40203	\$801.70
	0.40	-60	315/330	RK40210	281.20	RK40211	430.80	RK40212	801.70
				15m		30m		60m	
0.25	0.10	-60	330/350	RK10205	289.90	RK10208	488.80	RK10211	818.20
	0.25	-60	330/350	RK10220	278.50	RK10223	477.40	RK10226	818.20
	0.50	-60	330/350	RK10235	278.50	RK10238	477.40	RK10241	818.20
	1.00	-60	320/340	RK10250	278.50	RK10253	477.40	RK10256	818.20
0.32	0.10	-60	330/350	RK10206	312.60	RK10209	522.90	RK10212	884.10
	0.25	-60	330/350	RK10221	301.30	RK10224	511.60	RK10227	884.10
	0.50	-60	330/350	RK10236	301.30	RK10239	511.60	RK10242	884.10
	1.00	-60	330/350	RK10251	301.30	RK10254	511.60	RK10257	884.10
	1.50	-60	310/330	RK10266	301.30	RK10269	511.60	RK10272	884.10
	3.00	-60	280/300	RK10281	301.30	RK10284	511.60	RK10287	884.10
0.53	0.10	-60	320/340	RK10207	329.70	RK10210	579.70	RK10213	917.10
	0.25	-60	320/340	RK10222	318.30	RK10225	579.70	RK10228	917.10
	0.50	-60	310/330	RK10237	318.30	RK10240	579.70	RK10243	917.10
	1.00	-60	310/330	RK10252	318.30	RK10255	579.70	RK10258	917.10
	1.50	-60	310/330	RK10267	318.30	RK10270	579.70	RK10273	917.10
	3.00	-60	270/290	RK10282	318.30	RK10285	579.70	RK10288	917.10
	5.00	-60	270/290	RK10277	335.30	RK10279	579.70	RK10283	917.10

\*\* 6 packs also available. Please inquire.

# RESTEK CAPILLARY GC COLUMNS

## RESTEK FUSED SILICA COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Rtx®-5MS (Fused Silica)		(Crossbond® 95% dimethyl - 5% diphenyl polysiloxane) Polymer stable to 360°C Applications: pesticides, PCBs, aromatic hydrocarbons, environmental samples, essential oils.								
ID (mm)	df (µm)	Temp. Range °C*		15m		30m		60m		
0.25	0.10	-60	330/350	RK12605	\$352.90	RK12608	\$551.40	RK12611	\$867.10	
	0.25	-60	330/350	RK12620	335.00	RK12623	539.80	RK12626	867.10	
	0.50	-60	330/350	RK12635	335.00	RK12638	539.80	RK12641	867.10	
	1.00	-60	325/350	RK12650	335.00	RK12653	539.80			
0.32	0.10	-60	330/350	RK12606	370.90	RK12609	574.40	RK12612	936.40	
	0.25	-60	330/350	RK12621	359.00	RK12624	568.60	RK12627	936.40	
	0.50	-60	330/350	RK12636	359.00	RK12639	568.60	RK12642	936.40	
	1.00	-60	325/350	RK12651	359.00	RK12654	568.60			
0.53	0.50	-60	320/340	RK12637	365.00	RK12640	637.50			
	1.00	-60	320/340	RK12652	365.00	RK12655	637.50			
	1.50	-60	310/330	RK12667	365.00	RK12670	637.50			

Rtx®-5Sil MS (Fused Silica)		(Crossbond® 5% diphenyl/95% dimethyl polysiloxane) Polymer stable to 360°C Applications: semi-volatile analysis by GC/MS								
ID (mm)	df (µm)	Temp. Range °C*		15m		30m				
0.25	0.10	-60	330/350	RK12705	\$352.90	RK12708	\$574.40			
	0.25	-60	330/350	RK12720	341.00	RK12723	562.30			
	0.50	-60	330/350	RK12735	341.00	RK12738	562.30			
	1.00	-60	325/350	RK12750	341.00	RK12753	562.30			
0.28	0.25	-60	330/350	RK12790	341.00	RK12793	562.30			
	0.50	-60	330/350	RK12791	341.00	RK12794	562.30			
	1.00	-60	325/350	RK12792	341.00	RK12795	562.30			
0.32	0.10	-60	330/350	RK12706	376.90	RK12709	598.30			
	0.25	-60	330/350	RK12721	365.00	RK12724	592.30			
	0.50	-60	330/350	RK12736	365.00	RK12739	592.30			
	1.00	-60	325/350	RK12751	365.00	RK12754	592.30			
0.53	0.50	-60	320/340	RK12737	370.90	RK12740	664.10			
	1.00	-60	320/340	RK12752	370.90	RK12755	664.10			
	1.50	-60	310/330	RK12767	370.90	RK12770	664.10			

Rtx®-5 AMINE (Fused Silica)		(Crossbond® 95% dimethyl - 5% diphenyl polysiloxane - deactivated for basic compounds) Applications: alkylamines, diamines, triamines and nitrogen-containing heterocycles.								
ID (mm)	df (µm)	Temp. Range °C*		15m		30m				
0.25	0.50	-60	300/315	RK12335	\$400.80	RK12338	\$610.20			
	1.00	-60	300/315	RK12350	400.80	RK12353	610.20			
0.32	1.00	-60	300/315	RK12351	424.80	RK12354	646.10			
	1.50	-60	290/305	RK12366	424.80	RK12369	646.10			
0.53	1.00	-60	290/305	RK12352	442.70	RK12355	717.90			
	3.00	-60	280/295	RK12382	442.70	RK12385	717.90			

**Please note:** We recommend using base-deactivated fused silica guard columns with Rtx-5 Amine columns. Please see page 63 for further information.

# RESTEK CAPILLARY GC COLUMNS

## RESTEK FUSED SILICA COLUMNS

\* The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Rtx®-20 (Fused Silica)		(Crossbond® 80% dimethyl - 20% diphenyl polysiloxane) Polymer stable to 310°C Applications: volatile compounds, flavour aromatics, alcoholic beverages.									
ID (mm)	df (µm)	Temp. Range °C*		10m		20m		40m			
0.18	0.20	-20	300/320	RK40301	\$281.20	RK40302	\$430.80	RK40303	\$801.70		
	0.40	-20	300/320	RK40310	281.20	RK40311	430.80	RK40312	801.70		
				15m		30m		60m		105m	
0.25	0.10	-20	300/320	RK10305	\$317.10	RK10308	\$514.50	RK10311	\$861.30	RK10314	\$994.30
	0.25	-20	300/320	RK10320	305.20	RK10323	502.50	RK10326	861.30	RK10329	994.30
	0.50	-20	290/310	RK10335	305.20	RK10338	502.50	RK10341	861.30	RK10344	994.30
	1.00	-20	280/300	RK10350	305.20	RK10353	502.50	RK10356	861.30	RK10359	994.30
0.32	0.10	-20	300/320	RK10306	341.00	RK10309	550.40	RK10312	930.60	RK10315	1,133.00
	0.25	-20	300/320	RK10321	329.00	RK10324	538.50	RK10327	930.60	RK10330	1,133.00
	0.50	-20	290/310	RK10336	329.00	RK10339	538.50	RK10342	930.60	RK10345	1,133.00
	1.00	-20	280/300	RK10351	329.00	RK10354	538.50	RK10357	930.60	RK10360	1,133.00
	1.50	-20	270/290	RK10366	329.00	RK10369	538.50	RK10372	930.60	RK10375	1,133.00
	3.00	-20	250/270	RK10381	341.00	RK10384	538.50	RK10387	930.60	RK10390	1,133.00
0.53	0.10	-20	260/280	RK10307	359.00	RK10310	610.20	RK10313	965.40		
	0.25	-20	260/280	RK10322	347.00	RK10325	610.20	RK10328	965.40		
	0.50	-20	260/280	RK10337	347.00	RK10340	610.20	RK10343	965.40		
	1.00	-20	260/280	RK10352	347.00	RK10355	610.20	RK10358	965.40		
	1.50	-20	250/270	RK10367	347.00	RK10370	610.20	RK10373	965.40		
	3.00	-20	240/260	RK10382	347.00	RK10385	610.20	RK10388	965.40		

Rtx®-1301 (Fused Silica)		(Crossbond® 94% dimethyl polysiloxane - 6% cyanopropylphenyl) Polymer stable to 280°C Applications: volatile organics, pharmaceutical samples, alcohols, oxygenates, pesticides, Aroclors®.									
ID (mm)	df (µm)	Temp. Range °C*		15m		30m		60m		105m	
0.25	0.10	-20	280	RK16005	\$317.10	RK16008	\$514.50	RK16011	\$861.30	RK16014	\$994.30
	0.25	-20	280	RK16020	305.20	RK16023	502.50	RK16026	861.30	RK16029	994.30
	0.50	-20	270	RK16035	305.20	RK16038	502.50	RK16041	861.30	RK16044	994.30
	1.00	-20	260	RK16050	305.20	RK16053	502.50	RK16056	861.30	RK16059	994.30
0.32	0.10	-20	280	RK16006	341.00	RK16009	550.40	RK16012	930.60	RK16015	1,161.90
	0.25	-20	280	RK16021	341.00	RK16024	538.50	RK16027	930.60	RK16030	1,161.90
	0.50	-20	270	RK16036	341.00	RK16039	538.50	RK16042	930.60	RK16045	1,161.90
	1.00	-20	260	RK16051	341.00	RK16054	538.50	RK16057	930.60	RK16060	1,161.90
	1.50	-20	250	RK16066	341.00	RK16069	538.50	RK16072	930.60	RK16075	1,161.90
0.53	0.10	-20	280	RK16007	359.00	RK16010	610.20	RK16013	965.40		
	0.25	-20	280	RK16022	347.00	RK16025	610.20	RK16028	965.40		
	0.50	-20	270	RK16037	347.00	RK16040	610.20	RK16043	965.40		
	1.00	-20	260	RK16052	347.00	RK16055	610.20	RK16058	965.40		
	1.50	-20	250	RK16067	347.00	RK16070	610.20	RK16073	965.40		
	3.00	-20	240	RK16082	347.00	RK16085	610.20	RK16088	965.40	RK16091	1,497.20
	3.00	-20	240								
	3.00	-20	240							75m →	RK16076 1,127.20

Crossbond® technology reduces bleed, prolongs column lifetime, and allows rejuvenation through solvent rinsing.

Please see page 107 for Restek's Capillary Column Rinsing Reservoir, product number RK20612.



# RESTEK CAPILLARY GC COLUMNS

## RESTEK FUSED SILICA COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Rtx®-1701 (Fused Silica)		(Crossbond® 86% methyl polysiloxane - 14% cyanopropylphenyl) Polymer stable to 280°C <b>Applications:</b> pesticides, Aroclors®, PCBs, alcohols, oxygenates, pharmaceuticals, solvents.							
ID (mm)	df (µm)	Temp. Range °C*		10m		20m		40m	
0.18	0.20	-20	280	RK42001	\$281.20	RK42002	\$430.80	RK42003	\$801.70
	0.40	-20	270/280	RK42010	281.20	RK42011	430.80	RK42012	801.70
				15m		30m		60m	
0.25	0.10	-20	280	RK12005	317.10	RK12008	514.50	RK12011	861.30
	0.25	-20	280	RK12020	305.20	RK12023	502.50	RK12026	861.30
	0.50	-20	270/280	RK12035	305.20	RK12038	502.50	RK12041	861.30
	1.00	-20	260/280	RK12050	305.20	RK12053	502.50	RK12056	861.30
0.32	0.10	-20	280	RK12006	341.00	RK12009	550.40	RK12012	930.60
	0.25	-20	280	RK12021	341.00	RK12024	538.50	RK12027	930.60
	0.50	-20	270/280	RK12036	341.00	RK12039	538.50	RK12042	930.60
	1.00	-20	260/280	RK12051	341.00	RK12054	538.50	RK12057	930.60
	1.50	-20	240/260	RK12066	341.00	RK12069	538.50	RK12072	930.60
0.53	0.10	-20	270/280	RK12007	359.00	RK12010	610.20	RK12013	965.40
	0.25	-20	270/280	RK12022	347.00	RK12025	610.20	RK12028	965.40
	0.50	-20	260/270	RK12037	347.00	RK12040	610.20	RK12043	965.40
	1.00	-20	250/270	RK12052	347.00	RK12055	610.20	RK12058	965.40
	1.50	-20	240/260	RK12067	347.00	RK12070	610.20	RK12073	965.40
	3.00	-20	230/250	RK12082	347.00	RK12085	610.20	RK12088	965.40

Rtx®-XLB (Fused Silica)		(Proprietary Phase) Polymer stable to 340°C <b>Applications:</b> pesticides, PCB congeners and PAHs.							
ID (mm)	df (µm)	Temp. Range °C*		15m		30m		60m	
0.25	0.10	30	340/360	RK12820	\$328.70	RK12808	\$563.50	RK12826	\$880.40
	0.25	30	340/360			RK12823	551.80		
	0.50	30	340/360	RK12850	328.70	RK12838	551.80		
	1.00	30	340/360			RK12853	551.80		
0.32	0.10	30	340/360	RK12821	352.10	RK12809	587.00	RK12827	950.90
	0.25	30	340/360			RK12824	581.10		
	0.50	30	340/360			RK12839	581.10		
	1.00	30	340/360			RK12854	581.10		
0.53	1.5	30	340/360	RK12867	358.00	RK12870	651.50		

### Prefer a different column cage for your Restek column?

- **5-inch column cage / Agilent 6850**  
Add the suffix "6850" to your column catalog number
- **Uncaged**  
Add the suffix "051" to your column catalog number
- **4-inch column cage** (not available for 0.53mm ID columns)  
Add the suffix "280" to your column catalog number

Please contact Technical Support for further details.



# RESTEK CAPILLARY GC COLUMNS

## RESTEK FUSED SILICA COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Rtx®-35 (Fused Silica)		(Crossbond® 65% dimethyl - 35% diphenyl polysiloxane) Polymer stable to 300°C Applications: pesticides, Aroclors®, amines, nitrogen-containing herbicides.								
ID (mm)	df (µm)	Temp. Range °C*		10m		20m		40m		
0.18	0.20	0	300/320	RK40401	\$281.20	RK40402	\$430.80	RK40403	\$801.70	
	0.40	0	290/310	RK40410	281.20	RK40411	430.80	RK40412	801.70	
				15m		30m		60m		105m
0.25	0.10	0	300/320	RK10405	317.10	RK10408	514.50	RK10411	861.30	RK10414 \$994.30
	0.25	0	300/320	RK10420	305.20	RK10423	502.50	RK10426	861.30	RK10429 994.30
	0.50	0	290/310	RK10435	305.20	RK10438	502.50	RK10441	861.30	RK10444 994.30
	1.00	0	280/300	RK10450	305.20	RK10453	502.50	RK10456	861.30	RK10459 994.30
0.32	0.10	0	300/320	RK10406	341.00	RK10409	550.40	RK10412	930.60	RK10415 1,133.00
	0.25	0	300/320	RK10421	329.00	RK10424	538.50	RK10427	930.60	RK10430 1,133.00
	0.50	0	290/310	RK10436	329.00	RK10439	538.50	RK10442	930.60	RK10445 1,133.00
	1.00	0	280/300	RK10451	329.00	RK10454	538.50	RK10457	930.60	RK10460 1,133.00
	1.50	0	270/290	RK10466	329.00	RK10469	538.50	RK10472	930.60	RK10475 1,133.00
	3.00	0	250/270	RK10481	341.00	RK10484	538.50	RK10487	930.60	RK10490 1,133.00
0.53	0.10	0	260/280	RK10407	359.00	RK10410	610.20	RK10413	965.40	
	0.25	0	260/280	RK10422	347.00	RK10425	610.20	RK10428	965.40	
	0.50	0	260/280	RK10437	347.00	RK10440	610.20	RK10443	965.40	
	1.00	0	260/280	RK10452	347.00	RK10455	610.20	RK10458	965.40	
	1.50	0	250/270	RK10467	347.00	RK10470	610.20	RK10473	965.40	
	3.00	0	240/260	RK10482	347.00	RK10485	610.20	RK10488	965.40	

Rtx®-35MS (Fused Silica)		(Crossbond® 35% diphenyl - 65% dimethyl polysiloxane) Polymer stable to 340°C Applications: pesticides, Aroclors®, amines, nitrogen-containing herbicides.								
ID (mm)	df (µm)	Temp. Range °C*		15m		30m				
0.25	0.10	-20	320/340	RK14605	\$359.00	RK14608	\$574.40			
	0.25	-20	320/340	RK14620	347.00	RK14623	562.30			
	0.50	-20	310/330	RK14635	347.00	RK14638	562.30			
	1.00	-20	290/310	RK14650	347.00	RK14653	562.30			
0.32	0.10	-20	320/340	RK14606	382.90	RK14609	598.30			
	0.25	-20	320/340	RK14621	370.90	RK14624	592.30			
	0.50	-20	310/330	RK14636	370.90	RK14639	592.30			
	1.00	-20	290/310	RK14651	370.90	RK14654	592.30			
0.53	0.50	-20	300/320	RK14637	376.90	RK14640	664.10			
	1.00	-20	290/310	RK14652	376.90	RK14655	664.10			
	1.50	-20	280/300	RK14667	376.90	RK14670	664.10			

Rtx®-35 Amine (Fused Silica)		(Crossbond® 35% diphenyl - 65% dimethyl polysiloxane) Polymer stable to 310°C Applications: specific column for amines and other basic compounds including alkylamines.								
ID (mm)	df (µm)	Temp. Range °C*		15m		30m				
0.25	0.05	0	290/310	RK11335	\$406.80	RK11338	\$610.20			
	1.00	0	280/300	RK11350	406.80	RK11353	610.20			
0.32	1.00	0	280/300	RK11351	430.80	RK11354	646.10			
	1.50	0	270/290	RK11366	430.80	RK11369	646.10			
0.53	1.00	0	260/280	RK11352	448.70	RK11355	717.90			
	3.00	0	240/260	RK11382	448.70	RK11385	717.90			

Press-Tight® Connectors can be used to connect guard columns with any fused silica column that has an OD of 0.33 to 0.74mm.

Press-Tight® Connectors . . . . . See page 82  
Fused Silica Guard Columns . . . . . See pages 61-63

# RESTEK CAPILLARY GC COLUMNS

## RESTEK FUSED SILICA COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Rtx®-50 (Fused Silica)		(Crossbond® 50% methyl - 50% phenyl polysiloxane) Polymer stable to 340°C Applications: pesticides, herbicides, phthalate esters, cholesterol, triglycerides, rosin acids.							
ID (mm)	df (µm)	Temp. Range °C*		10m		20m		40m	
0.18	0.20	0	310/330	RK40501	\$281.20	RK40502	\$430.80	RK40503	\$801.70
	0.40	0	300/320	RK40510	281.20	RK40511	430.80	RK40512	801.70
				15m		30m		60m	
0.25	0.10	0	300/320	RK10505	\$317.10	RK10508	\$514.50		
	0.25	0	300/320	RK10520	305.20	RK10523	502.50	RK10526	\$861.30
	0.50	0	290/310	RK10535	305.20	RK10538	502.50	RK10541	861.30
	1.00	0	280/300	RK10550	305.20	RK10553	502.50	RK10556	861.30
0.32	0.10	0	300/320	RK10506	341.00	RK10509	550.40		
	0.25	0	300/320	RK10521	329.00	RK10524	538.50	RK10527	930.60
	0.50	0	290/310	RK10536	329.00	RK10539	538.50	RK10542	930.60
	1.00	0	280/300	RK10551	329.00	RK10554	538.50	RK10557	930.60
0.53	0.25	0	280/300	RK10522	347.00				
	0.50	0	270/290	RK10537	347.00	RK10540	610.20	RK10543	982.70
	0.83	0	270/290			RK10569	628.20		
	1.00	0	260/280	RK10552	347.00	RK10555	610.20	RK10558	982.70
	1.50	0	250/270	RK10567	347.00	RK10570	610.20	RK10573	982.70

Rtx®-200 (Fused Silica)		(Crossbond® trifluoropropylmethyl polysiloxane) Polymer stable to 360°C Applications: environmental samples, solvents, Freons®, ketones, alcohols, silanes, glycols.							
ID (mm)	df (µm)	Temp. Range °C*		10m		20m		40m	
0.18	0.20	-20	310/330	RK45001	\$305.20	RK45002	\$466.70	RK45003	\$819.60
	0.40	-20	310/330	RK45010	305.20	RK45011	466.70	RK45012	819.60
				15m		30m		60m	
0.25	0.10	-20	320/340	RK15005	347.00	RK15008	550.40	RK15011	861.30
	0.25	-20	320/340	RK15020	335.00	RK15023	538.50	RK15026	861.30
	0.50	-20	310/330	RK15035	335.00	RK15038	538.50	RK15041	861.30
	1.00	-20	290/310	RK15050	335.00	RK15053	538.50	RK15056	861.30
0.32	0.10	-20	320/340	RK15006	376.90	RK15009	580.40	RK15012	930.60
	0.25	-20	320/340	RK15021	365.00	RK15024	568.30	RK15027	930.60
	0.50	-20	310/330	RK15036	365.00	RK15039	568.30	RK15042	930.60
	1.00	-20	290/310	RK15051	365.00	RK15054	568.30	RK15057	930.60
	1.50	-20	280/300	RK15066	365.00	RK15069	568.30	RK15072	930.60
0.53	0.10	-20	310/330	RK15007	406.80	RK15010	652.10	RK15013	1,005.80
	0.25	-20	310/330	RK15022	394.80	RK15025	640.20	RK15028	1,005.80
	0.50	-20	300/320	RK15037	394.80	RK15040	640.20	RK15043	1,005.80
	1.00	-20	290/310	RK15052	394.80	RK15055	640.20	RK15058	1,005.80
	1.50	-20	280/300	RK15067	394.80	RK15070	640.20	RK15073	1,005.80
	3.00	-20	260/280	RK15082	394.80	RK15085	640.20	RK15088	1,005.80
								RK15091	1,242.80

### Which septa should I use?

Select septa based on the injection port temperature you will use. Generally, septa with lower thermal limits are softer, and thus are easier to seal or to pierce with a needle. However, softer septa are more prone to damage caused by over tightening the septum nut, and this can reduce the life of the septum. Change all septa regularly, regardless of their thermal limits, to avoid coring and bleed.

For GC Septa . . . . . See pages 85 - 87



# RESTEK CAPILLARY GC COLUMNS

## RESTEK FUSED SILICA COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Rtx®-200MS (Fused Silica)		(Crossbond® trifluoropropylmethyl polysiloxane) Polymer stable to 360°C Applications: similar to Rtx-200. Low bleed column.							
ID (mm)	df (µm)	Temp. Range °C*		15m		30m			
0.25	0.10	-20	320/340	RK15605	\$370.00	RK15608	\$574.40		
	0.25	-20	320/340	RK15620	359.00	RK15623	562.30		
	0.50	-20	310/330	RK15635	359.00	RK15638	562.30		
	1.00	-20	290/310	RK15650	359.00	RK15653	562.30		
0.32	0.10	-20	320/340	RK15606	394.80	RK15609	598.30		
	0.25	-20	320/340	RK15621	382.90	RK15624	592.30		
	0.50	-20	310/330	RK15636	382.90	RK15639	592.30		
	1.00	-20	290/310	RK15651	382.90	RK15654	592.30		
0.53	0.50	-20	300/320	RK15637	388.90	RK15640	676.00		
	1.00	-20	290/310	RK15652	388.90	RK15655	676.00		
	1.50	-20	280/300	RK15667	388.90	RK15670	676.00		

Rtx®-65 (Fused Silica)		(Crossbond® 35% dimethyl polysiloxane - 65% diphenyl) Stable to 320°C Applications: phenols and fatty acids.							
ID (mm)	df (µm)	Temp. Range °C*		15m		30m			
0.25	0.25	50	300	RK17020	\$365.00	RK17023	\$562.30		
	0.50	50	280/300	RK17035	365.00	RK17038	562.30		
	1.00	50	260/280	RK17050	365.00	RK17053	562.30		
0.32	0.25	50	300	RK17021	388.90	RK17024	598.30		
	0.50	50	280/300	RK17036	388.90	RK17039	598.30		
	1.00	50	260/280	RK17051	388.90	RK17054	598.30		
0.53	0.25	50	290/300	RK17022	418.80	RK17025	670.00		
	0.50	50	270/290	RK17037	418.80	RK17040	670.00		
	1.00	50	250/270	RK17052	418.80	RK17055	670.00		

Rtx®-65TG (Fused Silica)		(Crossbond® 35% dimethyl polysiloxane - 65% diphenyl) Polymer stable to 370°C Applications: triglycerides. Not to be used for compounds with active oxygenated groups.							
ID (mm)	df (µm)	Temp. Range °C*		15m		30m			
0.25	0.10	20	370	RK17005	\$359.00	RK17008	\$568.30		
0.32	0.10	20	370	RK17006	382.90	RK17009	604.20		
0.53	0.10	20	360/370	RK17007	412.80	RK17010	670.00		

Rtx®-225 (Fused Silica)		(Crossbond® 50% phenylmethyl polysiloxane - 50% cyanopropylmethyl) Polymer stable to 260°C Applications: FAMES, carbohydrates, neutral sterols.							
ID (mm)	df (µm)	Temp. Range °C*		15m		30m		60m	
0.25	0.10	40	220/240	RK14005	\$305.20	RK14008	\$514.50	RK14026 RK14041	\$861.30 861.30
	0.25	40	220/240	RK14020	293.10	RK14023	502.50		
	0.50	40	220/240	RK14035	293.10	RK14038	502.50		
0.32	0.10	40	220/240	RK14006	329.00	RK14009	550.40	RK14012	901.80
	0.25	40	220/240	RK14021	317.10	RK14024	538.50	RK14027	930.60
	0.50	40	220/240	RK14036	317.10	RK14039	538.50	RK14042	930.60
	1.00	40	200/220	RK14051	317.10	RK14054	538.50	RK14057	930.60
0.53	0.10	40	200/220	RK14007	347.00	RK14010	610.20	RK14013	1,017.40
	0.25	40	200/220	RK14022	347.00	RK14025	610.20	RK14028	982.70
	0.50	40	200/220	RK14037	347.00	RK14040	610.20	RK14043	1,011.60
	1.00	40	200/220	RK14052	347.00	RK14055	610.20	RK14058	1,011.60

# RESTEK CAPILLARY GC COLUMNS

## RESTEK FUSED SILICA COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Stabilwax® (Fused Silica)		(Crossbond® Carbowax® - provides oxidation resistance) Polymer stable to 250°C <b>Applications:</b> FAMES, flavours, acids, essential oils, amines, solvents, xylene isomers, BTEX, EPA Method 603.								
ID (mm)	df (µm)	Temp. Range °C*		15m		30m		60m		
0.25	0.10	40	250/260	RK10605	\$335.00	RK10608	\$514.50	RK10611	\$884.40	
	0.25	40	250/260	RK10620	323.10	RK10623	514.50	RK10626	884.40	
	0.50	40	250/260	RK10635	323.10	RK10638	514.50	RK10641	884.40	
0.32	0.10	40	250/260	RK10606	352.90	RK10609	562.30	RK10612	965.40	
	0.25	40	250/260	RK10621	341.00	RK10624	550.40	RK10627	965.40	
	0.50	40	250/260	RK10636	341.00	RK10639	550.40	RK10642	953.70	
	1.00	40	240/250	RK10651	341.00	RK10654	550.40	RK10657	953.70	
0.53	0.10	40	250/260	RK10607	365.00	RK10610	628.20	RK10613	988.50	
	0.25	40	250/260	RK10622	365.00	RK10625	628.20	RK10628	988.50	
	0.50	40	250/260	RK10637	365.00	RK10640	628.20	RK10643	988.50	
	1.00	40	240/250	RK10652	365.00	RK10655	628.20	RK10658	988.50	
	1.50	50	230/240	RK10666	382.90	RK10669	628.20	RK10672	988.50	
	2.00	50	220/230	RK10667	382.90	RK10670	628.20			

Rtx®-WAX (Fused Silica)		(Crossbond® polyethylene glycol) Polymer stable to 250°C Applications: FAMES, flavours, essential oils, solvents, xylene isomers, BTEX.								
ID (mm)	df (µm)	Temp. Range °C*		10m		20m				
0.10	0.10	20	250	RK41601	\$347.00	RK41602	\$568.30			
	0.20	20	240/250	RK41603	347.00	RK41604	568.30			
				15m		30m		60m		
0.25	0.10	20	250	RK12405	\$335.00	RK12408	\$514.50	RK12426      \$884.40 RK12441      884.40		
	0.25	20	250	RK12420	323.10	RK12423	514.50			
	0.50	20	250	RK12435	323.10	RK12438	514.50			
0.32	0.10	20	250	RK12406	352.90	RK12409	562.30	RK12427      953.70 RK12442      953.70 RK12457      953.70		
	0.25	20	250	RK12421	341.00	RK12424	550.40			
	0.50	20	250	RK12436	341.00	RK12439	550.40			
	1.00	20	240/250	RK12451	341.00	RK12454	550.40			
0.53	0.25	20	250	RK12422	365.00	RK12425	628.20	RK12443      988.50 RK12458      988.50		
	0.50	20	250	RK12437	365.00	RK12440	628.20			
	1.00	20	240/250	RK12452	365.00	RK12455	628.20			

FAMEWAX™ (Fused Silica)		(Crossbond® polyethylene glycol) Stable to 250°C <b>Applications:</b> essential oils, FAMES, polar solvents.						
ID (mm)	df (μm)	Temp. Range °C*			30m			
0.25	0.25	20	250		RK12497	\$526.50		
0.32	0.25	20	250		RK12498	574.40		
0.53	0.50	20	250		RK12499	640.20		

### Need Split or Splitless Injection Port Liners?

Injection port liners for Agilent, Varian and other GC models can be found on pages 88-92.

# RESTEK CAPILLARY GC COLUMNS

## RESTEK FUSED SILICA COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Rt-CW20M™ F&F (Fused Silica)		(Proprietary phase, non-bonded; similar selectivity to non-bonded Carbowax®) Stable to 220°C <b>Applications:</b> food and flavour analysis.					
ID (mm)	df (µm)	Temp. Range °C*		30m		50m	
0.25	0.25	60	220	RK12523	\$514.50		
0.32	0.33	60	220			RK12539	\$945.20

Stabilwax®-DA (Fused Silica)		(Crossbond® Carbowax® - for acidic compounds) Polymer stable to 250°C <b>Applications:</b> underivatized free fatty acids.								
ID (mm)	df (µm)	Temp. Range °C*		15m		30m		60m		
0.25	0.10	40	250/260	RK11005	\$341.00	RK11008	\$532.50	RK11011	\$884.40	
	0.25	40	250/260	RK11020	329.00	RK11023	532.50	RK11026	884.40	
	0.50	40	250/260	RK11035	329.00	RK11038	532.50	RK11041	884.40	
0.32	0.10	40	250/260	RK11006	352.90	RK11009	574.40	RK11012	953.70	
	0.25	40	250/260	RK11021	341.00	RK11024	574.40	RK11027	953.70	
	0.50	40	250/260	RK11036	341.00	RK11039	574.40	RK11042	953.70	
	1.00	40	240/250	RK11051	341.00	RK11054	574.40	RK11057	953.70	
0.53	0.10	40	250/260	RK11007	394.80	RK11010	652.10	RK11013	1,080.90	
	0.25	40	250/260	RK11022	382.90	RK11025	652.10	RK11028	1,046.30	
	0.50	40	250/260	RK11037	382.90	RK11040	652.10	RK11043	1,046.30	
	1.00	40	240/250	RK11052	382.90	RK11055	652.10	RK11058	1,046.30	
	1.50	40	230/240	RK11062	394.80	RK11065	652.10	RK11068	1,080.90	

Stabilwax®-DB (Fused Silica)		(Crossbond® Carbowax® - for amines and basic compounds) Polymer stable to 220°C <b>Applications:</b> amines, other basic compounds.								
ID (mm)	df (µm)	Temp. Range °C*		15m		30m		60m		
0.25	0.25	40	210/220	RK10820	\$388.90	RK10823	\$598.30			
	0.50	40	210/220			RK10838	598.30			
0.32	0.25	40	210/220	RK10821	406.80	RK10824	652.10			
	0.50	40	210/220			RK10839	652.10			
	1.00	40	210/220			RK10854	652.10	RK10857	\$1,109.90	
0.53	0.50	40	210/220	RK10852	448.70	RK10840	753.80			
	1.00	40	210/220			RK10855	753.80	RK10858	1,248.60	
	1.50	40	210/220			RK10869	765.80			

Rtx®-2330 (Fused Silica)		(10% phenylcyanopropyl - 90% biscyanopropyl) Polymer stable to 275°C <b>Applications:</b> FAMES, cis/trans isomers, TCDDs and TCDFs. <b>NOTE: Not Solvent Rinsable</b>									
ID (mm)	df (µm)	Temp. Range °C*		10m		20m		40m			
0.18	0.10	0	260/275	RK40701	\$287.10	RK40702	\$436.70	RK40703	\$807.70		
				15m		30m		60m		105m	
0.25	0.10	0	260/275	RK10705	329.00	RK10708	526.50	RK10711	919.10	RK10714	\$1,121.40
	0.20	0	260/275	RK10720	329.00	RK10723	526.50	RK10726	919.10	RK10729	1,121.40
0.32	0.10	0	260/275	RK10706	352.90	RK10709	574.40	RK10712	976.90	RK10715	1,213.90
	0.20	0	260/275	RK10721	352.90	RK10724	574.40	RK10727	976.90	RK10730	1,213.90
0.53	0.10	0	260/275	RK10707	388.90	RK10710	640.20	RK10713	1,052.00		
	0.20	0	260/275	RK10722	388.90	RK10725	640.20	RK10728	1,052.00		



# RESTEK CAPILLARY GC COLUMNS

## RESTEK FUSED SILICA COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Rt-2560 (Fused Silica)		(Highly polar phase; bis cyanopropylpolysiloxane - not bonded) Polymer stable to 250°C <b>Applications:</b> Application-specific column for cis/trans FAMES.					
ID (mm)	df (µm)	Temp. Range °C*					100m
0.25	0.20	20	250				RK13199 \$1,628.30

Rtx-440 (Fused Silica)		(Proprietary intermediate-polarity Crossbond® phase) Polymer stable to 340°C <b>Applications:</b> pesticides and PAHs.					
ID (mm)	df (µm)	Temp. Range °C*			30m		
0.25	0.25	20	320/340		RK12923	\$562.30	
	0.50	20	320/340		RK12938	562.30	
0.32	0.25	20	320/340		RK12924	592.30	
	0.50	20	320/340		RK12939	592.30	
0.53	0.50	20	320/340		RK12940	664.10	
	1.00	20	320/340		RK12955	664.10	

Rtx®-CLPesticides (Fused Silica)		(Proprietary phase) Stable to 340°C <b>Applications:</b> EPA Methods 8081, 608 and CLP (chlorinated pesticides).					
ID (mm)	df (µm)	Temp. Range °C*			30m		
0.25	0.25	-20	320/340		RK11123	\$574.40	
0.32	0.50	-20	310/330		RK11139	610.20	
0.53	0.50	-20	300/320		RK11140	676.00	

Rtx®-CLPesticides2 (Fused Silica)		(Proprietary phase) Stable to 340°C <b>Applications:</b> confirmation column for Rtx-CLPesticides with 4 elution order changes.					
ID (mm)	df (µm)	Temp. Range °C*			30m		
0.25	0.20	-20	320/340		RK11323	\$574.40	
0.32	0.25	-20	310/330		RK11324	610.20	
0.53	0.42	-20	300/320		RK11340	676.00	

Rtx-PCB (Fused Silica)		(Proprietary phase) Polymer stable to 320°C <b>Applications:</b> PCB analysis by GC/ECD or GC/MS.					
ID (mm)	df (µm)	Temp. Range °C*		20m	30m	40m	60m
0.18	0.18	30	320/340	RK41302 \$454.60		RK41303 \$801.70	RK41304 \$965.40
0.25	0.25	30	320/340		RK13223 562.30		RK13226 867.10
0.32	0.50	30	320/340		RK13239 592.30		

Chromatographic Specialties Inc. carries analytical standards for the analysis of pesticides, PCBs, petrochemicals, pharmaceuticals and other compounds.

Please see pages 227-258 for further information.

# RESTEK CAPILLARY GC COLUMNS

## RESTEK FUSED SILICA COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Rtx®-VMS (Fused Silica)		(Proprietary phase) Polymer stable to 280°C Applications: EPA Method 8260, volatile analysis by GC/MS.						
ID (mm)	df (µm)	Temp. Range °C*		20m		40m		
0.18	1.00	-40	240/260		RK49914 \$502.50	RK49915	\$855.50	
				30m	60m			
0.25	1.40	-40	240/260	RK19915 \$574.40	RK19916 \$919.10			
0.32	1.80	-40	240/260	RK19919 610.20	RK19920 994.30			
0.45	2.55	-40	240/260	RK19908 694.00	RK19909 1,080.90			

Rtx®-VGC (Fused Silica)		(Proprietary phase) Polymer stable to 260°C Applications: EPA volatile organic methods, excellent for EPA Method 8021A analysis.						
ID (mm)	df (µm)	Temp. Range °C*		20m		40m		
0.18	1.00	-40	240/260		RK49414 \$502.50	RK49415	\$855.50	
				30m	60m	75m		
0.25	1.40	-40	240/260	RK19415 \$574.40	RK19416 \$919.10			
0.32	1.80	-40	240/260	RK19419 610.20	RK19420 994.30			
0.45	2.55	-40	240/260	RK19408 694.00		RK19409	1,150.30	

Rtx®-VRX (Fused Silica)		(Proprietary phase) Polymer stable to 260°C Applications: EPA volatile organic methods, excellent for EPA Method 8021 analysis.						
ID (mm)	df (µm)	Temp. Range °C*		20m		40m		
0.18	1.00	-40	240/260		RK49314 \$502.50	RK49315	\$855.50	
				30m	60m	75m		
0.25	1.40	-40	240/260	RK19315 \$574.40	RK19316 \$919.10			
0.32	1.80	-40	240/260	RK19319 610.20	RK19320 994.30			
0.45	2.55	-40	240/260	RK19308 694.00		RK19309	1,150.30	

Rtx®-502.2 (Fused Silica)		(EPA Volatiles In Methods 502.2, 524.2) Polymer stable to 270°C Applications: EPA Method 502.2, volatile organics.						
ID (mm)	df (µm)	Temp. Range °C*		20m		40m		
0.18	1.00	-20	250/270		RK40914 \$460.60	RK40915	\$825.60	
				30m	60m	105m		
0.25	1.40	-20	250/270		RK10915 550.40	RK10916	\$884.40	
0.32	1.80	-20	250/270		RK10919 586.30	RK10920 953.70	RK10921	\$1,156.10
0.53	3.00	-20	250/270		RK10908 652.10	RK10909 982.70	RK10910	1,271.70

# RESTEK CAPILLARY GC COLUMNS

## RESTEK FUSED SILICA COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Rtx®-624 (Fused Silica)		(Crossbond® 6% cyanopropylphenyl - 94% dimethyl polysiloxane) Polymer stable to 280°C <b>Applications:</b> EPA Methods 502.2, 524, 624, 8240 and 8260.							
ID (mm)	df (µm)	Temp. Range °C*		20m		40m			
0.18	1.00	-20	240		RK40924 \$460.60	RK40925	\$825.60		
				30m	60m	75m	105m		
0.25	1.40	-20	240	RK10968 \$562.30	RK10969 \$884.40				
0.32	1.80	-20	240	RK10970 604.20	RK10972 953.70				
0.53	3.00	-20	240	RK10971 640.20	RK10973 1,005.80	RK10974 \$1,190.80	RK10975 \$1,289.00		

Rtx®-Dioxin (Fused Silica)		(Proprietary phase) Polymer stable to 380°C <b>Applications:</b> Dioxin or furan congeners.							
ID (mm)	df (µm)	Temp. Range °C*		60m					
0.25	0.15	-60	380		RK10755 \$872.90				

Rtx®-Dioxin2 (Fused Silica)		(Proprietary phase) Polymer stable to 320°C <b>Applications:</b> Dioxin or furan congeners.							
ID (mm)	df (µm)	Temp. Range °C*		40m	60m				
0.18	0.18	20	320	RK10759 \$825.60					
0.25	0.25	20	320		RK10758 \$913.30				

Rtx®-Volatiles (Fused Silica)		(EPA Volatile Organic Methods) Polymer stable to 280°C <b>Applications:</b> volatile organics, trihalomethanes.							
ID (mm)	df (µm)	Temp. Range °C*		30m		60m	105m		
0.25	1.00	-20	270/280		RK10900 \$550.40	RK10903 \$884.40			
0.32	1.50	-20	270/280		RK10901 586.30	RK10904 953.70			
0.53	2.00	-20	270/280		RK10902 652.10	RK10905 988.50	RK10906 \$1,271.70		

Rtx®-TNT (Fused Silica)		(Proprietary phase) Polymer stable to 340°C <b>Applications:</b> Explosives							
ID (mm)	df (µm)	Temp. Range °C*		6m					
0.53	1.50	-20	300/310	RK12998** \$412.80					

\*\* Pkg. 3

Rtx®-TNT2 (Fused Silica)		(Proprietary phase) Polymer stable to 340°C <b>Applications:</b> Explosives							
ID (mm)	df (µm)	Temp. Range °C*		6m					
0.53	1.50	-20	300/310	RK12999** \$412.80					

\*\* Pkg. 3



# RESTEK CAPILLARY GC COLUMNS

## RESTEK FUSED SILICA COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

Rtx®-BAC (Fused Silica)		(Proprietary phase) Applications: blood alcohol analysis, solvents in blood.					
ID (mm)	df (µm)	Temp. Range °C*			30m		
0.32	1.20	-20	240/260	(Rtx-BAC2) →	RK18002	\$598.30	
	1.80	-20	240/260	(Rtx-BAC1) →	RK18003	598.30	
0.53	2.00	-20	240/260	(Rtx-BAC2) →	RK18000	\$634.20	
	3.00	-20	240/260	(Rtx-BAC1) →	RK18001	634.20	

Rtx®-G27 (Fused Silica) w/5m Integra-Guard™ Column		(Crossbond® 5% diphenyl/95% dimethyl polysiloxane) Stable to 360°C Applications: residual solvents in USP <467>.					
ID (mm)	df (µm)	Temp. Range °C*			30m		
0.53	5.00	-60	270/290		RK10279126	\$682.10	

Stx-500 (Fused Silica)		(Crossbond® Carborane/dimethyl polysiloxane) Polymer stable to 380°C Applications: application specific column for brominated flame retardants and co-planar PCB congeners.					
ID (mm)	df (µm)	Temp. Range °C*			30m		60m
0.25	0.15	-60	380		RK10750	\$568.30	RK10751 \$855.50
0.53	0.15	-60	380		RK10752	664.10	

### What ferrules do I use with my column?

One-piece ferrules are available in two designs: the standard 1/16" compression-type and the short, compact design. Agilent GCs typically use the compact design at the injector and detector.

GC Ferrules . . . . . See pages 93-97

## INTEGRA-GUARD™

### Integrated Guard Columns

No guard column system is more permanent than one continuous length of tubing containing both the guard column and the analytical column.

Restek offers a wide variety of Integra-Guard™ capillary columns. A guaranteed leak-free connection! The column is tied using high temperature string with the guard column set apart from the analytical column. The transition area between the columns is the point at which the guard column ends and the analytical column begins. The entire setup is suspended in the unique "crush-free" cage that prevents the column from coming in contact with anything that could damage it.

#### TECH TIP

In capillary GC, the recommended way to set carrier gas flow rate is to inject a non-retained compound and calculate linear velocity in cm/sec.

Ordering is easy. Just add the appropriate suffix number and price to the analytical column's catalogue number and price. For example, a 30m, 0.25mm ID, 0.25µm Rtx®-5 with a 5-metre Integra-Guard column is RK10223124.

mm ID	Length	Suffix #
0.25	5m	124
	10m	127
0.32	5m	125
	10m	128
0.53	5m	126
	10m	129

## RESTEK FUSED SILICA PLOT COLUMNS

\*The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

### POROUS POLYMERS: Rt-QPLOT™, Rt-SPLOT™ and Rt-UPLOT™ COLUMNS

Unlike molecular sieve and alumina columns, porous polymer PLOT columns are **NOT MOISTURE SENSITIVE**, making them particularly useful for applications where moisture is of major concern.

They also do not have a minimum operating temperature because there is no phase transition point with the column material.

Rt-QPLOT™ (Fused Silica)	(True Divinylbenzene Homopolymer PLOT column) Stable to 250°C Applications: light hydrocarbons, aldehydes, ketones, chlorofluorocarbons, carbon dioxide.					
ID (mm)	Temp. Range °C*	15m		30m		
0.32	up to 250	RK19717	\$460.60	RK19718	\$634.20	
0.53	up to 250	RK19715	490.60	RK19716	694.00	

Rt-SPLOT™ (Fused Silica)	(Divinylbenzene and 4-vinylpyridine copolymer PLOT column) Stable to 250°C Applications: light hydrocarbons, aldehydes, ketones, chlorofluorocarbons and carbon dioxide.					
ID (mm)	Temp. Range °C*	15m		30m		
0.32	up to 250	RK19711	\$472.70	RK19710	\$646.10	
0.53	up to 250	RK19713	502.50	RK19712	694.00	

Rt-UPLOT™ (Fused Silica)	(Polar divinylbenzene and ethyleneglycol/dimethylacrylate copolymer PLOT column) Stable to 190°C Applications: gases, solvents, confirmation column for Rt-Q and Rt-S.					
ID (mm)	Temp. Range °C*	15m		30m		
0.32	up to 190	RK19725	\$460.60	RK19724	\$646.10	
0.53	up to 190	RK19727	490.60	RK19726	694.00	

## MOLECULAR SIEVE 5A PLOT COLUMNS

Molecular sieve 5A PLOT columns separate Ar/O<sub>2</sub> and H<sub>2</sub>/He at ambient temperature or above. These columns also are an excellent choice for rapid separation of permanent gases in refinery or natural gas.

Rt-Msieve™ 5A PLOT (Fused Silica)	(Molecular Sieve 5A PLOT column) Stable to 300°C Applications: argon/oxygen separation, hydrogen/helium separation.					
ID (mm)	Temp. Range °C*	15m		30m		
0.53	up to 300	RK19721	502.50	RK19723	\$694.00	

### TECH TIP

Molecular sieve materials are very hydrophilic, they will adsorb water from the sample or carrier gas. Water contamination can have a detrimental effect on peak symmetry and can reduce the resolution of all compounds. If water contamination occurs, reactivate your Rt-Msieve™ 5A PLOT column by conditioning at 300°C with dry carrier gas flow for 3 hours.

# RESTEK Silcosteel® CAPILLARY GC COLUMNS

We realize that there are some harsh environments or special applications where fused silica tubing may not be the ideal material. For these circumstances Restek offers MXT® capillary columns. In fact, Silcosteel parts are used to monitor the cabin systems on the space shuttle and Silcosteel-treated MXT columns are an important part of the Cassini Mission to Saturn.

MXT columns are made from unbreakable, thin wall, stainless steel that has been treated with their Silcosteel® process. This process deposits a submicron layer of flexible fused silica on the inside of the tubing giving it the same inertness as an Rtx® column, but with the ruggedness of stainless steel. MXT columns are caged in smaller diameter coils, making them ideal for portable or process control GCs such as the SRI.

For further information on portable SRI GCs, see pages 220-224.



## RESTEK SILCOSTEEL COLUMNS

### Unbreakable Metal Capillary Columns

\* The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

MXT®-1 (Silcosteel®)		(Crossbond® 100% dimethyl polysiloxane) Polymer stable to 400°C Applications: simulated distillation, solvents, petroleum products, pharmaceutical samples, waxes, fuel oils.									
ID (mm)	df (µm)	Temp. Range °C*		15m		30m		60m		105m	
0.25	0.10	-60	400	RK70105	\$305.20	RK70116	\$532.50	RK70117	\$900.50	RK70114	\$1,042.70
	0.25	-60	360	RK70120	305.20	RK70123	532.50	RK70126	900.50	RK70129	1,042.70
	0.50	-60	350	RK70135	305.20	RK70138	532.50	RK70141	900.50	RK70144	1,042.70
	1.00	-60	340	RK70150	305.20	RK70153	532.50	RK70156	900.50	RK70159	1,042.70
0.28	0.10	-60	400	6m →		RK70102	299.20				
	0.10	-60	360	RK70106	347.00	RK70109	580.40				
	0.25	-60	360	RK70121	347.00	RK70124	580.40	RK70127	983.40		
	0.50	-60	330	RK70136	347.00	RK70139	580.40	RK70142	983.40		
	1.00	-60	320	RK70151	347.00	RK70154	580.40	RK70157	983.40		
	3.00	-60	285	RK70181	347.00	RK70184	580.40	RK70187	983.40		
0.53	0.15	-60	400	6m →		RK70101	299.20				
	0.25	-60	360	RK70122	365.00	RK70125	640.20	RK70128	1,019.00		
	0.50	-60	330	RK70137	365.00	RK70140	640.20	RK70143	1,019.00		
	1.00	-60	320	RK70152	365.00	RK70155	640.20	RK70158	1,019.00		
	1.50	-60	310	RK70167	365.00	RK70170	640.20	RK70173	1,019.00		
	3.00	-60	285	RK70182	365.00	RK70185	640.20	RK70188	1,019.00	RK70189	1,309.30
	5.00	-60	270	RK70177	376.90	RK70179	646.10	RK70183	1,019.00		
	7.00	-60	250	RK70191	376.90	RK70192	646.10	RK70193	1,019.00		

MXT®-2887 (Silcosteel®)		(Crossbond® 100% dimethyl polysiloxane - for Sim Dist) Polymer stable to 400+°C Applications: simulated distillation.									
ID (mm)	df (µm)	Temp. Range °C*		10m							
0.53	2.65	-60	400+	RK70199	\$263.30						

MXT®-5 (Silcosteel®)		(Crossbond® 95% dimethyl - 5% diphenyl polysiloxane) Polymer stable to 360°C Applications: semi-volatiles, pesticides, PCBs, environmental samples, essential oils.									
ID (mm)	df (µm)	Temp. Range °C*		15m		30m		60m			
0.28	0.25	-60	360	RK70221	\$347.00	RK70224	\$580.40	RK70227	\$983.40		
	0.50	-60	330	RK70236	347.00	RK70239	580.40	RK70242	983.40		
	1.00	-60	325	RK70251	347.00	RK70254	580.40	RK70257	983.40		
	3.00	-60	290	RK70281	347.00	RK70284	580.40	RK70287	983.40		
0.53	0.25	-60	360	RK70222	365.00	RK70225	640.20	RK70228	1,019.00		
	0.50	-60	330	RK70237	365.00	RK70240	640.20	RK70243	1,019.00		
	1.00	-60	325	RK70252	365.00	RK70255	640.20	RK70258	1,019.00		
	1.50	-60	300	RK70267	365.00	RK70270	640.20	RK70273	1,019.00		
	3.00	-60	290	RK70282	365.00	RK70285	640.20	RK70288	1,019.00		
	5.00	-60	270	RK70277	376.90	RK70279	646.10	RK70283	1,019.00		

# RESTEK Silcosteel® CAPILLARY GC COLUMNS

## RESTEK SILCOSTEEL COLUMNS

\* The maximum temperatures listed are for 15 and 30 metre lengths. Longer lengths may have a slightly reduced maximum temperature.

MXT®-1701 (Silcosteel®)		(Crossbond® 86% methyl polysiloxane - 14% cyanopropylphenyl) Polymer stable to 280°C <b>Applications:</b> pesticides, Aroclors®, PCBs, alcohols, oxygenates, pharmaceuticals, solvents.					
ID (mm)	df (µm)	Temp. Range °C*		15m	30m	60m	
0.28	0.25	-20	280	RK72021	\$347.00	RK72024	\$580.40
	0.50	-20	270	RK72036	347.00	RK72039	580.40
	1.00	-20	260	RK72051	347.00	RK72054	580.40
	1.50	-20	250	RK72066	347.00	RK72069	580.40
0.53	0.25	-20	280	RK72022	365.00	RK72025	640.20
	0.50	-20	270	RK72037	365.00	RK72040	640.20
	1.00	-20	260	RK72052	365.00	RK72055	640.20
	1.50	-20	250	RK72067	365.00	RK72070	640.20
	3.00	-20	240	RK72082	365.00	RK72085	640.20

MXT®-WAX (Silcosteel®)		(Crossbond® Carbowax® - provides oxidation resistance) Polymer stable to 250°C <b>Applications:</b> FAMES, flavours, acids, essential oils, amines, solvents, xylene isomers, BTEX, EPA Method 603.					
ID (mm)	df (µm)	Temp. Range °C*		15m	30m	60m	
0.28	0.25	40	250	RK70621	\$347.00	RK70624	\$580.40
	0.50	40	250	RK70636	347.00	RK70639	580.40
	1.00	40	240	RK70651	347.00	RK70654	580.40
0.53	0.25	40	250	RK70622	365.00	RK70625	640.20
	0.50	40	250	RK70637	365.00	RK70640	640.20
	1.00	40	240	RK70652	365.00	RK70655	640.20
	1.50	50	230	RK70666	376.90	RK70669	646.10
	2.00	50	230	RK70667	376.90	RK70670	646.10

Other MXT® phases are available. Please contact our Technical Support Department for further information.

For Silcosteel® MXT® Guard Columns, please see page 63.

## RESTEK SILCOSTEEL® MICROPACKED COLUMNS

- Increased efficiency over traditional packed columns
- Higher capacity than PLOT columns
- Made from inert, flexible Silcosteel®-treated stainless steel tubing
- Silcosteel®-treated, braided-wire end plugs keep packing intact, even under intense pressure surges during valve switching
- Easy to install - multiple internal diameters

Restek Silcosteel® Micropacked columns are designed to fit packed and capillary injection systems. 1mm ID, standard wall (1/16" OD) micropacked columns offer improved efficiency in packed column instruments, without the expense of converting to capillary injection systems. 0.75mm ID, thin wall (0.95mm OD) micropacked columns install easily into a capillary injector, using slightly larger ferrules. Micropacked columns operate at flows exceeding 10cc/min., for trouble-free operation.

ShinCarbon ST 100/120 Micropacked Columns (Silcosteel®)		High surface area carbon molecular sieve (~1500 m²/g). Stable to 330°C. <b>Applications:</b> permanent gases, light hydrocarbons.					
ID (mm)	OD	Temp. Range °C*		1m	2m		
2.0	1/8"	up to 330			RK80486800	\$394.50	
1.0	1/16"	up to 330		RK19809	\$279.80	RK19808	315.60
0.75	0.95mm	up to 330		RK19810	279.80		



# AGILENT CAPILLARY GC COLUMNS

## AGILENT / J & W COLUMNS — OPTIMIZED FOR PEAK PERFORMANCE!



### J & W Low Bleed Columns Are A Smart Choice!

J & W invests heavily in R&D for superior performing, low-bleed GC columns. J & W's unique polymer chemistry and proprietary surface deactivation enhance the performance of siloxane polymers. The chemists at J & W are obsessed with reducing column bleed and developing new stationary phase chemistries. Column bleed is the degradation of the stationary phase polymer that accelerates as temperature increases, resulting in an elevated baseline.

Analytical sensitivities and detection limits are ultimately dictated by the signal to noise ratio. Decrease the noise and the sensitivity will increase. Reducing column bleed will help eliminate noise that can decrease detector sensitivity, increase instrument downtime, decrease column lifetime and lower reproducibility at trace levels. J & W low-bleed GC columns also provide the advantages of superior inertness and increased upper temperature limits.

### Better Precision for Better Results

J & W Scientific columns adhere to very high retention factor specifications, helping to ensure consistent retention from column to column. To assure separation reproducibility for the widest range of compounds, at least three retention indices are measured for each column. Narrow retention index ranges help ensure reproducible peak separations from column to column.

### Higher Performance — Nice and Narrow Peaks

Theoretical plates per metre is a measurement of column efficiency. Columns with higher plate counts generate the narrowest peaks, improving the resolution of closely eluting peaks. J & W pays close attention to the surface deactivation processes and coating of the stationary phase to obtain the highest number of theoretical plates. Their stringent QC performance evaluation tests provide the utmost confidence in the qualitative and quantitative results, especially for difficult to chromatograph compounds. J & W measures peak height ratios for acidic and basic compounds to ensure the highest column performance for the widest range and types of compounds. Peak symmetry and tailing are also carefully monitored for a broad range of chemical active compounds.



Maintain your Agilent GC/MS with genuine Agilent replacement parts. Chromatographic Specialties Inc. inventories many of these items, including 5972/5973 filament assemblies and electron multiplier horns.

Request literature code **AG11** to receive an informative guide for maintaining your GC/MS, or contact our Technical Support Group at 1-800-267-8103 to discuss your particular needs.

### J & W COLUMN PERFORMANCE CRITERIA

Feature	Advantage	Benefit
Narrow Retention Index and Retention Factor Window	Highest level of column-to-column reproducibility	Confidence in analytical results
	Minimal method adjustment when changing columns	Improved sample throughput Reduced downtime
	Specify J & W chemistry for intra-company methodologies	Confidence in method transfer and intra-company results
Increase Plates per Meter	Highest level of "resolving power" Improved sample throughput	Accurate quantification Potentially shorter run times
Lowest Bleed	Increased analytical sensitivity for all detectors	Reduced detection limits Smaller samples Reliable compound identification
	Fast baseline stabilization Faster column exchange	Minimized conditioning time Increased sample throughput
	Excellent thermal stability	Increase column lifetime Reduced downtime Increased sample throughput

## GS-OxyPLOT™ COLUMN

- Highly unique retention for oxygenated hydrocarbons
- Excellent selectivity for C1-C10
- Very strong adsorption characteristics for alcohols, ethers, ketones and aldehydes
- Suitable for ASTM D7059
- Temperature limit of 350°C
- Stationary phase is a proprietary, salt deactivated adsorbent



GS-OxyPLOT™ is suitable for ASTM methods that are intended to measure the amount of oxygenates in complex matrices such as gaseous hydrocarbons, motor fuels and crude oils.

Using an advanced dynamic coating process, Agilent's GS-OxyPLOT™ column exhibits virtually no detector spiking due to particle generation from the phase coating.

GS-OxyPLOT™ is a much better alternative to GC columns with gas-liquid phases such as TCEP that are often used for similar applications. GS-OxyPLOT™ has an upper temperature limit of 350°C and exhibits no bleed that is associated with liquid and siloxane coated GC columns.

### Three ASTM standardized methods\* that GS-OxyPLOT™ is specifically designed for:

- Determination of C1 to C5 Oxygenates at Trace Levels in High Ethanol Content Gasoline Streams by Multidimensional Chromatography with Flame Ionization Detection\*
- Determination of Oxygenates in Ethene, Propene, C4 and C5 Hydrocarbon Matrices by Gas Chromatography and Flame Ionization Detection\*

\* These are "proposed methods" (i.e., do not have method designation numbers) that are destined for approval by ASTM Committee D2. These methods have already been accepted by, and are being implemented in petrochemical refineries around the world.

### ASTM Method D7059

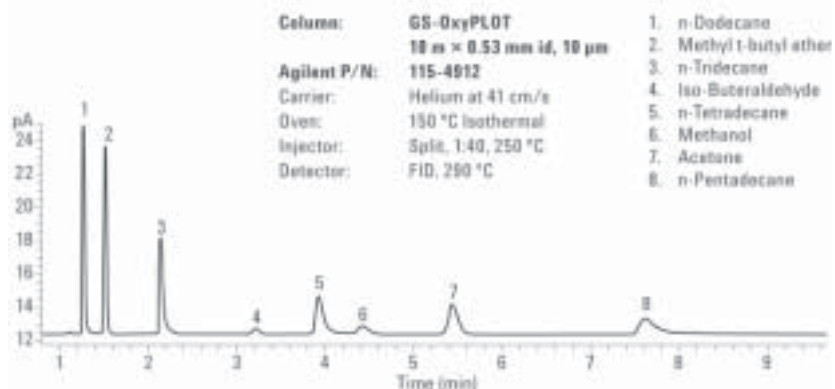
- Determination of Methanol in Crude Oils By Gas Chromatography with Flame Ionization Detection

### Free Literature



For further information regarding the Agilent **GS-OxyPLOT™** column, please request a copy of literature code **AG18E**.

### Selected oxygenates on a GS-OxyPLOT™ column



For information regarding the analysis of low concentration oxygenates in environmental samples, please request a copy of literature code **AG28**.

Product Number	Description	Price
J1154912	GS-OxyPLOT™, 10m x 0.53mm ID, 7' cage	\$1,666.00
J1154912E	GS-OxyPLOT™, 10m x 0.53mm ID, 5' cage	1,666.00

# AGILENT 'HP' GC COLUMNS

## Ask yourself:

1. Do you change liners greater than 2-3 times per week?
2. How long does it take you to change a liner (consider the instrument's total downtime)?
3. Do you want to increase your productivity and column life?
4. Have you ever burned your fingers or scraped your knuckles trying to open a hot inlet?



## Agilent's NEW Flip Top Inlet Sealing System is the faster, smarter way to change inlet liners on Agilent GC's

- Cuts liner replacement time to as little as 30 seconds
- No more frustrating searches for special wrenches or tools
- Improved inlet ergonomics — no more handling of heated parts; no more burns or scrapes.
- Decreased downtime = increased productivity

## Agilent's Flip Top Inlet System just might be right for you!

Product Number	Description	Price
CS51882717	Flip Top Inlet Sealing System	\$647.00
CS51885366	Inlet Liner O-rings Non-stick for Flip Top, Pkg. 10	\$24.30

Agilent's line of "HP" GC columns is designed and manufactured to offer excellent and reproducible performance for analyses ranging from the benign to the most difficult types of samples. With the lowest bleed levels, the best inertness for acids/bases/mixed functional compounds, and the tightest column-to-column reproducibility; HP columns offer unsurpassed quality and performance.

### HP-1 Columns

- 100% Dimethylpolysiloxane
- Excellent general purpose column - "Industry Standard"
- Equivalent to USP Phase G2

Product Number	Description	Price
CS19091Z431	HP-1, 15m x 0.25mm ID x 0.25µm	\$296.00
CS19091Z433	HP-1, 30m x 0.25mm ID x 0.25µm	496.00
CS19091Z411	HP-1, 15m x 0.32mm ID x 0.25µm	320.00
CS19091Z413	HP-1, 30m x 0.32mm ID x 0.25µm	536.00
CS19095Z421	HP-1, 15m x 0.53mm ID x 3.0µm	327.00
CS19095Z423	HP-1, 30m x 0.53mm ID x 3.0µm	595.00

### HP-5 Columns

- (5%-Phenyl)-methylpolysiloxane
- Excellent general purpose column
- Equivalent to USP Phase G27

CS19091J431	HP-5, 15m x 0.25mm ID x 0.25µm	\$296.00
CS19091J433	HP-5, 30m x 0.25mm ID x 0.25µm	496.00
CS19091J411	HP-5, 15m x 0.32mm ID x 0.25µm	320.00
CS19091J413	HP-5, 30m x 0.32mm ID x 0.25µm	536.00
CS19095J621	HP-5, 15m x 0.53mm ID x 5.0µm	327.00
CS19095J623	HP-5, 30m x 0.53mm ID x 5.0µm	595.00

### HP-INNOWax Columns

- Polyethylene glycol (PEG)
- High polarity
- Close equivalent to USP Phase G16

CS19091N131	HP-INNOWAX 15m x 0.25mm ID x 0.25µm	\$304.00
CS19091N133	HP-INNOWAX 30m x 0.25mm ID x 0.25µm	483.00
CS19091N111	HP-INNOWAX 15m x 0.32mm ID x 0.25µm	326.00
CS19091N113	HP-INNOWAX 30m x 0.32mm ID x 0.25µm	523.00
CS19095N121	HP-INNOWAX 15m x 0.53mm ID x 1.00µm	341.00
CS19095N123	HP-INNOWAX 30m x 0.53mm ID x 1.00µm	608.00

### HP-PLOT Q Columns

- Bonded polystyrene-divinylbenzene based column
- A PLOT column with polarity between Porapak-Q and Porapak-N
- Improved resolution in less time than conventional packed columns

CS19091PQO3	HP-PLOT Q 15m x 0.32mm ID x 20µm	\$439.00
CS19091PQO4	HP-PLOT Q 30m x 0.32mm ID x 20µm	610.00
CS19095PQO3	HP-PLOT Q 15m x 0.53mm ID x 40µm	451.00
CS19095PQO4	HP-PLOT Q 30m x 0.53mm ID x 40µm	671.00

### Columns for GC/MS

- Improved signal-to-noise ratio for better sensitivity and mass spectral integrity
- Reduced column bleed results in improved mass spectral purity and accurate library identification

CS19091S933	HP-1MS, 30m x 0.25mm ID x 0.25µm	\$571.00
CS19091S633	HP-1MS, 30m x 0.25mm ID x 0.50µm	575.00
CS19091S431	HP-5MS, 15m x 0.25mm ID x 0.25µm	348.00
CS19091S433*	HP-5MS, 30m x 0.25mm ID x 0.25µm	571.00

\* This is Agilent's most popular GC column worldwide.



Agilent Technologies not only designs and manufactures world class analytical instrumentation; they also supply all the consumable products and columns you require for your specific applications. This unique position allows them to develop and test their products in a variety of different configurations, ensuring that you experience a "Perfect Fit" between your analytical instrumentation and ancillary components. Agilent consumables and accessories will keep your GC and GC/MS systems running at peak performance.

## HP-5MSi Advanced Inertness MS Column

To meet the worldwide drive to lower detection levels, Agilent has developed the HP-5MSi Advanced Inertness MS column. This new capillary column complements Agilent's 5973 Inert source MS system.

- **Excellent for trace level analysis of acids and bases, such as Semi-volatiles analysis**
- (5%-Phenyl)-methylpolysiloxane, identical selectivity to HP-5MS
- Very low bleed characteristics, ideal for GC/MS

Product Number	Description	Price
CS19091S433I	HP-5MSi, 30m x 0.25 mm ID x 0.25µm	\$620.00

## Ultra 1 and Ultra 2 Columns

- Intended for use with **Sadtler Retention Index Library**
- Non-polar
- HP-1 and HP-5 with tighter specifications for retention index and capacity factors

CS19091A005	HP-Ultra 1, 50m x 0.20mm ID x 0.11µm	\$991.00
CS19091A105	HP-Ultra 1, 50m x 0.20mm ID x 0.33µm	991.00
CS19091B005	HP-Ultra 2, 50m x 0.20mm ID x 0.11µm	991.00
CS19091B105	HP-Ultra 2, 50m x 0.20mm ID x 0.33µm	991.00

## HP-35 Columns

- (35%-Phenyl)-Methylpolysiloxane
- Midpolarity - slightly less polar than DB-35
- Equivalent to USP Phase G42

CS19091G131	HP-35, 15m x 0.25mm ID x 0.25µm	\$304.00
CS19091G133	HP-35, 30m x 0.25mm ID x 0.25µm	510.00
CS19091G113	HP-35, 30m x 0.32mm ID x 0.25µm	536.00
CS19091G213	HP-35, 30m x 0.32mm ID x 0.50µm	536.00

## HP-50+ Columns

- (50%-Phenyl)-Methylpolysiloxane
- Mid-polarity - slightly less polar than DB-17
- Equivalent to USP Phase G3

CS19091L431	HP-50+, 15m x 0.25mm ID x 0.25µm	\$296.00
CS19091L433	HP-50+, 30m x 0.25mm ID x 0.25µm	496.00
CS19091L111	HP-50+, 15m x 0.32mm ID x 0.50µm	Inquire
CS19091L413	HP-50+, 30m x 0.32mm ID x 0.25µm	536.00
CS19095L021	HP-50+, 15m x 0.53mm ID x 1.0µm	327.00
CS19095L023	HP-50+, 30m x 0.53mm ID x 1.0µm	595.00

## HP-Blood Alcohol Column

- Proprietary phase permits baseline resolution of ethanol from interfering with components in biological matrices
- Every column is use-tested to assure baseline resolution of methanol, ethanol, isopropanol, n-propanol, and n-butanol

CS19091S510	HP-Blood Alcohol Column, 7.5m x 0.32mm ID x 20µm	\$363.00
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## Free Literature



Application note describing the use of the new highly deactivated HP-5 MSi column for the analysis of pesticides and semivolatile amines and phenols. Literature code **AG35**.

## TECH TIP

The easiest way to insure that you minimize background contamination and remove damaging oxygen from your carrier gas system is to use gas filters before the GC system. For further information about gas filters, please see pages 76-80.

## Separation Times Newsletter



To receive your free copy of the Separation Times newsletter, a quarterly publication that details the latest advances in Agilent Chromatography products, please contact your local Sales Representative at 1-800-267-8103 or [sales@chromspec.com](mailto:sales@chromspec.com).



# AGILENT 'J & W' CAPILLARY GC COLUMNS

COLUMN	PAGE	COLUMN	PAGE	COLUMN	PAGE	COLUMN	PAGE
DB®-1 . . . . .	36	DB®-210 . . . . .	43	DB®-VRX . . . . .	46	<b>PLOT COLUMNS</b> GS-Alumina . . . . . 50 GS-Alumina KCl . . . . . 50 GS-CarbonPLOT . . . . . 50 GS-GasPro. . . . . 50 GS-Q. . . . . 50	
DB®-1ht . . . . .	37	DB®-225 . . . . .	44	DB®-WAX . . . . .	45		
DB®-1ms . . . . .	37	DB®-225ms . . . . .	44	DB®-WAXetr . . . . .	45		
DB®-5 . . . . .	38	DB®-502.2 . . . . .	47	DB®-XLB . . . . .	48		
DB®-5ht . . . . .	38	DB®-608 . . . . .	47	CAM . . . . .	46		
DB®-5ms . . . . .	39	DB®-624 . . . . .	47	<b>CHIRAL COLUMNS</b> Cyclodex-B . . . . . 118 Cyclosil-B . . . . . 118		<b>PROSTEEL METAL COLUMNS</b> DB®-HT Sim Dis Prosteel . . . . . 50 DB®-PS1 . . . . . 50 DB®-PS624 . . . . . 50 DB®-PS2887 . . . . . 50 DB®-PSWAX . . . . . 50	
DB®-5ms EVDX . . . . .	39	DB®-1301 . . . . .	40				
DB®-5.625 . . . . .	39	DB®-1701 . . . . .	40				
DB®-17 . . . . .	42	DB®-1701P . . . . .	41				
DB®-17ht . . . . .	42	DB®-2887 . . . . .	37				
DB®-17ms . . . . .	42	DB®-ALC1 . . . . .	48				
DB®-23 . . . . .	43	DB®-ALC2 . . . . .	48				
DB®-35 . . . . .	41	DB®-DIOXIN . . . . .	49				
DB®-35ms . . . . .	41	DB®-FFAP . . . . .	46				
DB®-200 . . . . .	43	DB®-PETRO . . . . .	49				

## J & W FUSED SILICA COLUMNS

DB®-1		Dimethylpolysiloxane: Cross-linked and surface bonded. <b>Applications:</b> the most non-polar phase for general purpose analysis.									
ID (mm)	df (µm)	Temp. Range °C		10m		20m		40m			
0.05	0.05	-60	325/350	J1261012	\$542.00						
	0.20	-60	325/350	J1261013	542.00						
0.10	0.10	-60	325/350	J1271012	333.00	J1271022	\$517.00				
	0.12	-60	325/350	J127101A	CALL						
	0.40	-60	325/350	J1271013	333.00	J1271023	517.00	J1271043	\$925.00		
				10m		20m		40m			
0.18	0.18	-60	325/350	J1211012	268.00	J1211022	425.00				
	0.20	-60	325/350	J121101A	268.00						
	0.40	-60	325/350	J1211013	268.00	J1211023	425.00	J1211043	785.00		
				12m		25m		50m		60m	
0.20	0.11	-60	325/350	J1281012	252.00	J1281021	CALL	J1281052	706.00	J1281053	CALL
	0.33	-60	325/350			J1281022	419.00				
	0.50	-60	325/350			J1281023	CALL				
	0.80	-60	325/350								
				15m		30m		60m		100m	
0.25	0.10	-60	325/350	J1221011	296.00	J1221031	483.00	J1221061	871.00	J12210A2	CALL
	0.25	-60	325/350	J1221012	296.00	J1221032	496.00	J1221062	871.00		
	0.50	-60	325/350	J122101E	CALL	J122103E	496.00	J122106E	871.00		
	1.00	-60	325/350	J1221013	296.00	J1221033	496.00	J1221063	871.00		
				15m		25m		30m		60m	
0.32	0.10	-60	325/350	J1231011	320.00	J1231022	475.00	J1231031	536.00	J1231061	948.00
	0.25	-60	325/350	J1231012	320.00			J1231032	536.00	J1231062	948.00
	0.50	-60	325/350	J123101E	CALL			J123103E	536.00	J123106E	948.00
	0.52	-60	325/350	J1231026	475.00						
	1.00	-60	325/350			J1231013	320.00	J1231033	536.00	J1231063	948.00
	1.50	-60	300/320			J123101B	CALL	J123103B	536.00	J123106B	948.00
	3.00	-60	280/300			J1231014	320.00	J1231034	536.00	J1231064	948.00
	5.00	-60	280/300			J1231015	320.00	J1231035	536.00	J1231065	948.00
				15m		30m		60m		105m	
0.45*	0.13	-60	340/360	J1241011	CALL						
	0.42	-60	300/320	J1241017	CALL	J1241037	CALL				
	1.27	-60	300/320	J1241014	CALL	J1241032	595.00				
	2.55	-60	260/280			J1241034	595.00			J12410A4	CALL
0.53	0.15	-60	360	J1251011	327.00						
	0.25	-60	320/340	J125101K	327.00	J125103K	595.00	J125106K	CALL		
	0.50	-60	300/320	J1251017	327.00	J1251037	595.00				
	1.00	-60	300/320	J125101J	327.00	J125103J	595.00	J125106J	955.00		
	1.50	-60	300/320	J1251012	327.00	J1251032	595.00	J1251062	955.00		
	3.00	-60	260/280	J1251014	327.00	J1251034	595.00	J1251064	955.00	J12510A4	CALL
	5.00	-60	260/280	J1251015	327.00	J1251035	595.00	J1251065	955.00	J12510B5	1,335.00

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.

# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA COLUMNS

DB®-2887		10m, 3µ DB-1 Column. Cross-linked and surface bonded. <b>Applications:</b> ASTM D2887 Simulated Distillation.					
ID (mm)	df (µm)	Temp. Range °C		10m			
0.53	3.00	-60	350	J1252814	\$254.00		

DB®-1ht		Dimethylpolysiloxane: Extended high temperature limit. Cross-linked and surface bonded. <b>Applications:</b> heavy waxes, PNA, FAME > C <sub>25</sub> * triglycerides.					
ID (mm)	df (µm)	Temp. Range °C		15m		30m	
0.25	0.10	-60	400	J1221111	\$349.00	J1221131	\$571.00
				15m		30m	
0.32	0.10	-60	400	J1231111	368.00	J1231131	609.00

DB®-1ms		Dimethylpolysiloxane: Cross-linked and surface bonded. <b>Applications:</b> optimized for GC/MS applications, the most non-polar phase for general purpose analysis					
ID (mm)	df (µm)	Temp. Range °C		10m		20m	
0.10	0.10	-60	340/360	J1270112	\$405.00	J1270122	585.00
	0.40	-60	340/360	J1270113	405.00	J1270123	585.00
				12m		25m	
0.20	0.33	-60	340/360	J1280112	308.00	J1280122	473.00
				15m		30m	60m
0.25	0.10	-60	340/360	J1220112	348.00	J1220131	571.00
	0.25	-60	340/360			J1220132	571.00
						J1220162	973.00
				15m		30m	60m
0.32	0.10	-60	340/360	J1230112	377.00	J1230131	616.00
	0.25	-60	340/360			J1230132	616.00
						J1230162	1,059.00

## J & W GC COLUMN TUBING DIAMETERS

Column I.D. (mm)	J & W Nomenclature	Column O.D.* (mm)	Ferrule I.D. (mm)
0.05	Microbore	0.363	0.4
0.10	Microbore	0.363	0.4
0.18	Minibore	0.340	0.4
0.20	Narrowbore	0.340	0.4
0.25	Narrowbore	0.350	0.4
0.32	Widebore	0.430	0.5
0.45	Hi Speed Megabore	0.673	0.8
0.53	Megabore	0.673	0.8

\* Nominal outer diameter specifications

## GC Troubleshooting Guide



This free poster offers advice and hints on how to keep Agilent GC systems operating at peak performance through an easy to follow grid that breaks down causes, solutions, and comments. Please request literature code **AG25**.

# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA COLUMNS

DB®-5		(5% phenyl) methylpolysiloxane. Cross-linked and surface bonded. Applications: general purpose analysis (replaces SE54).							
ID (mm)	df (µm)	Temp. Range °C		10m		20m			
0.05	0.05	-60	325/350	J1265012	CALL				
	0.20	-60	325/350	J1265013	CALL				
0.10	0.10	-60	325/350	J1275012	\$339.00	J1275022	\$517.00		
	0.17	-60	325/350	J127501E	339.00				
	0.40	-60	325/350	J1275013	339.00	J1275023	517.00		
				10m		20m		40m	
0.18	0.18	-60	325/350	J1215012	268.00	J1215022	425.00	J1215042	\$785.00
	0.20	-60	325/350					J1215046	CALL
	0.40	-60	325/350	J1215013	268.00	J1215023	425.00	J1215043	CALL
				12m		25m		50m	
0.20	0.11	-60	325/350			J1285021	CALL	J1285051	CALL
	0.20	-60	325/350						
	0.33	-60	325/350	J1285012	246.00	J1285022	419.00	J1285052	706.00
	0.50	-60	325/350			J1285023	CALL	J1285053	CALL
				15m		30m		60m	
0.25	0.10	-60	325/350	J1225011	296.00	J1225031	496.00	J1225061	871.00
	0.12	-60	325/350	J1225017	CALL				
	0.25	-60	325/350	J1225012	296.00	J1225032	496.00	J1225062	871.00
	0.50	-60	325/350	J122501E	296.00	J122503E	496.00	J122506E	871.00
	1.00	-60	325/350	J1225013	296.00	J1225033	496.00	J1225063	871.00
				15m		25m		30m	
0.32	0.10	-60	325/350	J1235011	320.00			J1235031	536.00
	0.25	-60	325/350	J1235012	320.00	J1235022	475.00	J1235032	536.00
	0.50	-60	325/350					J123503E	536.00
	0.52	-60	325/350			J1235026	475.00		
	1.00	-60	325/350	J1235013	320.00			J1235033	536.00
	1.50	-60	300/320	J123501B	CALL			J123503B	536.00
				15m		30m		60m	
0.45*	0.42	-60	300/350			J1245037	595.00		
	1.27	-60	300/320	J1245012	327.00	J1245032	595.00		
	4.25	-60	260/280			J1245035	CALL		
0.53	0.25	-60	300/320	J125501K	327.00	J125503K	595.00	J125506K	CALL
	0.50	-60	300/320	J1255017	327.00	J1255037	595.00	J1255067	CALL
	1.00	-60	300/320	J125501J	327.00	J125503J	595.00	J125506J	CALL
	1.50	-60	300/320	J1255012	327.00	J1255032	595.00	J1255062	955.00
	3.00	-60	260/280	J1255014	CALL	J1255034	595.00	J1255064	CALL
	5.00	-60	260/280	J1255015	CALL	J1255035	595.00	J1255065	955.00

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.

DB®-5ht		(5%phenyl) methylpolysiloxane. Cross-linked and surface bonded. Extended high temperature limit. Applications: very heavy waxes, PNA, FAME > C <sub>25</sub> and triglycerides.							
ID (mm)	df (µm)	Temp. Range °C		15m		30m			
0.25	0.10	-60	400	J1225711	\$349.00	J1225731	\$571.00		
				15m		30m			
0.32	0.10	-60	400	J1235711	368.00	J1235731	609.00		

# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA COLUMNS

DB®-5ms		(5% phenyl) methylpolysiloxane. Cross-linked and surface bonded. <b>Applications:</b> Lower bleed to address a wider range of analytes. All DB-5 applications where a higher degree of performance is required.									
ID (mm)	df (μm)	Temp. Range °C		10m		20m		40m			
0.18	0.18	-60	325/350			J1215522	\$487.00	J1215542	\$874.00		
				12m		25m		50m			
0.20	0.33	-60	325/350	J1285512	\$308.00	J1285522	473.00	J1285552	796.00		
				15m		30m		50m		60m	
0.25	0.10	-60	325/350	J1225511	348.00	J1225531	571.00	J1225552 890.00 J122555A CALL	J1225561	\$973.00	
	0.25	-60	325/350	J1225512	348.00	J1225532	571.00		J1225562	973.00	
	0.40	-60	325/350								
	0.50	-60	325/350	J1225516	348.00	J1225536	571.00				
	1.00	-60	325/350	J1225513	348.00	J1225533	571.00	J1225563	973.00		
	0.25	-60	325/350			(Ion Trap Tested) →		J1224532	CALL		
				15m		25m		30m		60m	
0.32	0.10	-60	325/350	J1235511	377.00	J1235526 530.00		J1235531	616.00	J1235561	1,059.00
	0.25	-60	325/350	J1235512	377.00			J1235532	616.00	J1235562	1,059.00
	0.50	-60	325/350					J1235536	616.00		
	0.52	-60	325/350								
	1.00	-60	325/350	J1235513	377.00	J1235533	616.00	J1235563	1,059.00		
				15m		30m					
0.53	0.50	-60	300/320	J1255517	CALL	J1255537	678.00				
	1.00	-60	300/320			J125553J	678.00				
	1.50	-60	300/320	J1255512	386.00	J1255532	678.00				

DB®-5ms EVDX		(5% phenyl) methylpolysiloxane. Cross-linked and surface bonded. <b>Applications:</b> specially configured and tested for drugs of abuse confirmation.					
ID (mm)	df (µm)	Temp. Range °C		12m		25m	
0.20	0.33	-60	325/350	J1288512	CALL	J1288522	\$473.00

DB®-5.625		(5% phenyl) methylpolysiloxane. Cross-linked and surface bonded. <b>Applications:</b> EPA 625, 1625, 8270. Meets EPA performance criteria for semi-volatiles.								
ID (mm)	df (μm)	Temp. Range °C		15m		30m		60m		
0.25	0.25	-60	325/350	J1225611	CALL	J1225631	\$532.00	J1225661	\$903.00	
	0.50	-60	325/350	J1225612	CALL	J1225632	532.00			
	1.00	-60	325/350	J1225613	CALL	J1225633	632.00			
				15m		30m		60m		
0.32	0.25	-60	325/350	J1235611	CALL	J1235631	572.00	J1235661	CALL	
	0.50	-60	325/350	J1235612	CALL	J1235632	572.00			
				15m		30m				
0.53	0.50	-60	300/320	J1255613	CALL	J1255637	CALL			
	1.00	-60	300/320			J1255632	CALL			
	1.50	-60	300/320							



# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA COLUMNS

DB®-1301		(6% cyanopropylphenyl) methylpolysiloxane. Cross-linked and surface bonded. Applications: low polarity, pesticides, aromatics, halogenated hydrocarbons.									
ID (mm)	df (µm)	Temp. Range °C		10m							
0.18	0.40	-20	280/300	J1211313	CALL						
				15m		30m		60m		105m	
0.25	0.10	-20	280/300	J1221319	CALL	J1221339	CALL				
	0.25	-20	280/300	J1221312	CALL	J1221332	\$515.00	J1221362	\$898.00	J12213B2	CALL
	0.50	-20	280/300	J1221316	CALL	J1221336	CALL	J1221366	CALL	J12213B6	CALL
	1.00	-20	280/300	J1221313	CALL	J1221333	515.00	J1221363	898.00	J12213B3	CALL
				15m		30m		60m		105m	
0.32	0.10	-20	280/300	J1231319	CALL	J1231339	CALL				
	0.25	-20	280/300	J1231312	CALL	J1231332	555.00	J1231362	CALL	J12313B2	CALL
	0.50	-20	280/300	J1231316	CALL	J1231336	CALL	J1231366	CALL	J12313B6	CALL
	1.00	-20	280/300	J1231313	CALL	J1231333	555.00	J1231363	978.00	J12313B3	CALL
				15m		30m		60m			
0.45*	0.85	-20	260/280	J1241312	CALL	J1241332	CALL				
0.53	0.25	-20	260/280	J1251311	CALL	J1251331	CALL				
	1.00	-20	260/280	J1251312	\$338.00	J1251332	614.00	J1251362	CALL		
	1.50	-20	260/280			J1251333	614.00				

DB®-1701		(14% cyanopropylphenyl) methylpolysiloxane. Cross-linked and surface bonded. Applications: mid-polarity, drugs, sugars, steroids, phenols, alcohols and pesticides.									
ID (mm)	df (µm)	Temp. Range °C		10m		20m					
0.05	0.05	-20	280/300	J1260712	CALL						
	0.20	-20	280/300	J1260713	CALL						
0.10	0.10	-20	280/300			J1270722	\$523.00				
	0.40	-20	280/300			J1270723	523.00				
				10m		40m					
0.18	0.20	-20	280/300	J1210716	CALL	J1210746	CALL				
	0.40	-20	280/300	J1210713	\$270.00						
				15m		30m		60m		105m	
0.25	0.10	-20	280/300	J1220719	CALL	J1220739	CALL				
	0.15	-20	280/300			J1220731	515.00	J1220761	\$898.00		
	0.25	-20	280/300	J1220712	303.00	J1220732	515.00	J1220762	898.00	J12207B2	CALL
	1.00	-20	280/300	J1220713	303.00	J1220733	515.00	J1220763	898.00	J12207B3	CALL
				15m		30m		50m		60m	
0.32	0.10	-20	280/300	J1230719	CALL	J1230739	CALL				
	0.15	-20	280/300	J1230711	CALL	J1230731	555.00			J1230761	CALL
	0.25	-20	280/300	J1230712	331.00	J1230732	555.00			J1230762	\$978.00
	1.00	-20	280/300	J1230713	331.00	J1230733	555.00	J1230753	871.00	J1230763	978.00
				15m		30m		60m		105m	
0.45*	0.42	-20	260/280	J1240717	CALL	J1240737	CALL				
	0.85	-20	260/280	J1240712	CALL	J1240732	CALL				
0.53	0.50	-20	260/280	J1250717	CALL	J1250737	614.00	J1250767	CALL	J12507B7	CALL
	1.00	-20	260/280	J1250712	338.00	J1250732	614.00	J1250762	978.00	J12507B2	CALL
	1.50	-20	260/280	J1250713	CALL	J1250733	614.00	J1250763	CALL	J12507B3	CALL

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.

# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA COLUMNS

DB®-1701P		Specially Processed 1701. Cross-linked and surface bonded. <b>Applications:</b> eliminates on-column pesticide breakdown and maximizes resolution and response for CLP organochlorine pesticide list.					
ID (mm)	df (µm)	Temp. Range °C		30m			
0.25	0.25	-20	280/300	J1227732	\$530.00		
				25m	30m		
0.32	0.25	-20	280/300	J1237722	\$553.00	J1237732	569.00
	0.52	-20	280/300	J1237726	CALL		
				30m			
0.53	1.00	-20	260/280	J1257732	654.00		

DB®-35		(35% phenyl) methylpolysiloxane. Cross-linked and surface bonded. <b>Applications:</b> polarity between DB-5 and DB-17.					
ID (mm)	df (µm)	Temp. Range °C		10m	20m	40m	
0.18	0.20	40	300/320	J1211916	CALL	J1211926	CALL
	0.40	40	300/320	J121191B	CALL	J121192B	CALL
				50m			
0.20	0.33	40	300/320	J1281952	CALL		
				15m	30m	60m	
0.25	0.10	40	300/320	J1221919	CALL	J1221939	CALL
	0.15	40	300/320			J1221931	CALL
	0.25	40	300/320	J1221912	CALL	J1221932	\$510.00
				15m	30m	60m	
0.32	0.25	40	280/300		J1231932	536.00	J1231962
	0.50	40	280/300		J1231933	536.00	J1231963
	1.00	40	280/300	J1231914	CALL		J1231964
				15m	30m	60m	
0.45*	0.42	40	280/300		J1241937	CALL	
	0.85	40	280/300	J1241912	CALL	J1241932	CALL
0.53	0.50	40	260/280	J1251917	CALL	J1251937	595.00
	1.00	40	260/280	J1251912	\$327.00	J1251932	595.00
	1.50	40	260/280	J1251913	CALL	J1251933	CALL

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.

DB®-35ms		(35%phenyl) methylpolysiloxane. Cross-linked and surface bonded. <b>Applications:</b> lower bleed confirmation column for pesticides, herbicides, PCBs, drugs and industrial chemicals.					
ID (mm)	df (µm)	Temp. Range °C		25m			
0.20	0.33	40	340/360	J1283822	\$473.00		
				15m	30m	60m	
0.25	0.15	50	340/360		J1223831	571.00	
	0.25	50	340/360	J1223812	\$348.00	J1223832	571.00
				15m	30m	60m	
0.32	0.25	50	340/360	J1233812	377.00	J1233832	616.00
				15m	30m	60m	
0.53	0.50	50	320/340		J1253837	678.00	
	1.00	50	320/340	J1253812	CALL	J1253832	678.00

# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA COLUMNS

DB®-17		(50% phenyl) methylpolysiloxane. Cross-linked and surface bonded. <b>Applications:</b> analysis of steroids, drugs, pesticides.									
ID (mm)	df (μm)	Temp. Range °C		10m		20m					
0.05	0.10	40	280/300	J1261713	\$542.00						
0.10	0.10	40	280/300	J1271712	339.00	J1271722	\$517.00				
	0.20	40	280/300	J1271713	339.00	J1271723	CALL				
				10m		20m		40m			
0.18	0.18	40	280/300	J1211712	CALL	J1211722	425.00	J1211746	CALL		
	0.20	40	280/300			J1211726	CALL				
	0.30	40	280/300	J1211713	CALL	J1211723	425.00				
				12m		25m		50m			
0.20	0.16	40	280/300	J1281711	CALL	J1281721	CALL	J1281751	CALL		
	0.31	40	280/300	J1281712	CALL	J1281722	CALL	J1281752	CALL		
				15m		30m		60m			
0.25	0.15	40	280/300	J1221711	296.00	J1221731	496.00	J1221761	CALL		
	0.25	40	280/300	J1221712	296.00	J1221732	496.00	J1221762	\$871.00		
	0.50	40	280/300	J1221713	296.00	J1221733	496.00	J1221763	CALL		
				15m		30m		60m			
0.32	0.15	40	280/300	J1231711	320.00	J1231731	536.00	J1231761	CALL		
	0.25	40	280/300	J1231712	320.00	J1231732	536.00	J1231762	948.00		
	0.50	40	280/300	J1231713	320.00	J1231733	536.00	J1231763	CALL		
				5m		15m		30m			
0.45*	0.85	40	260/280	J1241704	CALL	J1241712	CALL	J1241732	CALL		
	1.70	40	260/280								
0.53	0.10	40	280/300			J1251719	CALL	J1251739	CALL		
	0.50	40	280/300			J1251717	327.00	J1251737	595.00	J1251767	CALL
	1.00	40	260/280			J1251712	327.00	J1251732	595.00	J1251762	\$955.00
	1.50	40	260/280			J1251713	327.00	J1251733	595.00	J1251763	CALL
	2.00	40	260/280	J1251704	210.00						

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.

Custom columns may be available, please inquire.

DB®-17ht		(50% phenyl) methylpolysiloxane. Cross-linked and surface bonded. Extended high temperature limits. <b>Applications:</b> very heavy waxes, PNA, FAME > C <sub>25</sub> & triglycerides.							
ID (mm)	df (µm)	Temp. Range °C		15m		30m			
0.25	0.15	40	340/365	J1221811	\$349.00	J1221831	\$571.00		
				15m		30m		60m	
0.32	0.15	40	340/365	J1231811	368.00	J1231831	609.00	J1231861	\$1,080.00

DB®-17ms		(50% phenyl) methylpolysiloxane. Cross-linked and surface bonded. Low bleed. <b>Applications:</b> analysis of steroids, drugs, pesticides.							
ID (mm)	df (µm)	Temp. Range °C				20m			
0.18	0.18	40	320/340			J1214722	\$492.00		
				15m				30m	
0.25	0.15	40	320/340	J1224711	\$352.00			J1224731	\$577.00
	0.25	40	320/340	J1224712	352.00			J1224732	577.00
				15m				30m	
0.32	0.15	40	320/340	J1234711	CALL			J1234732	622.00
	0.25	40	320/340	J1234712	380.00				

# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA COLUMNS

DB®-23		(50% cyanopropyl) methylpolysiloxane. Cross-linked and surface bonded. <b>Applications:</b> FAME analysis, cis- and trans- isomers.					
ID (mm)	df (µm)	Temp. Range °C		20m		40m	
0.18	0.20	40	250/260	J1212323	\$433.00	J1212343	CALL
				15m	30m	60m	
0.25	0.15	40	250/260	J1222311	CALL	J1222331	\$888.00
	0.25	40	250/260	J1222312	\$301.00	J1222332	888.00
				15m	30m	60m	
0.32	0.15	40	250/260	J1232311	CALL	J1232331	CALL
	0.25	40	250/260	J1232312	CALL	J1232332	967.00
				15m	30m		
0.53	0.50	40	230/240	J1252312	334.00	J1252332	606.00

DB®-200		(35% trifluoropropyl) methyl polysiloxane. Cross-linked and surface bonded. <b>Applications:</b> pesticides, herbicides, silanes, substituted benzenes, solvents, propylene oxide and Freons™.					
ID (mm)	df (µm)	Temp. Range °C		10m		20m	
0.18	0.20	30	300/320	J1212016	CALL	J1212026	CALL
	0.40	30	300/320	J1212013	CALL	J1212023	CALL
				15m	30m		
0.25	0.10	30	300/320	J1222011	CALL	J1222031	CALL
	0.25	30	300/320	J1222012	CALL	J1222032	\$520.00
	0.50	30	300/320	J1222013	CALL	J1222033	520.00
				15m	30m		
0.32	0.10	30	300/320	J1232011	CALL	J1232031	CALL
	0.25	30	300/320	J1232012	CALL	J1232032	560.00
	0.50	30	300/320			J1232033	560.00
				15m	30m	60m	
0.45*	0.85	30	280/300	J1242012	CALL		
0.53	0.25	30	280/300	J1252011	CALL	J1252031	CALL
	0.50	30	280/300	J1252017	CALL	J1252037	CALL
	1.00	30	280/300			J1252032	620.00

DB®-210		(50% trifluoropropyl) methylpolysiloxane. Cross-linked and surface bonded. <b>Applications:</b> acidic drugs, sugar acetates, halogenated compounds, pesticides, EPA 8140, alkylated benzenes and phenols.					
ID (mm)	df (µm)	Temp. Range °C		10m		20m	
0.18	0.30	45	240/260	J1210213	CALL	J1210223	CALL
				15m	30m		
0.25	0.15	45	240/260	J1220211	CALL	J1220231	CALL
	0.25	45	240/260	J1220212	\$306.00	J1220232	\$520.00
	0.50	45	240/260	J1220213	CALL	J1220233	520.00
				15m	30m		
0.32	0.15	45	240/260	J1230211	CALL	J1230231	CALL
	0.25	45	240/260	J1230212	CALL	J1230232	560.00
	0.50	45	240/260	J1230213	334.00	J1230233	560.00
				15m	30m		
0.45*	0.85	45	220/240			J1240232	CALL
0.53	1.00	45	220/240	J1250212	341.00	J1250232	620.00

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.



# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA COLUMNS

DB®-225		(50% cyanopropylphenyl) methylpolysiloxane. Cross-linked and surface bonded. <b>Applications:</b> cis- and trans- FAME isomers, general polar compounds.					
ID (mm)	df (µm)	Temp. Range °C		10m	20m		
0.05	0.05	45	240/260	J1262212	CALL		
0.10	0.10	40	220/240		J1272222	\$528.00	
				10m	20m		
0.18	0.20	40	220/240	J1212213	CALL	J1212223	433.00
				12m	25m		
0.20	0.20	40	220/240	J1282212	CALL		
				15m	30m		
0.25	0.10	40	220/240	J1222219	CALL	J1222239	CALL
	0.15	40	220/240	J1222211	CALL	J1222231	520.00
	0.25	40	220/240	J1222212	\$306.00	J1222232	520.00
				15m	30m		
0.32	0.10	40	220/240	J1232219	CALL	J1232239	CALL
	0.15	40	220/240	J1232211	CALL	J1232231	CALL
	0.25	40	220/240	J1232212	CALL	J1232232	560.00
				15m	30m		
0.45*	0.85	40	200/220	J1242212	CALL		
0.53	0.25	40	200/220	J1252211	CALL	J1252231	CALL
	0.50	40	200/220	J1252217	CALL	J1252237	620.00
	1.00	40	200/220	J1252212	341.00	J1252232	620.00

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.

DB®-225ms		(50% cyanopropylphenyl) methylpolysiloxane. Cross-linked and surface bonded. <b>Applications:</b> optimized for GC/MS applications, cis- and trans- FAME isomers, general polar compounds.					
ID (mm)	df (µm)	Temp. Range °C		15m	30m	60m	
0.25	0.25	40	240	J1222912	\$352.00	J1222932	\$577.00
				15m	30m		
0.32	0.25	40	240	J1232912	CALL	J1232932	622.00

For GC Guard Columns, please see Pages 61-63.

## SEMINARS

*"You don't need to be an expert to use GC, but the more you know, the better your results will be. That's why our mission is to educate our users through seminars, workshops and lectures. You'll learn how to improve analysis time, accuracy and sensitivity, which will make you a better chromatographer."*

Walter Jennings, Ph.D.  
Co-founder, J & W Scientific



Our seminar schedule changes from year to year.  
Please contact us at 1-800-267-8103 to inquire about dates and locations close to you.

# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA COLUMNS

DB®-WAX		Polyethylene glycol. Cross-linked and surface bonded. <b>Applications:</b> analysis of aqueous solutions, essential oils and perfumes.									
ID (mm)	df (µm)	Temp. Range °C		10m		20m					
0.05	0.05	20	250/260	J1267012	\$542.00						
	0.10	20	250/260	J1267013	542.00						
0.10	0.10	20	250/260	J1277012	339.00	J1277022	\$517.00				
	0.20	20	250/260	J1277013	339.00	J1277023	517.00				
				10m		20m		40m			
0.18	0.18	20	250/260	J1217012	268.00	J1217022	425.00				
	0.30	20	250/260	J1217013	CALL	J1217023	425.00	J1217043	\$785.00		
				15m		25m		30m		50m	
0.20	0.20	20	250/260	J12870H2	CALL	J1287022	407.00	J1287032	475.00	J1287052	\$685.00
	0.40	20	240/250			J1287023	CALL			J1287053	CALL
				15m		30m		60m			
0.25	0.10	20	250/260	J1227019	CALL	J1227039	CALL				
	0.15	20	250/260	J1227011	CALL	J1227031	496.00				
	0.25	20	250/260	J1227012	296.00	J1227032	496.00	J1227062	871.00		
	0.50	20	250/260	J1227013	296.00	J1227033	496.00	J1227063	871.00		
				15m		30m		60m			
0.32	0.10	20	250/260	J1237019	CALL	J1237039	CALL				
	0.15	20	250/260	J1237011	CALL	J1237031	536.00				
	0.25	20	250/260	J1237012	320.00	J1237032	536.00	J1237062	948.00		
	0.50	20	250/260	J1237013	320.00	J1237033	536.00	J1237063	948.00		
				15m		30m		60m			
0.45*	0.42	20	230/240			J1247037	CALL				
	0.85	20	230/240			J1247032	595.00				
0.53	0.25	20	230/240	J1257011	CALL	J1257031	595.00				
	0.50	20	230/240	J1257017	327.00	J1257037	595.00	J1257067	CALL		
	1.00	20	230/240	J1257012	327.00	J1257032	595.00	J1257062	955.00		

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.

DB®-WAXetr		Polyethylene glycol. Cross-linked and surface bonded. <u>extended temperature range.</u> <b>Applications:</b> analysis of aqueous solutions, essential oils and perfumes.									
ID (mm)	df (µm)	Temp. Range °C		15m		30m		60m			
0.25	0.10	30	260/280	J1227319	CALL	J1227339	CALL	J1227361	CALL	J1227362	\$871.00
	0.15	30	260/280	J1227311	CALL	J1227331	CALL				
	0.25	30	260/280	J1227312	CALL	J1227332	496.00				
	0.50	30	250/260	J1227313	CALL	J1227333	496.00				
				15m		30m		50m		60m	
0.32	0.10	30	260/280	J1237319	CALL	J1237339	CALL	J1237354	851.00	J1237361	CALL
	0.15	30	260/280	J1237311	CALL	J1237331	CALL				
	0.25	30	260/280	J1237312	320.00	J1237332	536.00				
	0.50	30	250/260	J1237313	CALL	J1237333	536.00				
	1.00	30	250/260	J1237314	320.00	J1237334	536.00				
				15m		30m		60m			
0.53	0.25	30	240/260	J1257311	CALL	J1257331	CALL	J1257361	CALL	J1257362	955.00
	0.50	30	240/260	J1257317	CALL	J1257337	CALL	J1257367	CALL		
	1.00	30	240/260	J1257312	327.00	J1257332	595.00				
	2.00	50	230/250	J1257314	327.00	J1257334	595.00				

# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA COLUMNS

DB®-FFAP		Nitroterephthalic acid modified polyethylene glycol. Cross-linked and surface bonded. <b>Applications:</b> acidic compounds such as volatile fatty acids and phenols.					
ID (mm)	df (µm)	Temp. Range °C		25m			
0.20	0.30	40	250	J1283222	CALL		
				15m	30m	60m	
0.25	0.10 0.25 0.50	40 40 40	250 250 250	J1223212	\$301.00	J1223231 CALL J1223232 \$506.00 J1223233 506.00	J1223261 CALL J1223262 \$888.00 J1223263 888.00
				15m	25m	30m	60m
0.32	0.10 0.25 0.50	40 40 40	250 250 250	J1233212	327.00	J1233231 CALL J1233232 547.00 J1233233 547.00	J1233262 \$967.00 J1233263 967.00
				10m	15m	30m	60m
0.45*	0.85	40	250			J1243232	606.00
0.53	0.25 0.50 1.00 1.50	40 40 40 40	250 250 250 250	J12532H2	278.00	J1253211 CALL J1253217 352.00 J1253212 352.00	J1253231 606.00 J1253237 606.00 J1253232 606.00 J1253233 606.00
							J1253267 CALL J1253262 1,018.00 J1253263 CALL

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.  
Custom columns are available, please inquire.

CAM		Base deactivated polyethylene glycol. <b>Applications:</b> specifically designed for amine analysis; excellent peak shape for primary amines.					
ID (mm)	df (µm)	Temp. Range °C		15m	30m	60m	
0.25	0.25 0.50	60 60	220/240 220/240	J1122112	\$339.00	J1122132 \$555.00 J1122133 555.00	J1122162 \$972.00
				15m	30m		
0.32	0.25 0.50	60 60	220/240 220/240	J1132112	CALL	J1132132 598.00 J1132133 598.00	
					30m	60m	
0.53	1.00	60	220/240		J1152132	671.00	J1152162 CALL

For GC Column Test Mixes, please see page 107.

DB®-VRX		Specially Formulated Phase. Cross-linked and surface bonded. <b>Applications:</b> analysis of volatile organic compounds as per EPA 502.2.					
ID (mm)	df (µm)	Temp. Range °C			30m	60m	
0.25	1.40	-20	260		J1221534	\$555.00	J1221564 \$931.00
					30m	60m	
0.32	1.80	-20	260		J1231534	617.00	J1231564 1,027.00
					30m		75m
0.45*	2.55	-20	260		J1241534	720.00	J1241574 \$1,239.00

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.

# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA COLUMNS

DB®-502.2		Specially Formulated Phase. Cross-linked and surface bonded. <b>Applications:</b> analysis of volatile organic compounds as per EPA 502.2.					
ID (mm)	df (µm)	Temp. Range °C		20m		40m	
0.18	1.00	0	260/280	J1211424	CALL	J1211444	CALL
				30m		60m	
0.25	1.40	0	260/280	J1221434	CALL	J1221464	CALL
				30m		60m	
0.32	1.80	0	260/280	J1231434	CALL	J1231464	\$949.00
						60m	
						75m	
0.45*	2.55	0	260/280			J1241474	CALL
							J12414A4
0.53	3.00	0	260/280			J1251464	CALL
							J12514A4

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.

DB®-608		Specially Formulated. Cross-linked and surface bonded. <b>Applications:</b> EPA 608, chlorinated pesticides and PCBs.					
ID (mm)	df (µm)	Temp. Range °C		30m			
0.25	0.25	40	280/300		J1226832	\$515.00	
				30m			
0.32	0.50	40	280/300		J1231730	541.00	
				15m		30m	
0.45*	0.42	40	260/280	J1246817	CALL	J1246837	CALL
	0.70	40	260/280	J1241710	CALL	J1241730	601.00
0.53	0.50	40	260/280			J1256837	601.00
	0.83	40	260/280	J1251710	\$331.00	J1251730	601.00

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.

DB®-624		Specially Formulated Phase. Cross-linked and surface bonded. <b>Applications:</b> analysis of volatile priority pollutants.					
ID (mm)	df (µm)	Temp. Range °C		20m		40m	
0.18	1.00	-20	260	J1211324	\$429.00	J1211344	CALL
				25m			
0.20	1.12	-20	260	J1281324	449.00		
				30m		60m	
0.25	1.40	-20	260	J1221334	536.00	J1221364	\$898.00
				30m		60m	
0.32	1.80	-20	260	J1231334	595.00	J1231364	998.00
				30m		60 m	
0.45*	2.55	-20	260	J1241334	678.00		J1241374
							\$1,186.00
0.53	3.00	-20	260	J1251334	678.00	J1251364	989.00
						J1251374	\$1,222.00

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.



# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA COLUMNS

DB®-ALC1		Special formulated phase. Cross-linked and surface bonded. <b>Applications:</b> blood alcohol analysis, solvents in blood.					
ID (mm)	df (µm)	Temp. Range °C		30m			
0.32	1.80	20	260/280	J1239134	\$541.00		
				30m			
0.53	3.00	20	260/280	J1259134	601.00		

DB®-ALC2		Special formulated phase. Cross-linked and surface bonded. <b>Applications:</b> blood alcohol analysis, solvents in blood.					
ID (mm)	df (µm)	Temp. Range °C		30m			
0.32	1.20	20	260/280	J1239234	\$541.00		
				30m			
0.53	2.00	20	260/280	J1259234	601.00		

DB®-XLB		Roughly equivalent to 14% Diphenyl methyl polysiloxane - eXtremely Low Bleed. Cross-linked and surface bonded. <b>Applications:</b> low polarity, low bleed for highly sensitive MS analysis.									
ID (mm)	df (μm)	Temp. Range °C				20m		30m		60m	
0.18	0.18	30	340/360			J1211222	\$492.00	J1211232	\$691.00	J1211262	CALL
				12m		25m					
0.20	0.33	30	340/360	J1281212	\$311.00	J1281222	477.00				
				15m		30m		60m			
0.25	0.10	30	340/360	J1221211	352.00	J1221231	577.00	J1221262	982.00		
	0.25	30	340/360	J1221212	352.00	J1221232	577.00				
	0.50	30	340/360			J1221236	577.00				
	1.00	30	340/360	J1221213	CALL	J1221233	577.00				
	0.25	30	340/360	(DB-XLB-MSD) →	J1224432	CALL					
				15m		30m		60m			
0.32	0.10	30	340/360	J1231212	CALL	J1231231	CALL	J1231262	1,069.00		
	0.25	30	340/360			J1231232	622.00				
	0.50	30	340/360			J1231236	622.00				
	1.00	30	340/360			J1231213	CALL				
				15m		30m					
0.45*	1.27	30	320/340	J1241212	CALL	J1241232	CALL				
0.53	1.50	30	320/340	J1251212	390.00	J1251232	691.00				

\* 0.45mm = High Speed Megabore — No special ferrules required for High Speed Megabore 0.45 mm I.D. columns.

Maintain your Agilent GC/MS with genuine Agilent replacement parts. Chromatographic Specialties Inc. inventories many of these items, including 5972/5973 filament assemblies and electron multiplier horns.

See pages 98-99 for a partial listing of genuine Agilent replacement parts.

Request literature code **AG11** to receive an informative guide for maintaining your GC/MS, or contact our Technical Support Group at 1-800-267-8103 to discuss your particular needs.



# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA COLUMNS

DB®-Petro		Specially Formulated DB-1. Cross-linked and surface bonded. <b>Applications:</b> PONA analysis (paraffins, olefins, naphthas and aromatics), petroleum process products					
ID (mm)	df (µm)	Temp. Range °C				50m	100m
0.20	0.50	-60	325/350			J1281056 \$748.00	
0.25	0.50	-60	325/350				J12210A6 \$1,024.00

DB®-DIOXIN		Special formulation. Cross-linked and surface bonded. <b>Applications:</b> resolution of 2,3,7,8 TCDD and 2,3,7,8 TCDF.					
ID (mm)	df (µm)	Temp. Range °C				60m	
0.25	0.15	40	250/270			J1222461 \$934.00	
	0.25	40	250/270			J1222462 934.00	
						60m	
0.32	0.19	40	250/270			J1232461 CALL	
	0.32	40	250/270			J1232462 CALL	



# AGILENT 'J & W' CAPILLARY GC COLUMNS

## J & W FUSED SILICA PLOT COLUMNS

GS-Alumina KCl		PLOT Column — KCl deactivated Al <sub>2</sub> O <sub>3</sub> , lower polarity than GS-Alumina® <b>Applications:</b> light hydrocarbons analysis, propylene impurities.							
ID (mm)	df (μm)	Temp. Range °C		30m		50m			
0.53	N/A	-60	200*		J1153332 \$610.00	J1153352	\$998.00		

\* -60°C is the lowest temperature J&W has used. Lower temperatures may be used depending on the sample.

GS-Q		PLOT Column — Divinylbenzene homopolymer <b>Applications:</b> gases and light hydrocarbons.							
ID (mm)	df (μm)	Temp. Range °C		15m		25m		30m	
0.32	N/A	-60	250*		J1133412 CALL	J1133422 CALL	J1133432	\$610.00	
				10m	15m	25m	30m		
0.53	N/A	-60	250*	J11534H2 \$346.00	J1153412 451.00	J1153422 566.00	J1153432	671.00	

\* -60°C is the lowest temperature J&W has used. Lower temperatures may be used depending on the sample.

GS-CarbonPLOT		High stability, carbon layer stationary phase. <b>Applications:</b> organic and inorganic gases.							
ID (mm)	df (μm)	Temp. Range °C		15m		30m		60m	
0.32	1.50	-60	350/360*	J1133112	\$368.00	J1133132	\$628.00	J1133162	\$1,110.00
	3.00	-60	350/360*			J1133133	628.00		
				15m	30m	60m			
0.53	3.00	-60	350/360*	J1153113	374.00	J1153133	717.00		

\* -60°C is the lowest temperature J&W has used. Lower temperatures may be used depending on the sample.

GS-GasPro		Unique bonded PLOT column technology. <b>Applications:</b> light hydrocarbons, sulfur gases, GC/MS.							
ID (mm)	df (μm)	Temp. Range °C		5m		15m		30m	
0.32	N/A	-80	260/300*	J1134302	\$318.00	J1134312	\$628.00	J1134332	\$755.00
								J1134362	\$1,135.00

\* -80°C is the lowest temperature J&W has used. Lower temperatures may be used depending on the sample.

## J & W PROSTEEL METAL COLUMNS

### DB-ProSteel COLUMNS

#### (DB-PS1, DB-PS2887, DB-HT SIMDIST ProSteel, DB-PS624, DB-PSWAX)

- Virtually unbreakable
- Available in a wide variety of stationary phases
- Bonded and cross-linked
- Ideal for high temperature analysis and process applications

DB-ProSteel metal columns are deactivated with a new formula (this is not glass lined steel) to provide inertness which truly rivals fused silica. These columns have the same outer diameter as standard Megabore (0.53 mm ID), so no special ferrules are required.

#### Applications

The Analysis of Alcohols Using Metal Capillary Columns

The Analysis of Aromatic Solvents Using Metal Capillary Columns

Contact Technical Support at 1-800-267-8103 for more information.

Typically wound on a 7" cage that fits most standard GCs. These columns can be custom wound to smaller diameters for small ovens (for a 5" diameter coil, simply add the suffix "E" to the column part number; for any other diameter indicate your requirements when placing your order).

# MACHEREY-NAGEL CAPILLARY GC COLUMNS

## OPTIMA® HIGH PERFORMANCE CAPILLARY COLUMNS FROM MACHEREY-NAGEL

Macherey-Nagel manufactures capillary columns with lower bleed levels, which are especially recommended for GC-MS. Less column bleed yields increased sensitivity and accuracy through a better signal to noise ratio, for any kind of GC detector!

- High thermal stability
- Reduced column bleed
- Higher inertness due to optimized deactivation



### Free Literature



For further information regarding the **OPTIMA®5MS and OPTIMA® XLB** columns, please request literature code **MNAAA**.

### OPTIMA® 1 (100% dimethylpolysiloxane)

Similar phases: OV-1, DB-1, SE-30, HP-1, Ultra-1, SPB-1, CP-SIL 5 CB, Rtx-1, 007-1, BP1

Product Number	Description	Price
MCN72605015	OPTIMA® 1, 15m x 0.25mm x 0.25µm film	\$310.60
MCN72605030	OPTIMA® 1, 30m x 0.25mm x 0.25µm film	502.40
MCN72605060	OPTIMA® 1, 60m x 0.25mm x 0.25µm film	864.90
MCN72632330	OPTIMA® 1, 30m x 0.32mm x 1.0µm film	538.30
MCN72652930	OPTIMA® 1, 30m x 0.53mm x 1.0µm film	624.90

### OPTIMA® 5 (5% phenyl - 95% dimethylpolysiloxane)

Similar phases: SE-54, SE-52, DB-5, HP-5, Ultra-2, SPB-5, CP-SIL 8, Rtx-5, 007-2, BP5

MCN72605615	OPTIMA® 5, 15m x 0.25mm x 0.25µm film	\$310.60
MCN72605630	OPTIMA® 5, 30m x 0.25mm x 0.25µm film	502.40
MCN72605660	OPTIMA® 5, 60m x 0.25mm x 0.25µm film	864.90
MCN72632530	OPTIMA® 5, 30m x 0.32mm x 1.0µm film	538.30
MCN72654130	OPTIMA® 5, 30m x 0.53mm x 1.0µm film	624.90

### OPTIMA® WAX (polyethylene glycol 20000 daltons)

Similar phases: DB-Wax, Supelcowax, HP-Wax, HP-INNOWAX, Rtx-Wax, CP-Wax 52 CB, Stabilwax, 007-CW

MCN72660030	OPTIMA® WAX, 30m x 0.25mm x 0.25µm film	\$502.40
MCN72660060	OPTIMA® WAX, 60m x 0.25mm x 0.25µm film	864.90
MCN72629630	OPTIMA® WAX, 30m x 0.32mm x 0.50µm film	583.30
MCN72629660	OPTIMA® WAX, 60m x 0.32mm x 0.50µm film	957.80
MCN72654930	OPTIMA® WAX, 30m x 0.53mm x 1.0µm film	624.90

### OPTIMA® MS HIGH PERFORMANCE CAPILLARY COLUMNS

MCN72620530	OPTIMA® 1 MS, 30m x 0.25mm x 0.25µm film	\$579.20
MCN72620560	OPTIMA® 1 MS, 60m x 0.25mm x 0.25µm film	995.00
MCN72622030	OPTIMA® 5 MS, 30m x 0.25mm x 0.25µm film	579.20
MCN72622060	OPTIMA® 5 MS, 60m x 0.25mm x 0.25µm film	995.00
MCN72585030	OPTIMA® XLB, 30m x 0.25mm x 0.25µm film	615.00
MCN72585060	OPTIMA® XLB, 60m x 0.25mm x 0.25µm film	1,103.80



For further information regarding **OPTIMA® WAX** columns, please request literature code **MNBBB**.

Other Macherey-Nagel OPTIMA® column phases are available, including:  
OPTIMA® 17, OPTIMA® 1301, OPTIMA® 1701, OPTIMA® 624, OPTIMA® 225, OPTIMA® FFAP

Please contact our Technical Support Group at 1-800-267-8103 or [tech@chromspec.com](mailto:tech@chromspec.com) for details.



# OTHER CAPILLARY GC COLUMNS

Chromatographic Specialties Inc. is pleased to announce that we are now carrying ValcoBond® GC capillary columns.



## Unimolecular™ Low Bleed VB-1 Columns (ULB-VB-1)

- Lowest bleed and highest temperature specifications available
- Unimolecular phase - entire column coating consists of a single molecule
- The newest development in stationary phase polymer technology

### VCFSA01525025U

ULB-VB1, 15m x 0.25mm ID x 0.25µm film  
Price: \$371.80

### VCFSA03025025U

ULB-VB1, 30m x 0.25mm ID x 0.25µm film  
Price: \$557.70

Many other ValcoBond® column phases and configurations are available. Please contact our Technical Support Department at 1-800-267-8103 or email tech@chromspec.com for further information.

## Valcobond® Capillary Columns from VICI Gig Harbor Group

- Individually tested
- High temperature limits
- Competitive pricing
- No-risk guarantee

ValcoBond® capillary columns meet the highest quality standards for resolution, retention characteristics, inertness, bleed, and reproducibility. Improved upper temperature limits enhance column "bake out", reducing sample carryover and cycle times.

ValcoBond® uses proprietary liquid phase processing to produce low bleed characteristics while maintaining identical retention characteristics to the phases you are used to. These processes combined with proprietary automated deactivation, coating, curing, bonding, and crosslinking produce MS-certified bleed characteristics equal to the best.

### VB-1 (100% dimethylpolysiloxane)

**Applications:** Amines, flavors and fragrances, hydrocarbons, pesticides, PCBs, phenols, sulfur compounds; EPA methods.

*Equivalent to DB-1, DB-1ms, HP-1, HP-1MS, Ultra-1, Rtx-1, Rtx-1MS, SPB-1, MDN-1, BP-1, CP-Sil 5 CB, GB-1, 007-1, OV-1, SE-30, AT-1, and ZB-1*

Product Number	Description	Price
VCFSA01525025B	VB-1, 15m x 0.25mm ID x 0.25µm film	\$235.40
VCFSA03025025B	VB-1, 30m x 0.25mm ID x 0.25µm film	394.90

### VB-5 (5% phenyl / 95% dimethylpolysiloxane)

**Applications:** Drugs, herbicides, hydrocarbons, PCBs, pesticides, phenols, semi-volatiles, and sulfur compounds.

*Equivalent to DB-5, DB-5ms, HP-5, HP-5MS, Ultra-5, Rtx-5, Rtx-5MS, Rtx-5sil MS, SPB-5, MDN-5, BP-5, CP-Sil 8 CB, GB-5, 007-5, OV-5, SE-54, AT-5 or ZB-5*

VCFSB01525025B	VB-5, 15m x 0.25mm ID x 0.25µm film	\$235.40
VCFSB03025025B	VB-5, 30m x 0.25mm ID x 0.25µm film	394.90

### VB-Wax (100% bonded polyethylene glycol)

**Applications:** Alcohols, aldehydes, aromatics, flavors and fragrances, organic acids, and solvents.

*Equivalent to DB-WAX, DB-WAXetr, HP-WAX, HP-InnoWax, HP-20M, CB-WAX, Stabilwax, Rtx-WAX, SUPEROX II, SUPELCOWAX-10, BP-20, CP-WAX 52 CB, GB-WAX, 007-CW, OV-WAX, AT-WAX, and ZB-WAX*

VCFSG03025025A	VB-WAX, 30m x 0.25mm ID x 0.25µm film	\$394.90
VCFSG06025025A	VB-WAX, 60m x 0.25mm ID x 0.25µm film	717.20

## FRONTIER LAB



## Ultra ALLOY - The Highly Inert Stainless Steel Capillary Column

- Ultra ALLOY from Frontier labs offers unsurpassed inertness and mechanical durability
- Patented 5-layer pre-treatment on inner surface of capillary tubing
- Stationary phases are cross-linked and chemically bonded
- Columns can be solvent rinsed to remove non-volatile residues
- Useful in petrochemical and many other high temperature applications

### UA1HT (100% Methyl)

F1HT15M015	UA1HT, 15m x 0.25mm ID x 0.15µm film	\$778.50
F1HT30M015	UA1HT, 30m x 0.25mm ID x 0.15µm film	1,317.50
F1HT15W015	UA1HT, 15m x 0.50mm ID x 0.15µm film	818.40

Other Ultra ALLOY column phases are available.

Please contact our Technical Support Department at 1-800-267-8103 or tech@chromspec.com.

# TECH TIP — CAPILLARY COLUMN INSTALLATION

The following is Restek's recommended procedure for a quick, trouble-free column installation\*:

1. Cool all heated zones.
2. Replace spent oxygen and moisture traps.
3. Clean and/or deactivate injector and detector sleeves if necessary.
4. Replace critical injector and detector seals.
5. Replace septum.
6. Set make-up and detector gas flow rates.
7. Carefully inspect the column for damage or breakage.
8. Cut 10 centimetres from each end of the column.
  - Use a sapphire scribe or ceramic scoring wafer to cut fused silica capillary columns
  - Use the serrated edge of a ceramic scoring wafer or the edge of a sharp file to cut metal capillary columns
9. Install a nut and ferrule on each end of the column.
10. Cut an additional 10 centimetres from each end of the column to remove ferrule fragments.
11. Inspect the column ends with a 10X magnifier to verify a square cut.
12. Mount the capillary column in the oven using a bracket that protects the column from becoming scratched or abraded.
13. Insert column the appropriate distance into the inlet as indicated in the instrument manual.
14. Set the approximate column flow rate by adjusting the head pressure to the value listed on the test chromatogram included with the column.
15. Set split vent, septa purge, and any other applicable inlet gases according to the instrument specifications.
16. Confirm the flow by immersing the column outlet in a vial of solvent (acetone or isopropyl alcohol).
17. Insert column the appropriate distance into the detector as indicated in the instrument manual.
18. Check for inlet and outlet leaks using a thermal conductivity leak detector. Do not use soaps or liquid-based leak detectors or the column may be damaged.
19. Set injector and detector temperatures. Turn the detector on when the temperatures have equilibrated.  
**CAUTION** — Do not exceed the phase's maximum operating temperature!
20. To set proper dead time (linear velocity), inject methane or a non-retained substance compatible with the detector being used.
21. Verify system integrity by checking the dead volume peak. It should not tail.
22. Condition the column at its maximum operating temperature to stabilize the baseline. (See the test chromatogram included with the column for the maximum temperature.)
23. Set oven to appropriate temperature and inject methane or an appropriate unretained substance, again to set the proper linear velocity.
24. Inject a duplicate of the original test mixture, or your specific test mixture, to confirm proper installation, system and column performance.
25. Calibrate the instrument and inject samples.

## Standby Operation

**Short Term:** In GC with carrier gas flow 100°C-150°C

**Long Term:** Flame-seal or cap ends with septa — keep in the dark.

\* For more detailed column installation assistance, please contact our Technical Department

Our Product Support Team is staffed by technically competent chromatographers. They are committed to helping you find answers to your product or application questions. If they don't have the answer, they have numerous resources available to help them find it for you.

**TOLL FREE . . . . . 800-267-8103**

**FAX . . . . . 613-342-1144**

**E-MAIL . . . . . tech@chromspec.com**



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## QUICK DELIVERY!

In 1963 the typical delivery of a packed GC column was 3-4 weeks after the order was placed. This lengthy delay created an opportunity, if columns could be manufactured and delivered in days rather than weeks, Canadian scientists would be better able to conduct their experiments. This opportunity led to the creation of Chromatographic Specialties Inc. Soon we began to distribute other products of use to chromatographers (syringes, derivatization reagents, standards,...). One of our suppliers, Restek Corporation, also manufactures packed GC columns. Through them we have access to still more phases, MXT passivated columns, and much more.

Chromatographic Specialties Inc. can also help you with many of your custom packing needs. We can pack just about anything, in just about anything to fit just about anything. Examples of this include:

- Custom trapping tubes
- Sample preparation devices
- Small diameter coiling
- etc.



Give us a call to discuss your custom needs and specifications. Whether it be a packed GC column, or any other custom packing need, chances are we can manufacture it for you quickly and cost effectively.



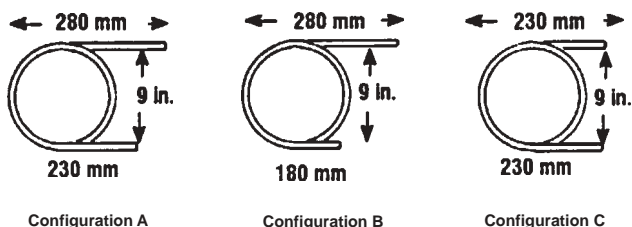
## EMPTY GLASS COLUMNS

Chromatographic Specialties Inc. stocks hundreds of pre-shaped empty glass columns. We have configurations for virtually every GC in the marketplace (including many older models). Metal and polymeric tubing in a wide range of materials and diameters is also inventoried, columns are bent and shaped in our manufacturing facility to your instrument's specifications. The combination of inventoried material and shaping capabilities ensures that we can quickly fill orders for packed columns; delivery is routinely less than a week from receipt of order.

The following table lists a short selection of empty glass columns. Many other configurations are available. Contact our technical support department at 1-800-267-8103 or tech@chromspec.com for assistance in selecting the correct column for your GC.

### AGILENT

#### Model 5880, 5890 (9" centres)



6890 columns are available.  
Call for assistance in selecting the correct configuration.

Product Number	Length x O.D. x I.D.	Price
C50744	2 ft. x 0.25" x 2.0mm	\$134.50
C50745	4 ft. x 0.25" x 2.0mm	134.50
C50750	6 ft. x 0.25" x 2.0mm	134.50
C50755	8 ft. x 0.25" x 2.0mm	156.60
C50756	10 ft. x 0.25" x 2.0mm	169.40
C50759	2 ft. x 0.25" x 4.0mm	129.60
C50760	4 ft. x 0.25" x 4.0mm	134.50
C50765	6 ft. x 0.25" x 4.0mm	134.50
C50770	8 ft. x 0.25" x 4.0mm	156.60
C50772	10 ft. x 0.25" x 4.0mm	169.40

### PERKIN ELMER

#### Model 8300, 8400, 8500 (Not On-Column)



C50880	1m x 0.25" x 2.0mm	\$134.50
C50885	2m x 0.25" x 2.0mm	134.50
C50890	1m x 0.25" x 4.0mm	134.50
C50895	2m x 0.25" x 4.0mm	134.50

### VARIAN

#### Model 3700, 3300, 3400, 3600 Vista 4600, 6000, 6500 (5.5" centres) 3300, 3400, 3600 (Inj. A - Det. A)



VA3800 is available.  
Call for assistance in selecting the correct configuration.

C51378	2 ft. x 0.25" x 2.0mm	\$134.50
C51380	4 ft. x 0.25" x 2.0mm	134.50
C51385	6 ft. x 0.25" x 2.0mm	134.50
C51390	8 ft. x 0.25" x 2.0mm	156.60
C51391	10 ft. x 0.25" x 2.0mm	169.40
C51394	2 ft. x 0.25" x 4.0mm	134.50
C51395	4 ft. x 0.25" x 4.0mm	134.50
C51400	6 ft. x 0.25" x 4.0mm	134.50
C51405	8 ft. x 0.25" x 4.0mm	156.60
C51410	10 ft. x 0.25" x 4.0mm	169.40

### SHIMADZU

#### Model GC-8A



C51156	2m x 5mm x 3.0mm	\$190.10
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The columns featured above are a small sampling of the hundreds of packed glass columns Chromatographic Specialties Inc. offers for Agilent, Varian, Perkin Elmer, Shimadzu and other GC manufacturers.

See pages 64-65 for a complete listing of SS, nickel and other tubing available for packed GC columns.

If you do not see your column listed above, please contact our technical support group at 1-800-267-8103 or tech@chromspec.com

#### DID YOU KNOW THAT WE:

- have access to just about any liquid phase and just about any solid support?
- can coat just about any phase on any support?
- have columns in just about any dimension in just about any material for just about any chromatograph?
- can do all of this for you in just a day or two?

**JUST TRY US.**

See page 58 for packed column fittings.



# CHROMSPEC™ PACKED COLUMNS

## STATIONARY PHASES AND PACKING MATERIALS

Chromatographic Specialties Inc. inventories hundreds of different stationary phases and solid support materials. We also custom manufacture packings to your specifications. There are virtually no packings that we cannot supply.

Better still, because most phases and supports are in stock, delivery of both packing materials and packed columns is typically within a few days after receipt of order. If you are tired of waiting weeks for delivery of your packed columns, give us a call. You'll wonder why you hadn't done so before!

The following page and a half lists a variety of packings and materials that we supply; it is far from a complete list. Many other phases, materials, mesh sizes and order quantities are available. Call our Technical Support Department at 1-800-267-8103 or tech@chromspec.com if you don't see what you need.

### PORAPAK

- Porapak porous polymers produce exceptional separations for a wide variety of organic compounds.
- Packings are cross-linked without a stationary phase coating.
- Sharp, symmetrical peaks and low retention volumes for water, alcohols, glycols, free fatty acids and more!

Product Number	Description	Mesh Size	75 cc Price
RK25594	Porapak N	50/80	\$187.30
RK25595	Porapak N	80/100	187.30
RK25596	Porapak N	100/120	187.30
RK25582	Porapak Q	50/80	187.30
RK25583	Porapak Q	80/100	187.30
RK25584	Porapak Q	100/120	187.30
RK25588	Porapak R	50/80	187.30
RK25589	Porapak R	80/100	187.30
RK25590	Porapak R	100/120	187.30
RK25591	Porapak S	50/80	187.30
RK25592	Porapak S	80/100	187.30
RK25593	Porapak S	100/120	187.30
RK25597	Porapak T	50/80	187.30
RK25598	Porapak T	80/100	187.30
RK25599	Porapak T	100/120	187.30
RK25585	Porapak Q-S	50/80	187.30
RK25586	Porapak Q-S	80/100	187.30
RK25587	Porapak Q-S	100/120	187.30

### HAYESEP

- HayeSep is thoroughly cleaned and preconditioned for 12 hours under oxygen-free nitrogen before packaging to ensure consistency, reproducibility with no shrinkage and minimal bleed.
- Applications include solvents, light hydrocarbons, glycols and more!
- **Pricing is based on quantity of 20 cc.**

C27492	HayeSep D	80/100	\$55.80
C27494	HayeSep D	100/120	55.80
C27505	HayeSep D <sub>B</sub>	80/100	55.80
C27506	HayeSep D <sub>B</sub>	100/120	55.80
C27400	HayeSep A	60/80	55.80
C27402	HayeSep A	80/100	55.80
C27404	HayeSep A	100/120	55.80
C27410	HayeSep N	60/80	39.80
C27412	HayeSep N	80/100	47.90
C27414	HayeSep N	100/120	39.80
C27416	HayeSep N	120/140	79.70
C27430	HayeSep Q	60/80	47.90
C27432	HayeSep Q	80/100	47.90
C27434	HayeSep Q	100/120	39.80
C27440	HayeSep R	60/80	39.80
C27442	HayeSep R	80/100	47.90
C27444	HayeSep R	100/120	39.80
C27450	HayeSep S	60/80	39.80
C27452	HayeSep S	80/100	47.90
C27454	HayeSep S	100/120	39.80
C27460	HayeSep T	60/80	47.90
C27462	HayeSep T	80/100	47.90
C27464	HayeSep T	100/120	39.80

### CHROMOSORB CENTURY SERIES

- Chromosorb porous polymers are composed of polyaromatic-type cross-linked resin.
- Uniform, rigid structure.
- Infusible and insoluble in most solvents.
- Especially effective in separating a wide variety of gases, alcohols, glycols, amines, free acids and more!

Product Number	Description	Mesh Size	Qty g	Price
C25304	Chromosorb 101	60/80	50	\$836.90
C25306	Chromosorb 101	80/100	50	836.90
C25308	Chromosorb 101	100/120	50	836.90
C25324	Chromosorb 102	60/80	50	836.90
C25326	Chromosorb 102	80/100	50	836.90
C25328	Chromosorb 102	100/120	50	836.90
C25344	Chromosorb 103	60/80	50	836.90
C25346	Chromosorb 103	80/100	50	836.90
C25348	Chromosorb 103	100/120	50	836.90
C25384	Chromosorb 105	60/80	50	836.90
C25386	Chromosorb 105	80/100	50	836.90
C25388	Chromosorb 105	100/120	50	836.90
C25404	Chromosorb 106	60/80	50	836.90
C25406	Chromosorb 106	80/100	50	836.90
C25408	Chromosorb 106	100/120	50	836.90
C25424	Chromosorb 107	60/80	50	836.90
C25426	Chromosorb 107	80/100	50	836.90
C25428	Chromosorb 107	100/120	50	836.90
C25444	Chromosorb 108	60/80	50	836.90
C25446	Chromosorb 108	80/100	50	836.90
C25448	Chromosorb 108	100/120	50	836.90

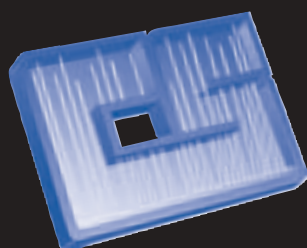
### ADSORBENTS

C23066	Tenax®-TA	35/60	10	\$177.60
C23066GN	Tenax®-TA	35/60	100	1,553.70
C23068	Tenax®-TA	60/80	10	175.50
C23068GN	Tenax®-TA	60/80	100	1,675.50
C23069	Tenax®-TA	80/100	10	177.60
C23056	Tenax®-GR	60/80	10	242.10
C23058	Tenax®-GR	80/100	10	218.00
C23000	Molecular Sieve 5A	40/60	227	179.20
C23002	Molecular Sieve 5A	60/80	227	179.20
C23004	Molecular Sieve 5A	80/100	227	179.20
C23010	Molecular Sieve 13X	40/60	227	179.20
C23012	Molecular Sieve 13X	60/80	227	179.20
C23014	Molecular Sieve 13X	80/100	227	179.20
C23020	Charcoal	40/60	227	77.00
C23022	Charcoal	60/80	227	77.00
C23024	Charcoal	80/100	227	77.00
C23040	Activated Alumina Type F1	40/60	227	123.20
C23042	Activated Alumina Type F1	60/80	227	123.20

*Other varieties and mesh sizes of stationary phases and packing materials are available — please inquire.*

## STATIONARY LIQUID PHASES

Product Number	Description	Max. °C	Qty g	Price
C29015	Apiezon L	300	25	\$384.20
C29100	Carbowax 400	100	50	130.00
C29105	Carbowax 550	125	50	130.00
C29120	Carbowax 1000	150	50	54.20
C29125	Carbowax 1500	175	50	54.20
C29145	Carbowax 20M	225	50	54.20
C29150	Carbowax 20M TPA (Terephthalic Acid)	250	50	125.60
C29165	Dexsil 300 GC	400	5	850.30
C29170	Dexsil 400 GC	375	5	850.30
C29205	Diethylene glycol succinate	200	25	173.40
C29285	Ethylene glycol succinate	200	25	236.90
C29295	FFAP	250	25	196.70
C29460	Polyethylene glycol adipate	200	25	126.10
C29465	Polyethylene glycol succinate	200	25	126.10
C29510	Propylene glycol	150	50	39.80
C29525	Silar 5CP	275	5	288.90
C29535	Silar 9CP	275	5	577.80
C29540	Silar 10C	275	5	577.80
C29560	Silicone fluid Dow 200, 500 cstks	250	50	54.20
C29570	Silicone fluid Dow 550	225	50	54.20
C29600	Silicone gum rubber SE30	300	50	54.20
C29605	Silicone gum SE 30 Ultraphase	350	10	165.80
C29655	Silicone OV-101	350	20	179.80
C29620	Silicone OV-17	350	25	214.60
C29670	Silicone OV-210	275	10	229.80
C29675	Silicone OV-215	275	10	203.70
C29680	Silicone OV-225	250	10	229.80
C29685	Silicone OV-351	270	10	97.50



We have phases in stock which are not listed above.

If the phase that you require is not shown, please contact our Technical Support Group at 1-800-267-8108 or [tech@chromspec.com](mailto:tech@chromspec.com).

## DIATOMACEOUS SOLID SUPPORTS

Product Number	Description	Mesh Size	Qty g	Price
C25542	Chromosorb T	40/60	225	\$1,174.50
C25526	Chromosorb 750	80/100	100	1,143.90

## DIATOMACEOUS SOLID SUPPORTS (cont'd)

Product Number	Description	Mesh Size	Qty g	Price
<b>High Performance</b>				
C25184	Chromosorb W	60/80	150	\$878.80
C25186	Chromosorb W	80/100	150	878.80
C25188	Chromosorb W	100/120	150	878.80
<b>AW-DMCS Treated</b>				
C25162	Chromosorb W	45/60	150	753.20
C25164	Chromosorb W	60/80	150	753.20
C25166	Chromosorb W	80/100	150	753.20
C25168	Chromosorb W	100/120	150	753.20
<b>Acid Washed</b>				
C25120	Chromosorb W	30/60	150	598.50
C25122	Chromosorb W	45/60	150	598.50
C25124	Chromosorb W	60/80	150	598.50
C25126	Chromosorb W	80/100	150	598.50
C25128	Chromosorb W	100/120	150	598.50
C25130	Chromosorb W	120/140	150	598.50
<b>Non-Acid Washed</b>				
C25102	Chromosorb W	45/60	150	439.40
C25104	Chromosorb W	60/80	150	439.40
C25106	Chromosorb W	80/100	150	439.40
C25108	Chromosorb W	100/120	150	439.40
<b>High Performance</b>				
C25286	Chromosorb G	80/100	225	1,192.70
C25288	Chromosorb G	100/120	225	1,192.70
<b>AW-DMCS Treated</b>				
C25262	Chromosorb G	45/60	225	991.80
C25264	Chromosorb G	60/80	225	991.80
C25266	Chromosorb G	80/100	225	991.80
C25268	Chromosorb G	100/120	225	991.80
<b>Acid Washed</b>				
C25222	Chromosorb G	45/60	225	690.50
C25224	Chromosorb G	60/80	225	690.50
C25226	Chromosorb G	80/100	225	690.50
C25228	Chromosorb G	100/120	225	690.50
<b>Non-Acid Washed</b>				
C25202	Chromosorb G	45/60	225	532.90
C25204	Chromosorb G	60/80	225	532.90
C25206	Chromosorb G	80/100	225	532.90
C25208	Chromosorb G	100/120	225	532.90
<b>AW-DMCS Treated</b>				
C25062	Chromosorb P	45/60	150	420.00
C25064	Chromosorb P	60/80	150	420.00
C25066	Chromosorb P	80/100	150	420.00
C25068	Chromosorb P	100/120	150	420.00
<b>Acid-Washed</b>				
C25020	Chromosorb P	30/60	454	1,001.50
C25022	Chromosorb P	45/60	454	1,001.50
C25024	Chromosorb P	60/80	454	1,001.50
C25026	Chromosorb P	80/100	454	1,001.50
C25028	Chromosorb P	100/120	454	1,001.50
<b>Non-Acid Washed</b>				
C25000	Chromosorb P	30/60	454	683.50
C25002	Chromosorb P	45/60	454	683.50
C25004	Chromosorb P	60/80	454	683.50
C25006	Chromosorb P	80/100	454	683.50
C25008	Chromosorb P	100/120	454	683.50

# CHROMSPEC™ PACKED COLUMN ORDERING

## 5 EASY STEPS TO ORDERING PACKED COLUMNS

If you are simply in need of an empty column or packing material, the part numbers are listed in the appropriate table on the preceding pages. If however, you need us to manufacture a packed column, the part number becomes a little more difficult. The following information explains the numbering process (or, simply contact our Technical Support Department for assistance).

Our custom made packed columns are prepared and shipped within a few days of receipt of your order. You can have the column of your choice, packed to your specifications, in your laboratory, shortly after placing your order. Special requirements and non-standard configurations should be discussed with our Technical Support Specialists. Delivery can be determined at that time.

### GLASS PACKED COLUMNS

**1** Describe the empty glass column by specifying the instrument manufacturer's complete model number, any configuration number if applicable and centre to centre distance (injector to detector).

**2** Describe the length, the OD and the ID required. Quote this product number.

e.g. Agilent 5890, configuration A, 9" centres, 6' x 0.25" x 0.2mm

Product Number is C50750 (from chart), **page 55**.

**3** Describe the column packing material by specifying the liquid phase, the % loading, the solid support, its treatment and mesh size.

Product Number	Packing Materials for Glass Columns	Price
C50000	Packing on Chromosorb W	\$76.00
C50001	Packing on Chromosorb G	76.00
C50002	Packing on Other Supports	76.00
C50003	Ultra High Cost Packing	76.00

**4** Describe any special requirements.  
e.g. • Glass columns are not supplied with fittings. Order from the table below.

- Precolumns.
- Special alterations, etc.

Product Number	Fittings for Glass Columns	Price
C50015	Stainless steel nuts and graphite ferrules	\$22.50
C50020	Brass nuts and graphite ferrules	18.80

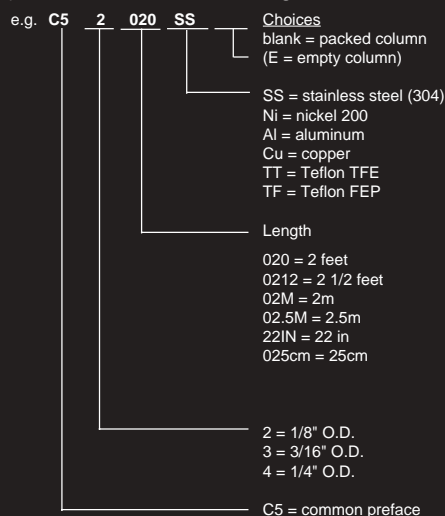
**5** Check with order desk for price verification on your specific column and quote the 2 or 3 product number selected.

### ADDITIONAL NOTES:

- There is a surcharge on all columns requiring ultra high cost packings such as Dextsil and Tenax®. The charge is based directly on the amount of material used.
- All metal and polymeric packed columns are tagged at the injector end; glass columns are shipped with a tag that is not yet attached.
- All metal and polymeric packed columns are supplied with brass fittings. Stainless steel fittings are available at additional cost. Glass columns are not supplied with fittings. They may be ordered separately. (See "Fittings for Glass Columns" table above).
- Reducing unions (brass and stainless steel), if required, can be found on page 66.
- Column conditioning is available for packed metal columns for a small surcharge. Inquire when placing your order. All columns are shipped with conditioning instructions included.

### METAL AND POLYMERIC PACKED COLUMNS

**1** Describe the column dimensions and material by building the product number according to the following chart.



**2** Describe the column shape by specifying the instrument manufacturer, complete model number, any configuration number if applicable and centre to centre distance (injector to detector).

e.g. Agilent 5831, configuration #5, 6" centres

**3** Describe the column packing material by specifying the liquid phase, the % loading, the solid support, its treatment and the mesh size.

e.g. 5% SE-30 on Chromosorb W, AW, 60/80

**4** Describe any special requirements.  
e.g. • supply with SS fittings (brass fittings are standard)  
• add a precolumn (see table below)  
• preconditioning, etc.

### Stainless Steel Precolumns

Product Number	Description (Length x O.D.)	Price (Includes Packing)
C52000SS	1/8" precolumn (up to 8 inches)	\$50.60
C54000SS	1/4" precolumn (up to 8 inches)	50.60

3/16" columns and precolumns are also available. Please inquire.

**5** Check with our order desk for price verifications on your specific column.

### Still Confused?

If you cannot find the material you require, or need assistance determining the part number of your packed column, contact our Technical Support Department at 1-800-267-8103 or tech@chromspec.com for fast, friendly assistance.



## THE CARE OF PACKED GC COLUMNS

Always cool the oven and injection port to room temperature before removing the column from the chromatograph. If the column is to be used again at a later date, cap the ends before storage to prevent diffusion of air into the column. Plastic column protectors can be used for this purpose. When a column is re-installed into a chromatograph, pass carrier gas through it for 15-30 minutes at room temperature to flush out any air before heating it to the desired operating temperature. It is advisable to further condition the column at the desired operating temperature for 1 hour before use.

Even with extreme care, column performance usually deteriorates upon prolonged use. Poor resolution and peak broadening or tailing is a result of column aging. This deterioration may be due to several factors. For example, the injection port temperature may have been set too high and thus overheated the injector end of the column, destroying liquid phase and exposing bare uncoated support surface. Sample residues or decomposition products might have built up on the glass wool plug. The front end of the column packing might have degraded due to oxidation or build-up of residue.

Before discarding an aged column the first few inches of packing should be removed and replaced with fresh packing, and a new silanized glass wool plug inserted. This will usually improve the performance of an old column. With non-polar silicone phase columns, periodic use of a silylation reagent such as Silyl-8 will extend column life. Pre-columns are sometimes used by chromatographers to protect and extend the life of an analytical column. A pre-column is a short piece (typically 6" long) of the same tubing material, joined to the analytical column with a zero dead volume union, and packed with the same packing as the analytical column.

## COLUMN CONDITIONING

To obtain optimum performance from a gas chromatographic column it is essential that it be properly conditioned before use. The use of oxygen free and moisture free analytical grade carrier gas is imperative.

The maximum usable temperature for a column is dependent upon the specific stationary phase used and also to some degree on the type of solid support and column material. The maximum temperature of the stationary phase is indicated on the conditioning sheet, enclosed with each packed column. Never exceed this temperature. Heating above the recommended temperature will result in column degradation with consequent loss of efficiency.

During the conditioning process the injection port temperature should not be higher than the oven temperature. In addition, we recommend that you DO NOT connect the column to the detector during the conditioning period. A short length of narrow bore tubing should be connected to the end of the column to prevent back diffusion of air during conditioning.

Optimum results are obtained by conditioning the column using these procedures: CARRIER GAS SHOULD BE FLOWING AT ALL TIMES.

Column conditioning is available for packed metal columns for a small surcharge. Inquire when placing your order. All columns are shipped with conditioning instructions included.

## Col-Treet COLUMN CONDITIONER

- Silylating mixture designed for conditioning gas chromatography columns
- Eliminates peak tailing, peak broadening and residues which may reduce column efficiency
- Not to be used with any hydrogen bonding stationary phases such as CARBOWAX® or phases with active hydrogen sites

RT970130	Col-Treet	10 x 1 mL	\$60.50
RT970131	Col-Treet	4 x 5 mL	75.60

USP Designation	Chromatographic Specialties Inc. Packed Equivalent
G1	OV-101
G2	OV-1
G3	OV-17
G4	DEGS
G5	Silar 10C
G6	OV-210
G7	Silar 5CP
G8	Silar 9CP
G9	UC W982
G10	Poly-A 103
G11	Di (2-ethylhexyl) sebacate (DOS)
G12	PDEAS
G13	Sorbitol
G14	Carbowax 1000
G15	Carbowax 4000
G16	Carbowax 20M
G17	OV-25
G18	UCON LB 1800-X
G19	OV-225
G20	Carbowax 400
G21	Neopentyl glycol succinate
G22	Di (2-ethylhexyl) phthalate
G23	Polyethylene glycol adipate
G24	Dilododecyl phthalate
G25	Carbowax 20M - TPA
G26	GE XE-60
G27	SE-52
G28	DC550
G29	3,3'-Thiodipropionitrile
G30	Bis [2(2-Methoxyethoxy)ethyl] ether
G31	Igepal C0880
G32	OV-7
G33	Dexsil 300GC
G34	DEGS Stabilized
G35	OV-351
G36	SE-54
G37	Polyimide
G38	G1 with 0.1% Carbowax 1500
G39	Carbowax 1500
G40	Ethylene glycol adipate
G41	OV-3
G42	OV-11
S1A (unsilanized)	Chromosorb W AW
S1A (silanized)	Chromosorb W HP
S1AB	Silcoport W BW
S1C (unsilanized)	Chromosorb P AW
S1C (silanized)	Chromosorb P AW DMCS
S1NS	Chromosorb W NAW
S2	Chromosorb 101
S3	Porapak Q or Hayesep Q
S4	Porapak R or Hayesep R
S5	Chromosorb T
S6	Chromosorb 102
S7	Carboblack C
S8	Porapak S
S9	Tenax® TA
S10	HayeSep C
S11	Carboblack B, 80/120, 3% Rt-1500
S12	Carboblack B

**Note:** Unless specified otherwise, mesh sizes of 80/100 or 100/120 are intended.

For further information regarding the operation, care and maintenance of packed columns, please request literature code #CS09.



# USP - GC COLUMN SPECIFICATIONS

Code	USP Specifications	Agilent	Restek	See Page(s)
G1	Dimethylpolysiloxane oil	DB®-1*	Rtx®-1, MXT®-1	15, 30, 36
G2	Dimethylpolysiloxane gum	DB®-1*	Rtx®-1, MXT®-1	15, 30, 36
G3	50% Phenyl-50% methylpolysiloxane	DB®-17*	Rtx®-50, MXT®-50	21, 42
G5	3-Cyanopropylpolysiloxane	DB®-23	N/A	43
G6	Trifluoropropylmethylpolysiloxane	DB®-210	Rtx®-200, MXT®-200	21, 43
G7	50% 3-Cyanopropyl-50% phenylmethylsilicone	DB®-225	Rtx®-225	22, 44
G14	Polyethylene glycol (Avg. MW of 950-1,050)	DB®-WAX	Stabilwax®, MXT®-WAX, Rtx®-WAX	23, 31, 45
G15	Polyethylene glycol (Avg. MW of 3,000-3,700)	DB®-WAX	Stabilwax®, MXT®-WAX, Rtx®-WAX	23, 31, 45
G16	Polyethylene glycol (Avg. MW of 15,000)	DB®-WAX*	Stabilwax®, MXT®-WAX, Rtx®-WAX	23, 31, 45
G17	75% Phenyl - 25% methylpolysiloxane	DB®-17	Rtx®-65, MXT®-65, Rtx®-65TG, MXT®-65TG	22, 42
G19	25% Phenyl - 25% cyanopropylmethylsilicone	DB®-225*	Rtx®-225	22, 44
G20	Polyethylene glycol (Avg. MW of 380-420)	DB®-WAX	Stabilwax®, MXT®-WAX, Rtx®-WAX	23, 31, 45
G25	Polyethylene glycol TPA (Carbowax 20M terephthalic acid)	DB®-FFAP*	Stabilwax®-DA	24, 46
G27	5% Phenyl - 95% methylpolysiloxane	DB®-5*, DB®-5ms, DB®-5ht	Rtx®-5, Rxi®-5ms, MXT®-5, Rtx®-5ms, Rtx®-5Sil ms	13, 16-17, 30, 38-39
G28	25% Phenyl - 75% methylpolysiloxane	DB®-35, DB®-35ms	Rtx®-20, MXT®-20	18, 41
G32	20% Phenylmethyl - 80% dimethylpolysiloxane	DB®-35, DB®-35ms	Rtx®-20, MXT®-20	18, 41
G35	Polyethylene glycol & diepoxide esterified with nitroterephthalic acid	DB®-FFAP*	Stabilwax®-DA	26, 46
G36	1% Vinyl - 5% phenylmethylpolysiloxane	DB®-5, DB®-5ms	Rtx-5, Rxi®-5ms, MXT-5, Rtx-5ms, Rtx®-5Sil ms	13, 16-17, 30, 38-39
G38	Phase G1 plus a tailing inhibitor	DB®-1	Rtx®-1, MXT®-1	15, 30, 36
G39	Polyethylene glycol (Avg. MW of 1,500)	DB®-WAX	Stabilwax®, MXT®-WAX, Rtx®-Wax	23, 31, 45
G41	Phenylmethyldimethylsilicone (10% phenyl substituted)	DB®-5, DB®-5ms	Rtx®-5, MXT®-5	16, 30, 38-39
G42	35% Phenyl - 65% dimethylvinylsiloxane	DB®-35*, DB®-35ms	Rtx®-35, MXT®-35	20, 41
G43	6% Cyanopropylphenyl - 94% dimethylpolysiloxane	DB®-624*, DB®-1301	Rtx®-1301, MXT®-1301, Rtx®-624, MXT®-624	18, 27, 40, 47

\* Indicates exact equivalent

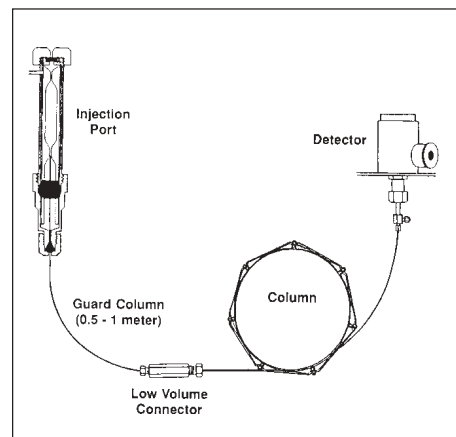
For USP codes not listed, please contact Technical Support at 1-800-267-8103 to discuss possible custom GC columns.

For USP codes for LC applications, visit our website at [www.chromspec.com/tech/LC](http://www.chromspec.com/tech/LC)

# AGILENT CAPILLARY TUBING/GUARD COLUMNS

DEACTIVATED TUBING		NOTE: Other lengths are available. Please inquire.	UNDEACTIVATED TUBING	
Product Number	Price	Common Description	Product Number	Price
<b>Megabore Tubing</b>				
J1602535	\$14.00	1m x 0.53mm x 0.8mm	J1602530	\$6.00
J1602535S2	27.90	2m x 0.53mm x 0.8mm	J1602530S2	12.10
J1602535S3	41.90	3m x 0.53mm x 0.8mm	J1602530S3	18.10
J1602535S4	55.90	4m x 0.53mm x 0.8mm	J1602530S4	24.10
J1602535S5	66.60	5m x 0.53mm x 0.8mm	J1602530S5	29.20
J1602535S10	125.00	10m x 0.53mm x 0.8mm	J1602530S10	53.80
J1602535S15	Inquire	15m x 0.53mm x 0.8mm	J1602530S15	Inquire
J1602535S20	Inquire	20m x 0.53mm x 0.8mm	J1602530S20	Inquire
J1602535S30	349.00	30m x 0.53mm x 0.8mm	J1602530S30	Inquire
<b>Wide Bore Tubing</b>				
J1602325	10.60	1m x 0.32mm x 0.5mm	J1602320	5.00
J1602325S2	19.90	2m x 0.32mm x 0.5mm	J1602320S2	7.10
J1602325S3	29.80	3m x 0.32mm x 0.5mm	J1602320S3	11.40
J1602325S4	39.80	4m x 0.32mm x 0.5mm	J1602320S4	15.20
J1602325S5	47.90	5m x 0.32mm x 0.5mm	J1602320S5	17.50
J1602325S10	88.80	10m x 0.32mm x 0.5mm	J1602320S10	33.90
J1602325S15	Inquire	15m x 0.32mm x 0.5mm	J1602320S15	Inquire
J1602325S20	Inquire	20m x 0.32mm x 0.5mm	J1602320S20	Inquire
J1602325S30	248.00	30m x 0.32mm x 0.5mm	J1602320S30	Inquire
<b>Narrow Bore Tubing</b>				
J1602255	9.30	1m x 0.25mm x 0.4mm	J1602250	5.00
J1602255S2	18.60	2m x 0.25mm x 0.4mm	J1602250S2	7.80
J1602255S3	27.90	3m x 0.25mm x 0.4mm	J1602250S3	11.80
J1602255S4	37.20	4m x 0.25mm x 0.4mm	J1602250S4	15.70
J1602255S5	44.40	5m x 0.25mm x 0.4mm	J1602250S5	17.60
J1602255S10	83.00	10m x 0.25mm x 0.4mm	J1602250S10	35.10
J1602255S15	Inquire	15m x 0.25mm x 0.4mm	J1602250S15	Inquire
J1602255S20	Inquire	20m x 0.25mm x 0.4mm	J1602250S20	Inquire
J1602255S30	230.00	30m x 0.25mm x 0.4mm	J1602250S30	Inquire
<b>Minibore Tubing</b>				
J1602615	14.00	1m x 0.18mm x 0.4mm	J1602610	9.80
J1602615S2	27.70	2m x 0.18mm x 0.4mm	J1602610S2	19.70
J1602615S3	41.60	3m x 0.18mm x 0.4mm	J1602610S3	27.60
J1602615S4	55.50	4m x 0.18mm x 0.4mm	J1602610S4	36.80
J1602615S5	66.60	5m x 0.18mm x 0.4mm	J1602610S5	46.80
J1602615S10	124.00	10m x 0.18mm x 0.4mm	J1602610S10	87.70
J1602615S15	Inquire	15m x 0.18mm x 0.4mm	J1602610S15	Inquire
J1602615S20	Inquire	20m x 0.18mm x 0.4mm	J1602610S20	Inquire
		30m x 0.18mm x 0.4mm	J1602610S30	Inquire
<b>Microbore Tubing</b>				
J1602635	21.00	1m x 0.10mm x 0.4mm	J1602634	12.10
J1602635S2	40.50	2m x 0.10mm x 0.4mm	J1602634S2	24.20
J1602635S3	60.80	3m x 0.10mm x 0.4mm	J1602634S3	36.20
J1602635S4	76.00	4m x 0.10mm x 0.4mm	J1602634S4	45.40
J1602635S5	97.00	5m x 0.10mm x 0.4mm	J1602634S5	58.50
J1602635S10	181.00	10m x 0.10mm x 0.4mm	J1602634S10	108.00
J1602635S15	Inquire	15m x 0.10mm x 0.4mm	J1602634S15	Inquire
J1602635S20	Inquire	20m x 0.10mm x 0.4mm	J1602634S20	Inquire
		30m x 0.10mm x 0.4mm	J1602634S30	Inquire
<b>Microbore Tubing</b>				
J1602655	21.00	1m x 0.05mm x 0.4mm	J1602650	18.40
J1602655S2	41.60	2m x 0.05mm x 0.4mm	J1602650S2	36.80
J1602655S3	62.40	3m x 0.05mm x 0.4mm	J1602650S3	55.20
J1602655S4	78.10	4m x 0.05mm x 0.4mm	J1602650S4	68.90
J1602655S5	99.30	5m x 0.05mm x 0.4mm	J1602650S5	87.70
J1602655S10	186.00	10m x 0.05mm x 0.4mm	J1602650S10	164.00
		15m x 0.05mm x 0.4mm	J1602650S15	Inquire
		20m x 0.05mm x 0.4mm	J1602650S20	Inquire
		30m x 0.05mm x 0.4mm	J1602650S30	Inquire

## GUARD COLUMNS



A short length of deactivated tubing can serve as a "retention gap". It permits large volumes to be injected onto an open tubular column without adversely effecting solute resolution. Solute bands broadened during injection migrate down the retention gap and encounter a precipitous decrease in phase ratio as they reach the column. This abrupt change in phase ratio effectively shortens the bands at the head of the column.

It can also serve as a guard column — a place where non-volatile residues tend to accumulate, preventing contamination of the analytical column. If a 0.53mm I.D. precolumn is used, on-column injections can be made using a "stand-ard" 26 gauge needle.

## HIGH TEMPERATURE DEACTIVATED TUBING

Product Number	Description	Price
J1602845	1m x 0.25mm x 0.4mm	\$10.10
J1602845S2	2m x 0.25mm x 0.4mm	21.40
J1602845S3	3m x 0.25mm x 0.4mm	32.20
J1602845S4	4m x 0.25mm x 0.4mm	40.30
J1602845S5	5m x 0.25mm x 0.4mm	51.40
J1602855	1m x 0.32mm x 0.5mm	10.60
J1602855S2	2m x 0.32mm x 0.5mm	22.50
J1602855S3	3m x 0.32mm x 0.5mm	31.80
J1602855S4	4m x 0.32mm x 0.5mm	42.40
J1602855S5	5m x 0.32mm x 0.5mm	53.80
J1602865	1m x 0.53mm x 0.8mm	20.80
J1602865S2	2m x 0.53mm x 0.8mm	39.10
J1602865S3	3m x 0.53mm x 0.8mm	62.40
J1602865S4	4m x 0.53mm x 0.8mm	78.10
J1602865S5	5m x 0.53mm x 0.8mm	99.30

Other dimensions are available. Please inquire.

## Capillary Column Connectors

See . . . . . Pages 81-84

## Zero Dead Volume Unions

See . . . . . Pages 192-193

# AGILENT CAPILLARY TUBING/GUARD COLUMNS

## J & W DuraGuard™ COLUMNS

When using deactivated fused silica tubing as a guard column, transfer line or retention gap; the choice, installation and effectiveness of the union have been a hassle . . . until now.

DuraGuard™ columns with a built-in guard column, retention gap, or transfer line are available! The guard column, retention gap or transfer line and the analytical column are made with a single, continuous piece of fused silica tubing, thus eliminating the need for a union. Installation hassles, peak shape problems and leaks associated with unions are a thing of the past. Samples containing difficult analytes such as pesticides or drugs can be chromatographed without any undesirable contributions from the union.

### CLP PESTICIDES

Column: **DB-5**, 15 m x 0.32 mm I.D., 0.25 µm  
10 m DuraGuard™ Column

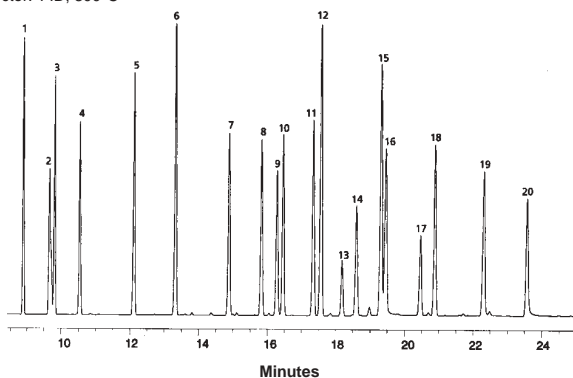
Carrier: Helium at 37.2 cm/sec.,  
measured at 50°C

Oven: 50°C for 1 min.  
50-150°C at 25°C/min  
150-230°C at 4°C/min.

Injector: Splitless, 250°C  
0.5 min. purge activation time

Detector: FID, 300°C

- |                       |                        |
|-----------------------|------------------------|
| 1. α-BHC              | 11. Dieldrin           |
| 2. β-BHC              | 12. p,p'-DDE           |
| 3. γ-BHC              | 13. Endrin             |
| 4. δ-BHC              | 14. Endosulfan II      |
| 5. Heptachlor         | 15. p,p'-DDT           |
| 6. Aldrin             | 16. Endrin aldehyde    |
| 7. Heptachlor epoxide | 17. Endosulfan sulfate |
| 8. γ-Chlordane        | 18. p,p'-DDT           |
| 9. Endosulfan I       | 19. Endrin ketone      |
| 10. α-Chlordane       | 20. Methoxychlor       |



### DRUGS

Column: **DB-5**, 15 m x 0.32 mm I.D., 0.25 µm  
10 m DuraGuard™ Column

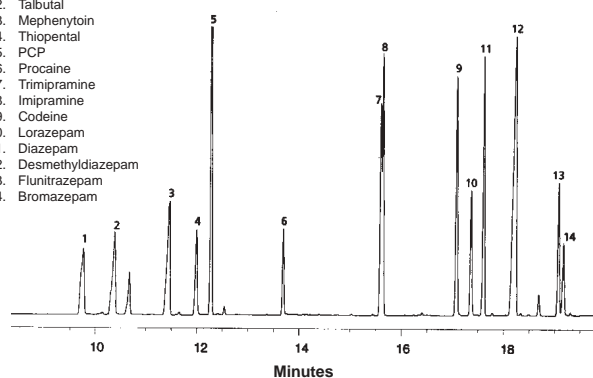
Carrier: Helium at 35.3 cm/sec.,  
measured at 50°C

Oven: 75°C-275°C at 10°C/min.

Injector: Splitless, 250°C

0.5 min. purge activation time  
Detector: FID, 300°C

- |                       |
|-----------------------|
| 1. Butabarbital       |
| 2. Talbutal           |
| 3. Mepherytoin        |
| 4. Thiopental         |
| 5. PCP                |
| 6. Procaine           |
| 7. Trimipramine       |
| 8. Imipramine         |
| 9. Codeine            |
| 10. Lorazepam         |
| 11. Diazepam          |
| 12. Desmethyldiazepam |
| 13. Flunitrazepam     |
| 14. Bromazepam        |



DuraGuard columns are available for any polysiloxane or "low bleed" stationary phase made with 0.18mm I.D. or larger fused silica tubing. Please contact our Technical Support Department at 1-800-267-8103 or tech@chromspec.com to determine the correct product number for your application.

## PROSTEEL STAINLESS STEEL TUBING, DEACTIVATED

For use as a retention gap or guard column with J&W ProSteel GC Columns. Other lengths are available. Please inquire.

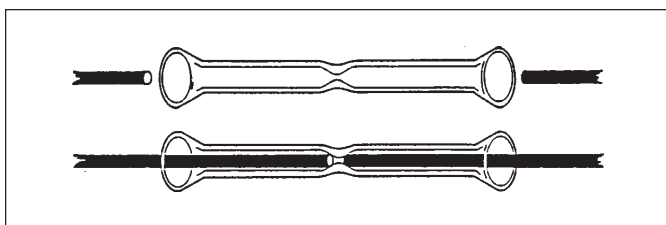
Product Number	Description	Price
J1604535	1m x 0.53mm x 0.8mm	\$22.30
J1604535S2	2m x 0.53mm x 0.8mm	44.60
J1604535S5	5m x 0.53mm x 0.8mm	99.30
J1604535S10	10m x 0.53mm x 0.8mm	Inquire

## KNIFE & NEEDLE FILES

- For small deburring jobs
- Enlarging ferrule holes
- Marking & cutting glass
- Ideal for cutting MXT and ProSteel capillary columns

C11308	Knife File, Pkg. 2	\$63.10
C11309	Needle File, Pkg. 2	46.70

## UNIVERSAL GLASS UNIONS



Can be used to:

- couple columns with different phases, added length, and different diameters
- couple an empty section of deactivated fused silica tubing to the inlet end of the capillary column. This prevents "Band Broadening in Space" which is often encountered with on-column injection. (K. Grob, Jr., Journal of Chromatography, 237 [1982] 15-2)

J7050805	Universal 2-Way Union	5	\$26.90
J7050825	Universal 2-Way Union	25	128.00

**NOTE:** These unions are made of glass and are deactivated.

# RESTEK CAPILLARY TUBING/GUARD COLUMNS

## POLAR DEACTIVATED FUSED SILICA GUARD COLUMNS

- Provides optimum wettability for polar compounds
- Minimizes peak splitting when using polar solvents such as methanol and water
- Polyethylene glycol deactivation layer
- Compatible with Stabilwax®, Rtx®-225 and Rtx®-2330 capillary columns

**Fused Silica Guard Columns** (polar polyethylene glycol deactivation)

Nominal I.D.	Nominal O.D.	5m Length		10m Length		30m Length*		60m Length**	
0.25mm	0.37 ± 0.04mm	RK10065	\$49.00	RK10068	\$98.10	RK10014	\$288.30	RK10015	\$576.50
0.32mm	0.45 ± 0.04mm	RK10066	61.30	RK10069	110.40	RK10024	325.00	RK10025	650.20
0.53mm	0.69 ± 0.05mm	RK10067	79.70	RK10070	147.20	RK10034	435.50	RK10035	877.10

## INTERMEDIATE-POLARITY DEACTIVATED GUARD COLUMNS/TRANSFER LINE

- Useful for a wide range of applications and most common solvents
- Maximum temperature: 325°C

**Fused Silica Intermediate-Polarity**

Nominal I.D.	Nominal O.D.	5m Length		10m Length		30m Length*		60m Length**	
0.25mm	0.37 ± 0.04mm	RK10043	\$49.00	RK10049	\$98.10	RK10012	\$288.30	RK10013	\$576.50
0.32mm	0.45 ± 0.04mm	RK10044	55.20	RK10048	110.40	RK10022	325.00	RK10023	650.20
0.53mm	0.69 ± 0.05mm	RK10045	79.70	RK10047	147.20	RK10032	435.50	RK10033	877.10

**Note:** Other nominal internal diameters are available as well as MXT passivated stainless steel. Contact our Technical Support Team at 1-800-267-8103 for product numbers and availability.

## BASE DEACTIVATED FUSED SILICA GUARD COLUMNS

**Fused Silica Guard Columns** (base deactivated)

Nominal I.D.	Nominal O.D.	5m Length	
0.25mm	0.37 ± 0.04mm	RK10000	\$55.20
0.32mm	0.45 ± 0.04mm	RK10001	61.40
0.53mm	0.69 ± 0.05mm	RK10002	79.70

- Provides excellent inertness for the analysis of basic compounds
- Recommended for use with Rtx®-5 Amine and Stabilwax®-DB capillary columns
- Tested with basic amine test mix
- Batch test chromatogram included

## HYDROGUARD™ WATER RESISTANT GUARD TUBING/TRANSFER LINES

**Use Hydroguard™ Tubing for Connecting GCs to:**

- Purge and trap systems
- Headspace analyzers
- Air concentrator units
- Air analysis equipment
- Other instruments that trap/release water vapours
- Any analytical instrument that needs an inert, water resistant pathway

**Benefits of Hydroguard™ Tubing:**

- Resists degradation from water injections
- Withstands harsh "steam-cleaning" chromatography processes
- Increases column lifetime
- Reduces effects of dirty samples on column performance
- Reduces downtime and maintenance
- Protects expensive analytical columns
- Prevents damage from harmful materials

**Hydroguard™ Fused Silica Guard Columns & Transfer Lines**

Nominal I.D.	Nominal O.D.	5m Length		10m Length		30m Length*		60m Length**	
0.05mm*	0.363 ± 0.012mm	RK10075	\$98.10	_____	_____	_____	_____	_____	_____
0.10mm*	0.363 ± 0.012mm	RK10076	98.10	_____	_____	_____	_____	_____	_____
0.15mm	0.363 ± 0.012mm	RK10077	98.10	_____	_____	_____	_____	_____	_____
0.18mm	0.34 ± 0.01mm	RK10078	67.50	_____	_____	_____	_____	_____	_____
0.25mm	0.37 ± 0.04mm	RK10079	55.20	RK10082	\$110.40	RK10085	\$325.00	RK10088	\$656.30
0.32mm	0.45 ± 0.04mm	RK10080	61.40	RK10083	122.70	RK10086	361.80	RK10089	729.80
0.53mm	0.69 ± 0.05mm	RK10081	79.70	RK10084	165.60	RK10087	478.40	RK10090	956.80

\* Not tested with the Grob mix because of a high pressure drop.

\*\* Recommendation: Cut 60m guard columns into shorter lengths. Using full length may cause peak distortion.

\* 30 and 60-metre lengths are banded in 5-metre sections.

**Hydroguard™ MXT® Guard Columns & Transfer Lines**

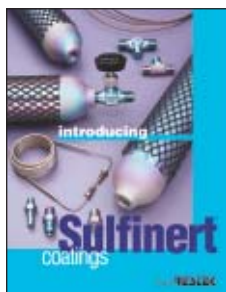
Nominal I.D.	Nominal O.D.	5m Length		10m Length		30m Length*		60m Length**	
0.28mm	0.53 ± 0.025mm	RK70080	\$71.80	RK70083	\$137.60	RK70086	\$388.90	RK70089	\$764.20
0.53mm	0.74 ± 0.025mm	RK70081	89.80	RK70084	173.50	RK70087	502.50	RK70090	1,001.20



## Free Literature



For further information regarding Siltek deactivation, please request literature code **RK37**.



For further information regarding Sulfinert deactivation, please request literature code **RK38**.



For further information regarding the entire line of Valco products, including tubing, valves and fittings, please request literature code **V01**.

## RESTEK SILTEK™-TREATED ELECTROPOLISHED TUBING

- Exceptional inertness.
- Improved reliability and reproducibility; longer lifetime.
- Use with treated fittings for the most inert sample pathway available.

Product Number	Description	Price
RK22538S25F	1/8" OD x 0.085" ID x 25 feet	\$712.00
RK22538S50F	1/8" OD x 0.085" ID x 50 feet	1,362.00
RK22538S100F	1/8" OD x 0.085" ID x 100 feet	2,706.70
RK22539S25F	1/4" OD x 0.180" ID x 25 feet	\$712.00
RK22539S50F	1/4" OD x 0.180" ID x 50 feet	1,362.00
RK22539S100F	1/4" OD x 0.180" ID x 100 feet	2,706.70

## RESTEK SULFINERT® TUBING: 316 SEAMLESS STAINLESS STEEL

- Sulfinert® coating is ideal for low-level sulfur compounds.

RK22508S25F	1/8" OD x 0.055" ID x 25 feet	\$533.20
RK22508S50F	1/8" OD x 0.055" ID x 50 feet	1,019.90
RK22508S100F	1/8" OD x 0.055" ID x 100 feet	2,026.80
RK22509S25F	1/4" OD x 0.180" ID x 25 feet	\$533.20
RK22509S50F	1/4" OD x 0.180" ID x 50 feet	1,019.90
RK22509S100F	1/4" OD x 0.180" ID x 100 feet	2,026.80

## VALCO ELECTROFORMED NICKEL TUBING

- Electroformed nickel tubing is electrolytically cut, electropolished and steam cleaned, ready for use.

### Standard Sizes

VTEFNI5105	1/32" OD x 0.010" ID x 5 feet	\$75.80
VTEFNI51025	1/32" OD x 0.010" ID x 25 feet	361.60
VTEFNI5205	1/32" OD x 0.020" ID x 5 feet	52.50
VTEFNI52025	1/32" OD x 0.020" ID x 25 feet	250.80
VTEFNI1305	1/16" OD x 0.030" ID x 5 feet	\$75.80
VTEFNI13025	1/16" OD x 0.030" ID x 25 feet	361.60
VTEFNI1405	1/16" OD x 0.040" ID x 5 feet	64.10
VTEFNI14025	1/16" OD x 0.040" ID x 25 feet	303.20

### Capillary Sizes

VTEFNI5022	1/32" OD x 0.002" ID x 2 feet	\$44.30
VTEFNI5042	1/32" OD x 0.004" ID x 2 feet	39.70
VTEFNI5052	1/32" OD x 0.005" ID x 2 feet	39.70

## VALCO HASTELLOY C TUBING

VTHC130S5F	1/16" OD x 0.030" ID x 5 feet	\$68.20
VTHC130S10F	1/16" OD x 0.030" ID x 10 feet	134.20
VTHC130S25F	1/16" OD x 0.030" ID x 25 feet	332.20
VTHC270S5F	1/8" OD x 0.070" ID x 5 feet	90.20
VTHC270S10F	1/8" OD x 0.070" ID x 10 feet	178.20
VTHC270S25F	1/8" OD x 0.070" ID x 25 feet	442.20

## CHROMSPEC™ CHROMATOGRAPHIC GRADE TUBING

The material is furnished with the ID free from oil, grease and foreign material. Careful quality control insures accuracy of size, soundness of material and uniform surface.

Product Number	Size	Description	Price
<b>Stainless Steel (Premium Quality, Chromatographic Grade)</b>			
C49300	1/16"	OD x 0.010" ID 316SS (Any length up to 300 ft.)	\$5.20 per ft.
C49305	1/16"	OD x 0.030" ID 316SS (Any length up to 300 ft.)	5.50 per ft.
C49306	1/16"	OD x 0.040" ID 316SS (Any length up to 300 ft.)	11.30 per ft.
C49310	1/8"	OD - 0.020 Wall 304SS (Up to 10 ft., straight lengths) (Min. 6 pcs.)	7.70 per ft.
C49315	1/8"	OD - 0.020 Wall 304SS 50 ft. continuous coils	274.20 per 50 ft.
C49320	3/16"	OD - 0.020 Wall 304SS (Up to 10 ft., straight lengths) (Min. 6 pcs.)	8.80 per ft.
C49325	1/4"	OD - 0.030 Wall 304SS (Up to 10 ft., straight lengths) (Min. 6 pcs.)	8.00 per ft.
<b>Nickel 200</b>			
C49330	1/16"	OD x 0.020" ID	8.40 per ft.
C49335	1/8"	OD Wall thickness 0.020"	9.20 per ft.
C49336	1/8"	OD Wall thickness 0.020"	331.00 per 50 ft.
C49340	1/4"	OD Wall thickness 0.020"	12.50 per ft.
<b>Copper (Refrigeration Grade Cleaned)</b>			
C49345	1/8"	OD Wall thickness 0.030"	79.00 per 50 ft.
C49350	3/16"	OD Wall thickness 0.030"	86.80 per 50 ft.
C49355	1/4"	OD Wall thickness 0.030"	98.50 per 50 ft.
<b>Aluminum</b>			
C49360	1/8"	OD Wall thickness 0.025"	64.40 per 50 ft.
C49370	1/4"	OD Wall thickness 0.032"	78.70 per 50 ft.
<b>Teflon Lined (Available only in 12 ft., 25 ft., and 50 ft. lengths)</b>			
C49395	1/8"	OD Stainless Steel Tubing Teflon Lined	16.60 per ft.
C49400	1/4"	OD Stainless Steel Tubing Teflon Lined	21.40 per ft.
<b>Teflon</b>			
C49405	1/8"	OD x 0.084" ID Teflon Tubing FEP (Max. Temp. 204°C)	198.50 per 100 ft.
C49410	1/8"	OD x 0.095" ID Teflon Tubing TFE (Max. Temp. 260°C)	194.70 per 100 ft.
C49415	1/4"	OD x 3/16" ID Teflon Tubing FEP	119.90 per 25 ft.
C49420	1/4"	OD x 1/8" ID Teflon Tubing TFE	123.90 per 25 ft.

Other tubing materials and dimensions are available. Contact our helpful Technical Support Team for product numbers and availability.

TUBING CUTTER, 1/8" & 1/16"	TUBING CUTTER, 1/16"	TUBING BENDER	TUBING REAMER	TUBING DRESSING TOOL
				
		<ul style="list-style-type: none"> <li>Bends 1/8", 1/16" or 1/4" tubing</li> <li>Accurate left-hand, right-hand or offset bends</li> </ul>	<ul style="list-style-type: none"> <li>Removes burrs from stainless steel tubing</li> <li>For 1/4" or 1/8" tubing</li> <li>Non-slip safety design</li> </ul>	<ul style="list-style-type: none"> <li>Opens stainless steel tubing bore and removes burrs</li> </ul>
Product Number	Description			Price
C440792	Tubing Cutter, 1/8" & 1/16"			\$65.20
C440793	Replacement Cutting Wheels for Tubing Cutter, 1/8" & 1/16", Pkg. 2			23.70
C11346	Terry Tool Tubing Cutter, 1/16"			\$144.90
C11348	Replacement Cutting Wheels for Terry Tool Tubing Cutter, 1/16", Pkg. 3			37.40
RK23009	Tubing Bender			104.90
RK20134	Tubing Reamer			45.20
RK20188	1/16" O.D. Tubing Dressing Tool			103.30
RK20190	1/8" O.D. Tubing Dressing Tool			153.40

# Swagelok™ GC FITTINGS

Description	Size (Inches)	Product Number	Brass		Product Number	Stainless Steel		
			Qty.	Price		Qty.	Price	
Unions 	1/16 1/8 3/16 1/4	B1006 B2006 B3006 B4006	2 2 2 4	\$25.00 20.40 19.00 31.40	SS1006 SS2006 SS3006 SS4006	1 1 1 1	\$30.70 22.00 20.50 21.80	
Union Tees 	1/16 1/8 3/16 1/4	B1003 B2003 B3003 B4003	1 1 1 1	23.40 21.00 21.70 21.20	SS1003 SS2003 SS3003 SS4003	1 1 1 1	77.90 48.30 48.70 44.40	
Reducing Unions 	1/8 to 1/16 3/16 to 1/8 1/4 to 1/8 1/4 to 3/16	B20061 B30062 B40062 B40063	2 2 2 2	21.70 21.70 17.60 18.50	SS20061 SS30062 SS40062 SS40063	1 1 1 1	30.00 21.00 22.90 23.00	
Male Connectors 	1/16 tube to 1/8 pipe 1/8 tube to 1/8 pipe 3/16 tube to 1/8 pipe 1/4 tube to 1/8 pipe	B10012 B20012 B30012 B40012	2 4 4 4	18.00 26.80 26.80 25.90	SS10012 SS20012 SS30012 SS40012	1 1 1 1	22.30 18.30 18.30 16.70	
Female Connectors 	1/8 tube to 1/4 pipe 1/4 tube to 1/4 pipe 1/8 tube to 1/8 pipe	B20074 B40074 B20072	2 2 2	19.00 16.20 18.00	SS20074 SS40074 SS20072	1 1 1	21.80 23.00 18.70	
Nuts 	1/16 1/8 3/16 1/4	B1021 B2021 B3021 B4021	12 24 24 24	27.60 34.50 33.00 27.60	SS1021 SS2021 SS3021 SS4021	2 6 6 6	16.70 31.80 29.10 29.10	
Front Ferrules 	1/16 1/8 3/16 1/4	B1031 B2031 B3031 B4031	12 24 24 24	19.20 28.80 27.60 27.60	SS1031 SS2031 SS3031 SS4031	6 6 6 6	31.80 20.70 22.20 16.70	
Back Ferrules 	1/16 1/8 3/16 1/4	B1041 B2041 B3041 B4041	12 24 24 24	19.20 23.20 22.20 22.20	SS1041 SS2041 SS3041 SS4041	6 6 6 6	30.50 19.40 20.70 15.20	
Reducers 	<b>Column Diameter</b> 1/16" 1/8" 1/8" 3/16" 1/4" 3/16"	<b>GC Fitting</b> 1/4" 3/16" 1/4" 1/4" 1/8" 1/8"	 B100R4 B200R3 B200R4 B300R4 B400R2	 2 2 2 2 2	 24.50 19.40 15.70 14.80 15.70	 SS100R4 SS200R3 SS200R4 SS300R4 SS400R2 SS300R2	 2 2 2 2 2 2	 81.50 50.00 45.80 49.00 60.60 68.90

\*Swagelok" is a trademark of Crawford Fitting Co.

## THREADULATOR

The Threadulator is suitable for re-threading instrument fittings to prevent expensive replacement of fittings welded or permanently mounted to the instrument.













Product Number	Description	Price
C37338	Threadulator 1/16"	\$75.90
C37340	Threadulator 1/8"	75.90
C37342	Threadulator 1/4"	75.90

## TEFLON TAPE

Teflon Tape helps make better joints. Thread life is extended on column fittings and a tighter joint is obtained without excessive torque. It is recommended for Chemicals, Corrosives, Hydraulic Fluids, Freon 22, Aromatic Fuels, Plastics, Aluminum, Stainless Steel, Ceramic, Synthetic Rubber, Monel and Carbon Steel Pipe. Temperature range is -156°C to +260°C.

Product Number	Description	Price
C13000	Teflon Tape 1/2" x 288"	\$15.50
C13005	Teflon Tape 1/4" x 576"	15.00

Description	Size	Brass			Stainless Steel		
		Product Number	Qty	Price	Product Number	Qty	Price
<b>Ball - Shut Off Valve</b> 	1/8" Tube Fitting	B41S2	1	\$68.60	SS41GS2	1	\$135.10
	1/4" Tube Fitting	B42S4	1	69.60	SS42GS4	1	130.90
<b>Needle Valve</b> 	1/8" Tube Fitting, Metal Stem	BOVS2	1	\$75.10	SSOVS2	1	\$130.20
	1/4" Tube Fitting, Metal Stem	B1VS4	1	56.50	SS1VS4	1	121.70
<b>Plug Valve</b> 	1/8" Tube Fitting	B2P4T	1	\$79.40	SS2P4T	1	\$115.60
	1/4" Tube Fitting	B4P4T	1	67.00	SS4P4T	1	113.60
<b>Diaphragm Valve</b> 	Stainless Diaphragm Valve, 1/4" Tube Fit, Alum. Round Handle	—	—	—	SSDSS4	1	\$342.60
<b>Toggle Valve</b> 	1/8" Tube Fitting	BOGS2	1	\$65.30	SSOGS2	1	\$143.40
	1/4" Tube Fitting	B1GS4	1	67.90	SS1GS4	1	128.80
<b>Fine Metering Valve</b> 	1/8" Tube Fitting	B2MG	1	\$88.80	SS2MG	1	\$182.20
	1/4" Tube Fitting	B4MG	1	91.00	SS4MG	1	182.60
<b>PFA (Plastic) Needle Valve</b> 	1/4" Tube Fitting	PFA4RPS4	1	\$209.00	—	—	—
<b>PFA (Plastic) Plug Valve</b> 	1/4" Tube Fitting	PFA43S4	1	\$157.10	—	—	—
<b>Brass Poppet Check Valve</b> 	1/8" Tube Fitting, 1 PSIG Spring	B2C1	1	\$40.80	—	—	—
<b>Inline Filter</b> 	1/8" Tube Fitting, 7 Micron	B2F7	1	\$51.20	SS2F7	1	\$108.30
	1/4" Tube Fitting, 7 Micron	B4F7	1	60.90	SS4F7	1	114.90

\*Swagelok" is a trademark of Crawford Fitting Co.



## RESTEK SURFACE TREATMENTS

### Silcosteel-CR



Request Literature Code RK113

### Restek Performance Coatings



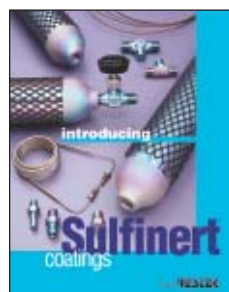
Request Literature Code RK111

### Siltek® Deactivation



Request Literature Code RK37

### Introducing Sulfinert® Coatings



Request Literature Code RK38

Restek offers two treatments, Siltek® and Silcosteel®, that are ideal alternatives to glass linings for passivating many types of surfaces. A Siltek® or Silcosteel® layer provides complete surface isolation while maintaining all the ruggedness of the untreated component. These layers are applied over the entirety of the surface, using a chemical vapor deposition process that does not depend on line-of-sight; corners, bends, and seams are uniformly coated.

In most situations Siltek® treatment is the ideal choice for ultimate inertness. The Siltek® layer is applied at a thickness of up to 0.12µm. At this thickness even parts-per-billion levels of reactive materials will be stable during storage or transfer. A Silcosteel® layer provides equivalent protection for parts-per-million levels of reactive materials.

Siltek®, Sulfinert®, or Silcosteel® treatments can eliminate interactions between process gases and transfer system components. Restek's extensive evaluations in the fields of passivation, corrosion resistance, and ultra-high vacuum show that these treatments eliminate outgassing of impurities into the sample stream and will not react with process stream components.

#### Restek's surface treatments are:

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

Restek passivation and surface protection layers are deposited using a chemical vapor deposition (CVD) process. The item(s) to be treated is heated under vacuum in a large oven, followed by the introduction of proprietary reactive gases that form the protective surface. These gases deposit as a durable, amorphous layer that grows and overlays itself multiple times. The reaction layer penetrates into the lattice of the treated piece and binds solidly. Consequently, it is possible to work a piece, such as bending a length of treated tubing, without creating cracks, flakes, or other flaws in the passivation layer. By controlling variables throughout the process, layer thicknesses can be tightly controlled in a range from 0.03µm to 30µm.

*As strong as steel, as inert as glass.*

Restek's current capacity enables them to treat items up to 6 feet long, or continuous lengths of coiled tubing exceeding 2000 feet (600 meters). Items that can be evacuated, such as gas chambers, can have a volume of up to 3.5 cubic feet.

**Contact our Technical Support Team to discuss your passivation requirements.**

## Siltek™ DEACTIVATION — THE NEXT GENERATION

- Maximizes the inertness of sample pathway
- Minimizes sample breakdown
- Low bleed
- Thermally stable
- Extremely durable
- "Clean and green" — manufactured without the use of harmful organic solvents



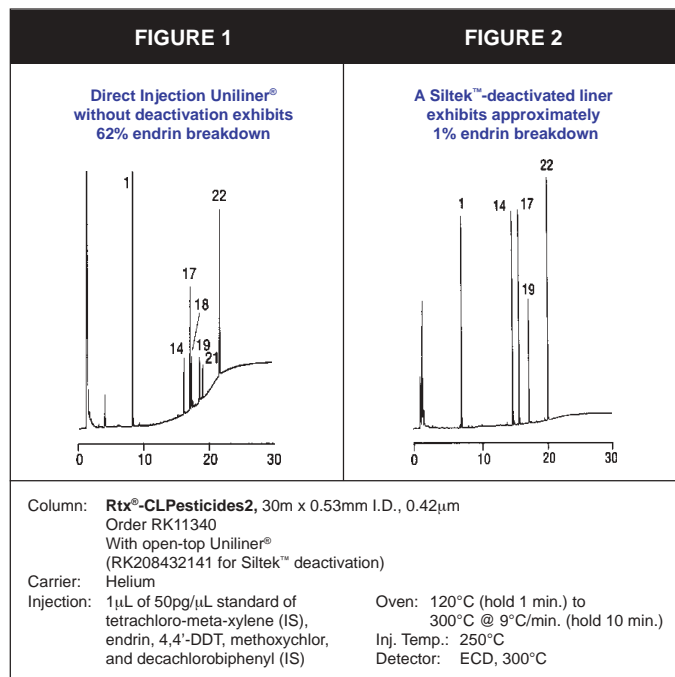
### Restek Introduces . . .

#### The Next Generation of Deactivation ... Siltek™

The Siltek™ deactivation process (patent pending) produces a highly-inert glass surface, which features high temperature stability, extreme durability, and low bleed. Try Siltek™-deactivated liners, guard columns, wool, and connectors for minimized breakdown and better recovery of sample analytes.

To illustrate the importance of proper surface deactivation for endrin and DDT analysis, a 50 pg/μL test mix was injected on an undeactivated direct injection glass inlet liner. Endrin breakdown was 62% and DDT breakdown was below detection limits as shown in Figure 1.

Next, the raw liner was removed and replaced with a Siltek™-deactivated direct injection liner. The results of this injection are shown in Figure 2. Endrin breakdown measured less than 1% and DDT breakdown again was below detection limits. The results not only confirm the necessity for inlet liner deactivation in pesticides analysis, but also show the inherent inertness of Siltek™ deactivation and its ability to improve the accuracy of pesticides analysis.



The best protection against endrin and DDT breakdown for chlorinated pesticide analysis is to outfit your GC with Siltek™-treated products. For a highly inert pathway and fast GC cycle times, use Rtx®-CLPesticides and Rtx®-CLPesticides2 analytical columns in combination with Siltek™-deactivated liners and guard columns.

### Siltek™ -Deactivated Guard Columns

Guard columns are commonly used in the analysis of chlorinated pesticides. Many analysts use them as a way to divide a sample equally onto two different analytical columns by way of a Press-Tight® 'Y' connector. This configuration allows a primary and a confirmational analysis using one injection. Guard columns also make routine maintenance easier by allowing removal of the first metre of column. This eliminates non-volatile contamination, without affecting the analytical column(s). Siltek™-deactivated guard columns and Siltek™-deactivated connectors provide an inert sample introduction pathway that is ideal for chlorinated pesticide analysis.

### Siltek™-Deactivated Inlet Liners

Siltek™	Siltek™ with Siltek™- Deactivated Wool	Siltek™ with CarboFrit	Qty
-214.1	-213.1	-216.1	1
-214.5	-213.5	-216.5	5

Please add the appropriate suffix to your liner's product number.

If you require assistance to determine the correct liner for your application, please contact our Technical Support Department at 1-800-267-8103 or tech@chromspec.com.

### Siltek™-Deactivated Press-Tight® Connectors\*

Product Number	Description	Qty	Price
RK20449	Straight Connector	25	\$262.30
RK20469	Angled "Y" Connector	3	232.80

\* Other types of Press-Tight® connectors can be ordered on a custom basis.

### Siltek™ -Deactivated Guard Columns

Product Number	Description	Price
RK10026	5m x 0.25mm ID	\$61.40
RK10027	5m x 0.32mm ID	67.50
RK10028	5m x 0.53mm ID	92.00
RK10036	10m x 0.25mm ID	116.50
RK10037	10m x 0.32mm ID	128.80
RK10038	10m x 0.53mm ID	177.90

### Siltek™-Treated Electropolished Tubing

- Exceptional inertness
- Improved reliability and reproducibility; longer lifetime
- Use with treated fittings for the most inert sample pathway available

Product Number	Description	Price
RK22538	Siltek™ Tubing, 1/8" per foot	\$37.20
RK22539	Siltek™ Tubing, 1/4" per foot	37.20

1/8" OD: 5 ft. to 100 ft. in one continuous coil; 1/4" OD: 5 ft. to 300 ft. in one continuous coil.

### Siltek™ -Deactivated Borosilicate Wool

Product Number	Description	Qty	Price
RK24324	Wool	10g	\$41.30

# RESTEK INERT ACCESSORIES

## WHAT IS Silcosteel®?

Silcosteel® is a process, which Restek has been refining for over ten years, that passivates active metal surfaces. This process bonds a thin, flexible layer of silica, typically less than 5,000 angstroms, to the surface of stainless steel and various other metals or alloys. The process is used to passivate various injector or detector parts, metal capillary columns, packed columns, and transfer line tubing for corrosive sample streams. Many instrument companies utilize Restek's Silcosteel process to passivate transfer line tubing and parts in their injectors, detectors, and sample loops.

## CUSTOM Silcosteel® SERVICE

Any metal part can be Silcosteel®-treated as long as it fits into Restek's reaction chambers or can be pressurized and evacuated to be leak-free at temperatures above 400°C. Restek can also further deactivate the Silcosteel® surface with siloxane chemistry that imparts steam resistance or improves sample-wetting characteristics. Please call our Technical Department for more information and quotations on custom Silcosteel® treatments.



Silcosteel® combines the durability of stainless steel with the inertness of glass.



*For further information  
please request a copy of  
Restek's Performance Coatings  
literature code RK111.*

## RESTEK Sulfinert™-Treated SAMPLE CYLINDERS

Whether you collect hydrocarbons in refineries or reactive compounds in chemical reaction vessels, we recommend that you use Sulfinert™-treated sample cylinders.

Restek's Sulfinert™ process coats a thin layer on the stainless steel, resulting in a very inert surface. Even trace levels of sulfur compounds can be collected and stored in these cylinders without significant loss. Sulfinert™-treated sample cylinders combine the inertness of glass with the strength of stainless steel.



Ideal for the analysis of sulfur compounds!

- Sizes range from 75cc to 1000cc
- 1/4-inch female NPT thread on both ends
- Made from 304 Stainless Steel
- D.O.T. rated to 1800psi at room temperature
- Sulfinert™-treated for use with active samples

Product Number	Description		Price
RK24130	Sample Cylinder	75cc	\$278.40
RK24131	Sample Cylinder	150cc	315.00
RK24132	Sample Cylinder	300cc	323.30
RK24133	Sample Cylinder	500cc	359.90
RK24134	Sample Cylinder	1000cc	597.60

## RESTEK SilcoCan™

A complete line of SilcoCan™ canisters for air sampling is now available from Restek!

The small 1.0 litre canister is perfect for grab samples and soil gases. The 3.2, 6.0 and 15.0 litre SilcoCan™ canisters are great for integrated ambient air samples. The 15.0 litre SilcoCan™ canister is an excellent size for making standards for analytical testing and easily allows for 24-hour sampling.



- Alternative to metal passivation by Summa polishing
- Silcosteel® process places silica layer on deactivated metal surface
- Layer will not crack from external dents caused by harsh handling
- Uses Ultraseal™ fitting for vacuum-tight and pressure sealing integrity
- Can withstand temperatures as high as 250°C for cleaning
- 6 L and other sizes available
- Carrying case available

RK24180	SilcoCan™	1.0L	\$664.30
RK24181	SilcoCan™	3.2L	688.40
RK24182	SilcoCan™	6.0L	712.60
RK24183	SilcoCan™	15.0L	1,093.10

The SilcoCan™ Canister may be ordered with a Silcosteel®-treated valve. Please inquire.

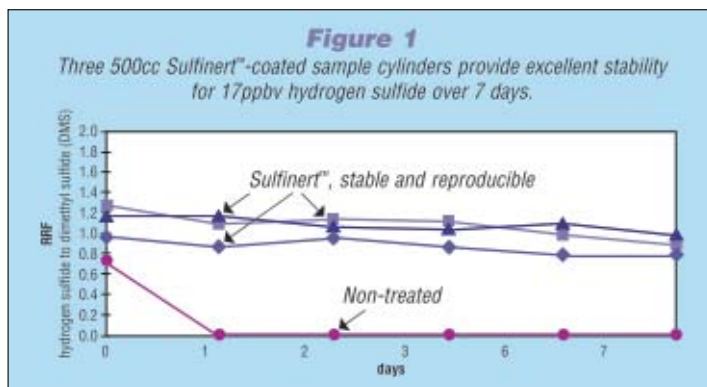


## SULFINERT™ COATING — The New Alternative for Metal Passivation

- Specialized for sulfur-containing compounds
- Thermally stable to a temperature of 360°C
- For the storage, transfer and analysis of low ppb sulfur samples
- Rugged, durable and thermally stable — provides extended life and reliability
- Sulfinert™ coating is non-adsorptive

Restek's Sulfinert™ coating is a rugged, durable, and thermally stable alternative to other metal passivation coatings. Like their Silcosteel® treatment, Sulfinert™ coating is applied in a way that incorporates it into the framework of atoms on the surface of the steel. Sulfinert™-coated surfaces can be bent without damage, as long as no physical stretching or deformation of the steel itself occurs. In addition, Sulfinert™-coated surfaces are stable to a temperature of 360°C, far above any commercially available polymeric coatings.

Holding studies have proven Sulfinert™ coatings to be non-adsorptive and unreactive to low ppb levels of sulfur compounds. The holding data for hydrogen sulfide over a 7-day period of time demonstrates how the non-treated control results in complete loss, while Restek's Sulfinert™-coated sample cylinders provide high stability and reproducibility (Figure 1). Now you have the ability to hold hydrogen sulfide at levels of 17 ppbv in a static sampling container.



## SULFINERT™ COATED TUBING

(Priced per-foot by length)

Product Number	Description	ID	OD	5-24 ft. Price	25-199 ft. Price	200-399 ft. Price	>400ft. Price
RK22500	304 SS	0.011" (0.28 mm)	0.022" (0.56 mm)	\$15.00	\$9.30	\$6.80	\$5.60
RK22501	304 SS	0.021" (0.53 mm)	0.029" (0.74 mm)	\$15.00	\$9.30	\$6.80	5.60
RK22502	304 SS	0.010" (0.25 mm)	1/16" (1.59 mm)	\$15.00	\$9.30	\$6.80	5.60
RK22503	304 SS	0.020" (0.51 mm)	1/16" (1.59 mm)	\$15.00	\$9.30	\$6.80	5.60
RK22504	304 SS	0.030" (0.76 mm)	1/16" (1.59 mm)	\$15.00	\$9.30	\$6.80	5.60
RK22505	304 SS	0.040" (1.02 mm)	1/16" (1.59 mm)	\$15.00	\$9.30	\$6.80	5.60
RK22506	304 SS	0.085" (2.16 mm)	1/8" (3.18 mm) *	\$15.00	\$9.30	\$6.80	5.60
RK22507	304 SS	0.210" (5.33 mm)	1/4" (6.35 mm) *	\$22.20	\$13.00	\$9.30	7.40
RK22508	316 SS***	0.055" (1.40 mm)	1/8" (3.18 mm) **	\$27.80	\$22.20	\$18.50	14.40
RK22509	316 SS***	0.180" (4.57 mm)	1/4" (6.35 mm) **	\$27.80	\$22.20	\$18.50	14.40

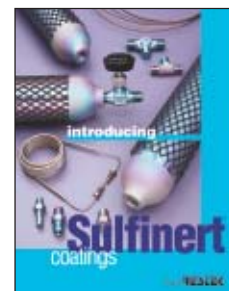
\* 0.020" wall thickness  
 \*\* 0.035" wall thickness  
 \*\*\* Seamless

NOTE: Prices above do not include cutting charges. Please inquire.

## SULFINERT™ COATED SAMPLE CYLINDERS AND SAMPLE CYLINDER VALVES

Product Number	Description	Price
RK24130	Sample Cylinder, 75cc	\$278.40
RK24131	Sample Cylinder, 150cc	315.00
RK24132	Sample Cylinder, 300cc	323.30
RK24133	Sample Cylinder, 500cc	359.90
RK24134	Sample Cylinder, 1000cc	597.60
RK21400	Sulfinert® Treated Alta-Robbins Sample Cylinder Valves, 1/4" NPT Exit	244.50
RK21401	Sulfinert® Treated Alta-Robbins Sample Cylinder Valves, 1/4" Compression Exit	244.50

Sulfinert™ is one of the best materials available for chromatographing organo-sulfur compounds because these materials do not adsorb onto nor are they catalysed by the Sulfinert™ surface.



For further information regarding **Sulfinert™ products**, please request literature code **RK38**.



Sulfinert™-Coated Tubing



Sulfinert™-Coated Sample Cylinders



Sulfinert™-Coated Sample Cylinder Valves

**Use Restek's  
 Sulfinert™-Coated  
 products for  
 Optimum Performance**

For your low-level sulfur testing, use Sulfinert™ products from Restek to ensure optimum performance and complete sample storage, transfer and analysis. Other Sulfinert™-Coated products are available. Please inquire.





## BOC BASELINE® MODEL C1061 SINGLE STAGE CYLINDER REGULATORS

### Features

- SS diaphragm
- 10µm filter
- Chrome plated brass body
- -40°C to 60°C temp. range
- 1/4" compression outlet



Product Number	Outlet Range	Gas	Price
C1061B320	0-100 psig	CO <sub>2</sub>	\$350.50
C1061B350	0-100 psig	H <sub>2</sub>	350.50
C1061B580	0-100 psig	He or N <sub>2</sub>	350.50
C1061B590	0-100 psig	Air	350.50

## BOC BASELINE® MODEL C1062 DUAL STAGE CYLINDER REGULATORS

### Features

- SS diaphragm
- 10µm filter
- Chrome plated brass body
- -40°C to 60°C temp. range
- 1/4" compression outlet



Product Number	Outlet Range	Gas	Price
C1062C320	0-100 psig	CO <sub>2</sub>	\$424.30
C1062C350	0-100 psig	H <sub>2</sub>	424.30
C1062C580	0-100 psig	He or N <sub>2</sub>	424.30
C1062C590	0-100 psig	Air	424.30

## BOC REDLINE® MODEL C200/2 DUAL STAGE CYLINDER REGULATORS

### Features

- Hastelloy diaphragm
- Ni/Cr plated body
- -40°C to 60°C temp. range
- 1/4" compression outlet



Product Number	Outlet Range	Gas	Price
C2002A320	0-100 psig	CO <sub>2</sub>	\$577.50
C2002A350	0-100 psig	H <sub>2</sub>	577.50
C2002A580	0-100 psig	He or N <sub>2</sub>	577.50
C2002A590	0-100 psig	Air	577.50

## BOC BASELINE® MODEL L104 LINE REGULATORS

### Features

- SS diaphragm
- PTFE seats and seal
- -40°C to 60°C temp. range
- 1/4" NPT inlet and outlet



Product Number	Outlet Range	Price
L104C24	0-100 psig	\$224.20
L104D24	0-150 psig	224.20
L104E24	0-250 psig	224.20
L104F24	0-500 psig	224.20

## AGILENT HIGH PURITY DUAL STAGE GAS REGULATORS

### Features

- Max inlet pressure: 3,000 psi
- Delivery pressures: 1 to 125 psi
- Outlet valve: 1/4" MNPT
- Brass body
- Dual SS diaphragms (1/8")



Product Number	Outlet Range	Price
CS51834641	CGA 346, 125 psi, (8.6 bar), Air	\$334.00
CS51834642	CGA 350, 125 psi, (8.6 bar), H <sub>2</sub> , Ar/Me	319.00
CS51834643	CGA 540, 125 psi, (8.6 bar), O <sub>2</sub>	319.00
CS51834644	CGA 580, 125 psi, (8.6 bar), He, Ar, N <sub>2</sub>	319.00
CS51834645	CGA 590, 125 psi, (8.6 bar), Air	319.00

# GAS REGULATORS AND FLOW CONTROLLERS

## ORIGINAL CONDYNE COMBO VALVES



These are the original, hex-bodied combo valves made by the Condylne division of VICI Metronics for nearly 30 years.

Standard construction features an anodized aluminum body with Viton® O-ring seals. Maximum inlet pressure is 100 psi, with a maximum temperature of 100°C. The valve can be panel mounted through an 11/16" or 3/4" diameter hole. Valco 1/16" and 1/8" fittings are available. Nuts and ferrules are included.

Typically, the knob colour is used as an indicator of the rated flow, but the standard knob can be changed if desired. A longer version of the knob is also available. Please consult our Technical Support Group for further details.

Product Number	Description	Price
VCVA10GS1	10 mL/min., 1/16"	\$103.80
VCVA50RS1	50 mL/min., 1/16"	103.80
VCVA150US1	150 mL/min., 1/16"	103.80
VCVA500BS1	500 mL/min., 1/16"	103.80
VCVA1KYS1	1L/min., 1/16"	103.80
VCVA10GS2	10 mL/min., 1/8"	103.80
VCVA50RS2	50 mL/min., 1/8"	103.80
VCVA150US2	150 mL/min., 1/8"	103.80
VCVA500BS2	500 mL/min., 1/8"	103.80
VCVA1KYS2	1L/min., 1/8"	103.80

## SOAP BUBBLE FLOWMETER

- Primary standard for measuring gas flow
- Easy to use; just time the bubble with a stopwatch
- Three sizes available
- Manufactured using Pyrex brand glass
- Supplied with a rubber bulb and two feet of rubber tubing
- See pages 74-75, 226 for Digital Flowmeters

C37100	SBF-10	10 cc	\$101.00
C37120	SBF-50	50 cc	132.40
C37130	SBF-100	100 cc	147.40

## FLOW CONTROLLER



The Model 202 Linear Set Adjustable Span Flow Controller is designed to maintain constant flow rates with changing downstream pressures. It is a convenient and flexible device for gas chromatographic and other instrument applications. The series 202 has a screwdriver adjustable laminar flow needle valve which can be adjusted to give the desired flow rate span when the 10 turn control stem is set to give maximum differential pressure across the valve. 1/8" fittings not included.

### Features

- Span continuously adjustable from 1 cc/min. to 1000 cc/min.
- No flow elements to change.
- Bar stock construction.
- Positive flow shut off.
- Differential pressure required 7.5 psi.

Product Number	Description	Price
VFC22AV1K	Flow Controller with Viton® Diaphragm	\$250.80
VFC22AS1K	Flow Controller with Stainless Steel Diaphragm	262.40

## MINICYL REGULATOR



This compact general purpose regulator has many laboratory applications including air-drying glassware, sparging or evaporating solutions, and controlling pneumatic valves. It is constructed of lightweight aluminum with an elastomer diaphragm. Includes a 0-60psi gauge and either 1/8" or 1/4" tube fittings.

RK20610	MINICYL Regulator, 1/8" fittings	\$68.70
RK20611	MINICYL Regulator, 1/4" fittings	68.70

## VERI-FLOW 500 — DIGITAL FLOW MONITOR

For Effortless Gas Chromatography Set Up And To Optimize GC Performance



### Features

- NIST traceable Calibration for N<sub>2</sub>, He, H<sub>2</sub>, 5% Ar/M and Air
- Pulse-free operation will not interfere with the operation of E.P.C.s
- Flow range 1.0 to 500 SCCM
- Accuracy:  $\pm .25$  SCCM or  $\pm 2\%$  whichever is larger
- Recharging Battery Pack w/charger
- ComPort w/Printer function standard
- 18-bit A/D performance
- Auto off function
- Capillary Column Adapter
- Auto zero function

### Operation

- Measures mass flow (converts to volumetric flow automatically)
- Displays volumetric flow - SCCM @ 1 atm/20°C
- Calibrated for five gases
- Calculates linear velocity
- Calculates split ratio

Product Number	Description	Price
C26500	Veri-Flow 500 Flow Monitor	\$837.00

## RESTEK FLOWMETER 6000

- Calculates linear velocity based on column ID
- Measures split flow and calculates split ratio
- Useful for measuring flows for N<sub>2</sub>, Air, He, H<sub>2</sub>, CO<sub>2</sub>, O<sub>2</sub>, Ar, 7.5% CH<sub>4</sub>/Ar
- Reads flow accurately from 1 to 500 mL/min. (1-300 mL/min. for CO<sub>2</sub>)

## GAS FLOWMETER CALIBRATION SERVICE



**CHROMATOGRAPHIC  
SPECIALTIES INC.**

[www.chromspec.com](http://www.chromspec.com)

### CERTIFICATE OF CALIBRATION

Model: ADM2000

Serial: 300-1330

Calib Date: 4 Jan 2005

Recal Date: 4 Jan 2006

Calibrated By: TCC

Work Order: 111201

Instrument Used: DryCal Nexus

Traceable standard for time: NIST: DAL-407580-51654

Traceable standard for volume: NIST: 821/260369-98

Traceable standard for temperature: NIST: 811/260178

Traceable standard for pressure: NIST: E2828 822/24960

Test Condition: 23.1 deg. Celsius 767.00 mm Hg

Prior to calibration the instrument was: Cleaned, inspected, new battery installed

According to SOP# Ins-c-001, the above flowmeter was calibrated to within an absolute accuracy of 3% to NIST traceable flowrate standard. The flowmeter is manufactured by Bios International Corporation. These flow rate standards are annually verified against the above listed NIST standard.

### CALIBRATION RESULT

#### Flow Rates (mL/min.)

Set At	Actual	Measured	% Diff.	Result
5	4.99	4.88	2.20	PASS
10	10.3	10.3	0.00	PASS
50	49.7	49.9	-0.40	PASS
100	102.2	101	1.17	PASS
250	254.8	253	0.71	PASS
500	502.3	498	0.86	PASS

Toll Free: (800) 267-8103

Tel: (613) 342-4678

Fax: (613) 342-1144

[sales@chromspec.com](mailto:sales@chromspec.com)

P.O. BAG 1150, 300 LAURIER BLVD., BROCKVILLE, ONTARIO K6V 5W1

### TECH TIP

Did you know that all digital flowmeters need to be recalibrated frequently according to these regulatory agencies:

- CGMP 211.68a: Equipment used shall be routinely calibrated
- ISO 9001 V2000 7.6a: Measuring equipment must be calibrated at regular intervals
- CAEAL: As per ISO 9001

Chromatographic Specialties Inc. now offers this calibration service for most makes and models of gas flowmeters.

Each calibration includes a signed NIST traceable certificate.

Turnaround time is typically 1-2 weeks.

Inquire about the possibility of a loaner flowmeter while yours is being serviced.

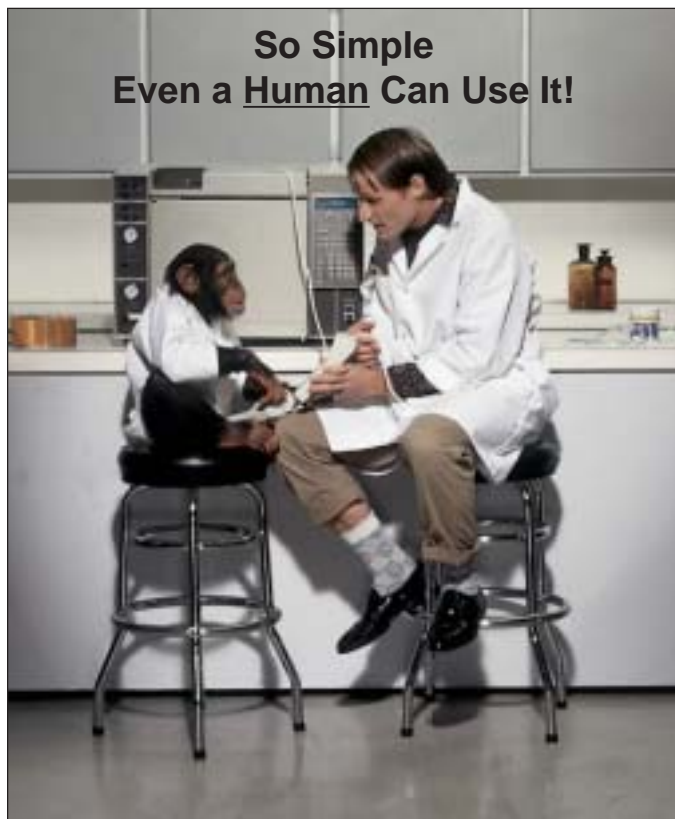
Product Number	Description	Price
CFLOWCAL	Single gas, 6pt calibration	\$240.00
CFLOWCAL500	Four gas, 6pt calibration	325.00

Product Number	Description	Price
RK21622	Restek Flowmeter 6000 (9-volt battery operated)	\$850.00



## ADM INTELLIGENT FLOWMETERS

### So Simple Even a Human Can Use It!



## ADM

Measuring Flow The Intelligent Way

### ADM1000

If you need rapid, real-time measurements of a gas stream, it's perfect for you. We have designed the ADM for basic gas chromatography laboratories.

#### The ADM measures:

- Flow rates from 0.1 to 1000 mL/min.
- Split ratios — compare the ratio from one gas measurement to another (i.e. injection port split ratios)

### ADM2000

In addition to the features of the ADM1000, the ADM2000 includes:

- Mass flow measurements — measure flow rate, independent of atmospheric pressure and temperature
- Data output through RS-232 port
- 9V battery and AC power adapter (120 or 220 VAC)

### ADM3000

If you measure flow rates for a variety of purposes, the ADM3000 offers you the most versatility. In addition to the features of the ADM1000, this model includes:

- Measurement of flow from positive and negative (vacuum) pressure sources
- Data output through RS-232 port
- 9V battery and AC power adapter (120 or 220VAC)

Want to use the simplest flowmeter for gas chromatographic analysis? ADM flowmeters allow most gas measurements with the touch of only one button — turn it on, and the instrument provides continuous, hands-free flow readings. You can measure column, detector and carrier gas flow without any adjustments. ADM flowmeters are ideal for measuring gas streams with a changing gas composition. For example, if you measure the gas flow from a digestion system, concentration changes in methane, carbon dioxide and oxygen will not affect accuracy.

All ADM flowmeters are battery powered and field portable. Agilent calibrates each instrument to 5-point, NIST-traceable standards to ensure the highest available accuracy. The ADM family measures flow volumetrically, so you don't have to make any adjustments when changing from one gas to another.

### Easy To Use

If you're using an old-style flowmeter, you'll appreciate how easy the ADM 1000 is to operate. Just turn it on, connect the gas to be measured and read the flow rate. That's all.

### Split Ratios, Quick

Even a split ratio is simple. Here's how it works: After reading the rate, press the "on" button again to store the rate in memory. Attach the ADM 1000 to the split vent. The display will indicate the split ratio continuously. Then, simply adjust the split vent control to obtain the desired ratio. It's that easy.

### Maximum Range and Accuracy

The ADM 1000 handles flow rates from 0.1 mL/min. to 1000 mL/min. — an order of magnitude better than any bubble meter. That means you won't need separate instruments to measure high and low flow rates.

We know the accuracy of your readings is critical. The ADM 1000 is accurate to within  $\pm 3\%$ , suitable for the most demanding applications. If you need rapid, real-time measurements of gas streams, ADM flowmeters are perfect for you.

### Operation

- Measures volumetric flow (acoustic displacement)
- Displays volumetric flow mL/min. (actual conditions)
- Can convert and display - SCCM @ 1 atmos./0°C
- Can be used with any **non-corrosive gas**
- Calculates split ratio

Agilent Technologies recommends calibrating ADM flowmeters once a year. Please call 1-800-267-8103 for more information.

Product Number	Description	Price
J2201170	ADM 1000 Flowmeter (measures mL/min. only)	\$748.00
J2201171	ADM 2000 Flowmeter (measures mL/min. and SCCM, RS232 output)	874.00
J2201172	ADM 3000 Flowmeter (measures + and - flows 1.0 - 750mL/min.)	874.00



# CHROMSPEC™ GAS FILTERS

## CHROMSPEC™ HIGH CAPACITY NON-INDICATING MOISTURE TRAPS

### Features:

- Trap body is one piece spun aluminum
- Each Swagelok end fitting includes a 40 micron stainless steel frit
- Maximum pressure is 250 psi



Product Number	Description	Price
C36086	750cc Moisture Trap, 1/8"	\$308.00
C36088	750cc Moisture Trap, 1/4"	308.00
C36194	Mounting Clip, Pkg. 2	28.70
C36034	Moisture Trap Refill, 1/2 gallon/1893cc	145.10

## CHROMSPEC™ INDICATING MOISTURE TRAPS

### Features:

- Inert polycarbonate body
- Simultaneous removal of H<sub>2</sub>O and CO<sub>2</sub>
- Combination molecular sieve 13X and indicating 4A
- Indicating 4A changes colour from blue to tan at 20% relative humidity
- Maximum pressure is 125 psi



Product Number	Description	Price
C36000	120cc Moisture Trap, 1/8"	\$88.00
C36005	120cc Moisture Trap, 1/4"	84.20
C36010	200cc Moisture Trap, 1/8"	117.00
C36015	200cc Moisture Trap, 1/4"	117.00
C36035	400cc Moisture Trap, 1/8"	141.00
C36040	400cc Moisture Trap, 1/4"	141.00
C36079	120 & 200cc Mounting Clip, Pkg. 2	28.70
C36080	400cc Mounting Clip, Pkg. 2	28.70
C36030	Moisture Trap Refill, 1 Pint/473cc	45.10

## CHROMSPEC™ GLASS BODIED INDICATING MOISTURE TRAPS

### Features:

- Especially recommended for ECDs and MSDs
- Capable of removing virtually all moisture in 6 standard gas cylinders
- Incorporates a band of indicating Molecular Sieve 4A
- Maximum pressure of 125 psi



Product Number	Description	Price
C36150	70cc Glass Moisture Trap, 1/8"	\$139.10
C36155	70cc Glass Moisture Trap, 1/4"	139.10
C36160	100cc Glass Moisture Trap, 1/8"	154.50
C36165	100cc Glass Moisture Trap, 1/4"	154.50
C36079	GMT Mounting Clip, Pkg. 2	28.70
C36170	GMT Refill, 1 Pint/473cc	45.10

**TECH TIP** — After installing filters, always check that the system is leak-free.

## CHROMSPEC™ OXYGEN TRAPS

- One-piece spun aluminum body
- Oxygen removed by a highly active, metal containing inert supported reagent
- Corrosive materials such as sulfur, chlorine and fluorine act as poisons to the trap
- Maximum pressure 250 psi

Product Number	Description	Price
C36060	Oxygen Trap, Disposable, OT-3-2, 300cc, 1/8" Fittings	\$131.10
C36065	Oxygen Trap, Disposable, OT-3-4, 300cc, 1/4" Fittings	131.10
C36082	Oxygen Trap, Disposable, OT-750-2, 750cc, 1/8" Fittings	308.00
C36084	Oxygen Trap, Disposable, OT-750-4, 750cc, 1/4" Fittings	308.00
C36078	Mounting Clip for 300cc Trap, Pkg. 2	28.70
C36194	Mounting Clip for 750cc Trap, Pkg. 2	28.70



1. When installing traps, place them as close to the chromatograph as is practical. Any connections or fittings downstream from the filters have the potential to leak and allow contaminants to enter the gas line unchecked.

2. After installing or replacing traps, ensure that the system is leak-free.

3. Traps are more effective if they are mounted in a vertical position with the carrier gas running upwards through the trap. This eliminates channelling of the carrier gas and maximizes the trapping capacity.

4. Always follow a bulk oxygen trap with an indicating oxygen trap. Bonded capillary phases are extremely sensitive to very small amounts of oxygen.

5. The indicating oxygen trap is extremely active and should not be exposed to air. When installing the indicating oxygen trap, run a very low flow of carrier gas through the lines. (Please read the instructions carefully!)

6. Replace the GC septum regularly. Repeated piercing of the septum will produce a hole. This occurs most readily with autosamplers. The autosampler pierces the same spot in the septum and it also utilizes a larger gauge needle than used for manual injections. A leaky septum will allow oxygen to enter the system and will negate all previous efforts to remove it from the gas with filters.

7. When using a non-indicating trap (HMT or HT) keep a record of when the trap was installed, or when it was refilled. Non-indicating traps should be changed or refilled on a regular basis.

8. To extend the life of gas traps, install an on-off toggle valve\* after the last trap. When the carrier gas is shut off the toggle valve can be closed, preventing air from back-diffusing through the traps.

## CHROMSPEC™ INDICATING OXYGEN TRAPS

- Changes colour from pale green to deep brown as catalyst becomes saturated
- Removes 50cc of oxygen before catalyst becomes expended
- Prevents premature replacement of high capacity trap by signalling oxygen breakthrough
- Maximum pressure 100 psi

C36070	Indicating Oxygen Trap, IOT-2, 1/8" Fittings	\$139.10
C36075	Indicating Oxygen Trap, IOT-4, 1/4" Fittings	139.10
C36077	IOT Mounting Clip, Pkg. 2	28.70



## CHROMSPEC™ HYDROCARBON TRAPS

- 750cc unit features a one-piece spun aluminum body
- Contains a highly active coconut based activated carbon
- Designed to remove alcohols, ethers, chlorinated hydrocarbons, ketones and aromatics
- Maximum pressure 250 psi

C36100	Hydrocarbon Trap, HT-200-2, 200cc, 1/8" Fittings	\$115.70
C36105	Hydrocarbon Trap, HT-200-4, 200cc, 1/4" Fittings	115.70
C36120	Hydrocarbon/Moisture Trap, HMT-200-2, 200cc, 1/8" Fittings	115.70
C36125	Hydrocarbon/Moisture Trap, HMT-200-4, 200cc, 1/4" Fittings	115.70
C36090	Hydrocarbon Trap, HT-750-2, 750cc, 1/8" Fittings	308.00
C36092	Hydrocarbon Trap, HT-750-4, 750cc, 1/4" Fittings	308.00
C36079	Mounting Clip for 200cc Trap, Pkg. 2	28.70
C36194	Mounting Clip for 750cc Trap, Pkg. 2	28.70
C36110	Activated Carbon Refill, 1 Pint/473cc	45.10
C36030	MSR-1 Molecular Sieve Refill, 1 Pint/473cc	45.10
C36111	Activated Carbon Refill, 1/2 gallon/1893cc	145.10



## TECHNICAL ASSISTANCE

DIRECT	613-342-4678
TOLL FREE	800-267-8103
FAX	613-342-1144
E-MAIL	tech@chromspec.com

\* On/Off Toggle Valves  
(1/8" = Product Number BOGS2 . . . \$65.30)  
(1/4" = Product Number B1GS4 . . . \$67.90)

# CHROMSPEC™ GAS FILTERS

## Free Literature

For a detailed explanation on taking a GC from the box and getting it up and running, request Restek's technical bulletin,

**A Guide to GC Set-Up**  
Literature Code **RK19**

## Pro ezGC™ Software (CD-Rom)

Take the guesswork out of selecting the best column and conditions for your GC analysis.

- Optimize temperature and flow programs with a single analysis
- Reduce analysis time and improve sample resolution

RK21487 . . . CD-ROM . . . . . \$277.60



Single-Tube Thermal Gas Purifier



Dual-Tube Thermal Gas Purifier



Replacement Straight Getter Tubes

Do you have any questions about which carrier gas purifier to use? Please contact our Technical Support Group at 1-800-267-8103 or tech@chromspec.com for further information.

## CHROMSPEC™ EXCELASORB TRAPS

- Designed for mass spec quality applications
- Reduces oxygen, moisture, hydrocarbons and CO<sub>2</sub> to part per billion levels
- Unique one-piece design
- Eliminates the leaks resulting from faulty welds
- Provides a uniform bed packing
- Promotes consistent flow



Product Number	Description	Price
C36192	Mass Spectrometer Grade Helium Gas Purifier, 1/4" Swagelok® stainless steel fitting	\$342.30
C36194	Mounting Clip, Pkg. 2	28.70

## CHROMSPEC™ CO<sub>2</sub> TRAPS

- CHROMSPEC carbon dioxide traps will remove CO<sub>2</sub> from gas streams down to less than 1 ppm
- The filtering medium changes colour from white to violet to indicate CO<sub>2</sub> absorption
- Since moisture is generated by the absorption of CO<sub>2</sub> and other acidic gases, it is recommended that a moisture trap be installed downstream of these units
- Maximum pressure is 125 psi



Product Number	Description	Fitting	Price
C36095	Carbon Dioxide Trap, 100cc	1/8"	\$173.80
C36096	Carbon Dioxide Trap, 100cc	1/4"	173.80
C36079	Mounting Clip for 100cc		28.70
C36098	Carbon Dioxide Trap, 250cc	1/8"	236.70
C36099	Carbon Dioxide Trap, 250cc	1/4"	236.70
C36080	Mounting Clip for 250cc		28.70
C36097	Refill of Fresh CO <sub>2</sub> absorbent, 1 Pint/473cc		63.00

## RESTEK THERMAL GAS PURIFIERS

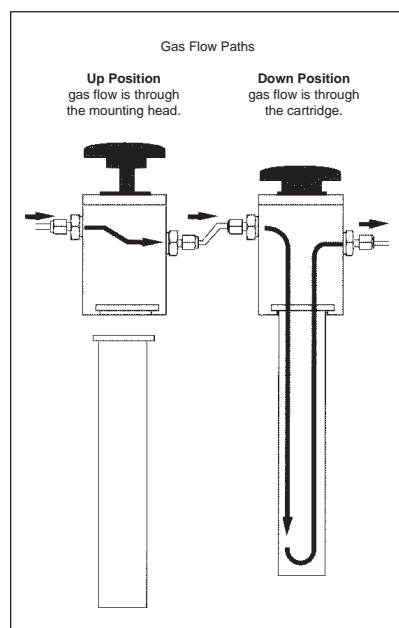
### (Do Not Use With Flammable Gases)

- Removes oxygen, water, carbon monoxide, carbon dioxide and hydrocarbons
- Purity in ppb levels
- Mass Spec. purity carrier gas produced
- Dual-tube model purifiers double capacity at less than double the price
- Welded end-fittings on getter tubes eliminate leaks
- Packed with reactor-grade, pure getter material for maximum efficiency and no contamination

Product Number	Description	Fitting	Price
RK21496	Single-Tube Thermal Gas Purifier, 110 volt	1/8"	\$728.70
RK21497	Single-Tube Thermal Gas Purifier, 110 volt	1/4"	728.70
RK21498	Dual-Tube Thermal Gas Purifier, 110 volt	1/8"	1,048.60
RK21499	Dual-Tube Thermal Gas Purifier, 110 volt	1/4"	1,048.60
RK21661	Replacement Straight Getter Tubes	1/8"	133.50
RK21660	Replacement Straight Getter Tubes	1/4"	133.50



## POINT OF OPERATION PANELS



QC+ is the latest development in the evolution of the cartridge type Point of Operation Panels. Now a complete set of gas purifiers can be quickly changed (that's the QC) without significant interruption in gas flow (that's the +), thus, eliminating instrument down time (that's the real +).

Each QC+ filter mounting head is equipped with an internal valve. The valve serves two purposes. 1) In the up position it provides a closed gas path through the mounting head. 2) As the valve is moved to the down position it punctures the seal on the cartridge top and shifts the gas flow through the cartridge.

The QC+ has a unique D-shaped cartridge top (patent pending) that is self aligning, assuring trouble free installation. As many as four cartridges can be replaced in a minute or less without contamination of your GC gas system due to lines being open to atmosphere during purifier replacement.

Agilent Technologies provides an effective, convenient and ultra high purity alternative by offering a QC+ single cartridge kit or 2, 3 or 4 cartridge panel mounted adjacent to your gas chromatograph.



Maximum Pressure = 120 psig

## HIGH PRESSURE STAINLESS STEEL TRAPS

These reusable traps were designed for high pressure applications where plastic bodied purifiers are not suitable. Constructed from seamless 316 stainless steel, these one piece housings are rated at 4,000 psig\*. In most cases they can be installed on the high pressure side of your GC system (commonly, traps can only be installed on the low pressure instrument side). A choice of 1/8" or 1/4" stainless steel Swagelok fittings are available. Each fitting is equipped with a 40 micron sintered stainless steel frit for particulate control. All adsorbents are conditioned prior to packing and again purged with ultra high purity Helium at high temperature before shipping (commercial activated carbon may contain as much as 20% moisture from the supplier).

\* Tested at over 12,000 psig without measurable distortion.

Product Number	Description	Price
C36032	SSMT, 1/8"	\$227.00
C36042	SSMT, 1/4"	227.00
C36031	MT Refill	73.30
C36110	HT Refill	45.10
C36097	CDT Refill	63.00
C36052	SSOT, 1/8"	241.00
C36066	SSOT, 1/4"	241.00
C36078	Mounting Clip	28.70

SSMT = stainless steel moisture trap  
SSHT = stainless steel hydrocarbon trap  
SSCDT = stainless steel carbon dioxide trap  
SSOT = stainless steel oxygen trap

Product Number	Description	(Newer Design)	Price
C36136	Bi-Cycle System 1/8" RBCD-2P, Moisture (GC-2)/Hydrocarbon(GC-3)		\$797.00
C36281	Tri-Cycle Module 1/8" RTC-2P, Oxygen (GC-1)/Water (GC-2)/Hydrocarbon (GC-3) * Indicating O <sub>2</sub> trap NOT included		1,155.00
C36141	Quad-Cycle System 1/8" RQC-2P, Moisture (GC-2)/Hydrocarbon (GC-3) Oxygen (GC-1)/Indicating O <sub>2</sub> (GC-4)		2,011.00

Replacement Cartridges	(for all units)
C36284 GC-1, Oxygen Cartridge	79.70
C36286 GC-2, Moisture Cartridge	79.70
C36288 GC-3, Hydrocarbon Cartridge	79.70
C36290 GC-4, Indicating O <sub>2</sub> Cartridge	193.00

NOTE: For use with 1/4" lines, a reducing union will be required.

## HIGH CAPACITY GAS PURIFICATION SYSTEM

Agilent's High Capacity Gas Purification System (GPS) provides low-cost gas contaminant removal for up to 18 cylinders of carrier gas. It includes a manifold with cartridge mounts and three replaceable cartridges: one moisture/hydrocarbon cartridge; one oxygen cartridge; and one oxygen indicating cartridge.

The system is designed to minimize column damage from impurities such as oxygen and to maximize performance by reducing sulfur compounds, moisture and hydrocarbons to extremely low levels.

### Features

#### High Capacity 3 Cartridge GPS

- **Maximum Pressure:** 200 psi
- **Capacity:** 1000 mL of oxygen, 18 tanks of 99.997% purity gas
- **Dimensions:** 25cm x 30cm x 8cm
- **Weight:** 4.8 kg
- **Purity Level:** < 0.2ppm oxygen; > 99.98% removal of moisture and hydrocarbons

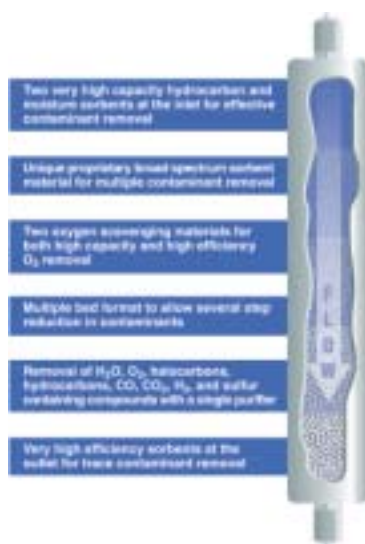
Product Number	Description	Price
CS51829776	High Capacity Gas Purification System, 1/4 fittings	\$710.00
CS51831907	High Capacity Gas Purification System, 1/8 fittings	767.00



*These purification systems are included as standard equipment on many new chromatographic instruments; regular replacement is necessary to maintain peak performance.*



Multiple Bed Format



## TECH TIP

### A Word about Fittings

Every connection in your gas delivery system has the potential for leaks; the more fittings you have, the greater the potential. We suggest that you limit connections to as few as possible.

## GAS PURIFIERS

- Point-of-use gas purification of helium, hydrogen, methane, nitrogen, carbon dioxide, or air
- Reduce gas impurities from high PPM to low PPB levels
- Decrease baseline noise and increase GC/MS sensitivity
- Replace three traps with one gas purifier

Gas purification is critical to GC performance. Several types of contaminants are detrimental - notably moisture, hydrocarbons, and oxygen. VICI Mat/Sen™ gas purifier modules are designed to be placed in-line with the GC carrier or detector gas supply to remove these contaminants from the analytical gases prior to entering the GC.

Mat/Sen gas purifiers dramatically reduce contaminant levels and absorb a greater variety of contaminants than other gas purification products. Advanced materials and design features guarantee that the modules will produce gases that are at least a factor of ten higher than a 99.9999% "chromatography grade" cylinder of gas when the purifier is supplied by a 99.995% cylinder.

Gas purification is optimized by a multiple bed format (see illustration in sidebar). Each bed functions at a lower contaminant concentration, resulting in a series of contaminant concentration gradients across the length of the gas purifier.

## Specifications

Length	52.3 cm (21")
Diameter	3.8 cm (1.5")
Maximum inlet pressure	6895 kPa (1000 psi)
Maximum recommended flow	500 mL/min.
Pressure drop, 827 kPa (120 psi) inlet, at a flow of 0 to 500 mL/min.	<0.20psi
Compression end fittings	1/8" or 1/4"
Shipping weight	1,300 g (3.04lb)

Product Number	Description	Price
VMSP1001	Helium purifier, 1/8"	\$231.00
VMSP1002	Helium purifier, 1/4"	231.00
VMSP2001	Hydrogen purifier, 1/8"	231.00
VMSP2002	Hydrogen purifier, 1/4"	231.00
VMSP3001	Nitrogen purifier, 1/8"	231.00
VMSP3002	Nitrogen purifier, 1/4"	231.00
VMSP4001	Air purifier, 1/8"	231.00
VMSP4002	Air purifier, 1/4"	231.00

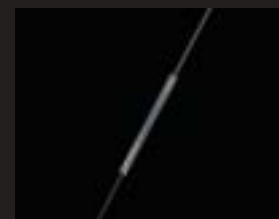
Brass compression fittings are standard. Also available with stainless steel compression fittings, Valco zero dead volume fittings, or stainless steel VCR fittings.

*Safety Note: Not to be used for the purification of oxygen.*

## ... Affordable CHROMSPEC™ Glass Unions for Quick Secure Connections

### CHROMSPEC™ UNIVERSAL GLASS UNIONS\*

- Connect a capillary column with a pre-column
- Connect capillary columns of different polarities
- Connect capillary columns to increase length
- Repair a broken capillary column



CHROMSPEC™ Universal Union



CHROMSPEC™ Defined Y-Splitter

Product Number	Fits Columns (mm ID)	Qty	Price
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### CHROMSPEC™ UNIVERSAL UNIONS

CS83305	0.20 to 0.75 mm OD	5	\$29.20
CS833025	0.20 to 0.75 mm OD	25	125.00

### CHROMSPEC™ DEFINED UNIONS

CS83125	0.53 to 0.53	5	\$31.30
CS83085	0.32 to 0.32	5	31.30
CS83025	0.25 to 0.25	5	31.30
CS831210	0.53 to 0.53	10	58.10
CS830810	0.32 to 0.32	10	58.10
CS830210	0.25 to 0.25	10	58.10
CS820010	0.20 to 0.20	10	58.10

### CHROMSPEC™ DEFINED REDUCING UNIONS

CS83065	0.53 to 0.25	5	\$31.30
CS83105	0.53 to 0.32	5	31.30
CS83045	0.32 to 0.25	5	31.30
CS830610	0.53 to 0.25	10	58.10
CS831010	0.53 to 0.32	10	58.10
CS830410	0.32 to 0.25	10	58.10
CS820410	0.20 to 0.32	10	58.10
CS820610	0.20 to 0.53	10	58.10

### CHROMSPEC™ DEFINED Y-SPLITTERS

CS8402	0.25 to 0.25 to 0.25	1	\$93.60
CS8404	0.32 to 0.32 to 0.32	1	93.60
CS8406	0.53 to 0.53 to 0.53	1	93.60
CS8442	0.53 to 0.32 to 0.32	1	97.30
CS8441	0.53 to 0.25 to 0.25	1	97.30
CS8430	0.32 to 0.25 to 0.25	1	97.30
CS8446	0.53 to 0.53 to 0.32	1	97.30
CS8444	0.53 to 0.53 to 0.25	1	97.30
CS8440	0.53 to 0.32 to 0.25	1	97.30

\* Other glass connectors (3-way, 4-way and Siltek-deactivated) are available. Please inquire.

For further information regarding fused silica or metal connectors, contact our Technical Support Group and request technical note "Fused Silica Connectors", literature code CS21.

### CHROMSPEC™ FUSED SILICA CUTTING STONES

- Scribes a straight line
- Lightweight
- Expendable
- Easy to use
- 8 cutting sides



C11150	Fused Silica Cutting Stones, Pkg. 2	\$12.50
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### POLYIMIDE SEALING RESIN

- Used to strengthen the column-union connection

J5001200	Polyimide Sealing Resin, 5 gm	\$29.20
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### TECH TIP

#### How to Make a Secure Connection

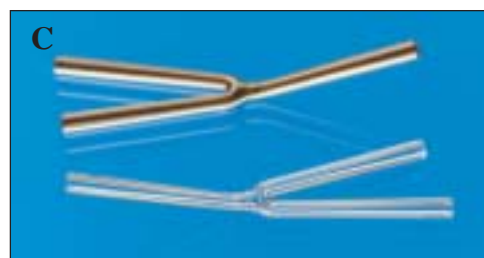
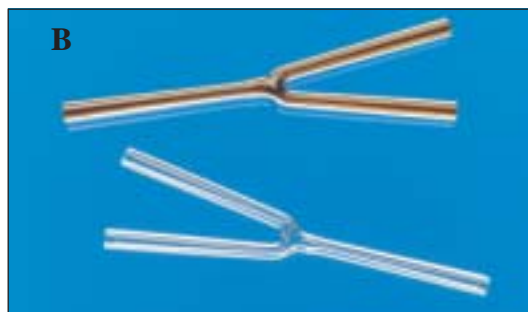


Good Cut Bad Cut

To obtain a proper connection it is essential to begin with a perfect 90 degree cut. First clean the tubing with solvent and use a ceramic scoring wafer (C11150) for the cut. Examine the end with a pocket magnifier. Assuming a good cut, push the column into the connector until the polyimide sticks to the glass surface. For a solid and tight connection and improved mechanical strength, the connector should be heated up under carrier gas to 200°C in the GC oven.

# RESTEK CAPILLARY COLUMN CONNECTORS

## RESTEK FUSED SILICA PRESS-TIGHT® CONNECTORS FOR FUSED SILICA COLUMNS



Connect fused silica tubing with outside diameters ranging from 0.3 to 0.75mm (0.25 to 0.53mm IDs). Press-Tight® Connectors are lightweight, install quickly, and are easy to use. They do not cause solvent tailing or adsorption of active compounds.

Not all fused silica or glass connectors are the same. Restek has thoroughly investigated the taper angle and tolerances to ensure a leak-tight fit on every connector. If you have used other connectors in the past, try their new improved connectors. We are sure the results will please you.

Press-Tights® are most often used to connect guard columns to an analytical column. They are also used to connect different polarity columns for unique separations, or to repair a broken column. Mass spectroscopists also use Press-Tights® for connecting analytical GC capillary columns to smaller diameter transfer lines.

### How Does A Press-Tight® Connector Work?

Press-Tight® Connectors form a leak-tight seal by using concentric compressive forces as the tubing end is pushed into a tightly controlled radial restriction. These forces are strong enough to form a leak-tight seal under the normal pressures used in capillary gas chromatography. The seal is further strengthened as the column's exterior polyimide coating bonds to the inner surface of the connector after several thermal cycles, at 200°C.

Press-Tight® is a trademark of Restek Corporation.

**NOTE:** All unions on this page are made from fused silica.

Column exhibiting proper connection  
- notice the ring.



### A) Universal Press-Tight® Connectors

- Connect guard columns to analytical columns.
- Repair broken columns.
- Also available angled. Please inquire.
- Also available deactivated. Please inquire.

Product Number	Description	Qty	Price
RK20400	Universal Press-Tight®	5	\$55.80
RK20401	Universal Press-Tight®	25	210.80
RK20402	Universal Press-Tight®	100	633.60

### B) Universal "Y" Press-Tight® Connectors

- Split sample flow onto two different columns.
- Split a single column flow into two different detectors.
- Perform confirmational analysis with a single injection.

RK20405	Universal "Y" Press-Tight®	1	\$79.20
RK20406	Universal "Y" Press-Tight®	3	220.60

### C) Universal Angled "Y" Press-Tight® Connectors

- Alleviates strain on column end connections.
- Perform confirmational analysis with a single injection.

RK20403	Universal Angled "Y" Press-Tight®	1	\$85.50
RK20404	Universal Angled "Y" Press-Tight®	3	226.70

### D) Universal "X" Press-Tight® Connectors

- Connect to three detectors or to two detectors and a sniffer port.
- Make injections onto three columns simultaneously.

RK20407	Universal "X" Press-Tight®	1	\$105.20
RK20408	Universal "X" Press-Tight®	3	279.40

# RESTEK CAPILLARY COLUMN CONNECTORS

## RESTEK Vu-Union® FOR FUSED SILICA COLUMNS

- Original design for standard and microbore capillary columns (graphite ferrules)



### Capillary Vu-Union®

- Connect guard columns, transfer lines or repair broken columns
- Seals easily with minimal torque
- For use between 0 to 100 psi
- Deactivated, tapered glass insert for column ODs 0.33 - 0.74mm
- Seals 0.15mm ID tubing with 0.35mm OD
- For use with standard graphite ferrules (**order separately**)

Product Number	Description (includes one insert)	Qty	Price
RK20418	Capillary Vu-Union®	1	\$128.70
RK20419	Replacement Inserts	3	95.60

### Microbore Vu-Union®

- Connect narrow bore tubing from 0 to 100 psi
- Deactivated, tapered glass insert for column ODs 0.15 - 0.45mm
- For use with standard graphite ferrules (**order separately**)

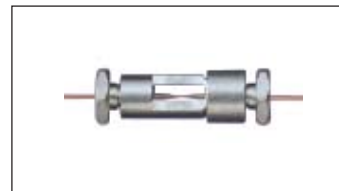
RK20416	Microbore Vu-Union®	1	\$152.20
RK20417	Replacement Inserts	3	143.50

### Vu-Union® Graphite Ferrules (For Capillary And Microbore Vu-Unions®)

- Easiest ferrules to use with the Vu-Union®
- Fits Vu-Union and connects capillary columns to most GC inlets
- 450°C maximum operating temperature

Product Number	Ferrule ID mm	Column ID mm	Qty	Price
RK20233	0.3	< 0.20	10	\$58.20
RK20200	0.4	0.25	10	48.50
RK20201	0.5	0.32	10	48.50
RK20202	0.8	0.53	10	48.50

- New design for GC/MS and SFC systems (Vespel®/graphite ferrules)



### Vacuum Vu-Union®

- Connect analytical columns to Mass Spec transfer lines
- Use under vacuum conditions
- Deactivated, tapered glass insert for column ODs 0.35 - 0.74mm
- Seals 0.15mm ID tubing with 0.35mm OD
- Vespel®/Graphite ferrules only (**order separately**)

A specifically designed Vu-Union® glass insert permits more torque to be applied to the ferrules without fear of cracking the insert. The hex end nuts enable you to use wrenches to tighten the end fittings.

Product Number	Description (includes one insert)	Qty	Price
RK20427	Vacuum Vu-Union®	1	\$134.90
RK20428	Replacement Inserts	3	82.90

For Valco Zero Volume Unions and Fittings, see pages 192-193.

### Vacuum Vespel®/Graphite Vu-Union® Ferrules

- Use only with the Vacuum Vu-Unions®
- 60% Vespel®/40% graphite
- 400°C maximum operating temperature

Product Number	Ferrule ID mm	Column ID mm	Qty	Price
RK20423	0.3	< 0.22 ID - < 0.4 OD	10	\$77.50
RK20420	0.4	0.25 ID - 0.4 OD	10	69.40
RK20421	0.5	0.32 ID - 0.5 OD	10	69.40
RK20422	0.8	0.53 ID - 0.8 OD	10	69.40

## Vu-Union® HELPING HAND — **FREE** with Vu-Union® purchase

The Helping Hand is designed to hold the metal housing of the Vu-Union® in place. This allows the user to easily assemble the columns in the glass insert and tighten the knurled nuts. The helping hand is included with all Vu-Union® connectors except the "Y" union.





# RESTEK CAPILLARY COLUMN CONNECTORS

## GERSTEL GRAPHPACK® CONNECTORS



GRAPHPACK® technology results in a complete system that makes truly leak-free, low-dead-volume connections quickly and reliably. The central component is a metal-jacketed graphite ferrule — the ideal sealant for GC applications. These GRAPHPACK® ferrules eliminate all the disadvantages and shortcomings associated with former sealing systems.

Product Number	Description	Price
RK20272	GRAPHPACK® 3D/2 Connector* (0.25mm to 0.32mm)	\$213.50
RK20273	GRAPHPACK® 3D/2 Connector* (0.7mm to 0.45mm)	213.50
RK20271	GRAPHPACK® 3D/2 Ferrules, 0.4mm	252.80
RK20270	GRAPHPACK® 3D/2 Ferrules, 0.5mm	252.80
RK20274	GRAPHPACK® 3D/2 Ferrules, 0.8mm	252.80

\* Use only with GRAPHPACK® 3D/2 Ferrules

## RESTEK MXT® LOW-DEAD-VOLUME CONNECTORS

These low-dead-volume connectors are Silcosteel®-treated and are deactivated to make them inert to active compounds, just like MXT® columns. They will not cause peak tailing or affect system inertness and can be used up to 400°C without degrading the deactivation layer. Restek chose a 1/32-inch body size to minimize thermal mass. Special metal ferrules were designed to fit the OD of the 0.28 and 0.53mm ID MXT® columns. Purchase the appropriately sized replacement ferrules when connecting 0.28 and 0.53mm ID columns with either of the MXT® low-dead-volume connectors.



MXT® Low-Dead-Volume "Y" Connector



MXT® Low-Dead-Volume Connector

**NOTE:** MXT® connectors are ideal for connecting metal tubing.

RK20397	MXT® Connector (0.28mm columns)	\$69.00
RK20394	MXT® Connector (0.53mm columns)	69.00
RK20396	MXT® "Y" Connector (0.28mm columns)	121.80
RK20395	MXT® "Y" Connector (0.53mm columns)	121.80
RK20398	1/32" stainless steel repl. ferrule, 0.28mm, Pkg. 10	75.40
RK20399	1/32" stainless steel repl. ferrule, 0.53mm, Pkg. 10	75.40
RK20259	1/32" Vespel®/graphite ferrule, 0.5mm, Pkg. 5	56.50

## RESTEK SeCure™ "Y" CONNECTORS



- 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.

RK20276	SeCure™ "Y" Connector Kit, 0.25/0.28mm	\$334.10
RK20277	SeCure™ "Y" Connector Kit, 0.32mm	334.10
RK20278	SeCure™ "Y" Connector Kit, 0.45/0.53mm	334.10

(Kits include: SeCure™ "Y" connector body, 3 knurled nuts, "Y" Universal Press-Tight® union, 3 ferrules)



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

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.

RK21105	0.15-0.25mm	\$197.90
RK21106	0.28-0.32mm	197.90
RK21107	0.45/0.50 and 0.53mm	197.90
RK21108	Knurled Nut	39.60

For further information regarding the Vu2 Union, please request literature code **RK116**.

## ... Minimize Bleed, Maximize Savings

All CHROMSPEC™ GC septa are formulated to low bleed specifications while maintaining exceptional needle penetration and sealing characteristics, long life and reduced injection port sticking. To ensure their performance, they are packaged in non-contaminating glass jars.

*Samples are available.*

*A Chromatographic Specialties Inc. coffee mug is shipped with every 50 and 100 pack order of CHROMSPEC™ septa (while quantities last).*



Septa with Guide Hole

## HT Red and Longevity are CHROMSPEC™ premium quality septa

- State-of-the-art silicone formulation for ultra-low bleed
- Precision injection molded for exact fit
- Available guide hole for repeatable penetration and reduced coring

## CHROMSPEC™ HT RED (High Temperature)

Septa Diameter	Package 25		Package 50		Package 100	
	Product Number	Price	Product Number	Price	Product Number	Price
9.5mm	C7910295	\$45.00	C791029550	\$58.00	C7910295C	\$80.00
10.0mm	C7910210	45.00	C791021050	58.00	C7910210C	80.00
11.0mm	C7910211	45.00	C791021150	58.00	C7910211C	80.00
Shimadzu Plug	C79102SP	45.00	C79102SP50	58.00	C79102SPC	80.00
9.5mm with guide hole	C7910295GH	45.00	C7910295GH50	58.00	C7910295GHC	80.00
10.0mm with guide hole	C7910210GH	45.00	C7910210GH50	58.00	C7910210GHC	80.00
11.0mm with guide hole	C7910211GH	45.00	C7910211GH50	58.00	C7910211GHC	80.00

- Low bleed
- Stable to 350°C



## CHROMSPEC™ LONGEVITY

Septa Diameter	Package 25		Package 50		Package 100	
	Product Number	Price	Product Number	Price	Product Number	Price
9.5mm	C7910595	\$40.00	C791059550	\$52.00	C7910595C	\$72.00
10.0mm	C7910510	40.00	C791051050	52.00	C7910510C	72.00
11.0mm	C7910511	40.00	C791051150	52.00	C7910511C	72.00
9.5mm with guide hole	C7910595GH	40.00	C7910595GH50	52.00	C7910595GHC	72.00
10.0mm with guide hole	C7910510GH	40.00	C7910510GH50	52.00	C7910510GHC	72.00
11.0mm with guide hole	C7910511GH	40.00	C7910511GH50	52.00	C7910511GHC	72.00

- Long Life Septa
- Stable to 300°C



**CHROMSPEC™ Emerald HT and Teflon Coated** compression manufactured septa offer superior performance in GC applications. Emerald-HT septa are designed for high sensitivity (MS) analysis. Teflon Coated septa are useful when analyzing active components such as fatty acids or sterols which may adhere to conventional silicone septa surfaces.

## CHROMSPEC™ EMERALD-HT

Septa Diameter	Package 25		Package 50		Package 100	
	Product Number	Price	Product Number	Price	Product Number	Price
9.5mm	C6613295	\$36.00	C661329550	\$44.00	C6613295C	\$60.00
10.0mm	C6613210	36.00	C661321050	44.00	C6613210C	60.00
11.0mm	C6613211	36.00	C661321150	44.00	C6613211C	60.00
Shimadzu/SRI Plug	C66132SP	36.00	C66132SP50	44.00	C66132SPC	60.00

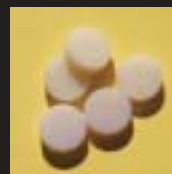
- Excellent for MS Applications
- Stable to 325°C



## CHROMSPEC™ TEFLON COATED

Septa Diameter	Package 25		Package 50		Package 100	
	Product Number	Price	Product Number	Price	Product Number	Price
9.5mm	C7910995	\$40.00	C791099550	\$52.00	C7910995C	\$72.00
10.0mm	C7910910	40.00	C791091050	52.00	C7910910C	72.00
11.0mm	C7910911	40.00	C791091150	52.00	C7910911C	72.00

- Teflon Coated for inertness
- Stable to 250°C



## SEPTUM SIZE CHART

Instrument	Septa Size
<b>Agilent (HP)</b> 5880A, 5890, 6890, and 6850 5700, 5880 On-Column Injection	11 mm 9.5/10 mm 5 mm
<b>CE Instruments (TMQ)</b> TRACE GC	17 mm
<b>Finnigan (TMQ)</b> GC 9001 GCQ GCQ w/TRACE QCQ™ TRACE 2000	9.5 mm 9.5 mm 17 mm 9.5 mm 9.5 mm
<b>Fisons/Carlo Erba (TMQ)</b> 8000 Series	17 mm
<b>Gow-Mac</b> 6890 series All other models	11 mm 9.5 mm
<b>Perkin-Elmer</b> Sigma series 900, 990 8000 series Auto SYS	11 mm 11 mm 11 mm 11 mm
<b>Pye/Unicam</b> All models	7 mm
<b>Shimadzu</b> All models	Plug
<b>SRI</b> Split/Splitless Injector All other models	9.5 mm Plug
<b>Tracor</b> 540 550, 560 220, 222	11.5 mm 9.5 mm 12.5 mm
<b>Varian</b> Injector Type: Packed column Split/splitless 1078/1079 1177	9.5/10 mm 10/11 mm 9 mm

**TECH TIP** — All septa may adsorb contaminants such as finger oils and volatile organics present in the air. Any such contaminants picked up by a septum may elute during analysis and appear as septa bleed or ghost peaks. To avoid contamination, store septa in their original glass containers with the lid tightly closed. Forceps are recommended for handling septa, but if you must touch them with your fingers, hold them only by the edges.

## What Septa Should I Use?

Select septa based on the injection port temperature you will use. Generally, septa with lower thermal limits are softer, and thus easier to pierce and seal. However, softer septa are more prone to damage caused by over tightening of the septum nut, which can reduce the life of the septum. Change all septa regularly regardless of their thermal limits to avoid coring and bleed.

## THERMOLITE® SEPTA

- Usable for inlet temperatures of up to 340°C
- Each batch tested on FIDs, ECDs, and MSDs to ensure lowest bleed
- Excellent puncturability



Septa Diameter	25-pack		50-pack		100-pack	
	Product Number	Price	Product Number	Price	Product Number	Price
5 mm (3/16")	RK27120	\$51.50	RK27121	\$74.40	RK27122	\$123.30
6 mm (1/4")	RK27123	51.50	RK27124	74.40	RK27125	123.30
7 mm	RK27126	51.50	RK27127	74.40	RK27128	123.30
8 mm	RK27129	51.50	RK27130	74.40	RK27131	123.30
9 mm	RK27132	51.50	RK27133	74.40	RK27134	123.30
9.5 mm (3/8")	RK27135	51.50	RK27136	74.40	RK27137	123.30
10 mm	RK27138	51.50	RK27139	74.40	RK27140	123.30
11 mm (7/16")	RK27141	51.50	RK27142	74.40	RK27143	123.30
11.5 mm	RK27144	51.50	RK27145	74.40	RK27146	123.30
12.5 mm (1/2")	RK27147	51.50	RK27148	74.40	RK27149	123.30
17 mm	RK27150	57.70	RK27151	98.10	RK27152	179.60
Shimadzu Plug (SRI)	RK27153	51.50	RK27154	74.20	RK27155	123.30

## ICEBLUE™ SEPTA

- Usable for inlet temperatures of up to 250°C
- General-purpose septa
- Excellent puncturability
- Preconditioned and ready to use
- Do not adhere to hot metal surfaces
- Packaged in non-contaminating glass jars
- Ideal for SPME



Septa Diameter	50-pack		100-pack	
	Product Number	Price	Product Number	Price
9 mm	RK27156	\$45.40	RK27157	\$80.20
9.5 mm (3/8")	RK27158	45.40	RK27159	80.20
10 mm	RK27160	45.40	RK27161	80.20
11 mm (7/16")	RK27162	45.40	RK27163	80.20
11.5 mm	RK27164	45.40	RK27165	80.20
12.5 mm (1/2")	RK27166	45.40	RK27167	80.20
17 mm	RK27168	46.60	RK27169	85.00
Shimadzu Plug (SRI)	RK27170	46.60	RK27171	85.00

## 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



Product Number	Description	Price
RK20117	Septum Puller	\$24.20



## INJECTION PORT SEPTA (LOW BLEED)

Product Number	Inches	mm	Qty.	Price
<b>Chromatherm</b>		<b>Blue</b>	<b>(High Temp.)</b>	
C13301	0.250	6.4	50	\$65.80
C13310	0.281	7	50	65.80
C13302	0.312	8	50	65.80
C13303	0.355	9	50	65.80
C13304	0.375	9.5	50	65.80
C13305	0.394	10	50	65.80
C13307	0.438	11	50	65.80
C13313	0.469	12	50	65.80
C13306	0.500	12.5	50	65.80

<b>Chromatherm</b>		<b>Red</b>	<b>(High Temp.)</b>	
C6649564	0.250	6.4	50	\$51.50
C6649595	0.375	9.5	50	51.50
C6649511	0.438	11	50	51.50
C66495125	0.500	12.5	50	51.50
C6649517C	0.669	17	100	86.10

<b>Ultra Sep R</b>		<b>Red</b>	<b>(High Temp.)</b>	
C660500	0.375	9.5	50	\$48.50
C660525	0.400	10.0	50	48.50
C660520	0.430	11.0	50	48.50
C660510	0.500	12.5	50	48.50
C660535	Sheet Stock 11-1/4" x 11-1/4"			312.00

<b>Chrom. Spec.</b>		<b>Grey</b>	<b>(Low Temp.)</b>	
C13050	0.375	9.5	144	\$56.40
C13045	0.438	11.0	144	56.40
C13055	0.500	12.5	144	56.40

<b>Hamilton</b>		<b>3-Layer</b>	<b>(Low Temp.)</b>	
H76022	0.197	5	12	\$16.10
H76001	0.250	6.4	12	16.70
H76010	0.281	7	12	16.10
H76002	0.312	8	12	16.10
H76003	0.355	9	12	16.70
H76004	0.375	9.5	12	16.10
H76005	0.394	10	12	16.10
H76007	0.438	11	12	23.10
H76013	0.469	12	12	24.20
H76006	0.500	12.5	12	24.20

<b>Teflon Faced</b>		<b>Yellow</b>	<b>(Med. Temp.)</b>	
C13408	0.197	5	12	\$15.40
C13401	0.250	6.4	12	15.40
C13410	0.281	7	12	15.40
C13402	0.312	8	12	15.40
C13403	0.355	9	12	15.40
C13404	0.375	9.5	12	15.40
C13405	0.394	10	12	15.40
C13407	0.438	11	12	15.40
C13413	0.469	12	12	15.40
C13406	0.500	12.5	12	15.40

## BTO® SEPTA

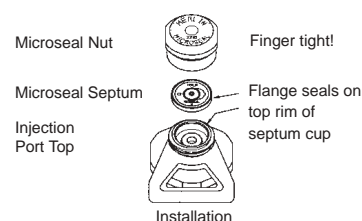
BTO® Premium septa offers the longest average injection lifetime with lowest bleed, at the highest inlet set-point temperatures.

- For high temperature use
- Lowest bleed
- Outstanding injection life
- Maximum set-point 400°C



Product Number	Description	Diameter (mm)	Qty	Price
C37500	Septa BTO® CenterGuide	5	50	\$86.40
C37036	Septa BTO® CenterGuide™	9	50	86.40
C37504	Septa BTO®	9.5	50	86.40
C37524	Septa BTO®	10	50	86.40
C37017	Septa BTO® 7/16", CenterGuide™	11	50	86.40
C37039	Septa BTO® CenterGuide™	11.5	50	86.40
C37508	Septa BTO® CenterGuide™	17	50	86.40
C37035	Septa BTO®	Shimadzu	50	86.40

## MERLIN MICROSEAL™ ORIGINAL AND HIGH PRESSURE SEPTUM



- 2 models available: 30 psi max., 100 psi max.
- Long life septum for Split/Splitless Capillary and Purged Packed Inlet Systems of Hewlett Packard Gas Chromatographs
- Double o-ring and spring assisted duckbill ensure complete needle seal during injection
- High pressure version allows operation from 2-100 psi
- Resistance to particulate contamination
- Duckbill design reduces shedding of septum particles into injection port liner
- Septum can be taken apart for cleaning
- Low syringe insertion force
- Suitable for autosampler or manual injections
- Requires 23s gauge blunt tip syringe (see page 168)

Product Number	Description	Price
MIC304	Original Microseal Septum Kit (Microseal Nut and 2 Microseal Septa)	\$320.10
MIC305	Original Microseal Septum Kit (Microseal Nut and 1 Microseal Septum)	223.50
MIC310	Replacement Microseal Septum with teflon washer	146.20
MIC404	High Pressure Microseal Septum Kit (Microseal Nut and 2 High Pressure Septa)	361.30
MIC405	High Pressure Microseal Septum Kit (Microseal Nut and 1 High Pressure Septum)	240.40
MIC410	High Pressure Microseal Septum, each	171.50



# CHROMSPEC™ INJECTION PORT LINERS

## INJECTION PORT LINERS

- 200 to 300% increase in sample transfer
- Permits use of glass wool for dirty samples
- Readily silanized
- Improved reproducibility
- Easily cleaned

A GC injection port liner serves as an inert environment where a sample can be vaporized prior to introduction onto an analytical column. Liner designs vary according to the type of injection technique used. Being the first part of the sample flow path, it is critical that the liner does not alter the composition of the sample. Liners that are incorrectly deactivated, dirty, broken, or poorly installed can contribute to inferior chromatographic results.

### Deactivated Liners

Liner deactivation is critical when analysing active or trace compounds. Undeactivated glass liners expose the sample to metal oxides and silanol groups which can interact with certain pesticides, herbicides, drugs, amines and acids. Total or partial loss of solute (irreversible adsorption) or solute tailing (reversible adsorption) can result from the use of undeactivated liners. Certain pesticides (eg. endrin) are prone to breakdown in undeactivated liners. Deactivation of the glass surface of the liner involves leaching with an acid, followed by silylation with DMDCS (dimethyldichlorosilane) or similar reagent. Care must be taken in cleaning deactivated liners. Methanol, followed by methylene chloride, hexane and the solvent the sample was in, are recommended for cleaning deactivated liners. Brushes that may scratch the surface and strong acids/bases or soaps/surfactants must be avoided. If the deactivation layer has been damaged, the liner will need to be re-deactivated.

### Undeactivated Liners

Undeactivated liners can be used successfully for non-active samples such as hydrocarbons. These liners still require frequent cleaning/replacing as dirty samples can quickly contaminate the liner and eventually the column.

### Liner Maintenance

Dirty or broken liners can cause poor chromatographic results even for non-active solutes. A contaminated liner can adsorb solutes to varying degrees. A cracked or poorly installed liner will result in poor sample transfer onto the column and consequently poor peak shape. Injection port liners should be changed frequently. The exact schedule of liner replacement will depend on the application, however, it is recommended that the liner be replaced whenever a new column is installed.

#### TECH TIP

**CHROMSPEC™ septa are an affordable alternative to many higher priced OEM products. All are formulated for low bleed and high performance.**

Please see page 85 for further information.

## LINERS FOR VARIAN GCs

## Replaces OEM



16-000830-01

C72100 Fritted Splitter

\$58.40



N/A

C72110 Cupped Splitter

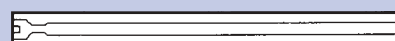
86.40



16-00829-00

C72120 Baffled Splitter

41.50



03-949437-00

C72130 Splitless

41.50

## LINERS FOR AGILENT GCs

## Replaces OEM



18740-80190  
18740-60840

C72200 Cupped Splitter (unpacked)

\$44.80

C72205 Cupped Splitter (packed)

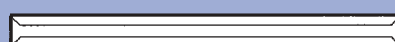
44.50



19251-60540

C72210 Split/Splitless, 1/4" x 4mm (with glass wool)

22.40



18740-80220

C72220 Splitless, 1/4" x 2mm

25.70



19251-60540

C72215 Split/Splitless, 1/4" x 4mm  
Disposable, not silanized, Pkg. 10

65.90

C72217 Split/Splitless, 1/4" x 4mm  
Disposable, not silanized  
with glass wool plug, Pkg. 10

65.00

## GENUINE AGILENT LINERS



N/A

J2102066H Hot On-Column Liner for HP5880/90

37.20

The FocusLiner™ traps a glass wool plug in the ideal position in the injection port liner. At the point of injection, the glass wool provides extra surface area for vaporization, traps non-volatile sample residue and wipes any residual sample from the needle — reproducibility is the result.



J21040045 FocusLiner™ deactivated with glass wool  
4mm ID, 6.3mm x 78.5mm, Pkg. 5

114.00

J21040225 FocusLiner™ tapered, deactivated with glass wool  
4mm ID, 6.3mm x 78.5mm, Pkg. 5

127.00

# GENUINE AGILENT INJECTION PORT LINERS

Chromatographic Specialties Inc. offers a complete line of liners for your Agilent GC split/splitless inlet. These liners are engineered to meet strict Agilent specifications for dimensional accuracy and inertness for demanding applications.



## SPLITLESS INLET LINERS

Product Number	Description	Qty	Price
CS51813316	Liner, splitless, single-taper, no glass wool, deactivated	1	\$34.00
CS51834695	Liner, splitless, single-taper, no glass wool, deactivated	5	144.00
CS51834696	Liner, splitless, single-taper, no glass wool, deactivated	25	620.00
CS50623587	Liner, splitless, single-taper, glass wool, deactivated	1	35.30
CS51834693	Liner, splitless, single-taper, glass wool, deactivated	5	150.00
CS51834694	Liner, splitless, single-taper, glass wool, deactivated	25	653.00
CS51813315	Liner, splitless, double-taper, no glass wool, deactivated	1	41.80
CS51834705	Liner, splitless, double-taper, no glass wool, deactivated	5	189.00
CS51834706	Liner, splitless, double-taper, no glass wool, deactivated	25	875.00

## DIRECT INLET LINERS

CS51818818	Liner, 2 mm ID, deactivated	1	\$27.40
CS51834703	Liner, 2 mm ID, deactivated	5	111.00
CS51834704	Liner, 2 mm ID, deactivated	25	483.00
CS1874080220	Liner, 2mm ID, non-deactivated, quartz	1	32.70
CS51834707	Liner, 2mm ID, non-deactivated, quartz	5	144.00
CS51834708	Liner, 2mm ID, non-deactivated, quartz	25	620.00
CS1874080200	Liner, 1.5mm ID, non-deactivated (headspace, p/t)	1	19.60
CS51834709	Liner, 1.5mm ID, non-deactivated (headspace, p/t)	5	84.90
CS51834710	Liner, 1.5mm ID, non-deactivated (headspace, p/t)	25	359.00
J2103003	Liner, straight, 4.0mm ID	1	22.20
J21030035	Liner, straight, 4.0mm ID	5	98.00

## SPLIT INLET LINERS

CS51834711	Liner, general purpose split, glass wool, taper, deactivated	1	\$31.30
CS51834712	Liner, general purpose split, glass wool, taper, deactivated	5	131.00
CS51834713	Liner, general purpose split, glass wool, taper, deactivated	25	555.00
CS51834647	Liner, split, low pressure drop, glass wool, taper, deactivated	1	40.50
CS51834701	Liner, split, low pressure drop, glass wool, taper, deactivated	5	183.00
CS51834702	Liner, split, low pressure drop, glass wool, taper, deactivated	25	816.00
CS1925160540	Liner, split, glass wool, non-deactivated	1	22.20
CS51834691	Liner, split, glass wool, non-deactivated	5	91.40
CS51834692	Liner, split, glass wool, non-deactivated	25	392.00
CS1874080190	Split Inlet Liner for Manual Injection, with cup, no wool	1	47.00
CS51834699	Split Inlet Liner for Manual Injection, with cup, no wool	5	209.00
CS51834700	Split Inlet Liner for Manual Injection, with cup, no wool	25	914.00
CS1874060840	Liner, split, with cup, glass wool, and packing	1	49.60
CS51834697	Liner, split, with cup, glass wool, and packing	5	222.00
CS51834698	Liner, split, with cup, glass wool, and packing	25	980.00

## DIRECT CONNECT LINERS

CSG154480730	Single taper direct connect liner, 4mm ID	\$71.80
CSG154480700	Dual taper direct connect liner, 4mm ID	71.80
CSG154480731	Inert direct connect liner, single taper, splitless 4mm ID	76.70

### TECH TIP —

#### Why should I change my injection port liner?

These problems will occur if the liner is not changed on a regular basis or if the correct liner is not used:

- peak shape degradation
- solute discrimination
- poor reproducibility
- sample decomposition
- ghost peaks

### AGILENT'S NEW NON-STICK FLUOROCARBON INLET LINER O-RING






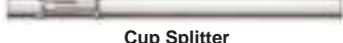
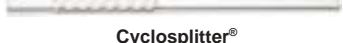

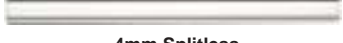


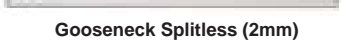



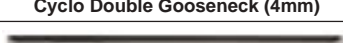
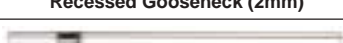

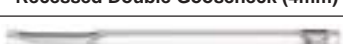

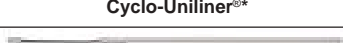
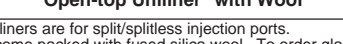
- Pre-cleaned and conditioned to eliminate out-gassing of contaminants, especially important for trace, ECD and MSD analyses
- Plasma Treated for a Non-stick contaminant-free surface that won't stick to the inlet metal surface creating un-necessary inlet maintenance
- Packaged for convenience and cleanliness—novel dial packaging for O-rings delivers 1 clean O-ring, ready for use

Product Number	Description	Price
CS51885365	Liner O-Ring, Non-Stick, Pkg. 10	\$14.30

# RESTEK INJECTION PORT LINERS FOR AGILENT GCs

## RESTEK DEACTIVATED INLET SLEEVES FOR AGILENT GCs.

Similar designs are available for Varian (See Page 91). For Perkin Elmer and Shimadzu please call 1-800-267-8103.

	Agilent	Benefits/Uses	OD & Length (mm)	Product Number			Use In Place Of Agilent Part #
				Each	5-pk	25-pk	
Split Sleeves	 1mm Split	for purge & trap inlet splitting or samples <1µL	6.3 x 78.5	RK20972 \$32.70	RK20973 \$91.00		
	 4mm Split with Wool**	universal, use with HP 7673 Autosampler	6.3 x 78.5	RK20781 \$30.20	RK20782 \$83.80	RK20783 \$352.90	19251-60540
	 Laminar Cup Splitter	high MW compounds	6.3 x 78.5	RK20801 \$72.80	RK20802 \$282.30	—	18740-80190
	 Cup Splitter	high & low MW compounds	6.3 x 78.5	RK20709 \$50.40	RK20710 \$202.30	—	18740-80190
	 Cycloplitter®	dirty samples, many injections before cleaning required	6.3 x 78.5	RK20706 \$54.60	RK20707 \$211.80	—	
Splitless Sleeves	 2mm Splitless	trace samples <2µL	6.5 x 78.5	RK20712 \$30.20	RK20713 \$98.40	RK20714 \$300.30	18740-80220 5181-8818
	 4mm Splitless	trace samples >2µL	6.5 x 78.5	RK20772 \$24.50	RK20773 \$75.30	RK20774 \$300.30	18740-80220 5181-8818
	 2mm Splitless (quartz)	trace samples >2µL	6.5 x 78.5	RK20912 \$37.70	RK20915 \$151.90	—	18740-80220 5181-8818
	 4mm Splitless (quartz)	trace samples <2µL	6.5 x 78.5	RK20914 \$39.00	RK20913 \$142.30	—	18740-80220 5181-8818
	 Gooseneck Splitless (2mm)	trace active samples <2µL	6.5 x 78.5	RK20795 \$37.70	RK20796 \$142.30	RK20797 \$583.30	5181-3316
	 Gooseneck Splitless (4mm)	trace active samples >2µL	6.5 x 78.5	RK20798 \$37.70	RK20799 \$103.20	RK20800 \$422.80	5181-3316
	 Double Gooseneck Splitless (4mm)	trace active samples up to 4µL	6.5 x 78.5	RK20784 \$37.70	RK20785 \$120.80	RK20786 \$520.80	5181-3315
	 Cyclo Double Gooseneck (2mm)	trace, active, dirty samples <2µL	6.5 x 78.5	RK20907 \$75.30	RK20908 \$293.10	—	5181-3315
	 Cyclo Double Gooseneck (4mm)	trace, active, dirty samples up to 4µL	6.5 x 78.5	RK20895 \$91.00	RK20896 \$350.60	—	5181-3315
	 Recessed Gooseneck (2mm)	base easily packed with wool for dirty samples up to 2µL	6.5 x 78.5	RK20980 \$37.70	RK20981 \$122.10	RK20982 \$515.90	5181-3316
	 Recessed Gooseneck (4mm)	base easily packed with wool for dirty samples up to 4µL	6.5 x 78.5	RK20983 \$37.70	RK20984 \$110.50	RK20985 \$506.10	5181-3316
	 Recessed Double Gooseneck (4mm)	base easily packed with wool for dirty samples up to 2µL	6.5 x 78.5	RK20986 \$44.90	RK20987 \$172.30	RK20988 \$770.90	5181-3315
Direct Injection Sleeves	 Uniliner®*	trace active samples, high recovery & linearity	6.3 x 78.5	RK20335 \$72.80	RK20336 \$283.60	—	—
	 Cyclo-Uniliner®*	trace, dirty, high MW active samples, high recovery & linearity	6.3 x 78.5	RK20337 \$89.40	RK20338 \$344.60	—	—
	 Open-top Uniliner® with Wool*	trace, dirty active samples, high recovery & linearity	6.3 x 78.5	RK20843 \$59.50	RK20844 \$232.10	—	—

\* These Uniliners are for split/splitless injection ports.



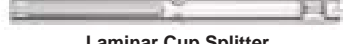


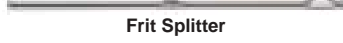

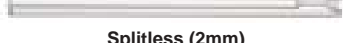
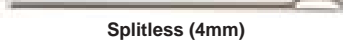



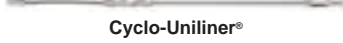

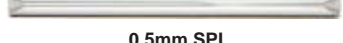




\*\* Sleeves come packed with fused silica wool. To order glass wool, add the suffix "202" to the sleeve's catalogue number.

**NOTE:** Remember to order splitless sleeves packed with fused silica or glass wool when using HP7673 Autosamplers.

# RESTEK INJECTION PORT LINERS FOR VARIAN GCs

## RESTEK DEACTIVATED INLET SLEEVES FOR VARIAN GCs.

Similar designs are available for Agilent (See Page 90). For Perkin Elmer and Shimadzu please call 1-800-267-8103.

	Varian	Benefits/Uses	OD & Length (mm)	Product Number			Use In Place Of VA Part #
				Each	5-pk	25-pk	
Split Sleeves for 1075/1077	 1mm Split	for purge & trap inlet splitting or samples <1µL	6.3 x 72	RK20970 \$41.50	RK20971 \$151.90	—	—
	 Splitter with Wool*	universal, use with rapid autosamplers	6.3 x 72	RK20792 \$44.90	RK20793 \$140.00	RK20794 \$644.60	01-900109-01
	 Laminar Cup Splitter	high MW compounds	6.3 x 72	RK20803 \$71.70	RK20804 \$277.60	—	01-900109-02
	 Cup Splitter	high & low MW compounds	6.3 x 72	RK20724 \$65.60	RK20725 \$202.30	—	—
	 Cyclosplitter®	dirty samples, many injections before cleaning required	6.3 x 72	RK20727 \$62.00	RK20728 \$227.30	—	—
	 Frit Splitter	dirty, non-active compounds	6.3 x 72	RK20715 \$41.50	RK20716 \$172.30	—	01-900109-03
	 Baffle Splitter	close boiling compounds	6.3 x 72	RK20718 \$41.50	RK20719 \$122.10	—	01-900109-04
Splitless Sleeves for 1075/1077	 Splitless (2mm)	trace samples <2µL	6.3 x 74	RK20721 \$44.90	RK20722 \$122.10	RK20723 \$561.30	01-900109-05
	 Splitless (4mm)	trace samples >2µL	6.3 x 74	RK20904 \$32.70	RK20905 \$122.10	RK20906 \$562.50	01-900109-05
	 Double Gooseneck	trace active samples up to 4µL	6.3 x 74	RK20847 \$44.00	RK20848 \$161.50	—	—
	 Cyclo Double Gooseneck	trace dirty, active samples up to 4µL	6.3 x 74	RK20897 \$87.40	RK20898 \$343.40	—	—
Direct Injection Sleeves for 1075/1077	 Uniliner®	trace, active samples, high recovery & linearity	6.3 x 72	RK20345 \$62.00	RK20346 \$244.10	—	—
	 Cyclo-Uniliner®	trace, dirty, high MW active samples, linearity	6.3 x 72	RK20347 \$77.70	RK20348 \$303.90	—	—
	 Open-top Uniliner® with Wool*	trace, dirty, active samples, high recovery & linearity	6.3 x 72	RK20845 \$53.50	RK20846 \$207.00	—	—
SPI Sleeves	 0.5mm SPI	high linearity for 0.25 & 0.32mm ID columns	4.6 x 54	RK20775 \$47.40	RK20776 \$165.20	RK20777 \$675.20	01-900109-06
	 0.8mm SPI	high linearity for 0.53mm ID columns	4.6 x 54	RK20778 \$44.90	RK20779 \$156.70	RK20780 \$654.40	01-900109-07
	 SPI with Buffer	dirty samples >1µL, fits 0.25, 0.32 & 0.53mm ID columns	4.6 x 54	RK20850 \$52.20	RK20851 \$202.30	RK20852 \$805.10	01-900109-08
1078	 1078 Split	dirty, non-active compounds	3.4 ID 5.0 x 54	RK21708 \$49.80	RK21709 \$215.40	—	03-918464-01
	 1078 Splitless	trace samples < 2µL	2.0 ID 5.0 x 54	RK21711 \$37.70	RK21712 \$142.30	—	03-918466-00

\* Sleeves come packed with fused silica wool. To order glass wool, add the suffix "202" to the sleeve's catalogue number.

**Chromatographic Specialties Inc. — The Accessories People!**



# RESTEK INJECTION PORT LINERS

## RESTEK CARBOFRIT™ INLET LINER INSERTS



*CarboFrit™ packing offers the advantages of glass wool but with superior inertness, higher temperature stability, improved retention of sample contaminants, and more consistent packing densities.*

- Exhibits excellent inertness for highly active compounds
- Allows unimpeded inlet flows
- Provides low inlet liner pressure drop
- Improves trapping of high molecular weight contaminants
- Eliminates off gassing or bleed from deactivation

4mm Splitless		4mm Gooseneck	
for HP	for Varian	for HP	
RK207722091	\$42.10	RK209042091	\$48.60
RK207732095	110.50	RK209052095	156.90
RK2077420925	397.10	RK2090620925	659.30
		RK207982091	\$53.50
		RK207992095	136.40
		RK2080020925	519.60

## FastPack™ INLET MAINTENANCE KITS FOR AGILENT GCs

FastPack™ Inlet Kits are an economical way to make routine maintenance easy!



Each kit includes one each: Inlet liner (choose from four popular styles), Viton® O-ring, 0.8mm ID gold-plated inlet seal, Inlet seal washer, 11mm Thermolite® septum

Product Number	Description	Price
RK21101	1 pack* of 4mm Splitless	\$226.20
RK21102	1 pack* of 4mm Splitless Gooseneck	249.00
RK21103	1 pack* of 4mm Splitless Double Gooseneck	296.70
RK21104	1 pack* of 4mm Split with Wool	237.60

\* A **Pack** includes 5 complete inlet maintenance kits. Extra price breaks are available for purchases of 5, and 20 **packs**. Please contact our order desk for details.

## RESTEK Siltek® METAL INLET LINERS FOR AGILENT GCs

**Siltek®...Unsurpassed Inertness & Durability!**



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

Product Number	Description	Price
RK21700	Split/Splitless w/wool, Pkg. 5	\$54.60
RK21701	Split/Splitless w/wool, Pkg. 25	219.40
RK20726	Cyclo splitter®, Pkg. 5	168.70
RK20729	Cyclo splitter®, Pkg. 25	686.30
RK21702	Single Gooseneck, Pkg. 5	113.00
RK21703	Single Gooseneck, Pkg. 25	508.60
RK20974	Cyclo/Single Gooseneck, Pkg. 5	262.10
RK20975	Cyclo/Single Gooseneck, Pkg. 25	1,045.30

### TECH TIP — Injector Maintenance

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

**We Carry The  
Complete Line Of  
Restek Columns and Accessories**



**Technical Support Is  
Available at 1-800-267-8103**

**Email [tech@chromspec.com](mailto:tech@chromspec.com)**

# GENUINE AGILENT GC AND GC/MS FERRULES

Agilent capillary ferrules are packaged in novel dial packs which deliver one ferrule at a time, keeping the others clean and ready for use. The dial packaging has been tested to ensure no out gassing of contaminants, including phthalates.



Capillary Column Ferrules in Dial Package

## General Purpose Graphite Ferrules (Short), 1/16"

Product Number	Description	Qty	Price
CS50808853	0.5mm ID	10	\$56.30
J5002114	0.4mm ID	10	33.00
J5002118	0.8mm ID	10	33.00
CS50808773	1.0mm ID	10	45.30

## 85% Vespel, 15% Graphite (Short), 1/16"

CS51813323	0.4mm ID	10	\$65.90
CS50623514	0.5mm ID	10	61.70
CS50623512	0.8mm ID	10	63.10

## Preconditioned 85% Vespel, 15% Graphite Ferrules (Long)\*, 1/16"

CS50623507	0.3mm ID	10	\$74.10
CS50623508	0.4mm ID	10	74.10
CS50623506	0.5mm ID	10	67.30
CS50623538	0.8mm ID	10	57.60

## 100% Vespel, High Performance Ferrules (Short)\*\*, 1/16"

CS51813322	0.4mm ID	10	\$65.90
CS50623513	0.5mm ID	10	61.70
CS50623511	0.8mm ID	10	61.70

## Specialty Ferrules, 85% Vespel, 15% Graphite, 1/16"

CS50623580	Two Hole 0.4mm/0.4mm ID	10	\$94.70
CS50623581	Two Hole 0.5mm/0.5mm ID	10	94.70
CS51813308	No Hole Ferrules	10	56.30

## Column Nuts (Short), 1/16"

CS51818830	Universal, 1/16" hex	2	\$31.60
CS50208293	Finger tight nut for 0.53mm	Each	21.90
CS50208292	Fingertight nuts for 0.32/0.25mm	Each	21.90
CS50208294	Blanking Plug, finger-tight style	Each	14.70

## Column Nuts (Long), 1/16"

CS0598820066	MS interface nut, female	Each	\$15.50
CS0592121170	Nut for long or long two-hole ferrules	Each	19.20

\* These ferrules are recommended for use with Agilent GC/MS transfer lines with the CS0598820066 MS interface column nut.

\*\* These ferrules are recommended for use in isothermal analysis only.

## Straight Ferrules

CS01001326	1/16" Graphite	10	\$34.30
CS01001325	1/8" Graphite	10	34.30
CS01001324	1/4" Graphite	10	34.30
CS01001379	1/16" Vespel/Graphite	10	49.40
CS01001332	1/8" Vespel/Graphite	10	60.40
CS01001331	1/4" Vespel/Graphite	10	60.40

## Reducing Ferrules

CS01001342	1/8" to 1/16" Vespel	10	\$60.40
CS01001344	1/8" to 1/16" Vespel/Graphite	10	60.40

## Ferrule Selection Recommendations

### Graphite (100%)

- General purpose for capillary columns. Suitable for FID and NPD. Recommended for high temperature and cool on-column applications.
- Upper temp limit of 450°C.

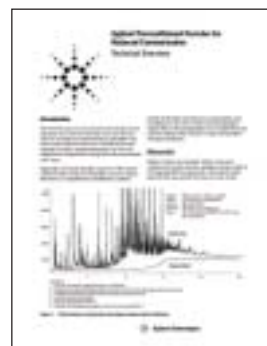
### Vespel/Graphite (85%/15%)

- General purpose for capillary columns. Recommended for MS and oxygen sensitive detectors. Most reliable leak-free connection.
- Upper temp limit of 350°C.

### Vespel (100%)

- Isothermal operation. Can be reused or removed easily. Excellent sealing material when making metal or glass connections.
- Upper temp limit of 280°C

## Free Technical Literature



The ferrules you use to seal your GC column in the injection port and the detector have the obvious task of creating and maintaining a leak-tight seal.

For further information about Agilent Preconditioned Ferrules for Reduced Contamination, please request a copy of AG000.

# CHROMSPEC™ GC FERRULES

## What type of ferrule should I choose?

Graphite or graphite/ Vespel® ferrules are used to seal the column to the injector and detector in capillary gas chromatography. Both ferrule types have advantages and disadvantages. Graphite ferrules are the easiest to use, and they are leak-free, universal for most systems, and preferred by most beginning capillary chromatographers. Because graphite ferrules are soft, they easily conform to column outside diameters and different types of instrument fittings. However, they can flake or fragment upon removal, causing particles to lodge in the injector or detector sleeves; and they will not hold a seal under vacuum. Graphite/ Vespel® ferrules are hard and they must match the column and fitting dimensions closely to seal properly. In addition, because graphite/Vespel® ferrules can deform during initial heating, they need to be re-tightened or leakage will occur. Graphite/Vespel® ferrules do not fragment, can be re-used many times, and are preferred by mass spectroscopists since they do not contaminate the ion source with particles and maintain their seal under vacuum. In all cases, it is best to choose a ferrule that fits snugly or is slightly larger than the capillary tubing outer diameter.

## FERRULE REMOVAL KIT



When ferrules get stuck in a fitting, these little spears will save the day! Each kit includes two sizes of tapered stabbers for retrieving capillary size ferrules.

Product Number	Description	Price
VFRK1	Ferrule Removal Kit	\$23.30

Chromatographic Specialties Inc. is pleased to offer our premium line of CHROMSPEC™ ferrules, to meet every chromatographer's needs! Other ferrule sizes are available; please inquire.

## CHROMSPEC™ UNIVERSAL GRAPHITE FERRULES

- Produced from specially formulated 100% graphite
- Ideal for glass to metal connections
- Temperature range: subambient to 450°C



Product Number	Description	Qty	Price
C19000	Front Ferrules, 1/4" *	10	\$29.90
C19010	Front Ferrules, 1/8" *	10	29.90
C19020	Front Ferrules, 1/16" *	10	29.90
C19025	Reducing Front Ferrules, 1/16" - 0.5mm *	10	29.90
C19030	Reducing Front Ferrules, 1/16" - 1.0mm *	10	29.90
C19710	Single Ferrules, 1/16"	10	29.90
C19700	Single Ferrules, 1/8"	10	29.90
C19720	Single Ferrules, 1/4"	10	29.90
C19725	Single Ferrules, 3/8"	10	63.10
C19726	Single Ferrules, 1/2"	10	78.80
C19790	Reducing Single Ferrules, 1/16" - 1.0mm	10	29.90
C19760	Reducing Single Ferrules, 1/8" - 1/16"	10	29.90
C19740	Reducing Single Ferrules, 1/4" - 1/16"	10	29.90
C19730	Reducing Single Ferrules, 1/4" - 1/8"	10	29.90
C19774	Reducing Single Ferrules, 1/16" - 0.3mm	10	34.50
C19805	Reducing Single Ferrules, 1/16" - 0.4mm	10	34.50
C19810	Reducing Single Ferrules, 1/16" - 0.5mm	10	29.90
C19800	Reducing Single Ferrules, 1/16" - 0.8mm	10	29.90
C19835	Reducing Single Ferrules, 1/8" - 0.4mm	10	34.50
C19775	Reducing Single Ferrules, 1/8" - 0.5mm	10	29.90
C19845	Reducing Single Ferrules, 1/8" - 0.8mm	10	29.90
C19820	Two Hole Ferrules, 1/16", 0.5mm/0.5mm	10	39.40
C19824	Two Hole Ferrules, 1/8", 0.5mm/0.5mm	10	39.40
C19772	No Hole Single Ferrules, 1/16"	10	29.90
C19773	No Hole Single Ferrules, 1/8"	10	29.90
C19777	No Hole Single Ferrules, 1/4"	10	34.50

\* Brass back ferrule required, see page 66.

## CHROMSPEC™ COMPACT FERRULES FOR AGILENT 5890/6890/6850 GCs

- High-purity, high-density graphite and graphite/Vespel®
- Pre-conditioned to eliminate out-gassing
- Smoother surface and cleaner edges than conventional ferrules



C75510	Reducing Single Ferrules, 1/16" - 0.4mm, graphite	10	\$22.90
C75502	Reducing Single Ferrules, 1/16" - 0.5mm, graphite	10	22.90
C75514	Reducing Single Ferrules, 1/16" - 0.8mm, graphite	10	22.90
C75522	Reducing Single Ferrules, 1/16" - 0.4mm, graphite/Vespel®	10	34.80
C75524	Reducing Single Ferrules, 1/16" - 0.5mm, graphite/Vespel®	10	34.80
C75526	Reducing Single Ferrules, 1/16" - 0.8mm, graphite/Vespel®	10	34.80

Chromatographic Specialties Inc. is pleased to offer our premium line of CHROMSPEC ferrules, to meet every chromatographer's needs! Other ferrule sizes are available; please inquire.

## CHROMSPEC™ UNIVERSAL GRAPHITE/VESPEL® FERRULES

- 40% graphite
- Ideal for GC/MS applications
- Temperature limit of 400°C



**TECH TIP** — Signs that a ferrule needs to be replaced:

- Background noise from oxygen diffusing into the system
- Column bleed catalyzed by oxygen
- Sample degradation
- Loss of sample
- Increase in detector signal/noise
- Poor retention time reproducibility

Product Number	Description	Qty	Price
C19705	Single Ferrules, 1/16"	10	\$71.00
C19721	Single Ferrules, 1/8"	10	98.60
C19722	Single Ferrules, 1/4"	10	118.30
C75004	Reducing Single Ferrules, 1/16" - 0.4mm	10	34.80
C75005	Reducing Single Ferrules, 1/16" - 0.5mm	10	34.80
C75008	Reducing Single Ferrules, 1/16" - 0.8mm	10	34.80
C75800	No Hole Single Ferrules, 1/16"	10	34.80
C75110	Two Hole Ferrules, 1/16", 0.4mm/0.4mm	10	41.70
C75112	Two Hole Ferrules, 1/16", 0.5mm/0.5mm	10	41.70

## CHROMSPEC™ UNIVERSAL VESPEL® FERRULES

- One piece design
- Machined from 100% polyimide
- Temperature limit of 350°C



C11015	Single Ferrules, 1/16"	10	\$68.00
C11030	Single Ferrules, 1/8"	10	71.60
C11020	Single Ferrules, 1/4"	10	88.60
C11035	Reducing Single Ferrules, 1/8" - 1/16"	10	71.60
C11040	Reducing Single Ferrules, 1/4" - 1/8"	10	87.70

## CHROMSPEC™ UNIVERSAL TEFLON FERRULES

- Ferrules have precision-drilled IDs
- PTFE is completely inert and does not stick to glass
- Temperature limit of 200°C



C37290	Single Ferrules, 1/16"	10	\$20.00
C37280	Single Ferrules, 1/8"	10	20.00
C37260	Single Ferrules, 1/4"	10	20.00
C37250	Reducing Single Ferrules, 1/8" - 1/16"	10	22.10
C37220	Reducing Single Ferrules, 1/4" - 1/16"	10	22.10
C37210	Reducing Single Ferrules, 1/4" - 1/8"	10	22.10

## FERRULE SIZE CHART

Ferrule ID	Fits Column ID
0.4mm	0.05mm
0.4mm	0.10mm
0.4mm	0.18mm
0.4mm	0.25mm
0.5mm	0.32mm
0.8mm	0.53mm

## Swagelok® TEFLON FERRULES

### Front Ferrules

T1031	1/16", Pkg. 10	\$70.50
T2031	1/8", Pkg. 10	47.30
T3031	3/16", Pkg. 10	47.30
T4031	1/4", Pkg. 10	35.30
T8131	1/2", Pkg. 4	23.10

### Back Ferrules

T1041	1/16", Pkg. 10	\$66.00
T2041	1/8", Pkg. 10	44.10
T3041	3/16", Pkg. 10	44.10
T4041	1/4", Pkg. 10	32.90
T8141	1/2", Pkg. 4	21.20

**CHROMSPEC™ ...The Name for Affordable Quality**



# RESTEK GC FERRULES

## Alumaseal™ FERRULES

- Provides leak tight seals, thus reducing detector noise
- Aluminum construction prevents cracking, fragmenting and out-gassing
- No need to retighten after temperature cycles
- Stable to 550°C
- Compatible with standard 1/16" compression-type fittings

Alumaseal™ ferrules combine the advantages of graphite and graphite/Vespel® ferrules while eliminating the common disadvantages associated with them. The unique front and back ferrule design seals securely without causing breakage to the fused silica tubing. The aluminum construction eliminates cracking, fragmenting and will not stick to fittings like graphite and graphite/Vespel® can. Alumaseal™ ferrules are stable to 550°C and do not require tightening after temperature cycles, thus making them ideal for GC-MS applications.



Alumaseal™ Ferrules

Product Number	Alumaseal™ Ferrule I.D. (mm)	Fits Tubing I.D. (mm)	Qty	Price
RK21472	0.4	0.25	10	\$52.80
RK21473	0.5	0.32	10	52.80
RK21474	0.8	0.53	10	52.80

## Vespel® FERRULES

- Made of 100% high temperature polyimide
- Stable to 350°C
- Durable
- Tends to permanently seal to the column



Vespel® Ferrules

Product Number	Ferrule I.D. (mm)	Fits Tubing I.D. (mm)	Fits Fitting Size/Type	Qty	Price
RK22213	0.3		1/16" Compression	10	\$56.50
RK22214	0.4	0.25	1/16" Compression	10	56.50
RK22215	0.5	0.32	1/16" Compression	10	56.50
RK22216	0.8	0.53	1/16" Compression	10	56.50
RK22217	1.0		1/16" Compression	10	56.50
RK22218	1.2		1/16" Compression	10	56.50
RK22210	1/16"		1/16" Standard	10	56.50
RK22211	1/8"		1/8" Standard	10	56.50
RK22212	1/4"		1/4" Standard	10	56.50
RK22219	1/8"		1/4" Standard	10	56.50

## ENCAPSULATED FERRULES - FOR 1/16" COMPRESSION FITTINGS

- Reusable
- Less torque required to seal ferrule
- Will not deform or stick to fittings
- Restek's unique blend of graphite minimizes fragmentation and out-gassing



Encapsulated Ferrules

Product Number	Ferrule I.D. (mm)	Fits Tubing I.D. (mm)	Qty	Price
RK21036	0.4	0.25	10	\$72.60
RK21037	0.5	0.28-0.32	10	72.60
RK21038	0.8	0.45-0.53	10	72.60

For more information on any of the ferrules featured here, please contact our knowledgeable Technical Support Group at 1-800-267-8103 or [tech@chromspec.com](mailto:tech@chromspec.com).

## RESTEK FERRULES

### Vespel®/graphite

- Vespel®/graphite ferrules are a 60%/40% blend, offering the best combination of sealing performance and ease of workability
- Seal with minimal torque, reusable, and preferred for vacuum and high-pressure uses
- Stable to 400°C

### Graphite

- 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

**SAVE MONEY!**  
Buy ferrules in  
bulk 50-packs!

### Capillary Ferrules (for 1/16" compression-type fittings)

Vespel®/Graphite			Common Description		Graphite		
Product Number	Qty	Price	Ferrule ID (mm)	Fits Column ID (mm)	Product Number	Qty	Price
—	—	—	0.3	0.10-0.20	RK20233	10	\$58.20
RK20211	10	\$56.50	0.4	0.25	RK20200	10	48.50
RK20229	50	201.80	0.4	0.25	RK20227	50	171.90
RK20212	10	56.50	0.5	0.32	RK20201	10	48.50
RK20231	50	201.80	0.5	0.32	RK20228	50	171.90
RK20232	10	75.90	0.6	0.28	—	—	—
RK20213	10	56.50	0.8	0.53	RK20202	10	48.50
RK20230	50	201.80	0.8	0.53	RK20224	50	171.90
RK21056	10	80.80	1.0	0.75*	RK21058	10	48.50
RK21057	10	80.80	1.6	1.00*	RK21060	10	48.50

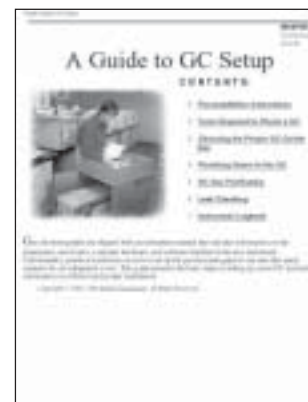
\* For micropacked columns

### Compact Ferrules (for Agilent GCs)

Vespel®/Graphite			Common Description		Graphite		
Product Number	Qty	Price	Ferrule ID (mm)	Fits Column ID (mm)	Product Number	Qty	Price
RK20238	10	\$68.80	0.4	0.25	RK20250	10	\$48.50
RK20239	50	268.20	0.4	0.25	RK20251	50	158.20
RK20248	10	68.80	0.5	0.32	RK21007	10	48.50
RK20249	50	268.20	0.5	0.32	RK21008	50	165.90
RK20263	10	68.80	0.8	0.53	RK20252	10	48.50
RK20264	50	268.20	0.8	0.53	RK20253	50	163.70
—	—	—	1.0	1.00	RK21059	10	48.50
—	—	—	1.6	1/16"	RK21061	10	48.50

### Reducing Ferrules (For 1/16", 1/8" and 1/4" Fittings)

Vespel®/Graphite			Common Description		Graphite		
Product Number	Qty	Price	Fitting Size (inch)	Ferrule ID (inch)	Product Number	Qty	Price
RK20258	5	\$38.80	1/4	3/16	—	—	—
RK20218	10	58.20	1/16	1/16	RK20207	10	\$48.50
RK20219	10	58.20	1/8	1/8	RK20208	10	48.50
RK20220	10	58.20	1/8	reduces to 1/16	RK20209	10	48.50
RK20221	10	58.20	1/4	1/4	RK20210	10	48.50
RK20222	10	58.20	1/4	reduces to 1/8	RK20225	10	48.50
RK20223	10	58.20	1/4	reduces to 1/16	RK20226	10	48.50



For your free copy of  
"A Guide To GC Setup",  
please request  
literature code **RK19**.



Ferrule-Septum Tool/Puller  
(RK20117)  
(See Page 82)

For more information, please contact  
our Technical Support Group at  
1-800-267-8103 or  
e-mail [tech@chromspec.com](mailto:tech@chromspec.com)

# GENUINE AGILENT GC REPLACEMENT PARTS



## Free Literature



### Maintaining your Agilent GC and GC/MS Systems

The guide contains everything from essential maintenance schedules to keep you up and running, to invaluable troubleshooting tips and problem-solving methods. Also included is an easy guide to help you choose the right parts and supplies to keep your downtime to a minimum.

For further information regarding Agilent replacement parts, please request the free technical guide, Maintaining your Agilent GC and GC/MS Systems, literature code AG11.

### Agilent 2007/2008 Catalog



**The Essential Chromatography Catalog.** Request literature code AG01.

Chromatographic Specialties Inc. offers the full line of Agilent Technologies replacement parts for GC and GC-MS instruments. A selection of the most popular, commonly ordered parts follows below. If you don't see the part you are looking for, please contact our Technical Support Group at 1-800-267-8103 or tech@chromspec.com.

### AGILENT 6890 SERIES GC SUPPLIES

Product Number	Description	Price
<b>GENERAL SUPPLIES</b>		
CS51818830	Column Nut for GC capillaries, Pkg. 2	\$31.60
CS50808853	0.5 mm ID Graphite Ferrules, (100, 200, 250, and 320 µm) Pkg. 10	56.30
CS50808773	1.0 mm ID Graphite Ferrules (530 µm), Pkg. 10	45.30
CS50808774	1/4" Vespel Ferrule, Pkg. 10	52.10
CS51813322	Ferrule, 0.4mm Vespel, Pkg. 10	65.90
CS51834757	Septa, 11 mm high-temperature, BTO, Pkg. 50	84.10
CS51834759	Septa, 11 mm advanced green, Pkg. 50	71.90
CS51834761	Septa, 11 mm long life, Pkg. 50	97.70
CS51811260	Septa, 5 mm through-hole, low bleed red, Pkg. 25	33.30
CS51834762	Septa, 5 mm long life, cool on-column, Pkg. 50	97.70

<b>SPLIT/SPLITLESS INLET SUPPLIES</b>		
CS1925160540	Split liner, 4 mm ID, 900-uL (with glass wool)	\$22.20
CS51813316	Single taper liner, 4 mm ID, 900-uL, deactivated, splitless	34.00
CS50623587	Single taper liner, 4 mm ID, 900-uL, deactivated, glass wool	35.30
CS51813315	Double taper splitless liner (deactivated)	41.80
CS51804168	Graphite O-rings for split applications, Pkg. 10	61.70
CS51804173	Graphite O-rings for splitless applications, Pkg. 10	61.70
CS51885365	Non-Stick Viton O-rings, 1/4" for all liner applications, Pkg. 10	14.30
CS1874020885	Gold plated seal, split/splitless inlet	38.70
CS1874020880	Inlet seal, stainless steel	30.70
CSG154460610	Split inlet flow trap*	331.00
CSG154480530	Replacement Cartridge	104.00

<b>COOL ON-COLUMN INLET SUPPLIES</b>		
CS1924580521	Septum nut (320, 250 µm columns)	\$72.20
CSG154580520	Septum nut (530 µm columns)	73.60
CS1924560760	Spring	10.20
CS1924520510	Inserts for 200 µm columns (1 ring)	105.00
CS1924520515	Inserts for 250 µm columns (6 rings)	134.00
CS1924520525	Inserts for 320 µm columns (5 rings)	91.30
CS1924520580	Inserts for 530 µm columns (no rings)	64.90
CS1924520780	On-column insert for 530um Al clad	63.60

<b>PACKED PORT INLET SUPPLIES</b>		
CS50808898	Packed Port Viton O-rings, Pkg. 12	\$17.20
CS50808774	Packed Port Vespel column ferrules, Pkg. 10	52.10
CS51804105	Packed Port Column nut 1/4" brass, Pkg. 10	16.00
CS50808732	Packed Port Glass insert, disposable, Pkg. 25	44.00

<b>FID SUPPLIES</b>		
CS1923160680	Glow plug/cable assembly	\$49.00
CS50208294	Blanking plug, finger-tight style	14.70
CSG153160690	FID collector assembly	227.00
CSG153180560	Capillary only FID Jet	50.50
CS1924480560	Capillary column jet (0.011" ID tip)	65.40
CS1871020119	NPD/FID Jet for packed columns, 0.018" ID	57.50
CS1930160660	FID flow measuring insert	61.70
CS93010985	FID cleaning kit: reamers, mini brush, handle	48.00
CS1871060170	Performance evaluation sample for FID	50.50

<b>NPD SUPPLIES</b>		
CSG153460570	NPD bead assembly	\$432.00
CSG153180560	Capillary only FID Jet	50.50
CS1924480560	Capillary column jet (0.011" ID tip)	65.40
CS1923460540	NPD Collector body	340.00

\* Order replacement cartridge CSG154480530 at the same time.

# GENUINE AGILENT GC REPLACEMENT PARTS

## SUPPLIES FOR AGILENT 6890 SERIES GC

### FID / NPD SUPPLIES

Product Number	Description	Price
CS1924480610	Capillary FID/NPD adapter	\$72.90
CS50808853	0.5 mm ID graphite ferrules (100, 200, 250, and 320 µm), Pkg. 10	56.30
CS50808773	1.0 mm ID graphite ferrules (530 µm), Pkg. 10	45.30
CS50808774	Vespel ferrule, 1/4", Pkg. 10	52.10
CS51804105	Brass tubing nut, 1/4", Pkg. 10	16.00
CS1871060170	FID and TCD sample	50.50

### TCD SUPPLIES

CSG153260675	6890 TCD Replacement Cell (original), 3-line manifold	\$1,208.00
CSG153260685	6890 TCD Replacement Cell (new), 2-line mini manifold	2,238.00
CSG263061230	6850 TCD Replacement Cell	Inquire
CS01001332	Vespel Ferrule, 1/8", Pkg. 10	60.40
CS51804103	1/8" Nut, brass, Pkg. 10	16.00
CS50808774	Vespel ferrule, 1/4", Pkg. 10	52.10
CS51804105	Brass tubing nut, 1/4", Pkg. 10	16.00
CSG153280540	TCD cap column adapter seal and nut	58.60
CS51834732	6850 column nut, Pkg. 2	56.50
CS50808773	1.0 mm ID graphite ferrules (530 µm), Pkg. 10	45.30
CS50808853	0.5 mm ID graphite ferrules (100, 200, 250, and 320 µm), Pkg. 10	56.30
CS1871060170	FID and TCD sample	50.50
CS1871160060	Performance Evaluation Sample for TCD, 3 x 0.5 mL ampules	53.20

### ECD SUPPLIES

CSG153380565	Standard ECD Makeup Gas Adapter	\$232.00
CSG239780520	Micro ECD Makeup Gas Adapter	Inquire
CSG343367565	ECD Makeup Gas Adapter, 7890 only	Inquire
CS1871360040	Electron Capture Detector Sample	53.20
CS1871360050	Micro ECD Wipe Test Kit	36.40
CS1923320625	ECD adapter replacement liner, fused silica	17.50
CS1923320755	ECD adapter end cap	37.90
CS1923460720	Nut warmer cup with insulation	68.40

### FLIP TOP INLET SEALING SYSTEM

#### Questions to ask yourself:

1. Do you change liners greater than 2-3 times per week?
2. How long does it take you to change a liner (total downtime)?
3. Do you want to increase your productivity and column life?
4. Have you ever burned your fingers or scraped your knuckles trying to open a hot inlet?

#### The faster, smarter way to change inlet liners on Agilent GC's

- Cuts liner replacement time to as little as 30 seconds
- No more frustrating searches for special wrenches or tools
- Installs easily in 15 minutes (customer installable)
- Minimizes exposure to ambient air extending column life
- Improved inlet ergonomics - No more handling of heated parts, no more burns or scrapes
- Decreased downtime = increased productivity

Available exclusively from Agilent, the Flip Top has a levered arm that attaches to any 6890/6850/5890 insert weldment and locks to the injection port using an adapter ring screwed onto the inlet. Once installed, the user simply lifts the arm of the Flip Top which releases the insert weldment from the injection port, and allows instant access to the liner. The process is simply reversed to re-seal the weldment to the port.

CS51882717	Flip Top Inlet Sealing System	\$647.00
CS51885366	Inlet Liner O-rings for Flip Top, Non-stick, Pkg. 10	24.30



#### Free Literature



#### Optimizing the 6890 Series GC for High Performance MS Analysis

This note is a "how-to" guide for improving GC performance. This will, in many instances, improve the overall performance of a GC/MS system. This guide is specific for the 6890 Series GC used with the 5973 MSD and the 6890 Series MSD. To receive a copy, please request literature code **AG44**.



Flip Top Inlet Sealing System



# RESTEK ACCESSORIES FOR AGILENT GCs

## DUAL VESPEL® RING INLET SEALS

- Vespel® ring embedded in bottom surface eliminates the need for washer
- Vespel® ring embedded in the top surface reduces operator variability by requiring minimal torque to seal
- Prevents oxygen from permeating the carrier gas, increasing column lifetime

The Dual Vespel® inlet seal features two soft Vespel® rings, one embedded in its top surface and the other embedded in its bottom surface. These rings eliminate the need for a washer and very little torque is required to make a leak tight seal. The rings will not harm the critical seal in the injector body or any other surface, and are outside the sample flow path.

Use a stainless steel seal for the analysis of unreactive compounds. To reduce breakdown and absorption of active compounds, use a gold-plated or Siltek™-treated seal. The gold seal offers better inertness than untreated stainless steel. Siltek™ treatment provides inertness similar to that of a fused silica capillary column.

Product Number	Description	Qty.	Price
RK21244	1.2mm ID Stainless Steel	2	\$56.50
RK21245	1.2mm ID Stainless Steel	10	233.20
RK21246	1.2mm ID Gold-Plated	2	72.80
RK21247	1.2mm ID Gold-Plated	10	315.70
RK21248	1.2mm ID Siltek™	2	72.80
RK21249	1.2mm ID Siltek™	10	315.70
RK21238	0.8mm ID Stainless Steel	2	56.50
RK21239	0.8mm ID Stainless Steel	10	233.20
RK21240	0.8mm ID Gold-Plated	2	72.80
RK21241	0.8mm ID Gold-Plated	10	315.70
RK21242	0.8mm ID Siltek™	2	72.80
RK21243	0.8mm ID Siltek™	10	315.70

## O-RINGS FOR AGILENT INJECTION PORTS

### Graphite O-Rings

Restek offers graphite o-rings for sealing Agilent split/splitless injection port liners. Graphite o-rings have excellent thermal stability and can be used at injection port temperatures up to 450°C! Order the appropriate o-ring I.D. to fit your inlet sleeve.

### Rubber O-Rings

Rubber o-rings are universally sized. One size fits both split (6.35mm I.D.) and splitless (6.50mm I.D.) sleeves. Also works with PE Auto System GCs.

Product Number	Description	Qty.	Price
<b>Graphite O-Rings</b>			
RK20296	O-Ring, 6.35mm I.D.	10	\$50.90
RK20297	O-Ring, 6.35mm I.D.	50	213.70
RK20298	O-Ring, 6.50mm I.D.	10	53.30
RK20299	O-Ring, 6.50mm I.D.	50	213.70
<b>Rubber O-Rings</b>			
RK20377	O-Ring, Viton® Max. Temp. 350°C	25	26.30

## INLET SEALS FOR AGILENT 5890 GCs



Available in:

- 0.8mm opening
- 1.2mm opening
- Stainless Steel
- Silcosteel®
- Gold Plated

The 1.2mm inlet seal is recommended for use with Vespel®/Graphite ferrules or when installing two columns using a 2-hole ferrule. The 0.8mm inlet seal is recommended for use with graphite ferrules and single capillary column installations.

Inlet seals with the 0.8mm or 1.2mm opening are available in three styles: Stainless steel, Silcosteel® or gold plate. The gold surface offers better inertness and easier sealing than standard stainless steel. Restek's unique Silcosteel® process places a micron thin layer of fused silica and a deactivation layer over the stainless steel to provide inertness similar to a fused silica capillary column. Both the Silcosteel® and gold plated inlet seals reduce breakdown and adsorption of active compounds.

Product Number	Description	Qty.	Price
RK20390	1.2mm Stainless Steel	2	\$56.50
RK20391	1.2mm Stainless Steel	10	233.30
RK21305	1.2mm Gold Plated	2	73.70
RK21306	1.2mm Gold Plated	10	316.10
RK21307	1.2mm Silcosteel®	2	73.70
RK21308	1.2mm Silcosteel®	10	316.10
RK21315	0.8mm Stainless Steel	2	56.80
RK21316	0.8mm Stainless Steel	10	234.10
RK21317	0.8mm Gold Plated	2	73.70
RK21318	0.8mm Gold Plated	10	316.10
RK21319	0.8mm Silcosteel®	2	73.70
RK21320	0.8mm Silcosteel®	10	316.10
RK20392	1/16" Stainless Steel	2	56.50
RK20393	1/16" Stainless Steel	10	233.30

## INLET AND FID MAINTENANCE KITS FOR AGILENT GCs

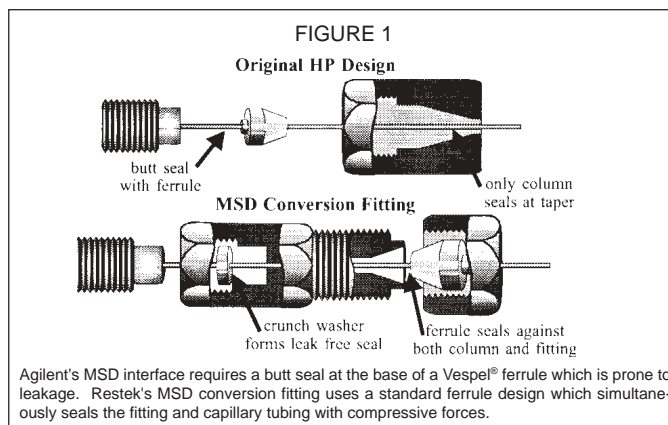
- Kits include the most common types of consumable supplies
- All parts meet or exceed instrument manufacturer's specifications
- Includes parts list that makes reordering easy



Product Number	Description	Price
RK21069	Inlet Kit for Agilent 5890/6890/6850 GCs	\$486.40
RK21070	FID Kit for Agilent 5890 GCs	681.20
RK21071	FID Kit for Agilent 6890/6850 GCs	681.20

## CONVERSION FITTING FOR AGILENT MSD

The interface transfer line for an Agilent MSD uses a reversed ferrule design that requires a butt seal between the back of the ferrule and the MSD fitting. The reversed ferrule does not seal well, requiring operators to frequently re-tighten the fitting when leakage occurs. Restek's chemists engineered a simple, inexpensive solution to solve this common problem. The new MSD conversion fitting uses a flat, soft aluminum sealing ring to deform and butt seal with the flat surface of the MSD interface (Figure 1). The aluminum crunch washer forms a leak-tight seal under high vacuum even while thermally cycling the oven. Once the MSD conversion fitting is sealed to the transfer line, a standard Vespel® ferrule can be used to seal the column and 1/16" SS Swagelok® type nut. This compression seal is much stronger and less prone to leakage than the original reversed ferrule design.



Product Number	Description	Qty	Price
RK21314	MSD Conversion Fitting	1	\$63.00
RK21313	Replacement Ring Seal (order ferrules separately)	2	20.60

## INJECTION PORT FOR AGILENT 5890 GCs: SureFit™ Split/Splitless

- Uses Restek's enhanced base fitting
- Hex design aligns every time for easy installation and removal
- Leak-tight injection port seals at temperatures as high as 400°C
- Redesigned injector base improves seal and simplifies column installation



Complete injection port assembly includes: \*Siltek® split/splitless weldment, Siltek® shell weldment, base fitting, Siltek® base screw, septum nut, 1/16" and 1/4" stainless steel nuts, 1/4" graphite ferrule. Does **NOT** include inlet liner, 1/16" capillary ferrule, or ferrules for split/splitless liners. Please order separately.

Product Number	Description	Price
RK22323*	Enhanced Injection Port Split/Splitless Kit	\$1,077.60
RK20290	Dual-taper, 1/4" ID Vespel®/graphite ferrules, for use with split liners (6.3mm OD)	79.20
RK20291	Ferrules for use with splitless liners (6.5mm OD)	79.20

## STAINLESS STEEL CAPILLARY NUTS FOR AGILENT 5890 GCs



Restek offers two stainless steel nuts for HP5890/6890 GCs. One version incorporates a deeper recess that allows the use of standard Swagelok®-type graphite or Vespel®/graphite capillary ferrules. The other version has a shallow recess for use with shorter length Agilent-type ferrules.

Similar to Agilent Part Number 5181-8830.

Product Number	Description	Qty	Price
RK20883	Nut, for use with standard ferrules	2	\$41.80
RK21884	Nut, for use with "short" HP-type ferrule	2	39.90

# RESTEK ACCESSORIES FOR AGILENT GCs

## FID/NPD ADAPTOR FITTING FOR AGILENT 5890 GCs

After wrestling with Agilent's detector adaptor fitting, Restek's chemists decided to engineer an improved version. First they replaced the awkward column fitting with a 1/16" Swagelok®-type nut that uses standard graphite or Vespel®/graphite ferrules. Then they shortened the fitting to make it more compact and improved the wrench pad to prevent it from turning when installing a capillary column. The end result? An easy-to-use, sturdy stainless steel fitting that makes capillary installation easy. The kit includes everything needed for installation: 1/4" SS nut, 1/4" Vespel® ferrule, 1/16" SS nut, and 0.4mm ID graphite ferrule. (Replaces Agilent part numbers 19244-80610 and 05921-21170).



Restek's FID/NPD Detector Adaptor Fitting is shorter and more compact than Agilent's fitting, making capillary column installation easy.

Product Number	Description	Price
RK20884	FID/NPD Adaptor Fitting, Agilent 5890	\$82.90

### Can't Find It?

Call 1-800-267-8103 or  
e-mail [tech@chromspec.com](mailto:tech@chromspec.com)

## MSD SOURCE NUT FOR AGILENT 5971A GCs

Restek now offers a replacement column nut that connects to the inlet interface. The column nuts are made to match the specifications of the manufacturer's original part. Additionally, the nut is made of brass to prevent thread stripping on the open split interface. (Replaces Agilent part # 05988-20066).



Product Number	Description	Price
RK20643	MSD Source Nut, Agilent 5971A, Pkg. 2	\$30.70

## GAUGE PACK FOR AGILENT 5890 FID GASES

Agilent 5890 GCs do not include the pressure regulators necessary to adjust the air and hydrogen flows to the Flame Ionization Detector (FID). Since most labs operate their gas supply lines at a higher pressure than is necessary for the proper operation of the FID, chromatographers must supply their own regulators to adjust flows for optimum detector performance.



Restek's FID Gauge Pack simplifies GC installation by incorporating pressure regulators and gauges for both air and hydrogen in a single enclosure. The gauge pack conveniently mounts onto the side of the GC. The 1/8" bulkhead fittings allow easy hook-up to instrument and supply lines. This unit is rated for inlet pressures up to 250psi and outlet pressures from 0 to 60psi.

Product Number	Description	Price
RK22071	FID Gauge Pack, Agilent 5890	\$372.10

## FID JETS FOR AGILENT



### Replacement Jets

- Standard Version: Engineered with a fluted tip to guide the capillary column into the jet.
- High-Performance Version: Identical to the standard version, except that it has been Silcosteel®-treated. Extremely inert, use with active compounds.

### Capillary FID Replacement Jet (0.011-inch ID tip)

(Similar to Agilent Part #019244-80560)

Type	Product Number	Each Price	Product Number	Pkg. 3 Price
Standard	RK20670	\$79.10	RK20671	\$212.40
High Performance	RK20672	89.40	RK20673	230.30

### Capillary FID Replacement Jet for Agilent 6890 GCs

(Similar to Agilent Part #G1531-80560)

Standard	RK21621	64.50	RK21682	190.50
High Performance	RK21620	71.80	RK21683	212.40



# RESTEK ACCESSORIES FOR AGILENT GCs

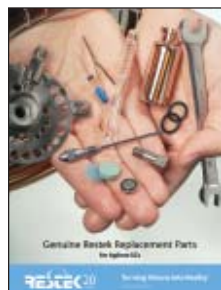
## FINGER-TIGHT NUT FOR AGILENT GCs



- Rapidly tighten columns without wrenches
- Avoid overtightened stripped threads
- Two versions available
- Both versions can be used with 0.25, 0.32 or 0.53mm ID columns
- Wrench pad for Vespel®/graphite ferrules
- 316 stainless steel body

Product Number	Description	Price
RK21312	Nut, for use with standard ferrules	\$52.80
RK21311	Nut, for use with "short" Agilent style ferrules	52.80

(Replaces Agilent part numbers 5020-8293 and 5020-8292, except that the Restek nut can be used with Vespel® ferrules.)



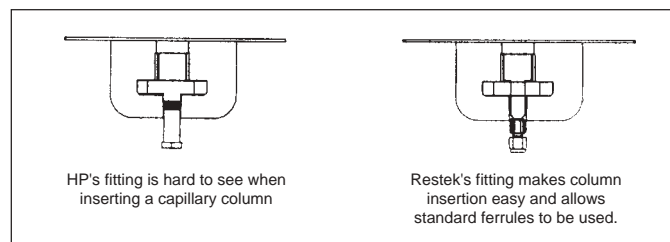
For further information, please contact our Technical Support Department at 1-800-267-8103 or tech@chromspec.com and request "Genuine Restek Replacement Parts for Agilent GCs", literature code RK20

## DIRECT REPLACEMENT SPLIT/SPLITLESS INJECTION PORTS

Product Number	Description	Similar to Agilent Part #	Price
<b>For Agilent 5890 GCs</b>			
RK20265	Replacement Weldment with manual flow	19251-60575	\$313.40
RK20266	Replacement Shell Weldment	19251-80570	278.20
RK20267	Silcosteel® Weldment with manual flow	—	418.80
RK20268	Silcosteel® Shell Weldment	—	385.00
<b>For Agilent 6890/6850 GCs</b>			
RK22674	Replacement Weldment with EPC	G1544-60575	\$326.00
RK20265	Replacement Weldment with manual flow	19251-60575	313.40
RK22673	Replacement Shell Weldment	G1544-80570	278.20
RK22672	Silcosteel® Weldment with EPC	—	434.30
RK20267	Silcosteel® Weldment with manual flow	—	418.80
RK22671	Silcosteel® Shell Weldment	—	382.30

## CAPILLARY INLET ADAPTOR FITTING FOR HP5890

Agilent 5890 capillary inlet fittings are frustrating because it is hard to see where the column is installed. Restek's chemists have engineered a simple capillary fitting for 5890 GCs that incorporates a standard 1/16" Swagelok®-type nut and standard graphite or Vespel®/graphite ferrules. This fitting also ensures a leak-tight seal with your capillary column.



They carefully machined the threads and matched the stainless steel types to eliminate seizing onto the injector body. They also paid careful attention to the fitting depth to keep the insertion distance exactly the same. The replacement inlet adaptor kit simplifies column installation due to this easy-to-use design. The kit includes everything needed for installation: the adaptor fitting, an inlet seal and washer, 1/16" SS nut, and a 0.4mm ID graphite ferrule. (Replaces Agilent part numbers 18740-20800, 05921-21170 and 18740-20880.)



Product Number	Description	Price
RK20633	Cap. Inlet Adaptor Fitting, Agilent 5890	\$93.80

## DETECTOR PLUG NUT FOR AGILENT GCs

Need to check detector or make-up gas flow rates? Want to prevent H<sub>2</sub> from accidentally diffusing into the oven from an unused detector base? Use Restek's new brass HP Plug Nut. (Replaces Agilent part number 5020-8294.)



RK21883	Detector Plug Nut, Pkg. 2	\$36.60
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# RESTEK REPLACEMENT PARTS FOR AGILENT GCs AND AUTOSAMPLERS

## Genuine Restek Replacement Parts for Agilent GCs



This mini-catalogue contains the complete line of genuine Restek replacement parts for Agilent GCs.

- Autosampler supplies
- Inlet supplies
- Detector supplies
- GC Racer Temperature program system
- EZ No Vent™ GC column MS connector
- Tubing
- Tools

Request literature code **RK20** to receive your copy.



Restek also offers a variety of replacement parts for Varian GCs.

Request literature code **RK54** or contact our Technical Support Team toll free at 1-800-267-8103 to discuss.

*Restek offers a wide variety of replacement parts for Agilent autosamplers. All parts meet or exceed OEM performance.*

<b>Carriage Motor for Agilent 7673A/7673B</b> 	<b>Carriage Motor Belt for Agilent 7673A/7673B</b> 
RK22693 . . . . . \$353.90	RK22692 . . . . . \$22.60
<b>Heat Sink for Agilent 5890 GC Split/Splitless Injector</b> 	<b>Autosampler Plunger Carrier Belt for Agilent 7673A/7673B</b> 
RK20409 . . . . . \$143.00	RK22695 . . . . . \$36.60
<b>Injector Mounting Post for Agilent Autosamplers</b> 	<b>Injector Turret Motor for Agilent 7673A &amp; 7673B</b> 
RK21236 . . . 7673A & B . . . \$125.10 RK21237 . . . . . 7683A . . . \$112.90 RK21172 . . . . . 7683N . . . \$73.20	RK22337 . . . . . \$304.20
<b>Z-Belt for Agilent 7673B Autosampler</b> 	<b>Turret Tray Assembly for Agilent 5890/6890 GC</b> 
RK22332 . . . . . \$13.50	RK22855 . . . . . \$310.00

# GENUINE AGILENT GC/MS REPLACEMENT PARTS

## AGILENT GC/MS SUPPLIES

### 5975/5973 MSD ION SOURCE PARTS (EI)

Product Number	Description	Price
CSG109920130	Ion Source Body	\$243.00
CSG109920132	Repeller	132.00
CSG109920136	Interface Socket	35.90
CS0597120134	Drawout Plate, 3mm	84.20
CSG316320530	Drawout Plate, 6mm	Inquire
CSG107220008	Drawout Cylinder	233.00
CS0597120143	Ion Focus Lens	323.00
CSG317020126	Entrance Lens Assembly	117.00
CSG109920133	Repeller Insulator	100.00
CS05151446	Set Screw for Lens Stack, Pkg. 2	6.60
CS30500891	Washer, for Repeller M3, Pkg. 2	Inquire
CS05350071	Nut, 5.5mm, Pkg. 2	Inquire
CSG109960104	Ion Source Sensor	Inquire
CSG317020530	Lens Insulator, MSD	354.00

### MSD FILAMENTS

CSG259060053	5975/5973 High Temperature (EI)	\$117.00
CSG109980053	5975/5973 (CI), Pkg. 2	339.00
CS0597160140	5971 (EI/CI) / GCD (EI)	191.00

### MSD ELECTRON MULTIPLIERS AND REPLACEMENT HORN

CS0597180103	Electron Multiplier Replacement Horn for 5975, 5973, 5972	\$1,194.00
CSG109980001	High Energy Dynode (HED) Electron Multiplier for 5973	Inquire
CS0597180102	Electron Multiplier Kit for 5972 and 5971	1,338.00

### FORELINE PUMP

CS60400621	Foreline Pump Oil, P3, 0.5L, 5975	\$129.00
CS60400798	Rotary Pump Oil, 4L, 5973, 5972, 5971	152.00
CS60400834	Rotary Pump Oil, 1L, 5973, 5972, 5971	45.90
CS93011104	Molecular Sieve, 5973, 5972 or 5971	Inquire
CS31621056	Oil Mist Filter Kit for E2M18	239.00
CS50635224	Oil Mist Filter for E2M8	545.00

### CLEANING AND MAINTENANCE SUPPLIES FOR 5975/5973

CS86500030	Nylon Gloves, Large, 1 Pair	\$18.60
CS86500029	Nylon Gloves, Small, 1 Pair	18.60
CS93104828	Lint-Free Industrial Wipes, Pkg. 300	220.00
CS0598060051	Cloths, Lint-Free, Pkg. 15	72.90
CS50805400	Cotton Swabs, Pkg. 100	11.20
CS50615896	Abrasive Sheets, Aluminum Oxide	30.80
CS86600791	Alumina Powder, Abrasive	33.50
CS85000656	PFTBA Sample, Certified, 10g	196.00
CS0598020018	Replacement Glass Vial for PFTBA sample, 5973	16.60
CSG109960566	MSD Tool Kit Includes small cleaning rod, source hold tool, cotton swabs (Pkg. 100), lint-free nylon gloves, abrasive sheets 30mm (Pkg. 5), tool kit with wrenches and driving tools	376.00
CS51818863	Ion Source Cleaning Kit Includes lint-free cloths (Pkg. 15), abrasive sheets (Pkg. 5), cotton swabs (Pkg. 100), lint free nylon gloves, Alumina powder, abrasive	147.00
CS85001233	Activated alumina, absorbent pellets for Edwards rough pump traps, non-LC-MS, 1lb. can	144.00

#### TECH TIP — Maintaining Mass Selective Detectors - Maintenance Schedule

##### Every Week

- Change injection port liners
- Check the foreline pump oil level
- Gas ballast the foreline pump
- Check the diffusion pump fluid

##### Every 6 Months

- Check the calibration vial
- Replace the foreline pump oil

##### Every Year

- Replace the diffusion pump fluid
- Replace the traps and filters

##### As Needed

- Clean the ion source
- Change the carrier gas traps
- Replace worn out parts
- Lubricate seals (where appropriate)
- Replace column

#### TECH TIP — Optimum GC Performance

The easiest way to ensure that you minimize background contamination and remove damaging oxygen from your carrier gas system is to use a carrier gas purifying trap right before the gas enters your GC system.

For further information regarding carrier gas purifying traps, please see pages 76-80

# GENUINE AGILENT PURGE AND TRAP SUPPLIES



## Tekmar 3100 and Agilent 7695A Purge and Trap Supplies

### Glassware

#### Fritless Sparger

Compared to a frit sparger, the fritless sparger may be the better choice when a water sample has a tendency to foam. This sparger is not appropriate for soil samples, which tend to clog the capillary tube. Available in 1/2" and 3/4" mount sizes.

#### Disposable (Needle) Tubes

The most practical choice for soil (and other solid or semi-solid) samples, these tubes permit easy sample loading and inexpensive disposal. Available only in 3/4" mount size, a 3/4" tube can be used on the 7695A Purge and Trap Concentrator with the adapter (to convert from 7695A Purge and Trap 1/2" to this 3/4" size).

#### Frit Sparger

This is the most efficient design in terms of purging and it is the standard choice for clean drinking water. Available in 1/2" and 3/4" mount sizes.

**Note:** The 7695A Purge and Trap Concentrator has a 1/2" mount and the automatic sampler has a 3/4" mount. An adapter is available to mount 3/4" glassware on the 7695A Purge and Trap Concentrator, but there is no adapter for using 1/2" glass on the automatic sampler.

For Analytical Reference Standards, please see pages 227-258.

## Tekmar 3100 and Agilent 7695 PURGE AND TRAP SUPPLIES

### GLASSWARE SUPPLIES, 1/2" MOUNT

Product Number	Description	Price
CS51820852	5mL Frit Sparger (Glassware only)	\$98.40
CS51820846	5mL Frit Sparger Kit with Fittings	117.00
CS51820851	25mL Frit Sparger (Glassware Only)	104.00
CS51820845	25mL Frit Sparger Kit with Fittings	132.00
CS51820850	5mL Fritless Sparger (Glassware Only)	88.00
CS51820844	5mL Fritless Sparger Kit with Fittings	96.60
CS51820849	25mL Fritless Sparger (Glassware Only)	132.00
CS51820796	25mL Fritless Sparger Kit with Fittings	117.00
CS51820848	5mL Needle Sparger (Glassware Only)	19.40
CS51820795	5mL Needle Sparger Kit	89.30
CS51820847	25mL Needle Sparger (Glassware Only)	23.30
CS51820794	25mL Needle Sparger Kit	98.40

### GLASSWARE AND CORRESPONDING NEEDLES, 3/4" MOUNT

CS51820893	5mL Frit Sparger	\$117.00
CS143195053TMR	Needle, 8"	Inquire
CS51820894	25mL Frit Sparger	117.00
CS51820789	Needle, 9 1/8"	19.40
CS51820895	5mL Fritless Sparger	142.00
CS120507024TMR	150mm Disposable Needle Tube Sparger	Inquire
CS145186153TMR	Needle, Pointed 8"	Inquire

### MISCELLANEOUS SUPPLIES

CS51820793	Sample Valve, 3-Port Assembly	\$288.00
CS51820792	Female Luer Connector for Sample Valve	12.20
CS145681102	Purge Line Assembly	Inquire
CS51820788	Needle for 5mL Frit or Fritless Sparger	15.00
CS51820746	Conversion Kit Adapter for use with 3/4" Tube on 1/2" Mount G1900A Concentrators	205.00
CS51829630	5mL Gas-Tight Syringe, Teflon Luer Lock	62.90

### AUTOSAMPLER TRAPS

CS51820783	Trap, Tenax (A Trap)	\$36.30
CS51820781	Trap, Tenax/Silica Gel/Charcoal (C Trap)	46.60
CS51820780	Trap, Tenax/Charcoal (D Trap)	64.70
CS51820779	Trap, OV-1/Tenax/Silica Gel/Charcoal (E Trap)	59.60
CS51820778	Trap, OV-1/Tenax/Silica Gel (F Trap)	41.40
CS51820775	Trap, Vocab 3000 (K Trap)	101.00
CS51820774	Trap, Vocab 4000 (I Trap)	50.30
CS51820773	Trap, BTEX	101.00
CS51820772	Heater Assembly Trap	117.00
CS51820771	Hydrocarbon Trap Assembly	114.00

## Tekmar AQUATek 70 PURGE AND TRAP AUTOSAMPLER SUPPLIES

### SAMPLE LOOPS

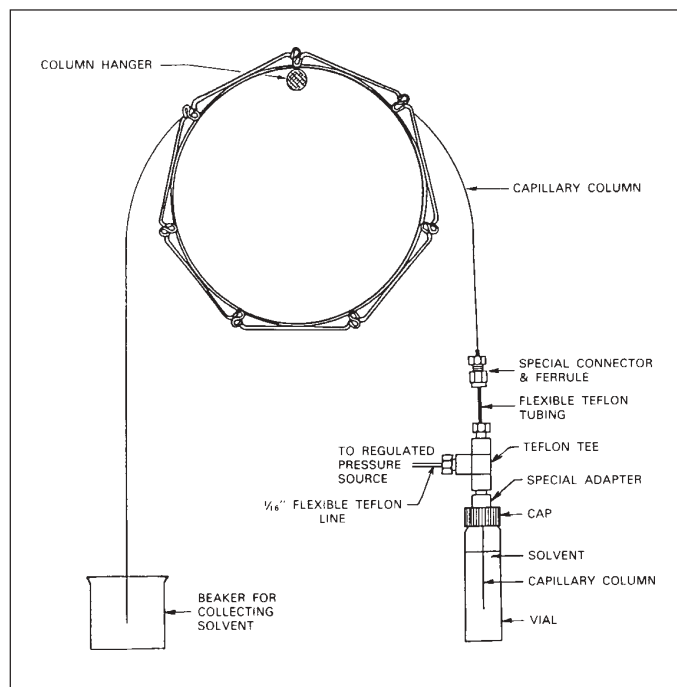
CS51829689	5mL Sample Loop, AQUATek 70	\$124.00
CS51834734	20mL Sample Loop, AQUATek 70	316.00
CS51834733	25 mL Sample Loop, AQUATek 70	316.00

### GLASSWARE

CS51834736	5mL Frit Sparger	153.00
CS51834737	5mL Fritless Sparger	132.00
CS51834735	25mL Frit Sparger	147.00
CS51834738	25mL Fritless Sparger	107.00

# CAPILLARY GC COLUMN ACCESSORIES

## J & W BONDED PHASE COLUMN RINSE KIT



A convenient way to rinse your bonded phase column. We recommend nitrogen as the most desirable gas to supply the pressure. Helium would be the second choice. Only low pressure is required. Do **NOT** attempt to rinse non-bonded phases. All DB phases can be rinsed with most solvents, including water. If in doubt, please call for advice. DB-WAX can be rinsed with water and methanol.

**NOTE:** Some "Bonded" phase columns from other manufacturers are not pre-rinsed. You may experience a 10% to 40% loss of phase upon rinsing.

Product Number	Description	Price
J4303000	Column Rinse Kit	\$108.00

## RESTEK CAPILLARY COLUMN RINSING RESERVOIR

Restore the performance of bonded-phase capillary columns by dissolving and removing soluble, non-volatile residue using this reservoir. The 50 mL rinsing reservoir includes a built-in fritted disk to prevent particulate matter from contaminating the column and is equipped with 1/4" inlet and outlet connections. The reservoir is available as a complete kit (containing the reservoir, pressure regulator, fittings, ferrules and tubing) or separately.

RK20612	Complete Kit	\$174.80
RK20613	Reservoir only	95.60

## CERAMIC SCORING WAFERS

Used for cutting fused silica columns and tubing.

RK20116	Ceramic Scoring Wafers, Pkg. 5	\$43.60
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## COLUMN TEST MIX

Product Number	Description	Price
J2000110	Test Mix for DB-1 & DB-5 (Meg)	\$38.60
J2000010	Test Mix for DB-1ht & DB-5ht (Cap)	38.60
J2000185	Test Mix for DB-5ms (Cap/Meg)	38.60
J2000310	Test Mix for DB-1 & DB-5 (Cap)	38.60
J2000117	Test Mix for DB-17 & DB-608 (Meg)	46.30
J2000103	Test Mix for DB-1301 (Meg)	46.30
J2000003	Test Mix for DB-1301 (Cap)	46.30
J2000107	Test Mix for DB-1701 (Meg)	46.30
J2000007	Test Mix for DB-1701 (Cap)	46.30
J2000102	Test Mix for DB-210 (Meg)	46.30
J2000002	Test Mix for DB-210 (Cap)	46.30
J2000113	Test Mix for DB-624 (Cap/Meg)	38.60
J2000032	Test Mix for DB-FFAP (Cap)	38.60
J2000070	Test Mix for DB-WAX (Meg)	38.60
J2000370	Test Mix for DB-WAX (Cap)	38.60

## DIMETHYLDICHLOROSILANE

Restek offers dimethyldichlorosilane (DMDCS), for deactivating liners and other glassware. Simply dilute the neat material to a 5% solution in toluene, soak the glass item(s) in the solution for 15 minutes, and rinse with toluene and methanol. DMDCS reacts with active hydroxyl groups on the glass surface producing a deactivated surface. A detailed procedure is included with the product.

RK31840	Neat, 20mL/ampoule	\$31.10
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## GROB TEST MIX

nC10-FAME	0.42 mg/mL	2,6-dimethylphenol	0.32
nC11-FAME	0.42	2-ethylhexanoic acid	0.38
nC12-FAME	0.41	nonanal	0.40
2,3-butanediol	0.53	1-octanol	0.36
dicyclohexylamine	0.31	undecane	0.29
2,6-dimethylaniline	0.32	decane	0.28

In CH<sub>2</sub>Cl<sub>2</sub>, 1 mL/ampoule

RK35000		\$45.90
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## AMINE COLUMN TEST MIX

1,2-butanediol	0.6 mg/mL	diethanolamine	1.20
pyridine	0.60	2-nonanol	0.60
decane	0.60	2,6-dimethylaniline	0.60
diethylenetriamine	1.20	dodecane	0.60

In CH<sub>2</sub>Cl<sub>2</sub>/methanol (50:50), 1 mL/ampoule

RK35002		\$45.90
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## ISOTHERMAL COLUMN TEST MIX

1,2-hexanediol	0.46 mg/mL	1-octanol	0.36
decane	0.29	nonanal	0.40
undecane	0.29	2,6-dimethylaniline	0.32
dodecane	0.29	2,6-dichlorophenol	0.57
tridecane	0.29	naphthalene	0.32

In CH<sub>2</sub>Cl<sub>2</sub>, 1 mL/ampoule

RK35003		\$45.90
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## FRAGRANCE MATERIALS TEST MIX

benzyl salicylate	362 parts	geraniol	6 parts
cinnamic aldehyde	5 parts	hydroxycitronellal	50 parts
cinnamic alcohol	3 parts	d-limonene	200 parts
cinnamyl acetate	3 parts	thymol crystal	3 parts
ethyl butyrate	362 parts	vanillin	1 parts
eucalyptol	5 parts	benzoic acid 1% of mix	

Neat, 0.5mL in an amber ampoule

(The required 5% test solution is made by diluting the 0.5mL of neat mixture to 10mL with acetone).

RK31807		\$66.60
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# RESTEK CAPILLARY GC ACCESSORIES

## EZ No-Vent™ GC COLUMN-MASS SPECTROMETER CONNECTOR... Change Columns in Minutes, Without Venting

- Easy to install and maintain — no special tools or extra plumbing required
- Gold plated for inertness
- 100µm ID transfer line keeps analytes focused
- Lower cost than other “no-vent” fittings
- Available for Agilent 5971/5972/5973 GC-MS and Varian



Restek designed the new EZ No-Vent™ GC column-mass spectrometer connector to be simple and easy to use. After studying user feedback concerning our EZ-Vent™ 2000 connector, Restek re-engineered the connector fitting for even better performance.

A critical orifice in the EZ No-Vent™ connector minimizes the amount of oxygen allowed into the MS source, eliminating the need for purge gas and enabling you to skip the lengthy vent and pump-down cycle otherwise required when you make a column change. This can save nearly a day of downtime with each column change. The EZ No-Vent™ connector easily attaches to the MS source without special tools or extra plumbing.

Product Number	Description	Qty	Price
RK21323	EZ No-Vent™ Connector Kit for <b>Agilent 5971/5972 and 5973 GC-MS</b> Kit includes: EZ No-Vent™ connector, two 0.4mm ID ferrules for capillary column, two 0.4mm ID for transfer line, 100µm deactivated transfer line (3ft.) column plug and column nut	Kit	\$261.30
RK22423	EZ No-Vent™ Connector Kit for <b>Varian Saturn 2000 MS</b> Kit includes: EZ No-Vent™ connector, two 0.4mm ID ferrules for capillary column, two 0.4mm ID for transfer line, 100µm deactivated transfer line (3ft.) column plug and column nut	Kit	261.30

### Replacement Parts and Accessories

RK21015	Ferrules, 0.4mm ID, Pkg. 2	51.40
RK21016	Ferrules, 0.5mm ID, Pkg. 2	51.40
RK21043	Ferrules, 0.4mm ID for connection transfer line to EZ No-Vent™, Pkg. 2	45.90
RK21018	Deactivated Transfer Line, 100µm ID, 3 ft.	36.70
RK21900	EZ No-Vent™ Column Nut, Pkg. 5	56.80
RK21915	EZ No-Vent™ Column Plug, Pkg. 2	68.10
RK20110	Open End Wrenches, 1/4" x 5/16", Pkg. 2	49.10

Request Literature Code RK12 for more information on how the EZ NO-VENT connector can save you time and money when switching columns on your MS.

### FID FLOW MEASURING ADAPTOR

For Agilent 5890/6890 GCs



- Makes setting flows easy
- Meets original equipment specifications

Similar to Agilent part #19231-60660

RK21000	FID Flow Measuring Adaptor, each	\$88.20
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### RESTEK'S 5-INCH COLUMN CAGE

Designed To Fit Agilent 6850 GCs

Get the Maximum Length in the minimum space . . .

Restek's 5-inch column cage fits Agilent 6850 GCs perfectly!

- Same innovative cage design as all other Restek fused silica columns
- Available in lengths up to 105 metres
- Dimensions fit smaller GCs, such as the Agilent 6850



To order, add the suffix “6850” to the product number of any fused silica GC column.

## Silcosteel® INLET SPRING

For Varian 1075/1077 Split Injectors

- Similar to Varian part number 03-949786-00



Product Number	Description	Price
RK21690	Inlet Spring For Varian, Pkg. 3	\$26.40

## STAINLESS STEEL SEPTUM NUTS

For Varian GCs



Coring is reduced when a needle guide that closely matches the syringe OD is used.



Coring from 100 manual injections with a standard septum nut.

- Similar to Varian part number 03-949666-01, except the nuts are not equipped with remote start capabilities

A stainless steel septum nut maintains a sharper knife edge longer than the original aluminum design, ensuring a leak-free septum seal. The 26-gauge needle guide septum nut greatly minimizes septum fragmentation, increases septum lifetime before leakage, and decreases the need to change inlet sleeves due to septum particle accumulation. The photograph (top right) illustrates reduced septum coring when the syringe needle is directed through the same hole each time.

Product Number	Description	Price
RK21310	26 Gauge Needle Guide Septum Nut	\$140.70
RK21304	Standard Stainless Steel Septum Nut	100.40

## TECHNICAL SUPPORT

DIRECT . . . . . 613-342-4678  
TOLL FREE . . . . . 800-267-8103  
FAX . . . . . 613-342-1144  
E-MAIL . . . . . tech@chromspec.com

## REPLACEMENT CAPILLARY NUTS

For Varian GCs

- Similar to Varian part number 03-949551-00

Inexpensive, original-equipment brass and stainless steel replacement nuts are available. The brass is softer and strips more easily, particularly if used at high oven or inlet temperatures. Stainless steel is tougher and lasts longer during heavy use. Use brass for routine applications with oven temperatures below 200°C, and stainless steel at higher oven temperatures, or when columns are frequently changed.

Product Number	Description	Price
RK20881	Brass Capillary Nut, Pkg. 2	\$30.70
RK20882	Stainless Steel Capillary Nut, Pkg. 2	41.00

## CAPILLARY NUT FOR SHIMADZU 17A, 2010, AND 2014 GCs

- Meets OEM Performance



Product Number	Description	Price
RK22688	Capillary Nut for Shimadzu, Pkg. 2	\$49.00

## INJECTOR NUT KIT

For Shimadzu 17A GCs

- Includes a 17A Injector Nut
- Includes a 0.4mm graphite ferrule
- Includes a 1/16" stainless steel capillary nut

RK21895	Injector Nut Kit	\$48.40
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## GC SEPTA

Please see pages 85-87 for Shimadzu and other GC septa information.

## TECH TIP

Shimadzu uses 128mm-long liners for their 9A series GCs, 99mm-long liners for their 14A GCs and 94mm-long liners for their model 17A. Make sure the ferrule seals tightly around the liner prior to installation or poor chromatographic performance will result.

# GC ACCESSORIES AND TOOLS

## CAPILLARY MAINTENANCE KIT

Column changes and system maintenance will be easier with the proper tools close at hand. The kit offers considerable savings over the individual price of each item. The kit includes:

- Fused silica cutting stones (pkg. 2)
- CHROMSPEC™ Septa 9.5 mm (pkg. 5), 11.0 mm (pkg. 5), 12.5 mm (pkg. 5)
- 20x Magnifier
- Ferrule Tool
- Septum Tool
- Snoop (8 oz)
- Round Needle File
- 1/4 & 5/16" Open-end Wrenches
- Swivel mirror
- Goose-neck light
- Pipecleaners (pkg. 5)
- Tweezers

Product Number	Description	Price
C14100	Capillary Maintenance Kit	\$232.70

## SILANIZED GLASS WOOL

- Treated with dimethyldichlorosilane
- Reduces tailing and decomposition of samples

C49100	Silanized Glass Wool, 12 g	\$23.00
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## FID CLEANING KIT

- Improves sensitivity
- Reduces noise and spikes
- Includes a set of jet reamers, two wire mini brushes and dual-ended handle

C37325	FID Cleaning Kit	\$62.40
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## TUBING INNER REAMER

Deburr tubing for cleaner flow and easier packing. The small reamer is for 1/32" to 1/16" tubing while the large is for 1/8" to 3/8" tubing.

C5002	Small Inner Reamer	\$59.20
C5004	Large Inner Reamer	50.20

## TUBING OUTER REAMER

Deburr the outer edge of tubing for easy insertion into fittings.

C5008	Reamer for 1/16" tubing	\$206.00
C5010	Reamer for 1/8"-1/4" tubing	112.30

## MINI HAND DRILL SET

Includes three drills for use with 0.25, 0.32 and 0.53 mm ID (0.4, 0.5 and 0.8mm OD) capillary columns. Drill ferrules to the proper ID in seconds!

RK20122	Mini Hand Drill Set	\$34.90
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## FUSED SILICA CUTTING TOOLS

C11150	Fused Silica Cutting Stone, Pkg. 2	\$12.50
J4201000	Diamond Tip Pencil	33.50

## POLYIMIDE SEALING RESIN

- Repair broken columns
- Make custom length columns
- Join two different columns
- Add guard columns

J5001200	Polyimide Resin	\$29.20
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## CYLINDER HOLDERS

Handles cylinders from 4 to 14 inches in diameter or up to two cylinders 9 inches in diameter.

Product Number	Description	Price
C31610	Bench Type Holder No. 508	\$69.20
C31620	Wall Type Holder No. 510	66.20

## COTTON GLOVES

- For column installation
- For handling delicate MS parts

C64701B	Men's Gloves, Pkg. 12	\$14.90
C64701WB	Women's Gloves, Pkg. 12	14.90

## SWAGELOK® FEMALE CONNECTORS

These connectors adapt the 0.25" NPT male threads on the gas cylinder regulator needle valve for the 0.125" O.D. or 0.25" O.D. tubing leading to the chromatograph.

B20074	Brass female connector, Pkg. 2 1/4" pipe — 1/8" tube	\$19.00
B40074	Brass female connector, Pkg. 2 1/4" pipe — 1/4" tube	16.20

## TUBING CUTTERS

- Quickly cuts thin walled metal tubing

C440792	Tubing Cutter, 1/8" & 1/16"	\$65.20
C440793	Replacement Cutting Wheels, Pkg. 2	23.70

## INSPECTION MIRROR

- 1" round, with plated handle
- Handy pocket clip
- Overall length 8"

C11312	Inspection Mirror	\$28.50
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## TUBE BENDERS

- Open side type slips over tube at any point
- Calibrated to show angle of bend

C5050	Tube Benders, 1/8"	\$178.30
C5054	Tube Benders, 1/4"	147.30

## COLUMN TAGS

- Mark either by pencil or vibrograver. 1-5/8" x 7/8".

C5020	Column Tags, Pkg. 100	\$70.70
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## PLASTIC COLUMN PROTECTORS

- Flexible, easily applied and removed
- Seals columns from moisture and contamination

C5030	Plastic Column Protector, 1/8", Pkg. 100	\$27.00
C5034	Plastic Column Protector, 1/4", Pkg. 100	32.40

## SNOOP LEAK DETECTOR

Snoop is recommended for use in leak testing any pressurized gas system such as air, argon, nitrogen, helium, etc. It is packaged in a squeezable plastic bottle and is applied at the joint or area being inspected. Any bubbling action denotes a leak.

C13020	Snoop — 8 oz. Bottle	\$12.90
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## STAINLESS STEEL TUBE BRUSHES



- Improves GC performance
- Used for all standard instruments

RK20112 . . . . . \$35.50

## INSTALLATION KIT

- Diamond tipped pencil
- 20X magnifier
- Ferrule tool
- Septum tool
- Snoop



J4302000 . . . . . \$144.00

## 54 PIECE TOOL KIT



- Screwdrivers
- Wrenches
- Pliers
- Sockets and more!

RK23004 . . . . . \$360.00

## 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

RK20101 . . . . . \$27.40

## FERRULE TOOL



- Especially useful for small capillary ferrules
- Tapered spiral tip

J4401000 . . . . . \$14.20

## PLIER SET



- 6 inch nose/side cutter
- 6 inch wire cutter
- 6 inch adjusting pliers

RK23033 . . . . . \$55.50

## WRENCH SET



- Includes 4, 6, and 8 inch adjustable wrenches

RK23001 . . . . . \$84.80

## SEPTUM TOOL



- Surgical steel tip
- Removes septum from cap and fittings
- Also removes ferrules from fittings

J4501000 . . . . . \$24.70

## 4" TAPERED NEEDLE FILES



- Multi purpose
- Especially useful for cutting Silcosteel columns

RK20106 . . . . Pkg. 2 . . . \$34.90



# GC ACCESSORIES AND TOOLS

## INJECTION PORT REPAIR TOOL



- Resurfaces critical inlet seal areas.
  - For Agilent split/splitless injection ports.
- Use the Restek injection port repair tool to easily resurface the inlet seal and remove contaminants.

RK21393 . . . . . \$130.00

## INLET LINER PACKING TOOL



- Position wool reproducibility every time.
- Accurate placement to a specific, measured depth.

RK20339 . . . . . \$97.10

## 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.

RK20181 . . . . . \$39.60

## FLASHLIGHT WITH SWIVEL HEAD AND FOCUS ADJUSTMENT



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

RK22187 . . . . . \$40.30

## CAPILLARY INSTALLATION GAUGE FOR AGILENT-STYLE FITTINGS (Compact Ferrules)



- Pre-seats graphite ferrule onto column for consistent installations.
- Prevents crushed column ends.
- Made from high-quality stainless steel.

RK21034 . . . . . \$90.80

## 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 max.).

RK23026 . . . . . \$246.30

## STAINLESS STEEL JET REAMERS



Serrated design is optimal for removing silica deposits and other contaminants from detector jets and other small orifices.

RK20113 . . . . . \$43.60

## HIGH-TEMPERATURE STRING, 10 METERS



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

RK20109 . . . . . \$35.50

## TEMPERATURE MEASURING STICK



- Verify GC oven or polymer temperature.
- Quick measurements via sensor in the measuring tip.
- Swivel head can turn 180°.
- Wide measuring range: -50 to + 350°C.

RK22066 . . . . . \$168.50

## GOOSE NECK FLASHLIGHT



- Flexible neck
- Includes batteries

C37332 . . . . . \$23.80

## MAGNET ON A STICK



- Pick up small parts
- Remove steel dust

C11313 . . . . . \$26.10

## MIRROR ON A STICK



- Peer around corners or tight spaces
- Also used at the outlet of flame detectors
- Condensation on the mirror indicates the flame is lit

C11312 . . . . . \$28.50

## PIN VISE AND DRILL INDEX



- Sizes 61-80 0.34 mm - 0.99 mm
- Drills tiny holes in ferrules
- Index case included

VF4095 . . . . . \$29.20

## GLASS TUBING CUTTER



- Holds 0 to .125" drills
- Also holds cleaning wires, etc.
- Swivel head

C37310 . . . . . \$36.30

## LIGHTED MAGNIFIER



- 4X main lens; 8X inset lens
- Batteries included

C37343 . . . . . \$40.40

## SEPTUM REMOVER



- Removes septa and pieces
- Scribes on metal
- Three interchangeable points

C37334 . . . . . \$25.50

## BALL POINT HEX WRENCHES



- Hex on one end
- Semi-ball allows angled entrance
- Set of 12 wrenches

C11314 . . . . . \$35.40

## KNIFE & NEEDLE FILES



- For small deburring jobs
- Enlarging ferrule holes
- Marking & cutting glass Pkg. 2

C11308 . . . Knife File . . . \$63.10  
C11309 . . . Needle File . . . \$46.70

## THERMAL CHART PAPER

Instrument/Model	Mfg. Number	Product Number	Description	Price
<b>Agilent</b>				
3390, 3392A, 3393	5080-8800	C13500S	Blue Trace, Roll, 107 mm x 400', Pkg. 2	\$96.50
	9270-1134	C13505	Black Trace, Roll, 107 mm x 400'	48.70
HP3396A	5181-1219	C13507	Black Trace, Roll, 9-1/2" x 272'	61.60
3380A, 3385A, 5830A, 5840A, 1080, 5880	5080-8735	C13510	Blue Trace, Fanfold, 200 sheets, 8-1/2" x 184'	33.30
		C13515	Black Trace, Fanfold, 200 sheets, 8-1/2" x 184', Pkg. 10	590.80
5880A, 3388A	5080-8778	C13520	Blue Trace, Fanfold, 200 sheets, 8-1/2" x 184'	45.80
	9270-0658	C13525	Black Trace, Fanfold, 200 sheets, 8-1/2" x 184', Pkg. 20	Inquire
<b>Perkin Elmer</b>				
PE LCI-100, GP-100	N625-1026	C13670	Black Trace, Roll, 283 mm x 100'	56.40
<b>Spectra Physics</b>				
SP-4000 Series	A0022-020	C13555	Black Trace, Fanfold, 200 sheets, 9-25/64" x 184'	59.00
SP-4270, SP-4290	A2157-020	C13610	Black Trace, Roll, 9-22/64" x 167'	40.10
<b>Shimadzu</b>				
C-R1A, C-R1B	221-13391-01	C13630	Black Trace, Roll, 8-3/16" x 170', Pkg. 10	619.00
C-R3A, C-R6A	221-25412	C13640	Black Trace, Roll, 8-3/16" x 167'	48.70
C-R5A	223-02037-81	C13635	Black Trace, Roll, 208 mm x 148'	51.30
<b>Varian</b>				
Vista 401, 402		C13560	Blue Trace, Fanfold, 200 sheets, 8-1/2" x 184', Pkg. 25	Inquire
3400	03-917650-01	C13568S	Black Trace, Roll, Pkg. 2	25.40
<b>Waters</b>				
730 Data Module	74703	C13570	Blue Trace, Fanfold, 200 sheets, 8-1/2" x 184'	41.10
740 Data Module	52057	C13605	Black Trace, Roll, 210 mm x 148', Pkg. 10	735.60
745 Data Module	54055	C13610	Black Trace, Roll, 9-22/64" x 167'	40.10
<b>Kipp &amp; Zonen</b>				
BD71 Printer/Plotter		C13580	Black Trace, Roll, Pkg. 10	774.40

If you don't see what you need, please contact our Technical Service Department.  
at 1-800-267-8103 or [tech@chromspec.com](mailto:tech@chromspec.com)

Modern Practice of Gas Chromatography. 4th Ed. R.L. Grob and E.E. Barry, Wiley-Interscience, 2004, 1045pp. RK21173.....\$293.10
Introduction to Analytical Gas Chromatography. 2nd Edition R. P. W. Scott, Marcel Dekker, Inc., 1998, 397pp. RK21084.....\$268.00
Gas Chromatographic Techniques and Applications A. J. Handley and E. R. Ardlard, CRC Press, LLC, 2001, 320pp. RK21491.....\$301.40
Techniques and Practice of Chromatography R. P. W. Scott, Marcel Dekker, Inc., 1995, 395pp. RK21088.....\$234.50
Quantitative Chromatographic Analysis T. E. Beesley, B. Buglio, and R. P. W. Scott, Taylor & Francis, 2000, 394pp. RK21093.....\$268.00
Chemical Technician's Ready Reference Handbook, 4th Ed. G. J. Shurgar and J. T. Ballinger, McGraw-Hill Inc., 1996, 972pp. RK21493.....\$150.70
The Merck Index: An Encyclopedia of Chemicals, Drugs and Biologicals, 14th Edition, Merck, 2006, 2564pp. RK21383.....\$209.40
Mass Spectrometry Basics C.G. Herbert and R.A.W. Johnstone, CRC Press LLC, 2002, 496pp. RK21461.....\$301.40
Current Practice of Gas Chromatography-Mass Spectrometry W.M.A. Niessen, Marcel Dekker, Inc., 2001, 528pp. RK21489.....\$318.20
Mass Spectrometry. Principles and Applications. 2nd Ed. E. de Hoffmann and V. Stroobant, John Wiley & Sons, Inc., 2001, 420pp. RK21978.....\$134.00
Mass Spectrometry, A Textbook J. H. Gross, Springer, 2004, XVIII, 518pp. RK22696.....\$157.30

GC/MS. A Practical Users' Guide M. McMaster and C. McMaster, John Wiley, 1998, 167pp. RK20496.....\$167.40
Environmental Sampling and Analysis Lab Manual M. Csuros, CRC Press LLC, 1997, 373pp. RK21375.....\$145.70
Environmental Sampling and Analysis for Technicians M. Csuros, CRC Press LLC, 1994, 336pp. RK21380.....\$167.40
Handbook of Environmental Analysis P. Patnaik, CRC Press LLC, 1997, 584pp. RK21381.....\$268.00
Fundamentals of Air Sampling G. D. Wight, CRC Press LLC, 1994, 254pp. RK20492.....\$251.20
Handbook of Air Toxics. Sampling, Analysis and Properties L. H. Keith and M. M. Walker, CRC Press LLC, 1995, 614pp. RK21373.....\$334.90
Forensic Applications of Mass Spectrometry J. Yinon, CRC Press LLC, 1994, 320pp. RK23056.....\$301.40
Flavor; Fragrance; and Odor Analysis R. Marsili, Marcel Dekker, Inc., 2001, 440pp. RK21465.....\$334.90
Chromatography in Food Science and Technology T. Cserhati and E. Forgacs, CRC Press LLC, 1999, 568pp. RK21492.....\$452.20
Chromatographic Analysis of Pharmaceuticals, 2nd Ed. J. A. Adamovics, Taylor & Francis Inc., 1996, 542pp. RK21089.....\$385.10
Chiral Chromatography T. E. Beesley and R. P. W. Scott, John Wiley, 1999, 506pp. RK21094.....\$611.40

## On-Going Education

Chromatographic Specialties Inc. recognizes that many of our customers try to keep themselves current on new developments and techniques in the field of analytical chemistry. To help them achieve this goal, in addition to technical books such as those listed above, Chromatographic Specialties Inc. offers a variety of on-going educational options. These include free on-site seminars in GC, HPLC, sample prep, troubleshooting, system maintenance and related topics; electronic and on-line training courses; and regularly updated technical literature. Visit the Continuing Education portion of our web site ([www.chromspec.com/tech](http://www.chromspec.com/tech)), or contact your local Sales Representative to learn about upcoming opportunities.



# CHIRAL PRODUCTS

Chirality is an increasingly important consideration for pharmaceutical, agrichemical, and environmental chemistry. In all these fields rapid and accurate analytical or preparative separations are vital.

Chromatographic Specialties Inc. is pleased to offer a wide selection of chiral columns for your analyses; our Technical Support Team is poised to offer you assistance in the selection of chiral products, please contact them toll free at 1-800-267-8103 or by email at [tech@chromspec.com](mailto:tech@chromspec.com).

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1-800-267-8103



# MACHEREY-NAGEL GC COLUMNS FOR CHIRAL SEPARATIONS

## CHIRAL GC COLUMNS FROM MACHEREY-NAGEL

### LIPODEX® Pure Cyclodextrin Stationary Phases

**FS-LIPODEX® A** hexakis-(2,3,6-tri-O-pentyl)- $\alpha$ -cyclodextrin

**FS-LIPODEX® B** hexakis-(2,6-di-O-pentyl-3-O-acetyl)- $\alpha$ -cyclodextrin

**FS-LIPODEX® C** heptakis-(2,3,6-tri-O-pentyl)- $\beta$ -cyclodextrin

**FS-LIPODEX® D** heptakis-(2,6-di-O-pentyl-3-O-acetyl)- $\beta$ -cyclodextrin

**FS-LIPODEX® E** octakis-(2,6-di-O-pentyl-3-O-butyryl)- $\gamma$ -cyclodextrin

**FS-LIPODEX® G** octakis-(2,3-di-O-pentyl-6-O-methyl)- $\gamma$ -cyclodextrin

Phase	ID (mm)	Film ( $\mu$ m)	Length (m)	Temperature Limits	Product Number	Price
LIPODEX® A	0.25		25	200/220°C	MCN72336025	\$1,173.10
	0.25		50	200/220°C	MCN72336050	1,752.20
LIPODEX® B	0.25		25	200/220°C	MCN72336225	1,173.10
	0.25		50	200/220°C	MCN72336250	1,752.20
LIPODEX® C	0.25		25	200/220°C	MCN72336425	1,173.10
	0.25		50	200/220°C	MCN72336450	1,752.20
LIPODEX® D	0.25		25	200/220°C	MCN72336625	1,173.10
	0.25		50	200/220°C	MCN72336650	1,752.20
LIPODEX® E	0.10	0.10	10	200/220°C	MCN72636110	357.60
	0.25		25	200/220°C	MCN72336825	1,173.10
	0.25		50	200/220°C	MCN72336850	1,752.20
LIPODEX® G	0.25		25	220/240°C	MCN72337925	1,173.10
	0.25		50	220/240°C	MCN72337950	1,752.20

### HYDRODEX® Cyclodextrin in polysiloxane phases

**FS-HYDRODEX®  $\beta$ -TBDAC** heptakis-(2,3-di-O-acetyl-6-O-t-butylidimethyl-silyl)- $\beta$ -cyclodextrin

**FS-HYDRODEX®  $\beta$ -PM** heptakis-(2,3,6-tri-O-methyl)- $\beta$ -cyclodextrin

**FS-HYDRODEX®  $\beta$ -3P** heptakis-(2,6-di-O-methyl-3-O-pentyl)- $\beta$ -cyclodextrin

**FS-HYDRODEX®  $\beta$ -6TBDM** heptakis-(2,3-di-O-methyl-6-O-t-butylidimethyl-silyl)- $\beta$ -cyclodextrin

HYDRODEX®	0.25		25	220/240°C	MCN72338425	\$1,173.10
$\beta$ -TBDAC	0.25		50	220/240°C	MCN72338450	1,752.20
HYDRODEX®	0.25		25	230/250°C	MCN72337025	1,173.10
$\beta$ -PM	0.25		50	230/250°C	MCN72337050	1,752.20
HYDRODEX®	0.25		25	230/250°C	MCN72335825	1,173.10
$\beta$ -3P	0.25		50	230/250°C	MCN72335850	1,752.20
HYDRODEX®	0.10	0.10	10	230/250°C	MCN72338310	779.60
$\beta$ -6TBDM	0.25		25	230/250°C	MCN72338125	1,173.10
	0.25		50	230/250°C	MCN72338150	1,752.20

### PERMABOND® L-CHIRASIL-VAL Bonded Chiral Phase

- Diamide chiral stationary phase
- For enantiomer separation of amino acids
- Chemically bonded
- High stability and longer column lifetime
- Stationary phase not dissolved by large volume injections
- Columns can be solvent rinsed

PERMABOND®	0.25		25	190°C	MCN72373025	\$1,118.70
L-CHIRASIL-VAL	0.25		50	190°C	MCN72373050	1,426.80
	0.32		25	190°C	MCN72373225	1,155.80
	0.32		50	190°C	MCN72373250	1,499.80

## Applications for Macherey-Nagel Chiral GC Columns

### FS-LIPODEX® A

Carbohydrates, polyols, diols, hydroxycarboxylic acid esters, (epoxy) alcohols, glycerol derivatives, spiroacetals, ketones, alkyl halides.

### FS-LIPODEX® B

Lactones, diols (cyclic carbonates), aminols, aldols (O-TFA), glycerol derivatives (cyclic carbonates).

### FS-LIPODEX® C

Alcohols, cyanhydrins, olefins, hydroxycarboxylic acid esters, alkyl halides.

### FS-LIPODEX® D

Amines (TFA), aminols (TFA), trans-cycloalkane-1,2-diols, trans-cycloalkane-1,3-diols (TFA),  $\beta$ -amino acid esters.

### FS-LIPODEX® E

$\alpha$ -amino acids,  $\alpha$ - and  $\beta$ -hydroxycarboxylic acid esters, alcohols (TFA), diols (TFA), ketones, pheromones (cyclic acetals), amines, alkyl halides, lactones.

### FS-LIPODEX® G

Menthol isomers, ketones, alcohols, carboxylic acid esters, terpenes.

### FS-HYDRODEX® $\beta$ -TBDAC

Alcohols, esters, ketones, aldehydes,  $\delta$  lactones, etc.

### FS-HYDRODEX® $\beta$ -PM

Hydroxycarboxylic acid esters, alcohols, diols, olefins, lactones, acetals.

### FS-HYDRODEX® $\beta$ -3P

Terpenes, dienes, allenes, terpene alcohols, 1,2-epoxyalkanes, carboxylic acid esters, hydroxycarboxylic acid esters, pharmaceuticals, pesticides.

### FS-HYDRODEX® $\beta$ -6TBDM

$\gamma$ -lactones, cyclopentanones, terpenes, esters, tartrates.

# GC COLUMNS FOR CHIRAL SEPARATIONS

## CHIRAL GC COLUMNS FROM AGILENT

**CycloSil-B** 30% heptakis (2,3-di-O-methyl-6-O-*t*-butyl dimethylsilyl)- $\beta$ -cyclodextrin in DB-1701  
**Applications:** Ideal for many chiral  $\gamma$ -lactones and terpenes.

**Cyclodex-B Columns** — 10.5%  $\beta$ -Cyclodextrin in DB-1701

**Applications:** Broad range of resolving potential and excellent peak shape.

**HP-Chiral  $\beta$  Columns** —  $\beta$ -cyclodextrin in (35%-Phenyl)-methylpolysiloxane

**Applications:** Recommended for nitrogen containing chiral compounds. Phenyl-based polymer provides low bleed and does not interfere with nitrogen-specific detectors. Available in two concentrations of  $\beta$ -cyclodextrin: 10% and 20%. 20% loading is recommended for initial screening.

Phase	ID (mm)	Film ( $\mu$ m)	Length (m)	Temperature Limits	Product Number	Price
Cyclosil-B	0.25	0.25	30	35 to 260/280°C	J1126632	\$549.00
	0.32	0.25	30	35 to 260/280°C	J1136632	589.00
Cyclodex-B	0.25	0.25	30	50 to 210/250°C	J1122532	549.00
	0.25	0.25	60	50 to 210/250°C	J1122562	896.00
	0.32	0.25	30	50 to 210/250°C	J1132532	589.00
HP-Chiral $\beta$	0.25	0.25	30	30 to 240/250°C	CS19091GB133	575.00
	0.25	0.25	30	30 to 240/250°C	CS19091GB233	575.00
	0.32	0.25	30	30 to 240/250°C	CS19091GB213	621.00

## CHIRAL GC COLUMNS FROM RESTEK

**Rt- $\beta$ DEXcst™** Proprietary cyclodextrin.

**Applications:** Optimum for semivolatile chiral compounds. Also the best column for resolving  $\gamma$ - and  $\delta$ -lactones. Good for separating the enantiomers of some barbiturates and TFA-derivatives of amphetamines as well.

**Rt- $\beta$ DEXm™** Permethylated  $\beta$ -cyclodextrin.

**Applications:** General purpose chiral phase with many published applications.

**Rt- $\beta$ DEXsa™** 2,3-di-acetoxy-6-O-*tert*-butyl dimethylsilyl  $\beta$ -cyclodextrin

**Applications:** Unique selectivity for esters and lactones, and other fruit flavor components.

**Rt- $\beta$ DEXse™** 2,3-di-O-ethyl-6-O-*tert*-butyl dimethylsilyl  $\beta$ -cyclodextrin

**Applications:** Similar performance to Rt- $\beta$ DEXsm™ but provides better resolution for limonene, linalool, linalyl acetate, ethyl-2-methylbutyrate, 2,3-butane diol, and styrene oxides.

**Rt- $\beta$ DEXsm™** 2,3-di-O-methyl-6-O-*tert*-butyl dimethylsilyl  $\beta$ -cyclodextrin

**Applications:** Excellent column for most chiral compounds found in essential oils.

**Rt- $\beta$ DEXsp™** 2,3-di-O-propyl-6-O-*tert*-butyl dimethylsilyl  $\beta$ -cyclodextrin

**Applications:** Often useful in dual-column configurations, with the Rt- $\beta$ DEXsm™ column, for complex enantiomeric separations.

**Rt- $\gamma$ DEXsa™** 2,3-di-acetoxy-6-O-*tert*-butyl dimethylsilyl  $\gamma$ -cyclodextrin

**Applications:** Similar to Rt- $\beta$ DEXsa™, but more effective for bulkier molecules.

Rt- $\beta$ DEXcst™	0.25	0.25	30	40 to 230°C	RK13103	\$741.90
	0.32	0.25	30	40 to 230°C	RK13102	783.70
Rt- $\beta$ DEXm™	0.25	0.25	30	40 to 230°C	RK13100	550.40
	0.32	0.25	30	40 to 230°C	RK13101	592.30
Rt- $\beta$ DEXsa™	0.25	0.25	30	40 to 230°C	RK13109	741.90
	0.32	0.25	30	40 to 230°C	RK13108	783.70
Rt- $\beta$ DEXse™	0.25	0.25	30	40 to 230°C	RK13107	741.90
	0.32	0.25	30	40 to 230°C	RK13106	783.70
Rt- $\beta$ DEXsm™	0.25	0.25	30	40 to 230°C	RK13105	741.90
	0.32	0.25	30	40 to 230°C	RK13104	783.70
Rt- $\beta$ DEXsp™	0.25	0.25	30	40 to 230°C	RK13111	741.90
	0.32	0.25	30	40 to 230°C	RK13110	783.70
Rt- $\gamma$ DEXsa™	0.25	0.25	30	40 to 230°C	RK13113	741.90
	0.32	0.25	30	40 to 230°C	RK13112	783.70

For application assistance, contact our knowledgeable Technical Support Team at 1-800-267-8103 or by email at [tech@chromspec.com](mailto:tech@chromspec.com).

To optimize chiral separations, use:

- Faster linear velocities (80cm/sec.) with hydrogen carrier gas
- Slower ramp rates (1-2°C/min.)
- Appropriate minimum operating temperature (40 or 60°C)
- On-column concentrations of 50ng or less

### About Rt-DEX Phases

By adding cyclodextrins to the bonded Rtx®-1701 stationary phase, column lifetime and overall utility of these columns is enhanced over columns made from pure cyclodextrins. Restek "DEX" columns demonstrate stability after hundreds of temperature program cycles.

### A Guide to the Analysis of Chiral Compounds by GC



Particularly with pharmaceutical or flavor and fragrance compounds, enantiomers must be quantified separately. Seven cyclodextrin-based Restek chiral capillary GC columns offer a unique range of selectivities, to enable you to accomplish these often-difficult separations. Example chromatograms in this guide will help you find the best column - or columns - for your needs.

Request Literature Code **RK31**



Chiral Capillary Columns & Kits  
 Request Literature Code **RK72**



## CHIRAL HPLC COLUMNS FROM AGILENT

### ULTRON® Chiral Columns

- ULTRON ES-OVM separates enantiomers of pharmaceuticals, such as hexobarbital, ibuprofen and profenamine
- ES-OVM contains an ovomucoid protein
- ULTRON ES-Pepsin Chiral columns are best suited to separate basic compounds that are difficult to separate by other columns
- Bonded to 120Å 5µm silica particles
- Usable with mobile phases such as acetonitrile or ethanol and phosphate buffer
- pH Range: ES-OVM 3 - 7.5; ES-Pepsin 3 - 6

\*Manufactured by Shinwa Chemical Industries, Ltd., Japan

### ChiraDex Chiral HPLC Columns

- Suitable for routine separation of enantiomers
- Available as ChiraDex cartridge columns
- Novel manufacturing process bonds β-cyclodextrin to spherical 5µm silica gel by means of a chemical spacer
- Use simple nonchiral solvent systems

**Applications:** Barbiturates, benzothiadiazines, calcium antagonists, PTH-amino acids

	Dimensions (mm)	ES-OVM	ES-Pepsin	Chiradex	Price
5µm	2.0 x 150	CS702111610			\$2,297.00
	4.0 x 10	CS712111630	CS832111630		412.00
	4.0 x 250			CS79925CB584	1,219.00
	4.6 x 150	CS702111651	CS822111651		2,703.00
10µm	4.6 x 250	CS724111653			2,033.00

## Eurocel® BY KNAUER — DERIVATIZED CELLULOSE COLUMNS

Eurocel® exhibits one of the highest loadabilities of all CSPs, it is an ideal choice for preparative methods. Its pressure resistance is comparable to that of regular silica. Eurocel® can be used in normal phase mode, polar organic mode, or reversed phase mode.

**Eurocel® 01** Cellulose-tris (3,5-dimethylphenylcarbamate)

**Applications:** Beta blockers, alkaloids, tropine compounds, amine derivatives, phenols  
A recommended alternative to Chiralcel OD

**Eurocel® 02** Cellulose tribenzoate

**Applications:** Small aliphatic and aromatic compounds

**Eurocel® 03** Cellulose-tris (4-methylbenzoate)

**Applications:** Aryl methyl esters, aryl methoxy esters

**Eurocel® 04** Cellulose-tris (phenylcarbamate)

**Applications:** Cyclopentenones

**Europak® 01** Amylose-tris (3,5 dimethylphenylcarbamate)

**Applications:** Alkaloids, tropines, amines, beta blockers

	Dimensions (mm)	Eurocel® 01	Eurocel® 02	Eurocel® 03	Eurocel® 04	Europak® 01	Price
5µm	4.0 x 5	KRP5DM370ECJ	KRP5DM390ECJ	KRP5DM400ECJ	KRP5DM480ECJ	KRP5DM320EPJ	Inquire
	4.6 x 150	KR15EM370ECJ	KR15EM390ECJ	KR15EM400ECJ	KR15EM480ECJ	KR15EM320EPJ	Inquire
	4.6 x 250	KR25EM370ECJ	KR25EM390ECJ	KR25EM400ECJ	KR25EM480ECJ	KR25EM320EPJ	Inquire
	8.0 x 30	KR03GM370ECJ	KR03GM390ECJ	KR03GM400ECJ	KR03GM480ECJ	KR03GM320EPJ	Inquire
	8.0 x 250	KR25GM370ECJ	KR25GM390ECJ	KR25GM400ECJ	KR25GM480ECJ	KR25GM320EPJ	Inquire
	20 x 250	KR25JM370ECJ	KR25JM390ECJ	KR25JM400ECJ	KR25JM480ECJ	KR25JM320EPJ	Inquire
10µm	4.0 x 5	KRP5DM370ECN	KRP5DM390ECN	KRP5DM400ECN	Inquire	KRP5DM320EPN	Inquire
	4.6 x 150	KR15EM370ECN	KR15EM390ECN	KR15EM400ECN	Inquire	KR15EM320EPN	Inquire
	4.6 x 250	KR25EM370ECN	KR25EM390ECN	KR25EM400ECN	Inquire	KR25EM320EPN	Inquire
20µm	4.6 x 150	KR15EM370ECS	KR15EM390ECS	KR15EM400ECS	Inquire	KR15EM320EPS	Inquire
	4.6 x 250	KR25EM370ECS	KR25EM390ECS	KR25EM400ECS	Inquire	KR25EM320EPS	Inquire
	8.0 x 30	KR03GM370ECS	KR03GM390ECS	KR03GM400ECS	Inquire	KR03GM320EPS	Inquire
	8.0 x 250	KR25GM370ECS	KR25GM390ECS	KR25GM400ECS	Inquire	KR25GM320EPS	Inquire
	20 x 250	KR25JM370ECS	KR25JM390ECS	KR25JM400ECS	Inquire	KR25JM320EPS	Inquire

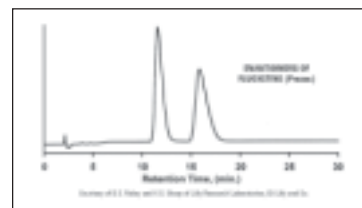
3µm packings are now available for many of these products. Some are also available in 10 and 20µm formats suitable for preparative HPLC work.

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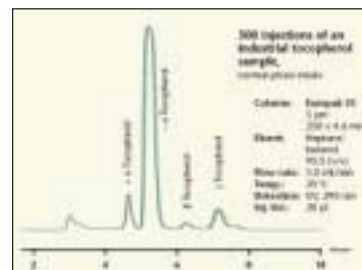


**ULTRON® ES-OVM** 4.6 x 150 mm (CS702111651)  
Mobile Phase: 0.8 mL/min 25:75 (v/v) EtOH / 20 mM KH<sub>2</sub>PO<sub>4</sub>, pH 5.5 (adjusted with NaOH)  
Injection: 10 µL  
Detect: UV (225 nm)  
Sample: Mixture Fluoxetine (Prozac) enantiomers

The R and S chiral forms of Fluoxetine (Prozac) are separated with high resolution (3.0) under these conditions, resulting in a rugged method and extended useful lifetime of the column.

### Outstanding Stability

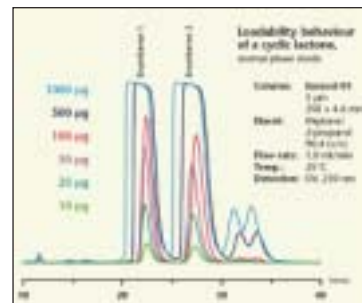
Eurocel and Europak chiral columns exhibit very high stability in multiple injection tests.



As shown here, peak areas and retention times are practically unaffected after 500 injections of an impure sample.

### High Loadability

KNAUER Eurocel and Europak chiral columns offer high loadability for easy and cost-effective upscaling.



All Eurocel and Europak CSPs are available in 3 µm, 5 µm, 10 µm, and 20 µm particle sizes.



# MACHEREY-NAGEL CHIRAL CHROMATOGRAPHY — HPLC COLUMNS

## NUCLEOCEL COLUMNS



Stationary phase based on modified cellulose (NUCLEOCEL DELTA) or amylose (NUCLEOCEL ALPHA) derivative, coated on a high quality silica support.

Both columns provide excellent enantioselective properties for a large number of known chiral molecules, which can be separated with high  $\alpha$ -values.

- Separate the majority of all known racemic compounds with outstanding resolution
- Avoid of timeconsuming and costly column screening
- Durable, longer use without loss of performance
- Many samples can be injected without tedious derivatising procedures, NUCLEOCEL columns help to make method development easy.

### NUCLEOCEL ALPHA S (5 $\mu$ m)

250x4.6 mm	MCN72064546	\$2,148.80
150x4.6 mm	MCN72064446	2,148.80
Guards	MCN72100040	222.80

### NUCLEOCEL ALPHA-RPS (5 $\mu$ m)

250x4.6 mm	MCN72065546	\$2,148.80
150x4.6 mm	MCN72065446	2,148.80
Guards	MCN72100140	222.80

### NUCLEOCEL DELTA S (5 $\mu$ m)

250x4.6 mm	MCN72044546	\$2,148.80
150x4.6 mm	MCN72044646	2,148.80
Guards	MCN72100240	222.80

### NUCLEOCEL DELTA-RPS (5 $\mu$ m)

250x4.6 mm	MCN72045046	\$2,148.80
150x4.6 mm	MCN72045146	2,148.80
Guards	MCN72100340	222.80

### NUCLEOCEL DELTA (10 $\mu$ m)

250x4.6 mm	MCN72044446	\$2,148.80
Guards	MCN72100740	222.80

### NUCLEOCEL DELTA-RP (10 $\mu$ m)

250x4.6 mm	MCN72044946	\$2,148.80
Guards	MCN72100840	222.80

## NUCLEODEX® COLUMNS

Cyclodextrin-based NUCLEODEX® HPLC columns are very well suited for the separation of optical and geometric isomers under reversed phase conditions. A large number of racemates, including pesticides and pharmaceuticals, have been separated using these phases. Based on 5  $\mu$ m NUCLEOSIL®-100.

### NUCLEODEX® $\beta$ -OH

$\beta$ -cyclodextrin, eluent in column CH<sub>3</sub>OH / 0.1% TEAA pH 4 (55:45)

### NUCLEODEX® $\alpha$ -PM

Permethylated  $\alpha$ -cyclodextrin, eluent in column CH<sub>3</sub>OH / 50 mM phosphate pH 3 (70:30)

### NUCLEODEX® $\beta$ -PM

Permethylated  $\beta$ -cyclodextrin, eluent in column CH<sub>3</sub>OH / 0.1% TEAA pH 4 (65:35)

### NUCLEODEX® $\gamma$ -PM

Permethylated, eluent in column CH<sub>3</sub>OH / 0.1% TEAA pH 4 (55:45)

Column Dimensions (mm)	NUCLEODEX® $\beta$ -OH	NUCLEODEX® $\alpha$ -PM	NUCLEODEX® $\beta$ -PM	NUCLEODEX® $\gamma$ -PM
4.0 x 200	MCN72012440 \$798.00	MCN72012740 \$951.20	MCN72012540 \$951.20	MCN72075240 \$1,060.80
Guard Column	MCN72146040 \$71.90	MCN72146440 \$79.00	MCN72146240 \$79.00	MCN72146640 \$94.30
MCN721920 NUCLEODEX® Screening Kit Consists of one CC 30/4 each with NUCLEODEX® $\beta$ -OH, $\alpha$ -PM, $\beta$ -PM and $\gamma$ -PM and a ChromCart® column holder 30 mm				

## NUCLEOSIL® CHIRAL COLUMNS

### NUCLEOSIL® CHIRAL-1 - Ligand Exchange

NUCLEOSIL® CHIRAL-1 works by ligand exchange chromatography (LEC). Analyte enantiomers and the chiral phase form diastereomeric complexes with metal ions. Retention varies with the stability of the complex. The stationary phase is L-hydroxyproline bonded to NUCLEOSIL® 120. Eluent in column 0.5 mM copper sulphate.

### NUCLEOSIL® CHIRAL-2 and CHIRAL-3 - Brush Type Phases

NUCLEOSIL® CHIRAL-2 and CHIRAL-3 separate enantiomers in normal phase. Chiral-2 and Chiral-3 have opposite selectivity, so elution order can be reversed to improve resolution.

### NUCLEOSIL® CHIRAL-2

N-(3,5-dinitrobenzoyl)-D-phenylglycine.

### NUCLEOSIL® CHIRAL-3

N-(3,5-dinitrobenzoyl)-L-phenylglycine. Eluent in columns n-heptane / isopropanol / trifluoroacetic acid 100:0.5:0.5

Column Dimensions (mm)	NUCLEOSIL® CHIRAL-1	NUCLEOSIL® CHIRAL-2	NUCLEOSIL® CHIRAL-3
4.0 x 250	MCN72008140 \$798.00	MCN72008840 \$798.00	MCN72035040 \$951.20
Guard Column	MCN72145540 \$71.90	MCN72145840 \$190.90	MCN72145840 \$190.90

## RESOLVOSIL® BSA-7 - Bovine Serum Albumin

Based on bovine serum albumin (BSA) covalently bonded to widepore silica.

- Extremely high selectivity
  - Easily modify retention by small changes in mobile phase composition
- Provides a high flexibility chromatographic system as resolution may be optimised to fit your requirements.

Column Dimensions (mm)	RESOLVOSIL® BSA-7	Price
4.0 x 150	MCN72004640	\$1,060.80
Guard Column	MCN72170240	94.30

# HPLC PRODUCTS

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For HPLC Applications, please visit our website at [www.chromspec.com](http://www.chromspec.com) or contact our Technical Support Group.

## 1-800-267-8103



## Agilent ZORBAX® Rx-Sil... The basis for all ZORBAX Columns

- Ultra pure
- Low metal content
- Narrow particle size distribution for better reproducibility from column to column, lot-to-lot
- Strong particles improve mechanical stability, thus increasing column lifetimes
- Variety of particle sizes

1.8 µm - Rapid Resolution High Throughput (RRHT)

3.5 µm - Rapid Resolution ideal for LC-MS

5 µm - Analytical HPLC

7 µm - Semi-Prep and Preparative HPLC



## Agilent ZORBAX® Column Selection Guide for HPLC

- How to choose the right HPLC column for your needs
- Ordering guide with column descriptions
- Simple method development procedures



For more information on  
ZORBAX® HPLC columns,  
please request  
Literature Code AG19.

## ZORBAX® HPLC COLUMNS

### Resolution That Lasts

Chromatographic resolution between two or more peaks depends on three factors, column efficiency, selectivity and retention. ZORBAX® HPLC columns are available in a variety of bonded phases for optimizing selectivity and resolution. Particle sizes ranging from 1.8 to 7 microns provide the efficiency needed for any separation. From research to QA/QC, there is a ZORBAX® HPLC column that offers a solution for your particular measurement or purification application.

### ZORBAX® Eclipse XDB and Eclipse Plus....

#### First Choice for Method Development of Small Molecules

- Excellent peak shape for acids, bases, neutrals over a wide pH range 2-9
- Extra densely bonded and double endcapped for superior peak shape

See Page 124

### ZORBAX® StableBond Columns

- Patented stable column chemistry allows use at high temperature and low pH without degradation
- Alternative selectivity to Eclipse columns
- Two pores sizes available, 80Å for small molecules and 300Å for large molecules

See Page 125

### ZORBAX® SB-AQ Columns

- Recommended for high resolution analysis of very polar compounds
- Suitable for use with 100% aqueous mobile phases

See Page 125

### ZORBAX® Bonus-RP Columns

- Polar column with an embedded amide group in a C14 chain
- Excellent peak shape for difficult basic compounds
- Suitable for use with 100% aqueous mobile phases
- Provides different selectivity at low and mid pH

See Page 127

### ZORBAX® Extend-C18

- Patented bidentate C18 bonded phase suitable for use from pH 2-11.5
- High pH improves retention and peak shape of difficult basic compounds

See Page 127

### ZORBAX® Rx-C18 HPLC Columns

- This phase has a slightly higher carbon load than the SB-C18
- Alternative selectivity at low pH

See Page 126

### ZORBAX® Wide Pore 300StableBond HPLC Columns

- Suitable for large molecule separations such as proteins and peptides
- Exceptional stability and long lifetime at low pH with TFA containing mobile phases

See Page 125

### ZORBAX® Poroshell 300SB HPLC Columns

- Fast high-resolution separations of biomolecules
- Unique particle design made of a thin layer of porous silica on a solid core of silica

See Page 125

### ZORBAX® Specialty Columns

- SAX is a strong anion exchange column
- SCX is a 300Å strong cation exchange column suitable for bio-molecules
- Carbohydrate, Amino based columns conditioned and tested for sugar analysis

See Page 127



# RAPID RESOLUTION COLUMNS FOR HIGH SPEED ANALYSIS

## Cut your Run Times

Old Run Time	RRHT Run Time
10µm packing	1/5
5µm packing	1/3
3.5µm packing	1/2



For more information on High Efficiency LC and LC/MS Applications using ZORBAX® RRHT Columns, request literature code **AG32**

### It's easy to switch to RRHT! 3 Steps to Ultra-fast LC

- 1) Use 4.6 x 50mm RRHT columns with a standard instrument. Just increase the sampling rate of your detector to 10 points / second.
- 2) Equip a 400 bar / 6,000 psi instrument with narrow bore capillaries and low volume mixer and flow cell. Lets you take advantage of the speed of shorter columns and solvent savings of narrow bore columns. Ideal for LC/MS.
- 3) Move to 600 bar + / 7,500 psi instruments. Take advantage of the speed and resolution offered by columns up to 100mm long.

## ZORBAX® LC/MS COLUMNS . . . FASTER SEPARATIONS

The selectivity of the MS detector requires less separation than optical detectors. These columns provide acceptable separation with run times that allow you to maximise your investment in LC/MS equipment.

### 3 packs of 3.5µm Columns for LC/MS

Dimensions (mm)		SB-C18	SB-C8	XDB-C18	XDB-C8	Price	
3.5µm	2.1 x 15mm	Z875700932	Z875700936	Z975700932	Z975700936	\$535.00	
	2.1 x 30mm	Z873700932	Z873700936	Z973700932	Z973700936	671.00	
	4.6 x 15mm	Z831975932	Z831975936	Z931975932	Z931975936	535.00	
	4.6 x 30mm	Z833975932	Z833975936	Z933975932	Z933975936	671.00	
Cartridge Fittings						Z820555901	\$241.00

Individual columns also available.

## ZORBAX® RRHT COLUMNS . . . FASTEST SEPARATIONS

### A New Technology for Ultra-Fast HPLC Separations

ZORBAX® Rapid Resolution High Throughput (RRHT) is the first sub-2µm (1.8µm), totally porous packing available for ultra-fast high throughput separations. The small particles provide high resolving power while very short column lengths provide the speed.

### You can use RRHT columns on your current instrument!

All RRHT columns 50mm and less can be run on standard HPLCs. Agilent's engineered particle size distribution reduces back-pressure 20% compared to competing <2µm columns, at a cost of only 2% to resolving power.

**NEW 600 bar column hardware** generates less back-pressure than the original 400 bar hardware, but operates leak free to 600 bar.

### You can transfer methods between RRHT and standard columns quickly!

RRHT columns use the same silica and phase chemistry as all other ZORBAX® columns. So the same phase has the same selectivity. From ultra-fast LC/MS to preparative chromatography. As a bonus, you can choose from the entire ZORBAX® line of phases to optimise your separations.

## 600 Bar RRHT COLUMNS - Rx-Sil also available

Dimensions (mm)	Eclipse Plus-C18	Eclipse Plus-C8	SB-C18	SB-AQ	SB-C8	SB-Phenyl	SB-CN	Extend C18	Price
2.1 x 20mm	—	—	Z826700902	—	Z826700906	—	—	Z726700902	\$332.00
2.1 x 30mm	Z959731902	Z959731906	Z824700902	Z824700914	Z824700906	Z824700912	Z824700905	Z724700902	398.00
2.1 x 50mm	Z959741902	Z959741906	Z827700902	Z827700914	Z827700906	Z827700912	Z827700905	Z727700902	561.00
2.1 x 100mm	Z959764902	Z959764906	Z828700902	Z828700914	Z828700906	Z828700912	Z828700905	Z728700902	688.00
2.1 x 150mm	Z959794902	—	Z820700902	—	Z820700906	Z820700912	Z820700905	—	858.00
3.0 x 20mm	—	—	—	—	Z826975306	—	—	Z726975302	\$332.00
3.0 x 30mm	—	—	—	—	Z824975306	—	Z824975305	Z724975302	398.00
3.0 x 50mm	Z959941302	Z959941306	Z827975302	Z827975314	Z827975306	Z827975312	Z827975305	Z727975302	561.00
3.0 x 100mm	Z959964302	Z959964306	Z828975302	Z828975314	Z828975306	Z828975312	Z828975305	Z728975302	688.00
3.0 x 150mm	Z959994302	—	Z829975302	—	Z829975306	Z829975312	Z829975305	—	858.00
4.6 x 20mm	—	—	Z826975902	—	Z826975906	—	—	Z726975902	\$332.00
4.6 x 30mm	Z959931902	Z959931906	Z824975902	Z824975914	Z824975906	Z824975912	Z824975905	Z724975902	398.00
4.6 x 50mm	Z959941902	Z959941906	Z827975902	Z827975914	Z827975906	Z827975912	Z827975905	Z727975902	561.00
4.6 x 100mm	Z959964902	Z959964906	Z828975902	Z828975914	Z828975906	Z828975912	Z828975905	Z728975902	688.00
4.6 x 150mm	Z959994902	—	Z829975902	Z829975914	Z829975906	Z829975912	Z829975905	—	858.00

400 Bar columns and Eclipse XDB columns still available. Call Technical Support for details.



# AGILENT / ZORBAX® HPLC COLUMNS

## ZORBAX® Eclipse

- First choice for method development of small molecules
- Excellent peak shape for acids, bases, neutrals
- High performance over a wide pH range (pH 2-9)
- eXtra Densely Bonded and double endcapped for superior peak shape
- Four bonded phases - C18, C8, Phenyl and CN for selectivity
- pH range 2-9, Temperature tolerant to 60°C (80°C for C18)



### Improvements of Eclipse Plus

- C18 and C8
- Proprietary silica treatments further decrease acidity
- Improved reagents increase particle surface coverage

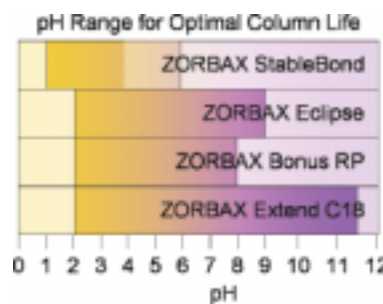
	ID x Length (mm)	Plus-C18	Plus-C8	Price	XDB-C18	XDB-C8	XDB-Phenyl	Price	XDB-CN	Price
Rapid Resolution (3.5µm)	2.1x50	Z959743902	Z959743906	\$487.00	Z971700902	Z971700906	N/A	\$386.00	N/A	N/A
	2.1x150	Z959763902	Z959763906	629.00	Z930990902	Z930990906	N/A	609.00	N/A	N/A
	3x100	Z959961302	Z959961306	526.00	Z961967302	Z961967306	Z961967312	546.00	N/A	N/A
	3x150	Z959963302	Z959963306	629.00	Z963954302	Inquire	Z963954312	609.00	Z963954305	\$607.00
	4.6x50	Z959943902	Z959943906	398.00	Z935967902	Z935967906	Z935967912	386.00	N/A	N/A
	4.6x75	Z959933902	Z959933906	487.00	Z966967902	Z966967906	Z966967912	473.00	Z966967905	471.00
	4.6x150	Z959963902	Z959963906	629.00	Z963967902	Z963967906	Z963967912	609.00	Z963967905	607.00
Analytical (5µm)	2.1x50	Z959746902	Z959746906	398.00	Z960967902	Z960967906	Z960967912	361.00	Z960967905	344.00
	2.1x150	Z959701902	Z959701906	526.00	Z993700902	Z993700906	Z993700912	547.00	Z993700905	546.00
	3x150	Z959993302	Z959993306	564.00	Z993967302	Z993967306	Z993967312	547.00	Z993967305	546.00
	3x250	N/A	N/A	N/A	Z990967302	Z990967306	Z990967312	609.00	Z990967305	607.00
	4.6x50	Z959946902	Z959946906	374.00	Z946975902	Z946975906	N/A	361.00	N/A	N/A
	4.6x150	Z959993902	Z959993906	564.00	Z993967902	Z993967906	Z993967912	547.00	Z993967905	546.00
	4.6x250	Z959990902	Z959990906	629.00	Z990967902	Z990967906	Z990967912	609.00	Z990967905	607.00
Guard (5µm)	2.1x12.5†	Z821125936	Z821125937	204.00	Z821125926	Z821125926	Z821125926	198.00	Z821125935	198.00
	4.6x12.5†	Z820950936	Z820950937	204.00	Z820950925	Z820950926	Z820950927	198.00	Z820950935	198.00

## ZORBAX® Poroshell

ZORBAX® Poroshell columns are ideal for fast separations of proteins and peptides because the unique particle allows for fast flow rates to be used while maintaining sharp, efficient peaks. Peptides and proteins are typically separated slowly to reduce the potential peak broadening of these slow diffusing analytes; however Poroshell columns use a unique particle made with a layer of porous silica on a solid core. This reduces the diffusion distance for proteins making rapid separations of peptides and proteins practical.

	ID x Length (mm)	300SB-C18	300SB-C8	300SB-C3	Price	Extend	Price
Analytical (5µm)	0.5x75	N/A	Z50654468	N/A	\$864.00		
	1x75	Z661750902	Z661750906	Z661750909	864.00	Z671750902	\$862.00
	2.1x75	Z660750902	Z660750906	Z660750909	864.00	Z670750902	862.00
Guard (5µm)	1x17 (3pk)	Z51855968	Z51855968	Z51855968	\$335.00		
	2.1x12.5†	Z821075920	Z821075918	Z821075924	223.00	Z51855968	335.00

†Zorbax ZGC Guard Cartridges require a re-useable holder; part number Z820888901. See Page 127.



## ZORBAX® StableBond

StableBond columns use bulky, unique silanes to sterically protect the siloxane bond. Acid labile endcapping reagents are not used. The result is vastly improved column life and extraordinary chemical and temperature stability below pH 3.

- Sterically protected
- Longest column lifetime and best reproducibility for low pH separations - down to pH 1
- Patented stable column chemistry allows use at high temperature and low pH without degradation
- Five different bonded phases provide broad selectivity: -C18, -C8, -CN, -Phenyl, and -C3
- High purity ZORBAX® Rx silica for superior peak shape
- Excellent choice for methods below pH 3
- **pH range 1-4, Temperature tolerant to 80°C (90°C for C18)**



	ID x Length (mm)	C18	C8	Aq	C3	Phenyl	Cyano		Price
Rapid Resolution (3.5µm)	2.1x50	Z871700902	Z871700906	Z871700914	N/A	N/A	N/A		\$386.00
	2.1x150	Z830990902	Z830990906	Z830990914	N/A	N/A	N/A		609.00
	3x100	Z861954302	Z861954306	Z861954314	Inquire	Z861954312	Z861954305		546.00
	3x150	Z863954302	Z863954306	Z863954314	Z863954309	Z863954312	Z863954305		609.00
	4.6x50	Z835975902	Z835975906	Z835975914	N/A	Z835975912	Z835975905		386.00
	4.6x75	Z866953902	Z866953906	Z866953914	N/A	Z866953912	Z866953905		473.00
	4.6x150	Z863953902	Z863953906	Z863953914	N/A	Z863953912	Z863953905		609.00
Analytical (5µm)	2.1x50	Z860975902	Z860975906	Z860975914	Z860975909	Z860975912	Z860975905		361.00
	2.1x150	Z883700922	Z883700906	N/A	Z883700909	Z883700912	Z883700905		547.00
	3x150	Z883975302	Z883975306	Z883975314	Z883975309	Z883975312	Z883975305		547.00
	3x250	Z880975302	Z880975306	Z880975314	Z880975309	Z880975312	Z880975305		609.00
	4.6x50	Z846975902	Z846975906	Z846975914	N/A	N/A	N/A		361.00
	4.6x150	Z883975902	Z883975906	Z883975914	Z883975909	Z883975912	Z883975905		547.00
	4.6x250	Z880975902	Z880975906	Z880975914	Z880975909	Z880975912	Inquire		609.00
Guard (5µm)	2.1x12.5†	Z821125915	Z821125915	Z821125933	Z821125924	Z821125915	Z821125924		198.00
	4.6x12.5†	Z820950920	Z820950915	Z820950933	Z820950922	Z820950917	Z820950916		198.00

## ZORBAX® 300 Å

Wide-pore, 300Å columns are necessary for an efficient separation of proteins, peptides, and other large molecules in order to allow these analytes complete access to the bonded phase.

300StableBond and 300Extend-C18 bring the durable constructions of their 80Å counterparts to biomolecule separations.



	ID x Length (mm)	SB-C18	SB-C8	SB-C3	SB-CN	Price
Rapid Resolution (3.5µm)	2.1x50	Z865750902	Z865750906	N/A	N/A	\$386.00
	2.1x150	N/A	Z863750906	N/A	N/A	609.00
	4.6x75	Z865973902	Z865973906	Z865973909	Z865973905	386.00
	4.6x150	Z863973902	Z863973906	Z863973909	Z863973905	609.00
Analytical (5µm)	2.1x150	Z883750902	Z883750906	Z883750909	Z883750905	547.00
	4.6x150	Z883995902	Z883995906	Z883995909	Z883995905	547.00
	4.6x250	Z880995902	Z880995906	Z880995909	Z880995905	609.00
Guard (5µm)	2.1x12.5†	Z821125918	Z821125918	Z821125924	Z821125924	198.00
	4.6x12.5†	Z820950921	Z820950918	Z820950924	Z820950923	198.00

Extend C18	Price
Z765750902	\$423.00
Z763750902	671.00
N/A	N/A
Z763973902	671.00
N/A	NA
Z773995902	602.00
Z770995902	602.00
Z821125932	218.00
Z820950932	218.00

†Zorbax ZGC Guard Cartridges require a re-useable holder; part number Z820888901. See Page 127.

# AGILENT / ZORBAX® HPLC COLUMNS

## The ZORBAX® Silica Manufacturing Process — The Making of a Rugged, High-Purity Silica

All Agilent ZORBAX® columns are manufactured using porous silica microspheres (PSM). This silica particle is made of tiny, solid sol microparticles agglutinated in a patented polymerization process, then fused together at very high temperatures to form the final particle. These strong, pH resistant silica particles are called ZORBAX® Rx-SIL or ZORBAX® SIL and are the base silicas for most ZORBAX® columns.

Specific bonded-phase chemistries are required to provide longer column life over various pH ranges because silica-based columns have different limitations at low and high pH. Agilent ZORBAX® RP-HPLC bonded phases are designed to give extended column lifetime and reproducibility in the pH ranges that provide optimum and long lasting resolution, all starting with high performance ZORBAX® Rx-SIL.



### ZORBAX® Original

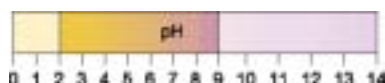
- Type A silica developed in the 1970s
- More acidic than Rx
- For legacy methods analyzing acid & neutral compounds
- Acidic silanols can provide additional selectivity between *cis* and *trans* isomers
- **For new method development, we recommend using ZORBAX® Rx-based columns**



	ID x Length (mm)	ODS (C18)	C8	TMS	Phenyl	Cyano RP	Cyano NP	Amino	Sil	Price
Analytical (5µm)	3x150	Z883952302	N/A	N/A	N/A	N/A	N/A	N/A	N/A	\$466.00
	3x250	Z880952302	N/A	N/A	N/A	N/A	N/A	N/A	N/A	547.00
	4.6x150	Z883952702	Z883952706	Z883952710	Z883952712	Z884950526	Z883952705	Z883952708	Z883952701	466.00
	4.6x250	Z880952702	Z880952706	Inquire	Z880952712	Z884950507	Z880952705	Z880952708	Inquire	547.00

### ZORBAX® Rx

- Type B (high purity) silica
- Low metal content, less acidity - less tailing
- Non-encapped for lower column bleed at low pH
- Economical, reliable columns for day to day analyses



	ID x Length (mm)	Rx-C18	Rx-C8	Rx-Sil	Price
Rapid Resolution (3.5µm)	4.6x75	Z866967902	Z866953906	N/A	\$473.00
	4.6x150	Z863967902	Z863953906	N/A	609.00
Analytical (5µm)	2.1x150	Z883700902	Z883700906	Z883700901	\$547.00
	3x150	Z883967302	Z883975306	N/A	547.00
	3x250	Z880967302	Z880975306	N/A	609.00
	4.6x150	Z883967902	Z883967901	Z883975901	547.00
	4.6x250	Z880967902	Z880967901	Z880975901	609.00
Guard (5µm)	2.1x12.5†	Z821125915	Z821125915	Z821125919	\$198.00
	4.6x12.5†	Z820950914	Z820950913	Z820950919	198.00

Need a brief guide to Agilent LC columns?  
Request literature code **AG19** for  
the **Agilent ZORBAX® Column  
Selection Guide for HPLC**

†Zorbax® ZGC Guard Cartridges require a re-useable holder; part number Z820888901. See Page 127.

## ZORBAX® Bonus-RP

Bonus-RP columns provide unique selectivity and applicability for mid pHs with an embedded amide linkage in the C14-alkyl chain. At pH 7 Bonus-RP provides excellent peak shape for even the most challenging basic compounds. Bonus-RP is protected from hydrolysis at low pH using the same sterically protecting bulky side chains as StableBond, and also is triple endcapped to minimize silanol interactions and improve stability at mid pH. Bonus-RP can be used without phase collapse in 100% aqueous mobile phases.

## ZORBAX® Extend-C18

Extend-C18 columns incorporate a unique patented bidentate silane, combined with a double-endcapping process that protects the silica from dissolution at high pH - up to 11.5. Columns are best for applied for separations of compounds that are either (1) basic and have little or no retention at low or intermediate pHs, (2) more stable or more soluble at high pH, or (3) basic and show poor peak shape at low or intermediate pH.

## ZORBAX® SAX and 300SCX ION EXCHANGE COLUMNS

ZORBAX® strong ion exchange columns are available as both quaternary amine Strong Anion Exchange (SAX) and sulfonic acid Strong Cation Exchange (300SCX) columns. Each column is packed with bonded, 5µm, spherical silica particles for optimum efficiency.

## ZORBAX® CARBOHYDRATE ANALYSIS COLUMNS

**Reproducible** - each lot of this application specific aminopropyl column packing material is tested for specific monosaccharide and disaccharide separations.

**Efficient** - uses ZORBAX® porous silica microsphere technology. Silica manufacture, bonding and packing are all performed in their ISO9002 facilities.

**Flexible** - can handle high volume injections as much as 50 µL on a 4.6 x 150mm column.

	Dimensions (mm)	Bonus-RP	Extend C18	SAX	300SCX	Carbohydrate
3.5µm	2.1 x 50	Z861700901 \$386.00	Z735700902 \$423.00	—	—	—
	2.1 x 150	Z863700901 \$607.00	Z735953902 \$423.00	—	—	—
	4.6 x 75	Z866668901 \$473.00	Z766953902 \$522.00	—	—	—
	4.6 x 150	Z863668901 \$609.00	Z763953902 \$671.00	—	—	—
5µm	2.1 x 50	Z861971901 \$361.00	Z760450902 \$398.00	—	Z860700704 \$361.00	—
	2.1 x 150	Z883725901 \$547.00	Z773700902 \$602.00	—	Z883700704 \$547.00	—
	3 x 150	Z883668301 \$546.00	Z773450302 \$602.00	—	—	—
	3 x 250	Z880668301 \$608.00	Z770450902 \$670.00	—	—	—
	4.6 x 50	—	Z746450902 \$398.00	—	Z846952704 \$361.00	—
	4.6 x 150	Z883668901 \$547.00	Z773450902 \$602.00	Z883952703 \$466.00	Z883952704 \$466.00	Z843300908 \$547.00
	4.6 x 250	Z880668901 \$609.00	Z770450902 \$670.00	Z880952703 \$522.00	Z880952704 \$609.00	Z840300908 \$609.00
	4.6 x 250	Z880668901 \$609.00	Z770450902 \$670.00	Z880952703 \$522.00	Z880952704 \$609.00	Z840300908 \$609.00
5µm Guard	2.1 x 12.5	Z821125928 \$198.00	Z821125930 \$218.00	—	—	—
	4.6 x 12.5	Z820950928 \$198.00	Z820950930 \$218.00	Z820950903 \$192.00	Z820950904 \$198.00	Z820950908 \$192.00

## OTHER COLUMN HARDWARE SYSTEMS USED BY AGILENT

### ZORBAX® Rapid Resolution and Rapid Resolution HT Cartridge Columns.

No guard cartridge required.  
Holder Z820555901.



ZORBAX® RP and NP columns with 1.8µm and 3.5µm packings, 400 bar pressure rating.

### ZORBAX® MicroBore Columns

ZORBAX® 1mm Guard Columns  
No separate hardware required.



Eclipse XDB  
StableBond®  
Bonus-RP  
Extend  
Poroshell®

### Agilent HPLC Cartridge

Cartridge column/Guard cartridge integral system

Holder CS50211845 (works with or without guard cartridge).

Asahipak®

Hypersil®

Lichrospher®

Nucleosil®

Purospher®

Superspher®



ZORBAX® RP (only certain columns available in this format).

## ZORBAX® GUARD CARTRIDGE HARDWARE

Stand-Alone design fits all cartridge columns and standard columns available from Agilent.



Product Number	Description	Price
Z820888901	ZORBAX® Guard Cartridge (ZGC) Stand-Alone Hardware	\$207.00



# MACHEREY-NAGEL NUCLEODUR® HPLC COLUMNS

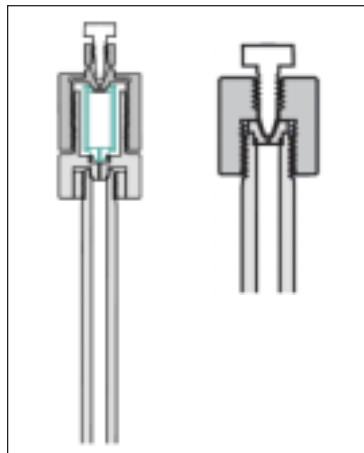
## Macherey-Nagel Column Hardware

Part numbers listed in this catalogue are for EC type columns.

Call 1-800-267-8103 for information on ChromCart® columns.

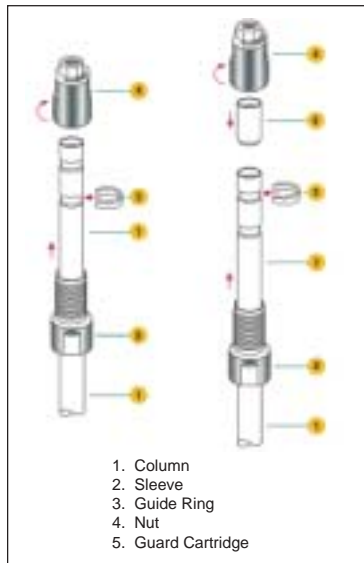
### EC columns

#### The standard MN column system



- Stainless steel columns with 2, 3, 4 and 4.6 mm ID
- Particle bed protected by a sandwich of metal screen and glass fibre filter
- Connection of ChromCart® guard column cartridges via adaptor (MCN721359) (left side graphic above)

#### ChromCart® Column System (CC)



- 2, 3, 4 and 4.6 mm ID and lengths from 30 to 250 mm
- Connect hardware without tools
- Use the same end-fittings with or without guard columns
- Easily couple columns

## You Know Nucleosil® . . . You'll Love NUCLEODUR®!

In LC the efficiency of the packing is strongly affected by the quality of the base silica itself. Shortcomings in the surface geometry of the particles or metal contaminants are the main reasons for inadequate coverage with the covalently bonded alkylsilanes in the subsequent derivatisation steps.

- NUCLEODUR® silica is synthesized in a manufacturing process which provides silica particles that are totally spherical
- Highly pure silica is required for achieving symmetric peak shapes and maximum resolution
- NUCLEODUR® has low acidic surface silanols
- Inclusions of metal ions on the silica surface are largely responsible for tailing of chelators and basic compounds
- NUCLEODUR® is virtually free of metal impurities

Aluminium < 5 ppm	Iron < 5 ppm	Sodium < 5 ppm	Calcium < 10 ppm
Titanium < 1 ppm	Zirconium < 1 ppm	Arsenic < 0.5 ppm	Mercury < 0.05 ppm



### NUCLEODUR® Standard Phases

#### NUCLEODUR® C18 ec and C8 ec

##### The Workhorse for Daily Routine Analysis to Preparative HPLC

- Exceptional surface coverage with monomeric bonded alkylsilanes
  - Exhaustive endcapping
- Low silanol activity
  - Tailing-free elution of polar compounds such as basic drugs

#### NUCLEODUR® Cyano

- Multiple retention mechanisms: dipole-dipole,  $\pi$  -  $\pi$  -, and hydrophobic interaction
  - Intermediate polarity
  - Distinct selectivity for: polar organics,  $\pi$ -electron systems (e.g. analytes with double bonds, tricyclic antidepressants)
- Short chain bonded phase still remains stable to hydrolysis at low pH
- Cyano phase can run in normal or reverse phase mode
  - Columns for reverse phase use are shipped in acetonitrile / water
  - Columns for normal phase applications are shipped in n-heptane

	Dimensions (mm)	C18 ec	C8 ec	CN-RP	CN	Price
3µm	2 x 50	MCN76005020	MCN76006320	MCN76015920	N/A	\$381.50
	2 x 125	MCN76005120	MCN76006020	N/A	N/A	487.50
	3 x 50	MCN76005030	MCN76006330	N/A	N/A	394.60
	3 x 125	MCN76005130	MCN76006030	MCN76015730	N/A	492.90
	4.6 x 50	MCN76005046	MCN76006346	N/A	N/A	443.80
	4.6 x 150	MCN76005346	MCN76006146	MCN76015646	N/A	514.90
Guard	3 x 8	MCN76100530	MCN76101230	MCN76143030	N/A	171.60
	4 x 8	MCN76100540	MCN76101240	MCN76143040	N/A	171.60
5µm	2 x 50	MCN76000420	MCN76070020	N/A	N/A	321.40
	2 x 125	MCN76000120	MCN76070120	N/A	N/A	400.00
	3 x 125	MCN76000130	MCN76070130	N/A	N/A	336.70
	3 x 250	MCN76000230	MCN76070330	N/A	N/A	414.30
	4.6 x 150	MCN76000846	MCN76070246	MCN76015446	N/A	357.40
	4.6 x 250	MCN76000246	MCN76070346	MCN76015246	MCN76015046	437.20
Guard	3 x 8	MCN76110030	MCN76170430	N/A	N/A	144.30
	4 x 8	MCN76110040	MCN76170440	MCN76142040	MCN76141940	144.30

Adapter for 8mm Guard Cartridges . . . . . MCN721359 . . . . . \$86.10

## NUCLEODUR® PREMIUM PHASES

- Excellent performance in challenging analysis
- All phases are end-capped
- High carbon loadings
- Unique selectivities

### NUCLEODUR® C18 Isis

- C18 phase with polymeric surface modification
- Exceptional steric selectivity
- Outstanding surface deactivation
- pH stable from 1-10

Broad range of applications

In the past bonded phases prepared using multifunctional silanes (polymeric phases) lacked reproducibility. NUCLEODUR® C18 Isis uses an ingenious surface derivatisation and reliable control of all subsequent manufacturing steps provide lot to lot reproducibility

### NUCLEODUR® Gravity C8 and C18

- Base deactivation
  - Unique derivatisation process creates a high density of bonded alkylsilanes
  - Thorough endcapping suppresses polar interactions
  - 18% carbon loading
- The columns for method development
  - Broad pH tolerance, allows sophisticated analytical separations

### NUCLEODUR® C18 Pyramid

- C18 phase with hydrophilic endcapping, compatible with 100% water
- Excellent retention characteristics
  - Retains very polar compounds such as small organic acids
  - Hydrophobic retention comparable to standard C18 phases
- Base deactivated
  - Strong basic amines such as tricyclic antidepressant test mix do not show tailing or lack of base deactivation

### NUCLEODUR® Sphinx RP

- Distinct selectivity based on bifunctional surface coverage
  - Balance of C18 and phenyl groups
  - Combines C18 hydrophobic with phenyl  $\pi$ - $\pi$  interactions
  - Widens the scope in method development
- High density of covalently bonded silanes for sharp peaks without tailing
- pH stable from pH 1 - 10
  - Low bleed for LC/MS applications
- High reproducibility

	Dimensions (mm)	Isis C18	Gravity C18	Gravity C8	Pyramid C18	Sphinx RP	Price
3µm	2 x 50	MCN76040020	MCN76008020	N/A	MCN76026320	N/A	\$561.80
	2 x 125	MCN76040220	MCN76008120	N/A	MCN76026020	N/A	644.90
	3 x 50	MCN76040030	MCN76008030	N/A	MCN76026330	N/A	557.40
	3 x 125	MCN76040230	MCN76008130	N/A	MCN76026030	N/A	651.40
	4.6 x 50	MCN76040046	MCN76008046	N/A	MCN76026346	N/A	611.00
	4.6 x 150	MCN76040346	MCN76008346	N/A	MCN76026146	N/A	706.20
Guard	3 x 8	MCN76130030	MCN76112430	N/A	MCN76185430	N/A	183.70
	4 x 8	MCN76130040	MCN76112440	N/A	MCN76185440	N/A	183.70
5µm	2 x 50	MCN76041020	MCN76010220	MCN76075020	MCN76020020	MCN76080020	448.20
	2 x 125	MCN76041220	MCN76010020	MCN76075120	MCN76020120	MCN76080120	517.00
	3 x 125	MCN76041230	MCN76010030	MCN76075130	MCN76020130	MCN76080130	521.40
	3 x 250	MCN76041430	MCN76010130	MCN76075330	MCN76020230	MCN76080330	588.10
	4.6 x 150	MCN76041346	MCN76010346	MCN76075246	MCN76020346	MCN76080246	562.90
	4.6 x 250	MCN76041446	MCN76010146	MCN76075146	MCN76020246	MCN76080346	622.00
Guard	3 x 8	MCN76131030	MCN76112530	MCN76175430	MCN76180030	MCN76155030	183.70
	4 x 8	MCN76131040	MCN76112540	MCN76175440	MCN76180040	MCN76155040	183.70

Adapter for 8mm Guard Cartridges. . . . . MCN721359 . . . . . \$86.10

Feel like you're comparing apples and oranges buying columns?

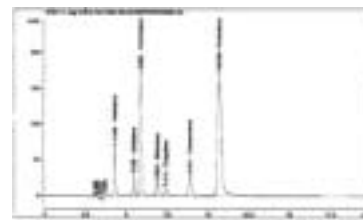


Our technical support department can help you find the right column for your analysis. Even if you need to compare apples and oranges!

### Determination of Organic Acids

NUCLEODUR® C18 Pyramid,  
5 µm, 250 x 4.6mm  
Product Number: MCN76180346  
0.02 M KH<sub>2</sub>PO<sub>4</sub>, pH 2.6  
Flow rate: 0.7 mL/min  
Inj. Volume: 20 µL  
Detection: UV, 250 nm

Substances: tartaric acid; malic acid;  
shikimic acid; lactic acid; acetic acid;  
citric acid; fumaric acid



# MACHEREY-NAGEL NUCLEOSIL® HPLC COLUMNS AND PACKINGS

**High bed stability** due to spherical particles

**High efficiency** due to narrow particle size distribution

**High separation performance** due to optimized binding techniques

**High chemical and mechanical stability**

**High load capacity and recovery rates**

**High reproducibility** from lot to lot

Pore diameters (50, 100, 120, 300, 500, 1000 and 4000 Å)

Particle sizes from 3 µm to 10 µm with very narrow fractionation.

All narrow-pore NUCLEOSIL® packings are stable up to 600 bar (8,500 psi)

NUCLEOSIL® 120 up to 800 bar (11,500 psi)

Wide-pore NUCLEOSIL® up to 300 or 400 bar (4,200 or 5,600 psi).

Contact our Technical Support Group at 1-800-267-8103 for column dimensions and product numbers.

## Planning a New Method?

Macherey-Nagel has used their experience producing NUCLEOSIL® to develop the next generation silica, NUCLEODUR®.

All NUCLEOSIL® phases are still available, and as reliable as ever. For new method development, check for equivalent NUCLEODUR® phases:

NUCLEOSIL® HD = NUCLEODUR® Gravity

NUCLEOSIL® Nautilus = NUCLEODUR® Pyramid

NUCLEOSIL® Protect I = NUCLEODUR® Pyramid

NUCLEOSIL® AB = NUCLEODUR® Isis

NUCLEOSIL® C<sub>18</sub>, C<sub>8</sub>ec = NUCLEODUR® C<sub>18</sub>ec, C<sub>8</sub>ec

NUCLEOSIL® CN = NUCLEODUR® CN

## NUCLEOSIL® - The Standard in HPLC

### Manufactured and Packed by Macherey-Nagel

NUCLEOSIL® is a family of totally porous spherical silica particles. They feature a very pure and uniform SiO<sub>2</sub> structure and have gained wide acceptance as outstanding chromatographic packing for very different fields of modern chromatography. Due to its particle sizes NUCLEOSIL® finds application in analytical as well as in preparative columns.

Functional Group		Pore Diameter (Å)							Particle Size
		50	100	120	300	500	1000	4000	
Base deactivated RP phases									
C <sub>18</sub> HD	Octadecyl, base deactivated monomer modification		• • •						3µm 5µm 7µm
C <sub>8</sub> HD	Octyl, base deactivated monomer modification		• •						3µm 5µm
C <sub>18</sub> NAUTILUS	Octadecyl, base deactivated embedded polar group for up to 100% aqueous eluents		• •						3µm 5µm
PROTECT I	Special RP phase base deactivated, monomer modification		• •						3µm 5µm
C <sub>18</sub> AB	Octadecyl, base deactivated polymer modification		• x						5µm
Standard RP phases									
C <sub>18</sub>	Octadecyl, endcapped	• x	• x • x • x • x	• x • x • x • x	• x x x	• x	• x	• x	3µm 5µm 7µm 10µm
C <sub>8</sub> ec	Octyl, endcapped	• x	• x						5µm
C <sub>8</sub>	Octyl, not endcapped		• x • x • x	• x x x	• x x x	x			3µm 5µm 7µm 10µm
C <sub>6</sub> H <sub>5</sub> ec	Phenyl, endcapped		• x						5µm
C <sub>6</sub> H <sub>5</sub>	Phenyl		• x • x	x	x	x	x		5µm 7µm
C <sub>4</sub>	Butyl			• x	• x • x x	x	x	x	5µm 7µm 10 µm
C <sub>2</sub>	Dimethyl		• x						7µm
Polar NUCLEOSIL® phases and NUCLEOSIL® ion exchangers									
CN	Cyano (Nitrile)		• x • x	• x	x	x			5µm 7µm 10µm
NO <sub>2</sub>	Nitro		• x x						5µm 10µm
OH	Diol		• • x		x	x	x	x	5µm 7µm
NH <sub>2</sub>	Amino		• x • x	• x	x				3µm 5µm 7µm

• = Available in pre-packed columns  
x = Available in bulk material

# COMMON SILICA-BASED HPLC COLUMNS

## HYPERASIL® COLUMNS

	Dimensions (mm)	ODS	MOS (C8)	Price	BDS-C18	Price
3µm	4.6 x 100	CK30103104630	CK30203104630	\$520.70	CK28103104630	\$601.40
	4.6 x 150	CK30103154630	CK30203154630	557.40	CK28103154630	645.40
5µm	4.6 x 100	CK30105104630	CK30205104630	454.70	CK28105104630	542.70
	4.6 x 150	CK30105154630	CK30205154630	498.70	CK28105154630	586.70
	4.6 x 250	CK30105254630	CK30205254630	542.70	CK28105254630	630.70
Guard	4.6 x 10*	CK30105014001	CK30205014001	Inquire	CK28105014001	Inquire

\*4 pack

## LICHROSPHER® CARTRIDGE COLUMNS (Require Holder CS50211845)

	Dimensions (mm)	RP-18	RP-18EC	RP-Select	RP-8	Price
5µm	4.0 x 125*	CS79925OD5643		CS79925SB56K	CS79925MO5643	Inquire
	4.0 x 125		CS79925ODE564	CS79925SB564		539.00
	4.0 x 250*	CS79925OD58K	CS79925OE58K	CS79925SB58K	CS79925MO58K	1,182.00
	4.0 x 250	CS79925OD584	CS79925ODE584	CS79925SB584	CS79925MO584	591.00

Cartridge Holder . . . . . CS50211845 . . . . . \$302.00

\*3 pack of cartridges

## LICHROSORB® COLUMNS

	Dimensions (mm)	RP-18	RP-8	Price
5µm	4.6 x 200	CS79915OD574	CS79915MO574	\$474.00
10µm	4.6 x 200	CS79915OD174	CS79915MO174	448.00

## PARTISIL® HPLC COLUMNS

Whatman Partisil® columns are packed with a high purity irregular silica gel in both 5 and 10µm particle sizes. Due to the greater surface area of the irregular Partisil®, the medium offers enhanced selectivity and loading capacity.

	Dimensions (mm)	ODS-3	ODS-2	C8	Silica	SAX	SCX	Price
5µm	4.6 x 100	WH4222225		WH4222232		WH4222227	WH4222228	\$686.60
	4.6 x 250	WH4238001		WH4239001	WH4215001			808.90
10µm	4.6 x 250	WH4228001	WH4224001	WH4229001	WH4216001	WH4226001	WH4227001	754.60

## Partisphere® 5µm HPLC COLUMNS

Partisphere® prepacked HPLC columns feature a 5µm spherical silica. Columns require one-time purchase of 4.6mm ID WVS end fittings: WH46311001, Pkg. 2 .....\$259.60

	Dimensions (mm)	C18	SAX	SCX	Price
5µm	4.6 x 125	WH46210502	WH46210505	WH46210507	\$508.90
	4.6 x 250	WH46211502	WH46211505	WH46211507	542.90
Guard			WH46410005	WH46410007	193.60

## INERTSIL®

Chromatographic Specialties Inc. has access to Inertsil® columns through a variety of channels. Contact our Technical Support Group for part numbers and availability.

## USP HPLC Packing Codes and their common names:

- L1** Octadecylsilane, ODS, C18
- L3** Silica, Sil
- L7** Octylsilane, C8, MOS
- L8** Aminopropylsilane, NH<sub>2</sub>, Amino
- L10** Nitrile, CN, Cyano
- L11** Phenylpropylsilane, Phenyl
- L13** Trimethylsilane, C1, TMS
- L16** Dimethylsilane, Dimethyl, RP-2
- L20** Dihydroxypropane, Diol
- L26** Butylsilane, C4, Butyl
- L30** Ethylsilane, C2
- L43** Pentafluorophenylpropyl, *PF<sub>5</sub>*, *PFPP*
- L45** Beta cyclodextrin, -Dex

### TECH TIP - Is it time to upgrade your column?

If you answer "yes" to one or more of these questions, the benefits of using a modern column may outweigh the costs of redeveloping a method.

- Are you paying a premium price because your column is in limited production?
- Are you using variable irregular silica packings?
- Do your peaks tail?
- Do your runs take more than 30 minutes each?
- Is your variable wavelength detector set at 254nm?

Call our Technical Support Team 1-800-267-8103 to discover if a more modern column will improve your bottom line.



## ALLURE™ AND ULTRA PHASES

### Aqueous C18

- Polar embedded, Non-encapped
- Highly selective phase for polar analytes, including acidic compounds
- Compatible with highly aqueous (up to 100%) mobile phases
- Highly base deactivated
- An excellent choice when analyzing a wide range of compounds, as in LC/MS screening methods

### PFP

- Pentafluorophenyl with a propyl spacer
- Highly retentive for basic analytes

### IBD

- Intrinsically base-deactivated (IBD) phase, containing a polar group near the hydrocarbon phase
- High base deactivation

## Available Application Notes



**ALLURE™ PFP Propyl & Ultra PFP HPLC Columns, Literature Code RKL59118A**



**ALLURE™ Basix, Ultra Cyano & IBD, Analyzing Cardiac Medications, Literature Code RKL59151**

## ALLURE™ HPLC PHASES

- Spherical 3µm or 5µm particles
- 60Å pores, very high specific surface area 550m²/g
- High carbon loads, high retention
- Excellent for LC/MS and ELSD analyses with high organic solvent concentrations
- High-purity, Type B silica gives excellent peak shapes for a wide range of columns

	Dimensions (mm)	C18	C18 Aq	Basix (Cyano)	PFP	Silica	Biphenyl	Price
3µm	0.3 x 50			RK916135B	RK916935B		RK916635B	\$494.60
	0.3 x 150			RK916136B	RK916936B		RK916636B	540.00
	3.2 x 50	RK9164353		RK9161353	RK9169353	RK9160353	RK9166353	Inquire
	3.2 x 100	RK9164313		RK9161313	RK9169313	RK9160313	RK9166313	Inquire
5µm	2.1 x 50	RK9164552	RK9168552	RK9161552	RK9169552	RK9160552	RK9166552	Inquire
	3.2 x 50	RK9164553	RK9168553	RK9161553	RK9169553	RK9160553	RK9166553	Inquire
	3.2 x 250	RK9164573	RK9168573	RK9161573	RK9169573	RK9160573	RK9166573	Inquire
	4.6 x 50	RK9164555	RK9168555	RK9161555	RK9169555	RK9160555	RK9166555	Inquire
	4.6 x 150	RK9164565	RK9168565	RK9161565	RK9169565	RK9160565	RK9166565	Inquire
	4.6 x 250	RK9164575	RK9168575	RK9161575	RK9169575	RK9160575	RK9166575	Inquire

## ULTRA HPLC PHASES

Restek's broadest selection of LC stationary phases

- Includes unique phases developed by Restek
- Spherical 3µm or 5µm particles
- 100Å pores
- High density bondings, for maximum retention
- High-purity, Type B silica gives excellent peak shapes for a wide range of compounds

	Dimensions (mm)	C18	C18 Aq	C8	Phenyl	IBD		Price
3µm	0.3 x 50	RK917435B	RK917835B					\$494.60
	0.3 x 150	RK917436B	RK917836B					540.00
	4.6 x 100	RK9174315	RK9178315	RK9103315	RK9105315	RK9175315		Inquire
5µm	4.6 x 150	RK9174565	RK9178565	RK9103565	RK9105565	RK9175565		Inquire
	4.6 x 250	RK9174575	RK9178575	RK9103575	RK9105575	RK9175575		Inquire
		PFP	Silica	Cyano	Amino			
5µm	4.6 x 100	RK9176315	RK9100315	RK9106315	RK9107315			Inquire
	4.6 x 150	RK9176565	RK9100565	RK9106565	RK9107565			Inquire
	4.6 x 250	RK9176575	RK9100575	RK9106575	RK9107575			Inquire

For guard columns and column hardware, including Trident™ Direct Connect fittings, see page 135.

## ALLURE™ ORGANIC ACIDS

- Enhanced retention and selectivity for polar organic acids
- Resolves key acids on a single 30cm column using AOAC 986.13
- Reproducible retention with the 100% aqueous mobile phase specified in AOAC 986.13

RK9165585	Allure™ Organic Acids, 300mm x 4.6mm, 5µm	\$653.70
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## ULTRA CARBAMATE COLUMNS

- Separates 10 target carbamates in just over 10 minutes
- Compatible with fluorescence or LC/MS
- Process samples up to twice as fast as general-purpose C18 columns
- Increased sample throughput, reduced solvent usage, reduced solvent waste

RK9177355	Ultra Carbamate, 50mm x 3.2mm, 3µm	\$516.10
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## ULTRA QUAT COLUMNS

- Retentive, high-purity, base deactivated reversed phase packing
- Ideal for paraquat and diquat when used with Ultra Quat Reagent Solution

RK9181565	Ultra Quat, 150mm x 4.6mm, 5µm	\$453.70
RK32441	Ultra Quat Reagent Concentrate	67.70

## RESTEK Viva™ WIDEPORE SILICA

Viva™ columns are based on a wide pore material Restek designed for optimal large molecule separations.

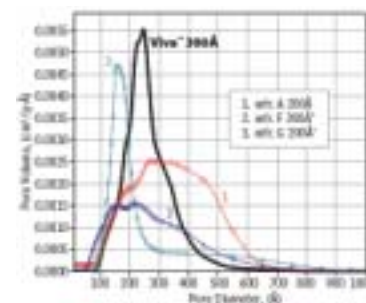
Many wide-pore silicas meet the standard 300Å mean pore size, however most have very broad distributions about this mean, with a significant portion of their pore volume falling below 150Å. This means the majority of the surface area is unavailable for interaction with larger molecules.

Viva™ columns have a narrow distribution about the mean pore size, permitting a larger portion of the silica surface to play a role in the separation.

- Excellent for separating peptides or proteins
- Rugged, spherical particles, with 300Å pore size
- High proportion of pore/surface area available to large molecules

	Dimensions (mm)	C18	C8	C4	Biphenyl	PFP	Silica	Price
3µm	0.3 x 50	RK951435B						\$494.60
	0.3 x 150	RK951436B						540.00
	2.1 x 50	RK9514352						449.10
	2.1 x 150	RK9514362						517.30
	3 x 50	RK9514353						449.10
	3 x 150	RK9514363						517.30
	4.6 x 50	RK9514355						449.10
	4.6 x 150	RK9514365						517.30
5µm	2.1 x 50	RK9514552	RK9513552	RK9512552	RK9516552	RK9519552	RK9510552	363.80
	2.1 x 150	RK9514562	RK9513562	RK9512562	RK9516562	RK9519562	RK9510562	425.20
	3 x 150	RK9514563	RK9513563	RK9512563	RK9516563	RK9519563	RK9510563	425.20
	3 x 250	RK9514573	RK9513573	RK9512573	RK9516573	RK9519573	RK9510573	485.50
	4.6 x 150	RK9514565	RK9513565	RK9512565	RK9516565	RK9519565	RK9510565	425.20
	4.6 x 250	RK9514575	RK9513575	RK9512575	RK9516575	RK9519575	RK9510575	485.50

Viva™ silica has a majority of pores in the 250-350Å range (BJH desorption)



\* Materials F and G are 200Å materials being sold as 300Å.

The tight distribution of pore sizes with Viva™ provides the most available surface area for retention of large biomolecules.

## RESTEK pHidility™ C18

- Stable under extreme pH conditions
- Polycarbosi-lane barrier layer
  - Protects silica particle from aggressive basic conditions
- Functional group (C18) layer attached to barrier layer
  - Stationary phase is resistant to acid catalysed hydrolysis
- More consistent retention times over the lifetime of the column
- True C18 selectivity

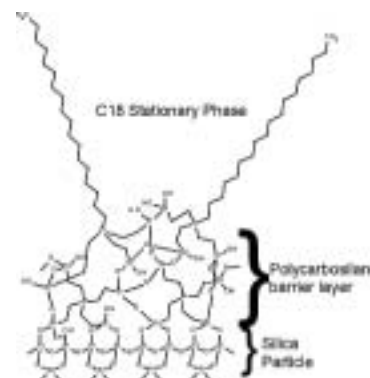
Particle size: 3µm

Pore size: 200Å

pH range: 1 to 12

Temperature limit: 80°C

	Dimensions (mm)	C18	Price
3µm	4.6 x 30	RK9579335	\$500.30
	4.6 x 50	RK9579355	500.30
	4.6 x 100	RK9579315	517.30
	4.6 x 150	RK9579365	534.30
Guard Cartridges	10 x 4.0	RK957930210	168.40
	20 x 4.0	RK957930220	168.40



### pHidility™ Particle Structure

Barrier layer protects silica particles and provides a solid attachment for C18 phase material over a broad pH range

The applications and literature listed here are a small sampling of what is available for Restek HPLC. Contact our Technical Support Group at 1-800-267-8103 for information on your analysis.

# RESTEK HPLC COLUMNS

## Pinnacle II™ PAH 4 μm COLUMNS

- Specialized polymeric C18 bonding
- Uses a simple water/acetonitrile mobile phase gradient
- Unique shape selectivity provides baseline resolution for all 16 PAHs listed in EPA 610
- Every lot tested to ensure baseline resolution of the Method 610 PAHs

If you are analyzing PAHs, Pinnacle II™ PAH columns are the reliable, cost-effective columns you need.

Product Number	Description	Price
RK9219463	Pinnacle™ II PAH, 3.2 x 150mm	\$554.00



For more information on Restek HPLC Products, request literature code **RK73**.

## SONIC DEBUBBLER

- Fast
- Easy to use
- Less solvent waste; less clean-up



Just touch the Sonic Debubbler to the inlet line or check valve — sonic vibrations will quickly dislodge or redissolve trapped air bubbles. Reduces downtime or conversion time from one mobile phase to another.

RK20444	Sonic Debubbler	\$337.00
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## Pinnacle™ DB - Replaces Hypersil® BDS

- Spherical 5μm particles
- 140Å pores
- Highly base deactivated
- Silica manufactured at Restek for total control of quality and reproducibility
- Good general purpose packing with a moderate surface area. Pinnacle™ DB is an excellent match for Hypersil® BDS in particle size, pore size, and most importantly in overall performance.

	Dimensions (mm)	Silica	C18	C8	Cyano	NEW 1.9μm Packing	Price
1.9 μm	2.1 x 30	RK9410232	RK9414232	N/A	N/A		\$513.50
	2.1 x 50	RK9410252	RK9414252	N/A	N/A		536.90
	2.1 x 100	RK9410212	RK9414212	N/A	N/A		606.90
3 μm	4.6 x 30	N/A	RK9414335	RK9413335	N/A		360.70
	4.6 x 50	N/A	RK9414355	RK9413355	N/A		378.10
	4.6 x 100	N/A	RK9414315	RK9413315	N/A		403.80
5 μm	4.6 x 150	RK9410565	RK9414565	RK9413565	RK9416565		403.80
	4.6 x 250	RK9410575	RK9414575	RK9413575	RK9416575		434.20

## Pinnacle II™ - Replaces Hypersil® and Pinnacle™

- Good general purpose packing, moderate surface area
- Spherical 3μm or 5μm particles, 110Å pores
- Silica manufactured at Restek for total control of quality and reproducibility
- Excellent replacement for the original Hypersil® material
- Physical and chromatographic properties similar to original Pinnacle™ materials but with enhanced lot-to-lot uniformity

	Dimensions (mm)	Silica	Amino	C18	C8	Cyano	Phenyl	Price
3 μm	4.6 x 30	RK9210335	RK9217335	RK9214335	RK9213335	RK9216335	RK9215335	\$280.10
	4.6 x 50	RK9210355	RK9217355	RK9214355	RK9213355	RK9216355	RK9215355	298.80
	4.6 x 100	RK9210315	RK9217315	RK9214315	RK9213315	RK9216315	RK9215315	316.30
5 μm	4.6 x 150	RK9210565	RK9217565	RK9214565	RK9213565	RK9216565	RK9215565	322.10
	4.6 x 250	RK9210575	RK9217575	RK9214575	RK9213575	RK9216575	RK9215575	359.50

## Kromasil® Packed by Restek

- High-purity silica with few silanol sites, high surface area, and excellent mechanical stability
- Good alternative when separating basic compounds such as pharmaceuticals
- Particle size: 3.5μm or 5μm, spherical
- Pore size: 100Å
- pH range: 1.5 to 10
- Column ID: 2.1-4.6mm
- Column Length: 50-250mm

	Dimensions (mm)	C1	C4	Amino	Phenyl	C8	C18	Price
3.5 μm	4.6 x 30	N/A	N/A	N/A	N/A	RK9203535	RK9204535	\$310.30
	4.6 x 50	N/A	N/A	N/A	N/A	RK9203555	RK9204555	310.30
	4.6 x 100	N/A	N/A	N/A	N/A	RK9203515	RK9204515	338.80
5 μm	4.6 x 150	RK9201565	RK9202565	RK9207565	RK9205565	RK9203565	RK9204565	379.80
	4.6 x 250	RK9201575	RK9202575	RK9207575	RK9205575	RK9203575	RK9204575	413.80

# RESTEK HPLC COLUMN HARDWARE

## Trident™ INTEGRAL HPLC GUARD COLUMN SYSTEM

- Convenient and economical leak-free guard column system
- Extremely easy to install
- Versatile configuration protects against all levels of contamination
- Integral design eliminates troublesome tubing connections



The system's foundation consists of the analytical column configured with the exclusive Trident™ end fitting and XF fitting. The XF fitting holds a replaceable cap frit, which can easily be changed without disturbing the packed bed. Changing the external frit can reverse the effects of accumulated particles, such as high backpressure or peak distortion. To obtain this basic configuration, simply order any Restek HPLC column, and add the suffix -700 to the catalogue number for the column.

For maximum protection against contaminants and particulate matter, add a guard cartridge. Order the XG-XF fitting for the length of the cartridge you want and a package of guard cartridges. Guard cartridges are available in 2.1 and 4.0mm ID and are interchangeable within the appropriate length holder.

Product Number	Description	Price
RK25026	XG-XF Fitting for 10mm Guard Cartridge	\$28.30
RK25062	XG-XF Fitting for 20mm Guard Cartridge	28.30
RK25024	Replacement XF Filter Fitting	28.30

## Trident™ DIRECT GUARD COLUMN SYSTEM

This economical, leak-free cartridge holder is convenient, economical, and reliable. The foundation of the Trident™ Direct system is a reusable direct connect holder that easily attaches to any HPLC column using CPI style end fittings. The direct holder can be used with Waters® with the optional Waters® tip.



RK25082	High-pressure filter	\$101.50
RK25083	10mm guard cartridge holder w/o filter	101.50
RK25084	10mm guard cartridge holder w filter	127.30
RK25085	20mm guard cartridge holder w/o filter	101.50
RK25086	20mm guard cartridge holder w filter	127.30
RK25088	PEEK tip, Waters®-style end fittings	15.50
RK25087	Replacement PEEK® tip, standard end fittings	15.50

## Trident™ HPLC IN-LINE GUARD CARTRIDGE HOLDERS

A Trident™ in-line guard cartridge holder can be used with almost any HPLC column by connecting it with a short piece of 1/16" tubing, appropriate nuts and ferrules, or finger-tight fittings. Compatible with either Restek columns or columns from other manufacturers.



RK25021	Holder for 10mm guard cartridge	68.10
RK25040	Holder with filter for 10mm guard cartridge	95.20
RK25061	Holder for 20mm guard cartridge	68.10
RK25060	Holder with filter for 20mm guard cartridge	95.20

## REPLACEMENT CAP FRITS (for Trident™ In-line, Direct, and Integral cartridge holders with filters)

RK25022	Replacement cap frits 4mm 2.0µm, Pkg. 5	\$34.80
RK25023	Replacement cap frits 4mm 0.5µm, Pkg. 5	41.10
RK25057	Replacement cap frits 2mm 2.0µm, Pkg. 5	41.10

## Guard Cartridges from Restek Protect your analytical column

### How To Determine Ordering Part Number

Choose the packing material for your guard cartridge from the LC phase table below and add the appropriate part number suffix from the Dimension Suffix table.

For example the product number for a Pinnacle™ DB C18 4.0x20mm guard cartridge is RK941450220.

## RESTEK LC PHASES

Phase	Number
Pinnacle™ DB C8	RK9413-
Pinnacle™ DB C18	RK9414-
Pinnacle™ DB Cyano	RK9416-
Pinnacle™ DB Silica	RK9410-
Pinnacle II™ Amino	RK9217-
Pinnacle II™ C8	RK9213-
Pinnacle II™ C18	RK9214-
Pinnacle II™ Cyano	RK9216-
Pinnacle II™ PAH	RK9219-
Pinnacle II™ Phenyl	RK9215-
Pinnacle II™ Silica	RK9210-
Allure™ Basix	RK9161-
Allure™ C18	RK9164-
Allure™ PFP Propyl	RK9169-
Allure™ Silica	RK9160-
Allure™ Organic Acids	RK9165-
Allure™ Aqueous C18	RK9168-
Ultra Amino	RK9107-
Ultra Aqueous C18	RK9178-
Ultra C1	RK9101-
Ultra C4	RK9102-
Ultra C8	RK9103-
Ultra C18	RK9174-
Ultra Carbamate	RK9177-
Ultra Cyano	RK9106-
Ultra IBD	RK9175-
Ultra PFP	RK9176-
Ultra Phenyl	RK9105-
Ultra Silica	RK9100-
Ultra Quat	RK9181-
Viva™ C18	RK9514-
Viva™ Silica	RK9510-

## DIMENSION SUFFIX

Dimension/Qty	Number
2.1 x 10mm, Pkg. 3	-50212
4.0 x 10mm, Pkg. 3	-50210
2.1 x 20mm, Pkg. 2	-50222
4.0 x 20mm, Pkg. 2	-50220

### Pricing

Pinnacle™ DB guard cartridge packs: **\$168.40**

Pinnacle II™ guard cartridge packs: **\$168.40**

All Other Restek guard cartridge packs: **\$168.40**



# JONES HPLC COLUMNS

## GENESIS® FROM GRACE VYDAC

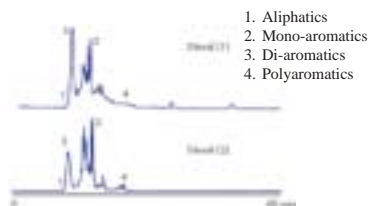
Be Tempted . . .

- Reversed phase HPLC packing material with enhanced stability in acidic and basic media
- Capable of coping with a wide range of analytes including many basic drugs which have traditionally been difficult to chromatograph
- No complex additives or ion-pairing reagents are required, due to a superb balance of high purity silica and high quality bonding techniques
- Evaluated by a comprehensive range of modern analytical techniques, including DRIFT, 29 Si CP-MAS NMR, X-ray fluorescence, plus many discrimination chromatographic probes
- C18 and C8 materials with a wide applicability to pharmaceutical, environmental, food and natural product analyses
- Packed in Jones Finesse™ cartridge column hardware for maximum performance.

### For hydrocarbon and fuel analysis try the GENESIS® Petro XL

4.6 mm x 250 mm, two columns in series. Different brands of diesel fuel can be differentiated by their fingerprint and differing aromatic content.

Flow: 1.0 mL/min Eluent: 100% Hexane  
Detection: Absorbance, 254 nm



1. Aliphatics
2. Mono-aromatics
3. Di-aromatics
4. Polyaromatics

Product Number	Description	Price
JCFM25991E	Genesis® Petro XL, 4.6 x 250mm, 3µm with endfittings	\$692.30

## APEX™ FROM GRACE VYDAC

An economical line of columns based on conventional 100 Å pore size spherical silica. These are quality products with uniform-sized spherical particles, narrow particle size distribution, limited porosity range, and controlled surface area. These properties provide packed beds of maximum efficiency and reproducibility.

## Genesis® HPLC COLUMNS - Complete with Reusable Endfittings

	Dimensions (mm)	C18	C8	AQ	Phenyl		Price
3µm	2.1 x 50	JCFK5963E	JCFK5968E	N/A	N/A		\$595.60
	2.1 x 100	JCFK10963E	JCFK10968E	N/A	N/A		586.20
	4.6 x 100	JCFM10963E	JCFM10968E	N/A	N/A		Inquire
	4.6 x 150	JCFM15963E	JCFM15968E	N/A	N/A		560.50
4µm	2.1 x 50	JCFK5960E	JCFK5962E	JCFK5951E	JCFK5980E		Inquire
	2.1 x 100	JCFK10960E	JCFK10962E	JCFK10951E	JCFK10980E		Inquire
	2.1 x 150	JCFK15960E	JCFK15962E	JCFK15951E	JCFK15980E		Inquire
	2.1 x 250	JCFK25960E	JCFK25962E	JCFK25951E	JCFK25980E		Inquire
	3.0 x 150	JCFL15960E	JCFL15962E	JCFL15951E	JCFL15980E		Inquire
	4.6 x 150	JCFM15960E	JCFM15962E	JCFM15951E	JCFM15980E		Inquire
	4.6 x 250	JCFM25960E	JCFM25962E	JCFM25951E	JCFM25980E		Inquire

## Genesis® HPLC REPLACEMENT CARTRIDGES

	Dimensions (mm)	C18	C8	AQ		Price
3µm	4.6 x 100	JCFM10963	JCFM10968	N/A		\$467.30
	4.6 x 150	JCFM15963	JCFM15968	N/A		Inquire
4µm	2.1 x 50	JCFK5960	JCFK5962	N/A		Inquire
	2.1 x 100	JCFK10960	JCFK10962	N/A		464.40
	2.1 x 150	JCFK15960	JCFK15962	JCFK15951		Inquire
	3.0 x 150	JCFL15960	N/A	JCFL15951		Inquire
	4.6 x 150	JCFM15960	JCFM15962	JCFM15951		Inquire
	4.6 x 250	JCFM25960	JCFM25962	N/A		534.60
4µm Guard	2.1 x 10	JCFK19602	JCFK19622	JCFK19512		Inquire
	2.1 x 20	JCFK29602	N/A	JCFK29512		Inquire
	3.0 x 20	JCFL29602	JCFL29622	N/A		192.10
	4.0 x 20	JCFH29602	JCFH29622	JCFH29512		Inquire

Direct Connect Holder for 2.1mm x 10mm Guard Cartridges . . . . .	JCF9141P . . . . .	\$143.40
Direct Connect Holder for 3-4mm x 10mm Guard Cartridges . . . . .	JCF9151P . . . . .	\$140.60
Direct Connect Holder for 3-4mm x 20mm Guard Cartridges . . . . .	JCF9152P . . . . .	\$174.10

## APEX™ HPLC COLUMNS - Conventional Hardware

	Dimensions (mm)	C18	C8	Cyano (RP)	Silica	Amino	Cyano (NP)	Price
3µm	4.6 x 100	JC4M10313	JC4M10323	N/A	JC4M10384	N/A	N/A	Inquire
	4.6 x 150	JC4M15313	JC4M15323	N/A	JC4M15384	N/A	N/A	Inquire
5µm	4.6 x 30	JC4M3310P	JC4M3320P	JC4M3358P	JC4M3300P	JC4M3340P	JC4M3350P	Inquire
	4.6 x 50	JC4M5310	JC4M5320	JC4M5358	N/A	JC4M5340	JC4M5350	Inquire
	4.6 x 100	JC4M10310	JC4M10320	JC4M10358	JC4M10300	JC4M10340	JC4M10350	382.90
	4.6 x 150	JC4M15310	JC4M15320	JC4M15358	JC4M15300	JC4M15340	JC4M15350	415.60
	4.6 x 250	JC4M25310	JC4M25320	JC4M25358	JC4M25300	JC4M25340	JC4M25350	469.60
5µm Guard	4.0 x 10	JCFH13102	JCFH13202	Inquire	JCFH13002	JCFH13402	JCFH13502	176.70
	4.0 x 20	JCFH23102	JCFH23202	Inquire	JCFH23002	JCFH23402	JCFH23502	Inquire

Stand-Alone Holder for 10mm Guard Cartridges . . . . .	JCF9111P . . . . .	\$143.40
Stand-Alone Holder for 20mm Guard Cartridges . . . . .	JCF9112P . . . . .	\$174.10

## BROWNLEE™ CARTRIDGE COLUMNS AND HARDWARE

### Spheri-5™ and Spheri-10™

	Column Size	C8	C18	C18 Polymeric	Phenyl	Cyano
5μm	2.1 x 30	BGS0852 \$180.00	BGS1852 \$240.00	BGS2252 \$174.00	N/A	N/A
	2.1 x 100	BRS0854 \$455.90	BRS1854 \$419.90	BRS2254 \$293.60	N/A	N/A
	2.1 x 220	BRS0856 \$611.90	BRS1856 \$455.90	BRS2256 \$647.90	N/A	N/A
	4.6 x 30	BGS0851 \$240.00	BGS1851 \$240.00	BGS2251 \$252.00	BGS2451 \$276.00	BGS2851 \$240.00
	4.6 x 100	BRS0853 \$551.90	BRS1853 \$336.00	BRS2253 \$539.90	BRS2453 \$503.90	BRS2853 \$419.90
	4.6 x 220	BRS0855 \$827.90	BRS1855 \$791.90	BRS2255 \$791.90	BRS2455 \$827.90	BRS2855 \$731.90
	4.6 x 250*	BCS0851 \$731.90	BCS1851 \$887.90	BCS2251 \$731.90	N/A	N/A
10μm	4.6 x 30	BGS0811 \$222.00	BGS1811 \$252.00	N/A	N/A	N/A
	4.6 x 100	BRS0813 \$372.00	BRS1813 \$635.90	N/A	N/A	N/A
	4.6 x 220	N/A	BRS1815 \$611.90	N/A	N/A	N/A
	4.6 x 250*	N/A	BCS1811 \$731.90	N/A	N/A	N/A
7μm	NewGuard	BGA3870 \$180.00	BGA2270 \$180.00	BGA2270 \$180.00	BGA2470 \$192.00	BGA2870 \$180.00

\*Conventional Column, no extra hardware required.

### OPTIMIZE OPTI-GUARD® 1mm and 1mm BIOCOMPATIBLE GUARD COLUMNS

OPTI-GUARD® 1mm Guard Columns set the standard for low-impact, easy to use pre-column protection. The unique floating stem design automatically adjusts to any manufacturer's tube stop depth for a zero-dead-volume connection every time. No larger than a standard fitting, the OPTI-GUARD® 1mm requires no special connecting hardware or tools for installation.

Special packing materials are selected to compliment the OPTI-GUARD®'s narrow ID, providing effective protection for your analytical column without influencing your chromatography. Fully disposable, simply switch out the OPTI-GUARD® 1mm as needed to maintain effective column protection.

1mm Biocompatible OPTI-GUARD® products have all the features of the standard OPTI-GUARD® but all materials are inert and biocompatible.

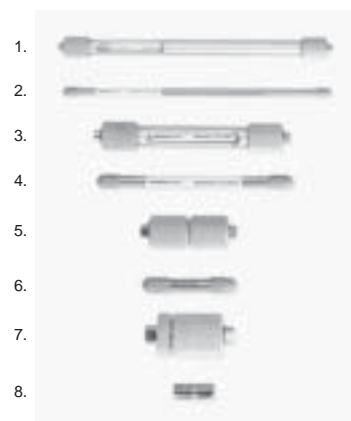
Product Number	Description	Qty	Price
M100200007	Guard Column C18	5	\$265.60
M100200010	Guard Column C8	5	265.60
M100200018	Guard Column Phenyl	5	265.60
M100200022	Guard Column Cyano/CN	5	265.60
M100200034	Guard Column Cation Exchange	5	265.60
M100203532	Biocompatible Guard Column C18 BIO	5	319.90
M100203534	Biocompatible Guard Column Silica BIO	5	319.90
M100203680	Biocompatible Guard Column Anion Exchange	5	319.90
M100203683	Biocompatible Guard Column Cation Exchange	5	319.90
M100200014	Guard Column Silica	5	265.60
M100203211	Guard Column C4	5	277.60
M100200030	Guard Column Anion Exchange	5	265.60
M100200026	Guard Column Amino/NH <sub>2</sub>	5	265.60
M100201714	Method Development Kit C18, C8, Silica, Phenyl, CN	1	277.60

### BROWNLEE™ CARTRIDGE COLUMN HARDWARE

When you establish a new method with Brownlee™ cartridges, you need to purchase the correct fittings.

If you are not familiar with Brownlee™ hardware, please call our Technical Support Group at 1-800-267-8103.

Product Number	Description	Price
BH203	30mm Holder Body	\$54.00
BH003	100mm Holder Body	66.00
BH403	220mm Holder Body	90.00
BH300	Column Coupler / NewGuard Direct Connect Holder	234.00
BH250	Column End-fitting	114.00
BH600	NewGuard End-fitting	192.00
BH601	NewGuard Holder	276.00
BH200	30mm Kit	288.00
BH230	100mm Kit	288.00
BH400	220mm Kit	288.00



1. 220mm Brownlee Cartridge and Hardware
2. 220mm Brownlee Cartridge
3. 100mm Brownlee Cartridge and Hardware
4. 100mm Brownlee Cartridge
5. 30mm Brownlee Hardware (cartridge not visible)
6. 30mm Brownlee Cartridge
7. NewGuard Hardware
8. NewGuard Cartridge

# ZirChrom® HPLC COLUMNS

## Zirconia is:

- Stable from pH 1-14
- Stable up to 200°C
- Compatible with all organic solvents
- Physically robust

## ZirChrom®-PS

- Extremely thin layer of polystyrene on the zirconia particle
- Offers alternative selectivity
- Ideal for non-polar analytes and highly aqueous mobile phases

## ZirChrom®-PBD

- Extremely thin layer of polybutadiene on zirconia
- Selectivity similar to C18 silica based column for non-ionic analytes
- Easy method transfer from ODS silica

## ZirChrom®-MS

- Very different selectivity for basic drugs compared to bonded phase C18 silica using LC-MS
- pH stable from 1 to 10
- Analyze acidic, basic and neutral analytes simultaneously
- Low bleed

## ZirChrom®-EZ

- Easy to use
- Metal chelator group deactivates Lewis acid sites
- Stable from pH 1 to 10
- Alternative selectivity

## ZirChrom®-SAX

- Polyethyleneimine coated for strong anion exchange

## ZirChrom®-SHAX

- Quaternized polyethyleneimine coated zirconia for strong hydrophilic anion exchange

## ZirChrom®-WAX

- Cross linked polyethyleneimine coated zirconia for weak anion exchange

## ZirChrom®-WCX

- Phosphate coated zirconia for weak cation exchange

## ZirChrom®-PEZ

- EDTA coated zirconia for cation exchange

Visit our website at:

[www.chromspec.com/literature/literature%20request.html#Zirchrom](http://www.chromspec.com/literature/literature%20request.html#Zirchrom)

for additional information on Zirchrom's HPLC solutions.

## ZirChrom® ZIRCONIA BASED HPLC COLUMNS

ZirChrom® columns let you use the full range of pH, organic solvents, and temperature (up to 200°C) to maximize selectivity and speed for your HPLC methods. Zirconia, or zirconium dioxide (ZrO<sub>2</sub>), is a metal oxide that can exist in a number of crystallographic and amorphous forms. The porous zirconia that is used for ZirChrom® columns is produced through the controlled polymerization induced aggregation of 1000Å colloidal zirconia to produce monodisperse 3µm porous zirconia spheres.

## ZirChrom® REVERSE PHASE COLUMNS

	Dimensions (mm)	Zirchrom® PBD	Zirchrom® PS	Zirchrom® MS	Zirchrom® EZ		Price
3µm	2.1 x 50	CHZR030521	CHZR090521	CHMS010521	CHEZ010521		\$728.40
	2.1 x 100	CHZR031021	CHZR091021	CHMS011021	CHEZ011021		728.40
	2.1 x 150	CHZR031521	CHZR091521	CHMS011521	CHEZ011521		753.70
	4.6 x 50	CHZR030546	CHZR090546	CHMS010546	CHEZ010546		728.40
	4.6 x 100	CHZR031046	CHZR091046	CHMS011046	CHEZ011046		728.40
	4.6 x 150	CHZR031546	CHZR091546	CHMS011546	CHEZ011546		753.70
5µm	2.1 x 50	CHZR0305215	CHZR0905215	CHMS0105215	CHEZ0105215		665.50
	2.1 x 100	CHZR0310215	CHZR0910215	CHMS0110215	CHEZ0110215		665.50
	2.1 x 150	CHZR0315215	CHZR0915215	CHMS0115215	CHEZ0115215		690.90
	4.6 x 50	CHZR0305465	CHZR0905465	CHMS0105465	CHEZ0105465		665.50
	4.6 x 100	CHZR0310465	CHZR0910465	CHMS0110465	CHEZ0110465		665.50
	4.6 x 150	CHZR0315465	CHZR0915465	CHMS0115465	CHEZ0115465		690.90
Guard	2.0 x 10	CHZR03G20	CHZR09G20	CHMS01G20	CHEZ01G20		251.20
	4.0 x 10	CHZR03G40	CHZR09G40	CHMS01G40	CHEZ01G40		251.20

## ZirChrom® REVERSE PHASE COLUMNS (cont'd)

	Dimensions (mm)	DiamondBond™ C18	Zirchrom® Carb		Price
3µm	2.1 x 50	CHDB010521	CHZR010521		\$855.20
	2.1 x 100	CHDB011021	CHZR011021		855.20
	2.1 x 150	CHDB011521	CHZR011521		880.50
	4.6 x 50	CHDB010546	CHZR010546		855.20
	4.6 x 100	CHDB011046	CHZR011046		855.20
	4.6 x 150	CHDB011546	CHZR011546		880.50
5µm	2.1 x 50	CHDB0105215	CHZR0105215		792.30
	2.1 x 100	CHDB0110215	CHZR0110215		792.30
	2.1 x 150	CHDB0115215	CHZR0115215		817.70
	4.6 x 50	CHDB0105465	CHZR0105465		792.30
	4.6 x 100	CHDB0110465	CHZR0110465		792.30
	4.6 x 150	CHDB0115465	CHZR0115465		817.70
Guard	2.0 x 10	CHDB01G20	CHZR01G20		276.60
	4.0 x 10	CHDB01G40	CHZR01G40		276.60

## ZirChrom® ION EXCHANGE COLUMNS

	Dimensions (mm)	SAX	SHAX	WAX	WCX	PEZ	Price
3µm	2.1 x 50	CHZR060521	CHZR070521	CHZR050521	CHZR040521	CHZR020521	\$728.40
	2.1 x 100	CHZR061021	CHZR071021	CHZR051021	CHZR041021	CHZR021021	728.40
	2.1 x 150	CHZR061521	CHZR071521	CHZR051521	CHZR041521	CHZR021521	753.70
	4.6 x 50	CHZR060546	CHZR070546	CHZR050546	CHZR040546	CHZR020546	728.40
	4.6 x 100	CHZR061046	CHZR071046	CHZR051046	CHZR041046	CHZR021046	728.40
	4.6 x 150	CHZR061546	CHZR071546	CHZR051546	CHZR041546	CHZR021546	753.70
3µm Guard	4.0 x 10	CHZR06G40	CHZR07G40	CHZR05G40	CHZR04G40	CHZR02G40	251.20
	2.0 x 10	CHZR06G20	CHZR07G20	CHZR05G20	CHZR04G20	CHZR02G20	251.20

# HAMILTON POLYMERIC HPLC COLUMNS

## HAMILTON PRP® REVERSE PHASE COLUMNS

Column Size	PRP®-h1 (5µm)	PRP®-h5 (5µm)	PRP®-1 (5µm)	PRP®-1 (10µm)	PRP®-3 (10µm)	PRP®-∞ (4µm)
2.1 x 100	H79250 \$579.20	H79270 \$591.30	H79790 \$499.90			H79748 \$557.20
2.1 x 150	H79249 \$640.10	H79271 \$652.30	H79366 \$557.20	H79480 \$449.90	H79392 \$598.60	
4.1 x 100	H79252 \$579.20	H79262 \$591.30	H79479 \$499.90	H79565 \$436.50		
4.1 x 150	H79253 \$640.10	H79272 \$652.30	H79444 \$557.20	H79425 \$449.90	H79466 \$598.60	
4.1 x 250	H79256 \$835.20	H79273 \$847.40	H79820 \$727.90	H79427 \$570.60	H79794 \$727.90	
Guard Kit	H79257 \$304.40		H79447 \$208.50	H79447 \$208.50	H79123 \$297.60	
Cartridges	H79258 \$338.20		H79445 \$228.20	H79445 \$228.00	H79454 \$228.00	

## HAMILTON PRP® ION EXCHANGE AND ION EXCLUSION COLUMNS

Column Size	PRP®-X100 (5µm)	PRP®-X100 (10µm)	PRP®-X110 (7µm)	PRP®-X110S (7µm)	PRP®-X200 (10µm)	PRP®-X300 (7µm)
2.1 x 150	H79852* \$757.20	H79421 \$598.60	H79744* \$622.80	H79745* \$622.80	H79394 \$598.60	H79396 \$598.60
2.1 x 250	H79190 \$827.90	H79346 \$727.90	H79746* \$757.20	H79747* \$757.20	H79397 \$729.90	H79397 \$727.90
4.1 x 100	H79538 \$625.50	H79439 \$557.20	H79730 \$579.70	H79731 \$579.70	H79363 \$557.20	
4.1 x 150	H79434 \$598.60		H79732 \$622.80	H79733 \$622.80	H79441 \$598.60	H79464 \$570.60
4.1 x 250		H79433 \$727.90	H79734 \$757.20	H79735 \$759.20	H79442 \$727.90	H79465 \$742.50
4.6 x 150	H79174* \$757.20	H79354* \$656.00	H79738* \$682.40	H79739* \$682.40	H79384* \$656.00	H79475* \$652.30
4.6 x 250	H79181* \$882.70	H79355* \$1,498.50	H79740* \$816.80	H79741* \$885.30	H79357* \$785.20	H79386* \$785.20
Guard Kit	H79448 \$208.50	H79448 \$208.50	H79726 \$220.70	H79726 \$220.70	H79456 \$212.10	H79460 \$212.10
Cartridges	H79446 \$228.00	H79446 \$228.00	H79728 \$242.30	H79728 \$242.30	H79449 \$232.90	H79453 \$232.90
Column Size	PRP®-X400 (7µm)	PRP®-X500 (7µm)	PRP®-X600 (7µm)	PRP®-X800 (7µm)		
4.1 x 150	H79717 \$692.50			H79855 \$643.80		
4.6 x 150		H79573* \$656.00	H79188* \$614.50	H79851* \$807.50		
4.6 x 250	H79387* \$899.80	H79189* \$757.20	H79829* \$816.80			
Guard Kit	H79459 \$208.50	H79319* \$453.60	H79361* \$291.40	H79830 \$220.70		
Cartridges	H79452 \$228.00	H79320* \$254.80	H79362* \$254.80	H79832 \$242.30		

## HAMILTON RCX AND HC ION EXCHANGE COLUMNS

Column Size	RCX-10 (7µm)	RCX-30 (7µm)	HC-40 (10-15µm)	HC-75 CA <sup>2+</sup> (9µm)	HC-75 Pb <sup>2+</sup> (9µm)	HC-75 H <sup>+</sup> (9µm)
4.1 x 250	H79440 \$727.90	H79803 \$727.90		H79431 \$727.90		H79476 \$727.90
7.8 x 305			H79432 \$842.50	H79436 \$842.50	H79438 \$1,048.60	H79544 \$842.50
Guard Kit	H79462 \$212.10	H79371* \$291.40	H79133 \$297.60	H79133 \$297.60	H79133 \$297.60	H79133 \$297.60
Cartridges	H79463 \$228.00	H79372* \$254.80	H79134 \$197.90	H79134 \$197.90	H79134 \$197.90	H79134 \$197.90

\* PEEK® Column

## HAMILTON HPLC COLUMNS

The column dimensions listed on this page are our most commonly requested. Columns listed are stainless steel unless otherwise indicated. For other column dimensions or for PEEK® columns, please call our Technical Support Group at 1-800-267-8103.

## HAMILTON BULK PACKING MATERIAL

Hamilton PRP® and HxSil packing material is available by the gram for packing analytical, preparative or SPE columns. A selection of particle sizes from 3µm to 75µm are available, depending on the support.

## GUARD KITS AND CARTRIDGES

Guard Kits come with the cartridge holder hardware, and two cartridges. Replacement cartridges come in packages of 5.

Unless indicated, the part numbers listed on this page are for stainless steel hardware and cartridges.



Photo courtesy of Jordanna Andrews



# VICI Jour HPLC TUBING

**Pressure limits on 316 grade stainless steel** are 5300 psi for, 1/16" OD, 1mm ID tubing. We strongly suggest that customers do not try to determine values for narrower bore 1/16" stainless steel tubing experimentally.

**\*\* Polymeric tubing pressure limits** are recommended maximum permanent working pressure (measured with ACN/water 1:1 at room temperature for PEEK® tubing). Elevated temperatures and aggressive solvents can lower the pressure tolerance of polymer tubing.

## NO-OX TUBING

Ensure that degassed solvents stay degassed until reaching the HPLC pump.

Co-extruded FEP and PVDF tubing

- Low permeability PVDF prevents "re-gassing"
- PTFE provides excellent chemical resistance

NOTE: PVDF is not very chemically resistant, but the PVDF layer can easily be stripped from the FEP with a VICI Jour Clean-Cutter or a razor blade so that only FEP contacts the solvent in the solvent reservoir. A special KEL-F tubing insert (P/N C44614110) prevents solvent from contacting the PVDF layer at the tubing end in the valve port. The ferrule fits into the ID of the tubing and seals against the bottom of the port.

Product Number	Description	Price
C446130	No-Ox tubing, 1/8" x 1.65 mm ID, 2m	\$31.50
C446130S10M	No-Ox tubing, 1/8" x 1.65 mm ID, 10m	\$150.50
C446140	No-Ox fitting kit: KEL-F inserts, PEEK® nuts, ETFE ferrules, 2 each	\$15.80
C44614110	KEL-F insert for No-Ox fitting, 10	\$35.50
C445507110	Flangeless 1/4"-28 PPS 1/8" nut, 10	\$17.80
C445508310	Adapter, PP, fingertight sleeve, black, 10	\$7.10
C4405110	1/8" ETFE ferrule, 10	\$19.00

## 1/16" OD 316 STAINLESS STEEL TUBING

I.D.	Product Number	Price (10 ft.)	Product Number	Price (100 ft.)
0.004"	VTSS104S10F	\$33.20	VTSS104S100F	\$312.20
0.005"	VTSS105S10F	33.20	VTSS105S100F	312.20
0.010"	VTSS110S10F	33.20	VTSS110S100F	312.20
0.020"	VTSS120S10F	33.20	VTSS120S100F	312.20
0.030"	VTSS130S10F	33.20	VTSS130S100F	312.20
0.040"	VTSS140S10F	33.20	VTSS140S100F	312.20

## SHORT LENGTH 316 STAINLESS STEEL CAPILLARY TUBING

Description	.005" ID	.010" ID	.020" ID	.030" ID	.040" ID	Price (Pkg. 2)
OD	Length	Product Number	Product Number	Product Number	Product Number	
1/32"	5 cm	C32940	C32942	C32944	-	\$7.70
	10 cm	C32950	C32952	C32954	-	7.70
	20 cm	C32960	C32962	C32964	-	9.90
1/16"	5 cm	C32900	C32902	C32904	C32906	7.70
	10 cm	C32910	C32912	C32914	C32916	7.70
	20 cm	C32920	C32922	C32924	C32926	9.90
	30 cm	C32930	C32932	C32934	C32936	12.10

## PEEK® TUBING — STRIPED COLOUR CODED STRAIGHT TUBING (10ft lengths)\*

				Striped Tubing		Dual Layer Tubing	
OD (in)	ID mm (in)	Colour Code	Pressure Limit (psi)**	Product Number	Price (10ft)	Product Number	Price (10ft)
1/16"	0.064 (0.002)	Pink	6300	C445998	\$27.90	—	—
	0.13 (0.005)	Red	6100	C445999	27.90	C446007D	\$28.00
	0.18 (0.007)	Yellow	5800	C446000	27.90	C446008D	28.00
	0.25 (0.010)	Blue	5600	C446001	27.90	C446009D	28.00
	0.50 (0.020)	Orange	4500	C446002	27.90	C446010D	28.00
	0.75 (0.030)	Green	3500	C446003	27.90	C446011D	28.00
	1.00 (0.040)	Grey	2400	C4460031	27.90	—	—
	1.40 (0.055)	Black	750	C4460032	27.90	—	—
1/8"	0.75 (0.070)	Natural	5000	C4460041	43.30	—	—
	1.59 (0.060)	Natural	3250	C446004	43.30	—	—
	2.00 (0.080)	Natural	2400	C4460042	43.30	—	—
1/4"	3.17 (0.125)	Natural	3300	C446006	234.60	—	—

\* Other lengths may be available. Please call our Technical Support Group for further information.

## LOW PRESSURE POLYMERIC TUBING

	OD (in)	ID	Pressure Limit (psi)**	Product Number	Price (10 ft.)	Product Number	Price (100 ft.)
Tefzel (ETFE)	1/16"	0.01"	2700	VTTZ11010	\$23.30	VTTZ110100	\$204.10
	1/16"	0.02"	2200	VTTZ12010	23.30	VTTZ120100	204.10
	1/16"	0.03"	1700	VTTZ13010	23.30	VTTZ130100	204.10
	1/8"	0.063"	1600	VTTZ26010	35.00	VTTZ260100	314.90
Teflon (PTFE)	1/16"	0.006"	900	VTTF10610	14.00	VTTF106100	128.30
	1/16"	0.010"	800	VTTF11010	14.00	VTTF110100	128.30
	1/16"	0.020"	700	VTTF12010	14.00	VTTF120100	128.30
	1/16"	0.030"	550	VTTF13010	14.00	VTTF130100	128.30
	1/16"	0.040"	350	VTTF140S10F	14.90	VTTF140S100F	148.60
	1/8"	0.060"	500	VTTF26010	17.50	VTTF260100	151.60
	3/16"	3.76mm	200	C444041	11.40	C44041S100F	118.10

## ONE-PIECE COLOUR CODED PEEK® FINGERTIGHT FITTINGS

Product Number	Description	Price
C44550205	Fingertight Fitting — Natural, Pkg. 5	\$23.70
C44550215	Fingertight Fitting — Black, Pkg. 5	23.70
C44550225	Fingertight Fitting — Red, Pkg. 5	23.70
C44550235	Fingertight Fitting — Yellow, Pkg. 5	23.70
C44550245	Fingertight Fitting — Blue, Pkg. 5	23.70
C44550255	Fingertight Fitting — Green, Pkg. 5	23.70

## PEEK® FINGERTIGHT NUTS AND SINGLE FERRULES

C4455705	Nut, Fingertight, 10-32, 1/16", Pkg. 5	\$24.90
C4450035	Ferrule, Single, 1/16", Peek, Pkg. 5	14.20

## PEEK® NUTS AND DOUBLE FERRULES

C4455805	PEEK® Handtight Nut, Pkg. 5	\$24.90
C4455105	PEEK® Hex-Head Nut, Pkg. 5	27.30
C4450045	PEEK® Double-Ferrule, Pkg. 5	14.20

## PEEK® ONE-PIECE COLUMN COUPLER

C4426501	One-piece Column Coupler, 0.13mm ID, Red	21.30
C4426502	One-piece Column Coupler, 0.18mm ID, Yellow	21.30
C4426503	One-piece Column Coupler, 0.25mm ID, Blue	21.30
C4426504	One-piece Column Coupler, 0.50mm ID, Orange	21.30

## 1/4-28 LOW PRESSURE FITTINGS, PEEK® FLANGE-FREE FITTINGS, 1/16"

C442012410	Flange-Free — Natural, Pkg. 10	\$62.80
C442012510	Flange-Free — Yellow, Pkg. 10	62.80
C442012610	Flange-Free — Red, Pkg. 10	62.80
C442012710	Flange-Free — Blue, Pkg. 10	62.80
C442012810	Flange-Free — Green, Pkg. 10	62.80
C442012910	Flange-Free — Black, Pkg. 10	62.80
C4404110	1/16" ETFE Ferrule, Pkg. 10	19.00

## 1/4-28 LOW PRESSURE PEEK® FLANGE-FREE FITTINGS, 1/8"

C442011610	Flange-Free — Natural, Pkg. 10	\$62.80
C442011410	Flange-Free — Yellow, Pkg. 10	62.80
C442011510	Flange-Free — Red, Pkg. 10	62.80
C442011310	Flange-Free — Blue, Pkg. 10	62.80
C442011210	Flange-Free — Green, Pkg. 10	62.80
C442011710	Flange-Free — Black, Pkg. 10	62.80
C4405110	1/8" ETFE Ferrule, Pkg. 10	19.00

## 1/4-28 LOW PRESSURE PEEK® FITTINGS WITH COLLAPSIBLE FERRULE

VCFL1A	1/16" Nut & CTFE Ferrule — Assorted Colours, Pkg. 12	\$23.30
VCFL1APK	1/16" Nut & PEEK® Ferrule — Assorted Colours, Pkg. 12	23.30
VCFL1Y	1/16" Nut & CTFE Ferrule — Yellow, Pkg. 5	11.70
VCFL1R	1/16" Nut & CTFE Ferrule — Red, Pkg. 5	11.70
VCFL1BE	1/16" Nut & CTFE Ferrule — Blue, Pkg. 5	11.70
VCFL1G	1/16" Nut & CTFE Ferrule — Green, Pkg. 5	11.70
VCFL1BK	1/16" Nut & CTFE Ferrule — Black, Pkg. 5	11.70
VCFLCB1KF	1/16" CTFE Ferrule, Pkg. 10	12.80
VCFLCB1PK	1/16" PEEK® Ferrule, Pkg. 10	12.80
VCFL2A	1/8" Nut & CTFE Ferrule — Assorted Colours, Pkg. 12	23.30
VCFL2APK	1/8" Nut & PEEK Ferrule — Assorted Colours, Pkg. 12	23.30
VCFL2Y	1/8" Nut & CTFE Ferrule — Yellow, Pkg. 5	11.70
VCFL2R	1/8" Nut & CTFE Ferrule — Red, Pkg. 5	11.70
VCFL2BE	1/8" Nut & CTFE Ferrule — Blue, Pkg. 5	11.70
VCFL2G	1/8" Nut & CTFE Ferrule — Green, Pkg. 5	11.70
VCFL2BK	1/8" Nut & CTFE Ferrule — Black, Pkg. 5	11.70
VCFLCB2KF	1/8" CTFE Ferrule, Pkg. 10	12.80
VCFLCB2PK	1/8" PEEK® Ferrule, Pkg. 10	12.80

### TECH TIP — The Added Value of Fingertight Fittings

Fingertight fittings allow the operator to change columns with more ease because the ferrule is never swaged onto the tubing. With standard stainless steel fittings, the ferrule becomes swaged onto the tubing and should be replaced with a new nut and ferrule if a new connection is being made. PEEK® fingertight fittings also allow for biocompatible applications and require no tools to install.

### One-Piece Colour Coded PEEK® Fingertight Fittings

- Work with all 1/16" OD tubing and female 10-32 ports
- Colour coded — six colours identify tubing lines
- 100% inert and biocompatible
- Non-extractable dye — will not interfere with your analysis

### VICI Jour Single Ferrules

- Pressure rating: < 280 bar (4000 psi)
- Reusable nut, replaceable ferrule
- Hex style nuts allow wrench tightening when space is limited (Caution: polymeric nuts can break under undue pressure)

### VICI Jour Double Ferrules

- High pressure rating - up to 420 bar (6000 psi)
- Ideal for use with 1/16" PEEK® tubing
- Fits any 10-32 female fitting

### PEEK® Colour-Coded Flangeless Nuts

- Flange-free - compatible with all 1/4"-28 flat bottom ports
- Excellent chemical resistance
- Available for 1/16" and 1/8" tubing
- Fingertight - no tools required
- Inert ETFE ferrule is the only part in contact with the fluid

### 1/4-28 Nuts with Collapsible Ferrules

- Excellent chemical resistance
- For 1/16" or 1/8" tubing, 1/4"-28 threads
- The collapsible ferrule makes a very effective seal on a narrow area with no distortion of the tubing. No flanging tool is required.
- Use CTFE (Kel-F) ferrules for soft tubing (PTFE, FEP, etc.), but use PEEK® ferrules for harder tubing (Tefzel, polyurethane, etc.)

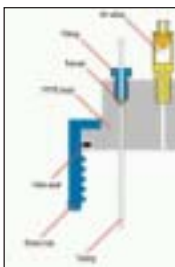
### 10-32 HIGH PRESSURE FITTINGS

Stainless steel nuts and ferrules are listed on pages 190-191.

# CAPS FOR SAFE SOLVENT STORAGE AND HANDLING FROM SCAT

## SCAT Safety Caps

Conventional caps for HPLC solvent bottles do not prevent organic vapours from escaping into the lab. The small gaps needed to allow air to replace the solvent pumped from the bottle also allow volatile solvents to diffuse out. The SCAT Safety Cap system seals solvent bottles tightly, even while they are in use. The heart of the system is a one way valve. When solvent is pumped from the bottle, the valve opens and equalises pressure. When the pump stops, the valve closes and the vapour remains in the bottle. The seals between the cap, solvent lines, and bottle are all made with air tight fittings.



## Safety Waste Caps

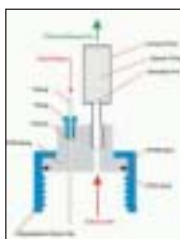
Unlike solvent reservoirs, air is displaced from waste bottles during operation. SCAT Safety Waste Caps remove organic vapours from displaced air with an activated charcoal filter.

Three sizes of filter are available:  
 24 gram (29m<sup>2</sup>) - 3 month lifespan  
 48 gram (58m<sup>2</sup>) - 6 month lifespan  
 100 gram (120m<sup>2</sup>) - 12 month lifespan

Lifespans are approximate, and based on use with a single HPLC. If multiple instruments share the same waste container, filter life will be proportionally shorter.



Waste Cap with funnel



Waste Cap Schematic

## Options for Waste Caps

Waste caps are available with optional barbed fittings for drip trays, funnels for manual solvent disposal, and grounding wires to reduce the risk of explosion from static discharge.

SCAT Europe GmbH is an ISO9001 certified manufacturer of environmental and solvent safety products. Their products are well regarded in Europe, and Chromatographic Specialties Inc. is delighted to introduce the SCAT line to Canada.

SCAT Safety Caps and Safety Waste Caps keep your lab environment healthier and your solvents cleaner. By sealing solvent vapours in the bottle, SCAT caps reduce organic vapours in lab air by approximately 73%, and prevent differential evaporation of mixed solvents.



## SOLVENT BOTTLE SAFETY CAPS

Thread Size	Fittings	Product Number	Price
GL 45	1 x 1/4-28	SCT107019	\$113.90
	2 x 1/4-28	SCT107909	126.00
	3 x 1/4-28	SCT107910	133.00
	1 x 3/16	SCT108032	130.00
	1 x 1/4-28 with stopcock	SCT107119	183.10
	2 x 1/4-28 with stopcocks	SCT107979	205.40
	3 x 1/4-28 with stopcocks	SCT107920	211.10
	1 x 1/4-28, 1 x 1/4-28 with stopcock	SCT107219	196.00
	1 x 1/4-28, 2 x 1/4-28 with stopcocks	SCT107319	222.40
GL 80	1 x 1/4-28	SCT107030	206.70
	2 x 1/4-28	SCT107031	211.00
	3 x 1/4-28	SCT107032	219.60

## REPLACEMENT AIR VALVE FOR SOLVENT BOTTLE CAPS

The air valve should be replaced approximately every 6 months for best function.

Product Number	Description	Price
SCT107010	Air Valve	\$42.70

## SAFETY WASTE CAPS

Thread Size	Fittings	Product Number	Price
GL 45	3 x 1/4-28	SCT107912	\$103.60
	2 x 1/4-28, 1 x 6-8mm barbed elbow	SCT107923	110.40
S 51	3 x 1/4-28	SCT107930	147.00
	2 x 1/4-28, 1 x 6-8mm barbed elbow	SCT107922	158.60
	3 x 1/4-28, grounded	SCT107935	175.20
	2 x 1/4-28, 1 x 6-8mm barbed elbow, grounded	SCT107942	199.70
GL 80	4 x 1/4-28	SCT107033	243.30
	4 x 1/4-28, 1 x 6-8mm barbed elbow	SCT107029	236.80
B 83 (Nalgene Carboys)	4 x 1/4-28	SCT107034	363.80
	4 x 1/4-28, 1 x 6-8mm barbed elbow	SCT107036	342.30
	4 x 1/4-28, Funnel	SCT108151	622.40

## Don't see the size of cap you need?

We have only listed a few of the more common cap sizes, and fitting arrangements. Contact our Technical Support Team at 1-800-267-8103 for information on the other sizes of cap, or to request a custom arrangement of fittings on your cap.

We also list a range of adapters for common bottle sizes on the following page.

# CAPS FOR SAFE SOLVENT STORAGE AND HANDLING FROM SCAT

## CHARCOAL FILTERS FOR WASTE CAPS

Filter Size	Description	Product Number	Price
24 grams	Standard	SCT107911	\$103.60
	With splash guard	SCT107985	122.50
48 grams	Standard	SCT107914	155.90
	With splash guard	SCT107982	179.00
100 grams	Standard	SCT107615	216.70
	With splash guard	SCT107986	239.30

## ADAPTERS FOR CHARCOAL FILTERS

The charcoal filter is the bulkiest portion of a SCAT cap. These adapters let you move the filter to a more convenient position. Extenders, pivots and elbows can be used in combination to position filter most effectively.

Description	Product Number	Price
Stem Extender	SCT107621	\$48.80
Offset - Pivot	SCT107622	100.20
Elbow	SCT107624	74.50

## THREAD ADAPTERS FOR SCAT CAPS

As well as expanding the range of bottles that SCAT caps can be used on, these adapters allow you to use larger caps (and more fittings) than the standard cap.

Bottle	Cap	Material	Product Number	Price
GL-38 (4L solvent bottle)	GL 45	PP	SCT107992	\$75.10
	GL 45	PTFE	SCT107995	62.90
GL 45	S 55	PP	SCT117094	87.60
	S 55	PTFE	SCT107094	62.90
2" BSP	S 60 (female)	PP	SCT108021	42.70
	S 60 (male)	PP	SCT108022	42.70
2" Drum	S 63 - S 65	PP	SCT108444	44.60

## 1/8" NPT FITTINGS

These adapters replace the 6-8mm barbed elbow on Safety Waste Caps. The parts below are for retrofitting or repairing existing installations. For new installations, call our Technical Support Group at 1-800-267-8103 and have your SCAT caps configured to your specifications.

Configuration	Fits Tubing	Material	Product Number	Price
Straight barbed connector	2-3 mm ID	PP	SCT107811	\$13.50
	3-4 mm ID	PP	SCT107812	13.50
	4-5 mm ID	PP	SCT107813	13.50
	5-6 mm ID	PP	SCT107814	13.50
	6-8 mm ID	PP	SCT107816	13.50
	10 mm ID	PP	SCT107817	13.50
Elbow barbed connector	6.4-8.0 mm ID	PP	SCT107808	13.50
	9.5-10.5 mm ID	PP	SCT107810	13.50
Straight 1/4-28 adapter	3 x 1/16" or 1/8" OD	PTFE*	SCT160132	73.50
Elbow 1/4-28 adapter	3 x 1/16" or 1/8" OD	PTFE*	SCT160131	92.30
	2 x 1/16" or 1/8" OD, 1 x 1/8" NPT	PTFE*	SCT160130	92.30

\* Wetted surfaces are PTFE.

## Filter Splash Guards

Splash caps are recommended for waste containers with funnels or any other application where drips or spills from solvents could shorten the life of the filters.



## Fitting SCAT Caps Into Your Lab

SCAT Safety caps are a new concept for North America; however, familiar parts are used. The following standard fitting sizes are used:

Solvent Lines - 1/4-28 fittings

Leak Connectors - 1/8" NPT

Air Valves - 1/4-28, male and female  
luer

Chromatographic Specialties is pleased to supply you with solvent and waste bottles matched to your new SCAT caps, but we'd be even happier if we can fit caps into your existing system. We have included the most common cap sizes on these pages. For the complete SCAT catalogue, as well as a handy guide to identifying the thread size(s) of your current bottles, call our Technical Support Group at 1-800-267-8103.

## SOLVENT AND WASTE BOTTLES

Product Number	Description	Price
CS93011421	1L GL45 Solvent Bottle	\$17.60
CS93016342	2L GL45 Solvent Bottle	24.30
N264711	5L GL45 Solvent Bottle	310.00
C62510	10L Carboy	72.80
C62520	20L Carboy	105.70



# IN-LINE HPLC FILTERS

## OPTI-SOLV® In-Line Filtration



OPTI-SOLV® features a unique swivel design that allows access to the filter compartment without removal of the connecting tubing; once the tubing and fittings are connected to the stainless steel inserts, there is no need to remove them again. Gorilla-grip Holders\* are hand-tightened, making frit changes a snap.

\* Gorilla-grip holders give you a gorilla's grip, they do not require a gorilla's grip.

## Mini-, Micro- and Nano- Filters



The OPTI-SOLV® Mini Filter provides low-impact filtering in a package no larger than a finger tight fitting. Use them as a last line of defense against debris.

Mini-Filters use a multi-layer depth filtration system to provide lasting protection in a compact package. Micro- and Nano-Filters have 200nL and 50nL internal volumes for the most critical applications.

## A Premium In-Line

The OPTI-LYNX™ In-Line Filter System features Optimize Technologies' proprietary OPTI-LYNX™ hardware, allowing filter changes to be done in a quick quarter-turn. OPTI-LYNX™ In-Line Filters also offer unmatched versatility with a choice of eight different filter insert porosity/diameter combinations for every possible filtering need.



## Aqueous IFD™ and Solvent IFD™



Whatman in-line filter/degassers (IFD) connect directly into an HPLC line to simultaneously filter and degas the mobile phase as it is being used. The Aqueous IFD provides pure filtration of aqueous based HPLC mobile phases while the Solvent IFD is used with organically based HPLC mobile phases. Specifically, the Aqueous IFD is designed to work with mobile phases containing at least 20% aqueous component.

## OPTIMIZE OPTI-SOLV® IN-LINE FILTERS

Product Number	Description	Qty	Price
M100402372	OPTI-SOLV® In-Line Filter, Gorilla-grip, 0.2µm Includes holder, fittings and 2 filter elements, 316 SS	1	\$177.00
M100400386	OPTI-SOLV® In-Line Filter, Gorilla-grip, 0.5µm Includes holder, fittings and 2 filter elements, 316 SS	1	177.00
M100400391	OPTI-SOLV® In-Line Filter, Gorilla-grip, 2µm Includes holder, fittings and 2 filter elements, 316 SS	1	177.00
M100402371	OPTI-SOLV® In-Line Filter, wrench-tight, 0.2µm Includes holder, fittings and 2 filter elements, 316 SS	1	196.70
M100400383	OPTI-SOLV® In-Line Filter, wrench-tight, 0.5µm Includes holder, fittings and 2 filter elements, 316 SS	1	196.70
M100400390	OPTI-SOLV® In-Line Filter, wrench-tight, 2µm Includes holder, fittings and 2 filter elements, 316 SS	1	196.70
M100402370	OPTI-SOLV® Replacement Frits, 0.2µm	10	90.30
M100400100	OPTI-SOLV® Replacement Frits, 0.5µm	10	88.50
M100400103	OPTI-SOLV® Replacement Frits, 2µm	10	88.50

## OPTIMIZE OPTI-SOLV® MINI-FILTER, MICRO-FILTER, NANO-FILTER

M100400095	OPTI-SOLV® Mini-Filter, 0.5µm, SS frit	5	\$226.90
M100400097	OPTI-SOLV® Mini-Filter, 2µm, SS frit	5	226.90
M100402768	OPTI-SOLV® Mini Filter, 5µm, SS frit	5	226.90
M100403621	OPTI-SOLV® Biocompatible Micro Filter, 0.5µm, Ti frit	5	271.60
M100403357	OPTI-SOLV® Micro Filter, 1µm, SS frit	5	253.50
M100403389	OPTI-SOLV® Micro Filter, 2µm, SS screen	5	253.50
M100403707	OPTI-SOLV® Micro Filter, 10µm, SS screen	5	253.50
M100403625	OPTI-SOLV® Biocompatible Nano Filter, 0.5µm, Ti frit	5	271.60

## OPTI-LYNX™ IN-LINE FILTERS

M1102225AA	OPTI-LYNX™ In-Line Filter/Trap Hardware Kit	1	\$202.50
M1102595CM	OPTI-LYNX™ Filter Frit, 0.2µm 0.187" Dia, SS	1	27.90
M1102797CM	OPTI-LYNX™ Filter Frit, 0.2µm 0.187" Dia, SS	10	235.10
M1102595CH	OPTI-LYNX™ High Capacity Filter Frit, 0.5µm/0.187" Dia, SS	1	25.40
M1102797CH	OPTI-LYNX™ High Capacity Filter Frit, 0.5µm/0.187" Dia, SS	10	220.90
M1102595CI	OPTI-LYNX™ High Capacity Filter Frit, 2.0µm/0.187" Dia, SS	1	25.40
M1102797CI	OPTI-LYNX™ High Capacity Filter Frit, 2.0µm/0.187" Dia, SS	10	220.90
M1102595CD	OPTI-LYNX™ Low Volume Filter Frit, 0.5µm/0.062" Dia, SS	1	25.40
M1102797CD	OPTI-LYNX™ Low Volume Filter Frit, 0.5µm/0.062" Dia, SS	10	220.90
M1102595CE	OPTI-LYNX™ Low Volume Filter Frit, 2.0µm/0.062" Dia, SS	1	25.40
M1102797CE	OPTI-LYNX™ Low Volume Filter Frit, 2.0µm/0.062" Dia, SS	10	220.90
M1102595CF	OPTI-LYNX™ Medium Capacity Filter Frit, 0.5µm/0.125" Dia, SS	1	25.40
M1102797CF	OPTI-LYNX™ Medium Capacity Filter Frit, 0.5µm/0.125" Dia, SS	10	220.90
M1102595CG	OPTI-LYNX™ Medium Capacity Filter Frit, 2.0µm/0.125" Dia, SS	1	25.40
M1102797CG	OPTI-LYNX™ Medium Capacity Filter Frit, 2.0µm/0.125" Dia, SS	10	220.90
M1102595CJ	OPTI-LYNX™ Semi-Prep Filter Frit, 2.0µm/0.250" Dia, SS	1	30.90
M1102797CJ	OPTI-LYNX™ Semi-Prep Filter Frit, 2.0µm/0.250" Dia, SS	10	259.90
M1102595CL	OPTI-LYNX™ Semi-Prep Filter Frit, 10.0µm/0.250" Dia, SS	1	30.90
M1102797CL	OPTI-LYNX™ Semi-Prep Filter Frit, 10.0µm/0.250" Dia, SS	10	259.90

## WHATMAN IN-LINE FILTER DEGASSER (IFD)

The Solvent IFD is designed to work with mobile phases containing at least 30% organic component.

WH67265002	Aqueous IFD, 50mm, 0.2µm Nylon Media	10	\$165.70
WH67255002	Solvent IFD, 50mm, 0.2µm Polypropylene Media	10	165.70

# HPLC SOLVENT RESERVOIR FILTERS

## OPTIMIZE OPTI-SOLV® TITANIUM / PTFE RESERVOIR FILTERS

Product Number	Description	Qty	Price
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### Analytical Filters - 1/16" OD Tubing

M100400079	2 µm	1	\$60.80
M100400080	2 µm	5	292.10
M100400081	10 µm	1	60.80
M100400082	10 µm	5	292.10

### Analytical Filters - 1/8" OD Tubing

M100400047	2 µm	1	60.80
M100400050	2 µm	5	292.10
M100400051	10 µm	1	60.80
M100400053	10 µm	5	292.10

### Analytical Filters - 3/16" OD Tubing

M100400054	2 µm	1	60.80
M100400056	2 µm	5	292.10
M100400057	10 µm	1	60.80
M100400058	10 µm	5	292.10

## OPTIMIZE HASTELLOY C® RESERVOIR FILTERS

### Analytical Filters - 1/16" OD Tubing

M100400115	2 µm	1	\$55.00
M100400119	2 µm	5	248.80
M100400111	10 µm	1	55.00
M100400114	10 µm	5	248.80

## VICI Jour SS FILTERS

Product Number	Porosity	Pipe OD	Max Flow Rate	Qty	Price
C443670082	2 µm	1/8"	8 mL/min.	1	\$15.50
C4436700810	10 µm	1/8"	20 mL/min.	1	15.50
C443670162	2 µm	1/16"	8 mL/min.	1	15.50
C4436701610	10 µm	1/16"	20 mL/min.	1	15.50
C4436782	2 µm	1/8"	50 mL/min.	1	35.50
C44367825	25 µm	1/8"	100 mL/min.	1	35.50

## VICI Jour BIOCOMPIBLE FILTERS (NO-MET)

Product Number	Porosity	Qty	Price
C4432171	No-Met Mobile Phase Filter, 5 µm	1	\$21.30
C4432172	Replacement PTFE Filter Element, 5 µm	1	11.90

## VICI Jour LAST DROP FILTERS AND FILTER/SPARGER

C4490000640	SS Filter 2 µm/Stainless Steel Sparger 10 µm	1	\$52.10
C4490000642	SS Filter 10 µm/Stainless Steel Sparger 10 µm	1	52.10
C4490000530	Last Drop Filter 2.5 µm Stainless Steel Filter	1	22.60
C4490000532	Last Drop Filter 10 µm Stainless Steel Filter	1	22.60
C4490000522	Last Drop Filter with 10 µm Teflon Filter	1	22.60

To keep particulates out of your system, start at the most basic level - the reservoir bottle.



OPTI-SOLV® Reservoir Filters employ a unique conical design inside the filter housing preventing air bubbles from getting trapped and disturbing your analysis.

The Optimize Solvent Reservoir Filters are made of Hastelloy C® for maximum corrosion resistance. For extended flow systems and where flow rates exceed 10 mL/minute a 10µm filter is required. For most analytical applications the 2µm filter is desired. All filters accept 1/8" ID Teflon tubing.



VICI Jour mobile phase filters protect HPLC systems from small particles in the mobile phase. These filters are made from 316 stainless steel with PEEK or PTFE connectors and are suitable for most solvents. The complete line has versions for both analytical and preparative applications.

- No-Met Biocompatible Mobile Phase Filters
- Inert and biocompatible
- Replaceable filters
- Recommended for ion chromatography
- Last Drop Filter/Sparger
- Parallel filtering and sparging
- SS frits or biocompatible PTFE frits
- Three different porosities
- Combine filtration and sparging in a single unit

Need advice on polymers?

Unsure when to use PEEK® or PTFE?

Contact our Technical Support Group at 1-800-267-8103 or tech@chromspec.com

# GENUINE AGILENT HPLC CONSUMABLES AND SUPPLIES



## Plunger Seals

To get the greatest life time and reliability from your PTFE or PE seals, check your mobile phase components on the solvent compatibility table listed on page 150.

## Seal Wash Kits

The routine use of highly concentrated buffer solutions (>100mM) will reduce the life of the seals and pistons in your 1100/1200 Series pump. You can counteract the problem with one of Agilent's seal wash kits, which flush the backside of the seal with a wash solvent. The continuous seal wash uses gravity to supply the wash solvent. It is compatible with all 1050, 1100, and 1200 standard and capillary pumps. The active seal wash uses a peristaltic pump to supply the wash solvent. It is compatible with 1100 and 1200 series pumps with the following (or higher) serial numbers:

G1310A: DE40906378  
G1311A: DE40926032  
G1312A: DE40914884

## AGILENT QUIET COVER II

Agilent has a solution to the annoying, frequent maintenance of LC/MS rough pumps as well as the inherent noise they produce. The Quiet Cover II was designed for easy movement, maintenance, and better living with rough pumps used with Agilent and other LC/MS systems. The Quiet Cover II is compatible with many popular BOC Edwards rough pump models including E2M28, E1M28, E2M18, and E1M18.

- Locking castors to move heavy pump for maintenance
- Built in Lift and Tilt lever raises end of pump to drain oil
- Sound absorbing cabinet with resistant foam insulation to reduce pump noise

Product Number	Description	Price
CSG3199B	Quiet Cover II	\$2,965.00

Chromatographic Specialties Inc. carries the full line of Agilent Technologies replacement parts for HPLC and LC/MS instruments. A selection of the most popular, commonly ordered parts follows below. If you don't see the part you are looking for, please contact our Technical Support Group at 1-800-267-8103 or tech@chromspec.com.

## SUPPLIES FOR THE AGILENT 1100 AND 1200 SERIES HPLCs

### AGILENT IN-LINE FILTERS

Product Number	Description	Qty	Price
CS0109068702	Low-dispersion In-Line filter, 2µm frit	1	\$152.00
Z280959904	Replacement 2µm frits for low dispersion filter	10	66.30
Z280959907	Replacement 0.5µm frits for low dispersion filter	10	79.70
CS0109068703	Universal In-Line filter, 2µm frit	1	192.00
CS0109027609	Replacement 2µm frits for Universal filter	2	45.80
CSG131160006	In-Line filter for G1311A, recommended for high salt concentrations	1	263.00

### PUMP MODULE SUPPLIES

CS50636586	Sapphire Plunger	1	\$131.00
CS50636589	Plunger seals, graphite filled Teflon®	2	97.40
CS09051420	Plunger seals, polyethylene for normal phase	2	126.00
CS0101822707	PTFE frits for Purge Valve	5	29.80
CSG131160012	Outlet valve for isocratic and quaternary pump	1	309.00
CSG131260012	Outlet valve for binary pump, 400 bar	1	347.00
CS50013707	Gold seal, outlet	1	28.30
CS50636505	Sieves, stainless steel for outlet valve	10	16.20
CS50628562	Cartridge for active inlet valve, 400 bar	1	190.00
CS0101868722	Seal wash kit	1	586.00
CS50412168	Glass filter, solvent inlet	1	45.10
CS50628517	Frit adapter, PTFE, 3mm	4	31.10
CS93011421	Solvent reservoir, 1 litre, with cap	1	17.60
CS93016342	Solvent reservoir, 2 litre, clear	1	24.30
CS50622483	Solvent tubing, 1.5mm ID x 3mm OD	5m	31.10

### SEAL WASH UPGRADE KITS

CS0101868722	Continuous seal wash kit	1	586.00
CSG131168711	Active seal wash kit for isocratic or quaternary pumps	1	987.00
CSG131268711	Active seal wash kit for binary pumps	1	1,522.00
CS09051175	Wash seal	1	51.40
CS50013743	Wash seal keeper	1	95.90
CS50622484	Wash seal gasket	1	33.80

### SUPPLIES FOR G1312B 1200SL (RRHT) BINARY PUMP

The Agilent 1200SL is a specially designed version of the 1200 series HPLC that operates at up to 600bar (9,000psi) with very low extra column volume for ultra-fast chromatography. These parts are high pressure, low volume versions of standard 1200 pump parts.

CSG131260020	Cartridge for active inlet valve, 600 bar	1	\$352.00
CSG131260022	Outlet valve for binary SL pump, 600 bar	1	370.00
CS50428952	Seal keeper, ceramic, hipped	1	59.30
CSG131287303	SS Capillary 400 x 0.17mm, pre-swaged, pump to autosampler	1	60.00
CSG131287304	SS Capillary 700 x 0.17mm, pre-swaged, pump to cooled ALS	1	62.20
CSG131287305	SS Capillary 150 x 0.17mm, pre-swaged, damper to pressure sensor	1	60.00
CSG131287306	SS Capillary 105 x 0.17mm, pre-swaged, damper to mixer or mixer to outlet valve	1	60.00
CSG131267500	Calibration capillary assembly	1	347.00
CSG131287300	Absorber capillary, 500 µL volume	1	73.40
CSG131287301	SS Restriction Capillary, 0.17 mm ID T-piece to pressure sensor	1	107.00



# GENUINE AGILENT PUMP SUPPLIES

## BINARY PUMP SL SUPPLIES

1200 SL series pumps require some specialized components for high pressure operation. Other components are listed under the Standard Pump Supplies.

Product Number	Description	Price
CSG131287300	Absorber capillary, 500 µL volume	\$73.40
CSG131260025	Active inlet valve, without cartridge	330.00
CSG131267500	Calibration capillary assembly	347.00
CSG131260020	Cartridge for active inlet valve (600bar)	352.00
CS50230240	Hex driver, 1/4", slitted	31.70
CSG131260022	Outlet valve, 600 bar	370.00
CSG131260023	Purge valve assembly, 600 bar	420.00
CS50428952	Seal keeper, ceramic, hipped	59.30
CS50671565	Solvent mixer, short, 200 µL	184.00
CSG131287306	SS Capillary 105 x 0.17 mm, m/m, ps/ps	60.00
CSG131287305	SS Capillary 150 x 0.17 mm, m/m, ps/ps	60.00
CSG131287303	SS Capillary 400 x 0.17 mm, m/m, ps/ps	60.00
CSG131287304	SS Capillary 700 x 0.17 mm, m/m, ps/ps	62.20
CSG131287301	SS Restriction Capillary, 0.17 mm ID	107.00

## CAPILLARY PUMP SUPPLIES (G1382A)

CSG137668710	PM kit	\$306.00
CSG137668705	Accessory kit for capillary pump	723.00
CSG137660003	Bottle head assembly	107.00
CS50648273	Filter assy with 0.5 µm pore size filter	151.00
CS50222185	Replacement frits 0.5 µm	15.70

## PREPARATIVE PUMP SUPPLIES

CSG136168707	Accessory kit for preparative pump - gradient use	\$729.00
CSG136168708	Accessory kit for preparative pump G1361A	796.00
CSG136468705	Accessory kit for preparative pump G1361A - gradient use	225.00
CSG136123205	Frit adapter, PTFE for 4.7 mm OD tubing	17.80
CS31500944	Glass filter, solvent inlet, 40µm	46.40
CS50654500	Inline filter, 3.3, 10µm pore size	340.00
CS50659901	Inline filter, 3.3, 10µm pore size	240.00
CS09051516	O-ring, Viton, 30mm	10.60
CS50654445	Peristaltic pump for 1100 Series LC	41.10
CS50222188	Piston seal for prep pump	85.40
CSG136122402	Sapphire plunger for prep pump	292.00
CS93016341	Solvent bottle, amber, 2L	71.60
CS93016342	Solvent bottle, clear 2L	24.30
CS50654421	Solvent bottle, clear, 2L, 2 inlets	81.70
CSG136167303	SS capillary, 0.5 x 160 mm, 2 1/16" male	70.30
CSG136167304	SS capillary, 0.6 x 111 mm, 1/16" male	70.30
CSG136167300	SS capillary, 0.6 x 173 mm, 2 1/16" male	70.30
CSG136167301	SS capillary, 0.6 x 175 mm, 2 1/16" male	70.30
CSG136167306	SS capillary, 0.6 x 367 mm, 1/16" male	70.30
CSG136167305	SS capillary, 0.6 x 40 mm, 1/16" male	70.30
CSG136167302	SS capillary, 0.6 x 400 mm, 2 1/16" male	70.30
CS50222192	2µm SS filter assy with PEEK® ring	19.20
CSG136160012	Valve assy, inlet/outlet for prep pump	99.50

## STANDARD PUMP SUPPLIES (G1311/12/54A)

Product Number	Description	Price
CS50013708	Gold Seal for Inlet Valve	\$14.90
CSG131260012	1100/1050 SS outlet valve for binary pump	347.00
CSG131160012	1100/1050 SS outlet valve for quat/isocratic pumps	309.00
CS0101860032	1100/1050 Ti outlet valve for quat/isocratic pumps	351.00
CSG131160009	1100/1050 SS purge valve	406.00
CS50636505	Sieves for outlet valve	16.20
CS50013707	Pump outlet seal, gold	28.30
CS50636589	Piston seals for 1100/1050, PTFE	97.40
CS09051420	Piston seals, 1100, UMHV-PE	126.00
CS50636586	Sapphire plunger for 1050 and 1100	131.00
CS0101822707	PTFE frits for 1050/1100 pumps	29.80
CSG131268730	PM kit for binary pumps	290.00
CSG131068730	PM kit for isocratic and quat pumps	171.00
CS50654499	Extended PM kit 1100/1050 pumps	824.00
CSG131068731	PM kit for seal wash option	111.00
CSG131268711	Active seal wash kit for binary pumps	1,522.00
CSG131168711	Active seal wash kit for iso/quat pumps	987.00
CS0101868722	Continuous seal wash upgrade kit	586.00
CS50659972	Biocompatibility kit for 1100 Series LC	1,062.00
CS0101868723	Purge valve upgrade kit	634.00
CSG131168705	1100 pump accessory kit	162.00
CSG131168710	1100 pump start-up kit	513.00
CS09051175	1050 wash-option seal	51.40
CS50622484	Wash seal gasket, Pkg. 6	33.80
CS50622465	Support ring for 1050 seal wash option	257.00
CS0101823702	Insert tool, for inserting wash seals	950.00
CSG131287330	1100 Mixer assembly	216.00
CSG131267301	1100 tubing, piston 1 to damper	60.90
CS0101821207	Cap, pump head inlet valve	8.10
CSG131167304	Connecting tube for 1050/1100 pumps	62.20
CS50628515	Connector, helium sparger	33.80
CS50412168	Filter, solvent inlet	45.10
CSG131160006	In-line SS filter for G1311A	263.00
CS50622485	Outlet cap, 1100/1050 pumps	25.70
CS01001847	PEEK® adapter 1/4-28 to 10-32	16.20
CS31500958	Solvent inlet filter, PTFE, 10 µm pore	23.90
CS93011420	Solvent Reservoir 1L	14.90
CS93011421	Solvent Reservoir 1L with Cap	17.60
CS93011450	Solvent reservoir, amber, 1L, 1100	29.20
CS50636531	Bottle cap with 3-hole insert	22.50
CSG131160003	Bottle head assembly	87.90
CSG131268716	Bottle head assembly for F29/32 tapered solvent bottle	81.30
CSG131267305	SS connecting capillary, 60 cm, 0.17mm, used as outlet capillary or pump to injector	64.90
CSG132267300	Tubing Kit-degasser to Pump	47.70
CS50622486	Velocity regulator, Pkg. 3	23.00



Chromatographic Specialties Inc. carries the full line of Agilent Technologies replacement parts for HPLC and LC/MS instruments. This page details a selection of the most popular, commonly ordered parts. If you don't see the part you are looking for, please contact our Technical Support Group at 1-800-267-8103 or tech@chromspec.com.



# GENUINE AGILENT AUTOSAMPLER SUPPLIES

## STANDARD AUTOSAMPLER SUPPLIES (G1313/27A) AND (G1329A)

Product Number	Description	Price
CSG131368705	1100 Autosampler accessory kit	\$141.00
CSG131368711	1100 Autosampler multi-draw upgrade	216.00
CSG131368709	1100 Autosampler start-up kit	338.00
CSG132968727	Door replacement kit for G1329A	36.40
CSG131368730	Preventive maintenance kit for standard autosamplers	235.00
CS50654498	Extended PM kit 1100 autosampler	470.00
CS50636506	Finger caps	16.20
CSG132968718	Light protection Kit for G1329A	74.50
CSG131387203	Needle assy for use with PEEK® seat for standard autosampler	153.00
CSG131368713	Needle clamp kit	32.50
CSG131387101	Needle seat, 0.17mm ID	101.00
CSG131387103	Needle seat, 0.12mm ID	103.00
CSG131387104	Needle seat PEEK® w/o capillary, G1313A	156.00
CSG131387102	Needle seat PEEK®, 0.17 mm ID capillary for standard autosampler, 2.3 µL	216.00
CSG226087101	Needle seat, prep autosampler, 0.5 mm ID, 20µL	117.00
CSG131387201	Needle, 1100 Autosampler	64.90
CSG131387202	Needle, 1100 Autosampler, 900 µL head	120.00
CSG131387306	PEEK® capillary, 0.25 mm ID, 160 mm	40.40
CSG131387309	PEEK® loop capillary for 100 µL sample	93.50
CSG131387302	PEEK® seat tubing, 0.17mm ID 100mm	40.40
CSG131387307	Seat Capillary, 0.5mL, 0.5mm ID	67.60
CSG131387308	Seat Capillary, 1.5mL, 0.9mm ID	67.60
CS09051294	Metering seal, 900µL	93.30
CS50628587	Plunger Assembly 900µL Agilent 1100	483.00
CS01001849	Rotor seal for Rheodyne 7750-020, Tefzel	107.00
CS01001853	Rotor seal for Rheodyne 7750-020, Vespel	107.00
CS01002231	Rotor seal, PEEK®, 2-groove for 0101-0921 Injection valve (Rheodyne 7750E)	168.00
CS01001851	Stator face assembly for Rheodyne 7750-020, 7750-030	223.00
CS01001850	Stator for Rheodyne 7750-020, 7750-030	393.00
CS15354857	Screw, stator	Inquire
CS50659902	Tantal loop capillary, 900µL	1,638.00
CSG132960011	Tray for 100 2mL vials, thermostatable	72.90
CSG131344513	Tray for 15 6mL vials for use with G1313A, G1329A, G1389A, G2260A	26.80
CSG131344503	Tray for 15 6mL vials G1313A	28.40
CSG131344512	Tray for 40 2mL vials G1313A (1200)	26.80
CSG131344502	Tray for 40 2mL vials G1313A	28.40
CSG131360004	Tray, External, for 17 2mL vials	268.00
CSG131327302	Disposal tube for ext. vial tray	48.70
CSG131387301	Tubing, valve to metering head	52.70
CS01010921	Valve, 1100 6-port autoinjector	1,272.00
CSG131343206	Waste adapter, 1100 series autosamplers	13.10
CSG131343216	Waste adapter, 1100 series autosamplers	11.10
CS50622463	Waste tubing, 5 m, 6.5 mm ID, corrugated polypropylene	27.10
CS01000900	ZDV union, stainless steel, with fittings	93.30

## PLATE/HIGH PERFORMANCE AUTOSAMPLER SUPPLIES (G1367A/B)

Product Number	Description	Price
CS50421388	384 Well Plate, PP	\$241.00
CS51885375	384 Well plates, polypropylene, max 45 µL, skirted, Pkg. 25	362.00
CS50426454	96 Deep well plates, 1.0mL, PP	456.00
CS50654402	96 Well Plate with glass inserts, caps, septa preassembled, 0.35mL	99.60
CS50421386	96 Well Plates, 0.5mL, PP, Pkg. 10	25.10
CS50421385	96 Well Plates, 0.5mL, PP, Pkg. 120	224.00
CS50428502	96 Well Plates, 150µL, skirted, Pkg. 25	216.00
CSG136768705	Accessory kit for well plate sampler	321.00
CS51885322	Caps/Septa for glass inserts, Pkg. 1000	601.00
CS50421389	Closing mats for 0.5mL 96 well plates, Pkg. 50	267.00
CS51885321	Glass inserts, 350 µL, Pkg. 1000	214.00
CSG136787300	Loop capillary assy	263.00
CSG136787200	Needle assy well plate autosampler	117.00
CSG136787201	Needle assy well plate autosampler (new)	219.00
CSG136787102	Needle seat, well plate autosampler, 0.12 mm ID capillary, 1.2 µL	118.00
CS50654445	Peristaltic pump for 1100	41.10
CSG136768730	Preventive maintenance kit for well plate autosamplers	443.00
CSG136787101	Seat assy for G1367 well plate autosampler	117.00
CSG137587300	Seat Capillary, 50µm, 150mm, Fused silica/PEEK® with fittings	77.20
CSG132960011	Tray for 100 2mL vials, thermostatable	72.90
CSG225860001	Tray for well plate autosampler, holding 2 well plates with maximum 50 mm height and 10 2mL vials	106.00
CSG225860011	Tray for well plate autosamplers	109.00
CSG136760001	Tray for well plate autosamplers	109.00
CS50226538	Tray, holding 27 Eppendorf safe-lock tubes	96.30
CS50226539	Vial plate for 15 x 6 mL vials	96.30
CSG225568700	Vial plate for holding 54 2 mL vials, Pkg. 6	237.00

See pages 337-339 for more 96-well plates.

## PREPARATIVE AUTOSAMPLER SUPPLIES (G2260A)

CSG226068711	5mL Multi draw loop for use with G2260A	\$316.00
CSG226068705	Accessory kit for preparative autosampler	547.00
CSG226087300	Capillary sampler to column, SS	67.60
CSG226087201	Needle assy for G2260-87101 needle seat	121.00
CSG131344513	Tray for 15 6mL vials for use with G1313A, G1329A, G1389A, G2260A	26.80
CSG131343206	Waste adapter, 1100 series autosamplers	13.10
CSG131343216	Waste adapter, 1100 series autosamplers	11.10

## HIGH PERFORMANCE SL AUTOSAMPLER SUPPLIES (G1367C)

CS01011422	Injection valve with 2 positions, 6 ports, max 600 bar	\$2,180.00
CS01011416	Rotor seal, 3 grooves, max 600 bar	448.00
CSG136787104	Seat assembly for G1367 well plate sampler	217.00
CSG136787303	Seat capillary 0.12 x 100 mm, 0.8 mm OD	60.00
CSG136787302	Seat capillary 0.17 x 100 mm, 0.8 mm OD	60.00
CS01011417	Stator for 6 port switch valve, 600 bar	899.00



# AGILENT HPLC DETECTOR LAMPS AND VACUUM DEGASSER SUPPLIES

## AGILENT DETECTOR LAMPS

Chromatographic Specialties is an authorized Agilent distributor. All lamps listed on this page are direct from Agilent.

Unless designated as 2,000 hour lamps, Agilent detector lamps carry a 1,000 hour pro-rated warranty. 2,000 hour lamps carry a 2,000 hour pro-rated warranty.



Product Number	Model	Type	Price
CS7988360002	1050 VWD (79853), MWD (79854A), DAD (G1306A);1090 / 1040 Series DAD	D2	\$639.00
CSG131460100	1100 VWD (G1314A)	D2	627.00
CS21400590	1100 DAD (G1315), 1100 MWD (G1365)	D2	686.00
CS21400813*			1,006.00
CS51811530*			1,006.00
CS21400820	1200 DAD (G1315C), 1200 MWD (G1365C)	D2	1,013.00
CSG110360001*	1100 DAD (G1315A) 8453 UV/Vis Spectrophotometer	W	170.00
CS21400605	8453 UV/Vis Spectrophotometer	D2	686.00
CS0845260104	8452	D2	713.00
CS7988060002	1090 Series 79881A FPD	D2	598.00
CS21400585	G1600 CE DAD	D2	686.00
CS21400600	1100 Series G1321A FLD	Xe	800.00
CS0103760002	1050 Series 1037/1047 RID	D2	239.00
CS21400549	1050 Series 1046 FLD	Xe	659.00

\* 2,000 hour warranty (Double Life Lamp)

For non-OEM lamps that are compatible with Agilent HPLCs, see pages 156-157.

## VACUUM DEGASSER SUPPLIES (G1322A/G1379A)

Product Number	Description	Price
CS50628534	Disposable syringes, 20 mL, Pkg. 10	\$12.20
CSG137960010	Dual-channel u-degasser vacuum chamber	695.00
CS50412168	Filter, solvent inlet	45.10
CS50428922	Micro vacuum degasser tubing kit	88.40
CS01001710	Mounting tool for flangeless nuts	10.60
CSG132268705	Online degasser assembly kit	50.40
CS50226536	PEEK® fitting, long for 1/32" OD capillary	15.50
CS93011337	Syringe adapter	23.00
CSG132267300	Tubing kit — degasser to pump	47.70
CSG137967310	u-Vacuum degasser tubing kit	45.50

### TECH TIP

Why don't Agilent lamps have timers anymore?

The only reliable on-cord timers for deuterium lamps are mercury based — mercury evaporates from the leading edge of a gap in a fine capillary column, and redeposits on the trailing edges. Health and safety concerns, and Reduction of Hazardous Substances regulations have caused Agilent and other high quality lamp suppliers to remove the timers from their lamps.

Agilent's C series DAD and MWD detectors use RFID tracking of bulbs to replace mercury timers (see below).

For other instruments, a detector logbook tracking the number of hours of use is more than accurate enough to track lamp life for warranty purposes.

### TECH TIP

CS21400813 and CS51811530 are both 2,000 hour lamps from Agilent. CS21400813 has greater intensity for very short wavelengths (<200nm), while CS51811530 is more durable overall.

CS21400820 lamps have an RFID (Radio Frequency I.D.) tag that tracks installation date, burn time, and number of ignitions. This allows full use of the G1315C and G1365C detectors' self-diagnostic tools. G1315/G1365 lamps can be used in "C" series detectors, but automated tracking will not be possible.




# OPTIMIZE HPLC REPLACEMENT PARTS

## OPTIMIZE CHECK VALVES

### You Have A Choice

Optimize Technologies offers three choices when replacing a check valve:

#### 1. OPTI-MAX® Cartridges: A Universal Solution

- Easy to use
  - Just drop the pretested high-grade cartridge into the custom designed OPTI-MAX® housing for your HPLC
  - Free-Turn™ Housings let you replace cartridges without disconnecting tubing. Look for the  logo
- Cartridges are interchangeable across multiple pump brands
  - Waters, Shimadzu, Agilent/HP, and most other OEMs
- Cartridges function in either the inlet or outlet position
  - Minimize the number of spare parts you keep on hand
  - Reduce inventory costs
- Economical and Reliable
  - Cartridges typically cost less than a rebuild kit
  - Pre-tested cartridges have the same integrity as the best pre-tested valves

#### 2. Pretested Check Valve Assemblies

- Direct replacements for OEM components, meet or exceed OEM specifications
  - Precisely engineered to match the OEM ball diameter, number of balls and seats, total liquid volume and flow geometry
- Every Optimize valve assembly is tested and packed to assure proper functioning under actual conditions
- Shipped with step-by-step installation instructions
- Performance of your pump will remain consistently high

#### 3. Check Valve Rebuild Kits

For those of you who need the most economical way to maintain OEM style check valves, Optimize also offers check valve rebuild kits.

- Contain parts to rebuild one or two check valves, depending on model
- Components in the rebuild kit are identical to the ones Optimize uses in their valve assemblies
- Come with user-friendly instructions to help those of you interested in achieving the greatest economy

**Caution:** Cleanliness is next to Godliness with check valves! It is crucial that you rebuild your check valve assemblies in the cleanest dust-free environment you can find. All the components that go into each check valve must be handled by forceps only - even the slightest contamination can drastically impair the performance of any rebuilt check valve.

Replacement parts are available for the following instruments: ABI/Kratos, Beckman/Altex, Bio-Rad, Bischoff, Dionex, Gilson/Rainin, Gynkolek, Hewlett-Packard, Hitachi, Isco, Jasco, Kontron, Knauer, LDC/Milton Roy, LKB, Perkin-Elmer, Rainin, Shimadzu, Spectra-Physics, SSI, Tracor, Varian and Waters.

## OPTIMIZE SEALS

### The Choice Is Yours . . .

There are a wide range of mobile phases, temperatures and individual pump characteristics involved when using HPLC equipment. As a result, two distinct families of seals are offered, to better match any set of variables.

#### ITB™ SEALS

Solve shedding problems associated with most OEM graphite filled PTFE seals.

- PTFE-based seals shed particles of PTFE and graphite into the mobile phase
- ITB™ seals shed particles larger than 2 µm
- Most OEM PTFE seals shed particles as fine as 0.5 µm
  - ITB™ particles stay on the surface of standard frits, OEM particles can clog pores

#### OPTI-SEAL®

Longest-lasting and most versatile seal in the industry.

- A special UHMW-PE blend
- Coefficient of friction approaching that of PTFE
- Five to ten times more resistant to wear than PTFE blends
- Shedding almost nonexistent
- The few particles produced are stringy fibres
- Do not clog frits or internal passages
- Especially well-suited for water or aqueous buffers
- Last up to seven times longer than PTFE-based seals

#### Which Seal Is Better?

OPTI-SEAL® provides the longer life and the least particle shedding. Where mobile phase is aqueous or buffered, the advantage over PTFE-based seals can be very dramatic. ITB™ seals work well with high temperatures and organic mobile phases where the softer material seals tighter on the piston. ITB™ seals are more forgiving of piston wear and misalignment.

Solvent	OPTI-SEAL®	ITB™
Acetamide	√√	√
Acetone	x	√√
Acetonitrile	√√	√
Acrylonitrile	√√	√
Aqueous/Aqueous Buffered	√√	√
Benzene	x	√√
Butanol	√√	√
Chlorinated Solvents	x	√√
Cyclohexane	x	√√
Cyclohexanone	x	√√
Dimethyl Formamide (DMF)	√√	x
Dimethyl Sulfoxide	√√	x
Ethanol	√	√√
Ethyl Acetate	x	√√
Ethyl Ether	x	√√
Ethylene Diamine	√√	√
Ethylene Glycol	x	√√
Heptane	√	√√
Hexane	x	√√
Iso-octane	x	√√
Isopropyl Alcohol	√√	√
Methanol	√√	√
Methyl ethyl ketone	√	√√
Pentane	x	√√
Pyridine	√	√√
Tetrahydrofuran (THF)	x	√√
Toluene	x	√√
Xylene	√	√√



# OPTIMIZE REPLACEMENT PARTS FOR AGILENT HPLCs

## OPTI-MAX® CARTRIDGE CHECK VALVES

For Agilent 1050, 1100, 1200  FREE TURN™

Product Number	Description	OEM #	Price
M275601330	OPTI-MAX® Outlet Housing & Cartridge	01018-60008	\$182.00
M105602004	OPTI-MAX® Replacement Cartridges, 1/8" Ball, Pkg. 2		228.10
M273802363	Replacement Cartridge for Active Inlet Valve	5062-8562	181.20

The above part numbers utilize a ceramic ball and stainless steel housing. Ruby ball and PEEK® housing also available.

## SEALS AND PISTONS

For Agilent 1050, 1100, 1200

M273601570	OPTI-SEAL® UHMW-PE Piston Seal	0905-1420	\$58.20
M273601571	OPTI-SEAL® UHMW-PE Piston Seal, Pkg. 10		531.10
M273601572	ITB™ PTFE Piston Seal	5063-6589	50.70
M273601573	ITB™ PTFE Piston Seal, Pkg. 10		458.70
M273400658	Sapphire Piston	5063-2484	132.80
M273602364	OPTI-SEAL® UHMW-PE Wash Seal for 1100	0905-1175	54.50
M273602851	1100 Gasket Wash Seals, Pkg. 6	5062-2484	32.70
M270402852	1100 PTFE Frits, Pkg. 5	01018-22707	44.80
M273102853	1100 2-in-1 Seal Cap	5062-2485 / 5001-3707	21.70

For Agilent 1100, 1050

M273102277	Purge Valve Upgrade Kit Includes: Filter Holder, PEEK Insert, and 2 Filter Elements (2.0µ)		\$194.40
M100400100	Replacement Frits, 0.5µ, Pkg. 10		88.50
M100400103	Replacement Frits, 2.0µ, Pkg. 10		88.50
M273103329	Autosampler Needle Seat Assembly, Agilent/HP	G1313-87101	106.30
M273103215	Autosampler Needle, Agilent/HP	G1313-87201	73.00
M273103212	Autosampler Rotor Seal Assembly, Agilent/HP	0100-1853	106.00

For Agilent 1090

M273800672	Check Valve Cartridge Replacement, Agilent/HP, Pkg. 2	79835-67101	\$356.10
M273600663	OPTI-SEAL® UHMW-PE Piston Seal	0905-1194	54.50
M273600664	OPTI-SEAL® UHMW-PE Piston Seal, Pkg. 10		494.90
M273600665	ITB™ PTFE Piston Seal	5062-2494	40.80

## Recommended Maintenance Schedule for HPLC Pumps

Timing	Part	Action
Every 3-6 months	Piston Seals	Depending on HPLC use, replace every 3-6 months to minimize pump downtime. For best performance, always presoak piston seals in methanol or isopropanol prior to installation.
	Sapphire Pistons	Inspect and replace if necessary
Every 6 months	Solvent Inlet Filter	Clean or replace if necessary
Every year	Check Valves	Change when required or at least once a year to prevent unscheduled downtime. Replace more frequently if required.

## PURGE VALVE UPGRADE KIT FOR AGILENT 1100/1050



FREE-TURN™ filter holder lets you change frits without removing any tubing.

In-line filtration is a necessity for protecting downstream components from damage and blockages due to particulates. But what use is a filter if it is never replaced? The Agilent/HP PTFE filter is buried deep within the pump head making what is usually a quick job into a laborious procedure. Optimize continues its tradition of innovative solutions with the Purge Valve Upgrade Kit.

The Purge Valve Upgrade Kit resolves the difficulty by permanently replacing the PTFE filter with a low volume PEEK® insert, and then relocating the filter frit to an easily accessible holder on the side of the purge valve. What once was a cumbersome production of changing the filter becomes a quick and easy task.

## 2-in-1 Seal Cap, Agilent/HP



Optimize's 2-in-1 Seal Cap replaces both the OEM outlet gold seal and outlet cap with a single component.

Use it on your purge valve, OEM outlet check valve, or anywhere else on your 1100/1050 system where gold seals and outlet caps are required.



# OPTIMIZE REPLACEMENT PARTS FOR WATERS HPLCs

## SEALS AND PLUNGERS

### ALLIANCE/2690

Product Number	Description	OEM Number(s)	Price
M393602596	OPTI-SEAL® UHMW-PE Plunger Seal	WAT270938	\$44.10
M393602603	OPTI-SEAL® UHMW-PE Plunger Seal, Pkg. 2	WAT270938	92.80
M393602597	OPTI-SEAL® UHMW-PE Plunger Seal, Pkg. 10	WAT270938	407.60
M393602856	Seal Wash Face Seal	WAT271017	48.20
M393602858	Seal Wash Tube Seals, Pkg. 4	WAT270940	157.10
M393602860	Seal Wash Piston Seal, Pkg. 2	WAT271018	81.40
M393402180	Sapphire Plunger	WAT270959	184.30
M393602855	Face Seals Replacement Kit, Pkg. 4	WAT270939	206.80

### 100 µL Head

(M45/45G, M501, 510, 515, 590, 600/600E, 610, 6K/6KA)

M393601305	OPTI-SEAL® UHMW-PE Plunger Seal	WAT022934	\$50.00
M393601306	OPTI-SEAL® UHMW-PE Plunger Seal, Pkg. 10	WAT022934	465.00
M393601206	ITB™ PTFE Plunger Seal, Black	WAT026613	44.60
M393601207	ITB™ PTFE Plunger Seal, Black, Pkg. 10	WAT026613	398.30
M393401188	Plunger, 510, 590, 600/600E, 610, 6K/6KA	WAT025656	193.20
M393401191	Plunger For M45/45G, M501	WAT026524	193.20
M393401195	Plunger Indicator Rod & Spring Kit, Pkg. 2	WAT069583	24.90

### 225 µL Head (#3) (510, 590, 600/600E, 610, 650, 6K/6KA)

M393601216	OPTI-SEAL® UHMW-PE Plunger Seal	N/A	\$50.70
M393601217	OPTI-SEAL® UHMW-PE Plunger Seal, Pkg. 10	N/A	458.70
M393601214	ITB™ PTFE Plunger Seal	WAT026644	46.30
M393601215	ITB™ PTFE Plunger Seal, Pkg. 10	WAT026644	398.30
M393401193	Plunger	WAT060304	215.50

### 616, 625/626

M393401930	Plunger and Spring	WAT031788	\$248.30
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## INLET MANIFOLD REBUILD PARTS

M393101144	Ball Plug, Pkg. 6	WAT005061	\$33.30
M393101293	Threaded Seal Insert, M45/45G, M501, 510, 590, 600/600E, 610	WAT005098	33.00
M393101143	Ruby Ball	WAT005089	22.90
M393801233	Actuator Seal, PTFE, Pkg. 3	WAT025681	36.00
M393101133	Oil Seal, 6KA, 510 & 590	WAT005081	13.50
M393101174	Inlet Manifold Rebuild Kit, M45/45G, M501, 510, 590, 600/600E, 610	WAT060448	56.90
Contains one each of the above parts (except M393101145)			

## WISP™ REBUILD KITS

M393001128	WISP™ Fluid Pack Rebuild Kit 710 High and Low Pressure Valves and 710 Injector	N/A	\$381.40
M393001131	712 High Pressure Valve Rebuild Kit	WAT015697	295.70
M393001132	715, 717 Seal Pack Assembly Rebuild Kit	N/A	184.70

\* All kits include parts and instructions.

## OPTI-PRIME™ PRIMING VALVE U.S. PAT. NO. 5,616,300

Replace your OEM priming valve with an integrated valve and syringe fitting that automatically places the syringe in the best orientation for priming.

For M45/M45G, M456, M501, M510, M590, M600/M600E, M610, M6K & M6KA pumps

Product Number	Description	Price
M393101157	OPTI-PRIME™ Priming Valve	\$245.70
M393101170	OPTI-PRIME™ Priming Valve with Optimize Safety Syringe	415.40

## WISP™ SAMPLE PROCESSOR REPLACEMENTS

Product Number	Description	OEM Number(s)	Price
M393001093	250 µL WISP™ Syringe	73109	\$195.20
M393001095	Liquid Seal, Black Injector, Pkg. 3 (special blend graphite/teflon)	WAT005101	36.00
M393001097	Seal Retainer, Pkg. 6	WAT005118	56.30
M393001099	Liquid Seal, White High Pressure Valve PTFE, Pkg. 3	WAT005112	26.30
M393001102	LPV, PTFE Washer, Pkg. 6	WAT005126	50.00
M393001104	Syringe Barrel Seal	WAT077347	20.30
M393001106	Injector Wash Frit, Pkg. 3	WAT005106	22.40
M393001111	Spacer, Lower Needle Wash, Pkg. 6	WAT005134	39.60
M393001113	WISP™ Solvent Seal	WAT077230	83.70
M393001114	PTFE Washer, Pkg. 6	WAT005135	27.10
M393001115	Spacer, Upper Needle Wash, Pkg. 6	WAT005133	35.40
M393001117	Injector Air Seal	WAT077300	36.10
M393001118	PTFE O-Ring, 712 HPV	N/A	6.60
M393001124	U6K Injector Seal	WAT005151	10.80
M393001125	WISP™ Solvent Seal, Long (Waters' has metal ring)	N/A	83.70

## WATERS Pump Head, Bushing and Fluid Upgrade Kits

Product Number	Description	Price
M395601139	Fluid Upgrade Kit, Cartridge with OPTI-MAX® Cartridge Check Valves* Includes: OPTI-PRIME Pump Head, 2 OPTI-MAX Outlet Check Valve Housing and Cartridge, 2 OPTI-MAX Inlet Check Valve Housing and Cartridge, 2 Pump Head Support Bushing, 2 OPTI-SEAL, 2	\$1,340.00
M393502176	HEAD•LOCK™ Quick-Release Kit	138.80
M391002246	5/32" Wrench for •LOCK™ Alignment Pins	10.20

\*Components available separately

For further information, please contact our  
Technical Support Group at 1-800-267-8103  
or email [tech@chromspec.com](mailto:tech@chromspec.com).

# OPTIMIZE REPLACEMENT PARTS FOR WATERS HPLCs

## OPTI-MAX® CARTRIDGE CHECK VALVES

ALLIANCE/2690, 616  FREE-TURN™

Product Number	Description	OEM Number(s)	Price
M394602187	OPTI-MAX® Alliance Conversion Kit	WAT270941, 700002332	\$338.00
M394602168	OPTI-MAX® 616 Conversion Kit	55845, 24960	675.90
M104602004	OPTI-MAX® Replacement Cartridges, 1/16" Ball, Pkg. 2	700000254	253.50

100 µL Head (M45/45G, M501, 510, 515, 590, 600/600E, 610, 6K/6KA)  FREE TURN™

M395602186	OPTI-MAX® 100µL Single Head Conversion Kit	WAT033679, 700000253	\$295.70
M395602166	OPTI-MAX® 100µL Dual Head Conversion Kit	WAT025216, 700000253	591.50
M105602004	OPTI-MAX® Replacement Cartridges, 1/8" Ball, Pkg. 2	700000254	228.10

225 µL Head (#3) (510, 590, 600/600E, 610, 650, 6K/6KA)  FREE TURN™

M396602167	OPTI-MAX® #3 Dual Head Conversion Kit	WAT025216	\$233.00
M106602005	OPTI-MAX® Replacement Cartridges, 3/16" Ball, Pkg. 2	N/A	271.60
M105602004	OPTI-MAX® Replacement Cartridges, 1/8" Ball, Pkg. 2	N/A	228.10

400 µL (#4) & 900 µL (#6) Heads (Delta Prep™ 3000, 600/600E, 650)  FREE TURN™

M396601267	OPTI-MAX® Outlet Housing & Cartridge	33326	\$706.10
M106602005	OPTI-MAX® Replacement Cartridges, 3/16" Ball, Pkg. 2	N/A	271.60

The above part numbers utilize a ceramic ball and stainless steel housing. Ruby ball and PEEK housing also available.

### 625/626

M394802170	OPTI-MAX® 625/626 Conversion Kit	30543, 30541, 24120	\$675.90
M104802004	OPTI-MAX® Replacement Cartridges, 1/16" Ball, Pkg. 2	N/A	253.50

The above part numbers utilize a ceramic ball and PEEK® housing.

### TECH TIP

Waters Performance PLUS™ check valve cartridges have the same exterior dimensions as OPTI-MAX® 1/16" and 1/8" cartridges. If you use Performance PLUS™, changing to OPTI-MAX® requires absolutely no change to your system. Just use the table below to determine your needs:

Waters Product Number	Instrument	OPTI-MAX® Product Number
700000254	1515, 1525, 515, 600, LC1, 2695, 2695D, 2795	M105602004 (M104602004 for low flow rates)
700002275	1525 Micro HPLC Pump	M104602004

## HEAD•LOCK™ Upgrade for Waters Pumps



### An Idea So Good....Even Waters Likes It!

The Optimize Head•Lock™ kit replaces the two pump head retaining screws with a pair of support rods and a locking face plate.

#### HEAD•LOCK™

- Supports the pump head as you slide it on and off the sapphire piston, preventing snapped pistons.
- Automatically applies even sealing pressure to both retaining / support pins from a single thumbscrew. No need to apply equal torque to two machine screws when you replace the pump head.
- Tool free use after installation.

Photos show HEAD•LOCK™ separate from pump for clarity. Normal maintenance is performed with the support bushing still attached to the pump.

## OPTI-PRIME™ Priming Valve



Open



Closed

In the open/up position, air rises to the top of the syringe as the pump is primed

When priming is complete, lower and remove the syringe, then start the pump

Take the tedium out of priming older Waters pumps. A quick, one-time installation and priming becomes a matter of moving the priming syringe up and down. In the up position, OPTI-PRIME™ is open and ready for purging - air rises to the top of the syringe as the pump is primed. Move OPTI-PRIME™ to the down position and it is closed, ready for removal and pump operation.

For more Waters syringes, please see page 169.

# OPTIMIZE REPLACEMENT PARTS FOR OTHER HPLC PUMPS

Manufacturer/Model	Plunger	Seals / Each		Seals / Pkg. 10		OPTI-SEAL® Conversion Kit
		OPTI-SEAL®	ITB	OPTI-SEAL®	ITB	
Varian						
2010	M383400999 \$263.70	M383601000 \$81.10	M383601002 \$78.00	M383601001 \$754.40	M383601003 \$700.10	M385602164 \$591.50
9000 Star	M383401342 \$284.80	M383601555 \$58.80	M383601553 \$52.00	M383601556 \$537.10	M383601554 \$464.70	M385601704 \$150.90
2510	M383400999 \$263.70	M383601000 \$81.10	M383601002 \$78.00	M383601001 \$754.40	M383601003 \$700.10	M385602165 \$295.70
Shimadzu						
LC6A	M343400854 \$126.20	M343600865 \$48.30	M343600863 \$45.60	M343600866 \$434.50	M343600864 \$404.40	M345602159 \$295.70
LC10AS	MM343401345 \$209.80	M343600865 \$48.30	M343600863 \$45.60	M343600866 \$434.50	M343600864 \$404.40	M345602159 \$295.70
LC600/LC9A, LC10AD, ESA 580	M343400853 \$131.50	M343600865 \$48.30	M343600863 \$45.60	M343600866 \$434.50	M343600864 \$404.40	M344602158 \$675.90
LC10AT	M343401997 \$278.90	M343600865 \$48.30	M343600863 \$45.60	M343600866 \$434.50	M343600864 \$404.40	M344602160 \$338.00
PE						
Series 1,2,3, 3B	—	M333601301 \$53.20	M333601299 \$53.20	M333601302 \$488.90	M333601300 \$470.70	M335602155 \$591.50
Series 10	—	M333601301 \$53.20	M333601299 \$53.20	M333601302 \$488.90	M333601300 \$470.70	M335602156 \$295.70
200, 250, 200, 410, 620, 4000 - LP Side	M333400797 \$272.20	M333600804 \$50.70	M333600802 \$47.50	M333600805 \$452.60	M333600803 \$416.40	M335602157 \$439.40
200, 250, 200, 410, 620, 4000 - HP Side	M333400798 \$365.20	M333601301 \$53.20	M333601299 \$53.20	M333601302 \$488.90	M333601300 \$470.70	—
400 - LP Side	—	M333600804 \$50.70	M333600802 \$47.50	M333600805 \$452.60	M333600803 \$416.40	M335602157 \$439.40
400 - HP Side	—	M333601301 \$53.20	M333601299 \$53.20	M333601302 \$488.90	M333601300 \$470.70	—
Dionex						
DQP, GPM1, DRP	M253400596 \$113.50	M253600599 \$43.50	—	M253600600 \$409.00	—	M255802142 \$295.70
GPM2, DXP, AGP, 2000, 4000	M253400596 \$113.50	M253600599 \$43.50	—	M253600600 \$409.00	—	M255802143 \$295.70
Hitachi						
655, 6000, 6200	M283400685 \$122.70	M283600690 \$58.20	M283600692 \$537.10	M283600688 \$54.50	M283600689 \$488.90	M284602147 \$338.00
L7100	M283400685 \$122.70	M283600690 \$58.20	M283600692 \$537.10	M283600688 \$54.50	M283600689 \$488.90	M284602148 \$338.00

## Conversion Kits

Each conversion kit contains all the housings and cartridges required to convert your pump to OPTI-MAX® cartridges. Purchasing complete kits allows you to convert your instrument for about 20% less than the cost of individual components.

## OPTI-MAX® Replacement Check Valve Cartridges

2 packs of cartridges are convenient for maintaining individual instruments. For larger labs, call about further savings on 10, 24 or 40 packs of replacement cartridges.

M103902004	OPTI-MAX® Check Valve Cartridge, Microbore 1/32", PEEK/Ruby, Pkg. 2	\$307.80
M104602004	OPTI-MAX® Check Valve Cartridge, Microbore 1/16", SS/Ceramic, Pkg. 2	253.50
M104702004	OPTI-MAX® Check Valve Cartridge, Microbore 1/16", SS/Ruby, Pkg. 2	253.50
M104802004	OPTI-MAX® Check Valve Cartridge, Microbore 1/16", PEEK/Ceramic, Pkg. 2	253.50
M104902004	OPTI-MAX® Check Valve Cartridge, Microbore 1/16", PEEK/Ruby, Pkg. 2	253.50
M105602004	OPTI-MAX® Check Valve Cartridge, Analytical 1/8", SS/Ceramic, Pkg. 2	228.10
M105702004	OPTI-MAX® Check Valve Cartridge, Analytical 1/8", SS/Ruby, Pkg. 2	228.10
M105802004	OPTI-MAX® Check Valve Cartridge, Analytical 1/8", PEEK/Ceramic, Pkg. 2	228.10
M105902004	OPTI-MAX® Check Valve Cartridge, Analytical 1/8", PEEK/Ruby, Pkg. 2	228.10
M106602005	OPTI-MAX® Check Valve Cartridge, Extended Flow 3/16", SS/Ceramic, Pkg. 2	271.60

## Piston Seal Tools

Shape and insert piston seals easily with these high quality tools from Optimize. Available in single sizes for single instrument labs, or a kit of small medium and large tools for multiple instruments.

M101002695	Seal Forming / Insertion Tool Kit (S,M,L Tools), Instruction Booklet and Solvent Compatibility Chart	\$111.00
M101002699	Small Seal Forming / Insertion Tool	59.10
M101002700	Medium Seal Forming / Insertion Tool	59.10
M101002701	Large Seal Forming / Insertion Tool	59.10

## TOOLS FOR COLUMN PACKING

While most needs can be satisfied with commercially packed columns, there are still times that you need to produce your own HPLC columns. Some useful components are listed below. If you also need packing materials, call our technical support group for more information on the range of bulk packings we can supply.

### VALCO HPLC INTERNAL COLUMN END FITTINGS

Internal fittings are stronger and more reliable than external fittings.

#### Analytical Columns - 1/4" to 1/16"

Product Number	Description	Price
VCEF4121F	CEF 412.1F for 2.1 mm I.D. column	\$16.30
VCEF4130F	CEF 413.0F for 3.0 mm I.D. column	16.30
VCEF4140F	CEF 414.0F for 4.0 mm I.D. column	16.30
VCEF4146F	CEF 414.6F for 4.6 mm I.D. column	16.30

#### Preparative Columns - 3/8" to 1/16"

C33718	CEF 616.0F for 6.0 mm I.D. column	\$21.00
C33720	CEF 617.0F for 7.0 mm I.D. column	21.00

#### Preparative Columns - 1/2" to 1/16"

C33722	CEF 819.0F for 9.0 mm I.D. column	\$24.50
C33724	CEF 8110.0F for 10.0 mm I.D. column	25.70

### RESTEK EMPTY 1/4" HPLC COLUMNS

With pre-attached fittings

2.1mm ID			3.2mm ID		4.6mm ID	
Length	Product Number	Price	Product Number	Price	Product Number	Price
30mm	RK25118	\$96.10	RK25124	\$96.10	RK25130	\$89.00
50mm	RK25119	96.10	RK25125	96.10	RK25131	89.00
100mm	RK25120	96.10	RK25126	96.10	RK25132	89.00
150mm	RK25121	104.80	RK25127	104.80	RK25133	96.10
200mm	RK25122	104.80	RK25128	104.80	RK25134	96.10
250mm	RK25123	104.80	RK25129	104.80	RK25135	96.10

### PACK IN A BOX: HPLC COLUMN PACKING STATION

Restek's new Pack in a Box Kit is a complete column-packing system. Everything you need to pack your own analytical HPLC columns is included: pump, reservoir, column hardware, packing material, and system control software (computer not included). Detailed packing instructions and a video also are included. The packing pump is electric, so no pressurized air is required.



Product Number	Description	Price
RK26408	Pack in a Box Kit	\$8,081.00

### FITTING EXTRACTOR FOR PEEK® FITTINGS

Drill into the broken fitting, then screw the extractor into the fitting and remove it easily. Eliminate the need for heat or other techniques that could damage your column.



RK25325	PEEK® Fitting Extractor	\$62.90
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### PISTON SEAL INSERTION TOOL: HPLC

Simplify pump maintenance: use one end to remove your old seal, then simply slip your new seal on the other end and push it flush into position. The tool cannot mar the surrounding metal surface of the pump housing.



RK21356	HPLC Piston Seal Insertion Tool	\$72.60
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## TOOLS FOR GOOD CONNECTIONS

### Clean Cut Tubing Cutter



- Makes burr-free, perpendicular cuts
- Does not distort tubing
- Cuts PEEK®, Teflon®, Tefzel®, other polymeric tubing

Product Number	Description	Price
C440797	Clean Cut Tubing Cutter	\$17.80

#### Replacement Blades

C440798	Clean Cut Blades, Pk/3	7.10
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### Metallic Tubing Cutters



Terry Cutter



Tubing Cutter

C11346	Terry Cutter	\$144.90
C440792	Tubing Cutter	65.20

#### Replacement Cutter Wheels

C11348	Terry Cutter Wheels, Pk/3	37.40
C440793	Tubing Cutter Wheel, Pk/2	23.70

The Terry cutter is limited to use on 1/16" tubing, while the generic tubing cutter will cut 1/8" and 1/16" tubing.

### TECH TIP

The real keys to success are:

**Technique:** These tools are only used to score the tubing. The tubing is cut by repeated flexing at the score.

**Sharpness:** Replace cutter wheels regularly. A dull wheel will crush rather than score tubing.

### Custom Socket Wrench



1/4" socket wrench with a slot to slip over 1/16" tubing.

Works where an open end wrench won't fit.

VSWH4	Socket Wrench	\$7.00
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### Tubing Dressing Tool



Opens stainless steel tubing bore and removes burrs.

RK20188	1/16" O.D. Tubing Dressing Tool	\$103.30
RK20190	1/8" O.D. Tubing Dressing Tool	153.40



# CHROMSPEC™ HPLC DETECTOR LAMPS

## Bright Ideas for Lamps



### Handle with care

Deuterium lamps produce a plasma ball approximately 0.5mm in diameter. Disturbing the filaments by tenths of a millimeter will wreck the alignment of your bulb.

### Shelf-life is not warranty life

Lamps stored away from jostling and bumping last a long time. If you keep a spare bulb for a year before using it, we will still be there to support you.

### Clean lamps are happy lamps

Wear cotton or thin rubber gloves to protect your lamp from fingerprints. Wipe all lamp bulbs down with IPA before installing.

### Track your operating time

CHROMSPEC™ brand lamps are produced in accordance with RoHS rules. On-wire timers are mercury based. On-off times in a lab book or calculating bulb time based on working hours per/day and number of days is accurate for tracking bulb life.

### Warranties

A 1,000 or a 2,000 lamp doesn't need to be replaced when its warranty runs out. A 1,000 hour warranty says we expect a lamp to last at least 1,000 hours. However, if you really feel you need to replace your lamps early, we won't object.

### Lamps have turn-offs too

If your instrument will be left unused for more than a few hours, turn the lamp off to preserve its useful life. If it will be less than two hours until your next run, leave it on. The thermal cycling and warm-up time will offset the advantages of turning the lamp off.

## CHROMSPEC™ BRAND REPLACEMENT LAMPS

CHROMSPEC™ brand lamps are sourced from the same manufacturers used by instrument OEMs. Lamps are pre-aligned using the same techniques specified by OEMs. As well as lamp alignment, all base bulbs are instrument specific for proper air circulation and temperature control.

The lamps in the table below are some of the more commonly requested lamps in our selection. If your detector is not listed in the table, please contact our Technical Support Group for information on your particular lamp.

Product Number	Model	OEM Lamp	Type	Price
<b>Agilent (For Genuine Agilent Lamps, See Page 149)</b>				
C55D101AG	1050 VWD (79853), MWD (79854A), DAD (G1306A); 1090 / 1040 Series DAD	79883-60002	D2	\$512.10
C55D401AGLL*	1100 VWD (G1314A)	G1314-60100	D2	537.80
C55D501AG	1100 DAD (G1315), 1100 MWD (G1365)	2140-0590 /	D2	573.30
C55D501AGLL*		2140-0813 /		758.90
C55D501AGLL3**	(as above, Pkg. 3)	5181-1530		1,933.70
C55D601AG	8452A	08452-60104	D2	547.60
<b>Waters</b>				
C55D001WA	Waters 480LC, 481LC, 481 Lambda Max	WAT099499	D2	507.30
C55D201WA	Waters 486LC Module 1	WAT080678	D2	597.50
C55D401WALL*	Waters 966 2996 DAD	WAT057760	D2	598.30
C55D401WALL3**	(as above, Pkg. 3)			1,611.80
C55D501WALL*	Waters Alliance 2487, 2488	WAS081142	D2	476.70
C55X051WA	Waters 470, 474, 2475	WAT047447	Xe	753.70
C55D431WA	990, 991, 994	WAT021516	D2	935.60
<b>ABI / Perkin-Elmer</b>				
C55D001AB	757, 759, 783A, 785A, 1000S, FS980, 120A, 130A	N2920149	D2	417.20
<b>Shimadzu</b>				
C55D001SH	LC3A, LC4A, LC6A, SPD2A, SPD6A, SPD6AV, SP4 6500AA	062-65056-02	D2	391.30
C55D101SHLL*	SPD10A, 10AS, 10AV, 10AVP, M10AVP	228-34016-02	D2	472.60
C55D301SHLL*	LC2010	228-37401	D2	640.60
<b>Hitachi</b>				
C55D001ME	L & U Series	855-1000	D2	417.60
<b>Gilson</b>				
C55D101GI	115, 116, 117, 118, 119, 151, 152, 155, 156	100326	D2	483.10
<b>Beckman</b>				
C55D001BE	163	239372	D2	668.80
C55D301BE	166 (Pre-Aligned)	239372	D2	905.10
C55D501BE	168 (Pre-Aligned)	240295	D2	905.10
<b>TSP</b>				
C55D201TS	SP100/200, UV100/150/200/1000/2000/3000, Focus, CE	9551-0202	D2	476.70
C55X101TS	FL2000, FL3000, LC304	9551-0144	Xe	1,426.40
<b>Varian</b>				
C55D301VALL*	Vista 5000, 5500, UV50/100/200, 9050, Prostar 310	391615691	D2	640.60
C55D301VALLE*	Varian Vista 5000, 5500, UV50/100/200, 9050, Prostar 310 (Bracket Exchange)	391615691	D2	539.40
C55D401VA	Prostar 330 DAD	393570502	D2	417.60
C55D501VALL*	Prostar 325, 335	110715400	D2	640.60

\* Double life lamp with 2,000 hour warranty.

# SONNTEK HPLC DETECTOR LAMPS

Product Number	Model	OEM Number	Type	Price
<b>Dionex</b>				
TEKLH40	DSA-1	—	D2	\$521.20
<b>Agilent (For Genuine Agilent Lamps, See Page 149)</b>				
TEKLH10	1050 VWD (79853), MWD (79854A), DAD (G1306A);1090 / 1040 Series DAD	79883-6002	D2	\$484.50
TEKLH14	1100 VWD (G1314A)	G1314-60100	D2	484.50
TEKL890	1050 Series 1046 FLD	2140-0549	Xe	543.30
TEKL205T	1080 (1084B)	79875-60012	D2	405.80
TEKL295	1050 (79853A)	79853-60002	D2	481.50
TEKLH13	1100 DAD (G1315), 1100 MWD (G1365)	2140-0590	D2	607.10
TEKLH13X2	1100 DAD (G1315), 1100 MWD (G1365) Double Life	5181-1530	D2	797.20
TEKL850	1100 DAD (G1315A) 8453 UV/Vis Spectrophotometer	G1103-60001	W	154.10
TEKLH15	8453 UV/Vis Spectrophotometer	2140-0605	D2	607.10
<b>Knauer</b>				
TEKLH22	2000, 2001, 2500, 2501, 2600, 2650, 2700	A4071	D2	\$484.50
<b>Perkin Elmer</b>				
TEKL210	LC-55/55B/65/75/85B/95, LC-135/235	0871171 / C 0550505 / 02711340 / N2351285	D2	\$414.60
TEKL280	LC-480	B0160917	D2	414.60
TEKL800	203, 204, 512, 650 Series MPF-2A, 3,4, 43, 43A, 44 44A, 44B	3501646	Xe	555.20
<b>Shimadzu</b>				
TEKL305	SP-4, SPD-2A/2AV/6A/6AV/7A/7AV	062-65056-02	D2	\$379.50
TEKL835	SPD-6A	228-14486-91	W	39.40
TEKLH80	SPD-10A, 10AV	670-14603-00	D2	552.00
TEKL830	SPD-10A, 10AV	670-14602-00	W	252.00
TEKLH81	SPD-M10A, M10AV	228-34016-00	D2	552.00
TEKL800	RF-10A/10AXL/ 535/540/551/1501/5000/5301	228-34216-00	Xe	555.20
TEKL801	RF-551	228-34216-00	Xe, O <sub>3</sub> free	555.20
<b>Thermo Separation Products</b>				
TEKLH910	LDC FL2000	9551-0144	Xe	\$677.80
TEKLH760	LDC SC100-234, UV100, UV150	9551-0111	W	358.80
<b>Varian/Cary</b>				
TEKL290	2050	395130399	D2	\$414.60
TEKL295	2550	996800	D2	481.50
TEKLH53	ProStar 330	393570502	D2	484.50
<b>Waters</b>				
TEKL820	440, 441	WAT097323	Hg	\$203.80
TEKL800	470, 474	WAT047447	Xe	555.20
TEKL205T	480, 481	WAT099499	D2	405.80
TEKLH30	484	WAT080357	D2	484.50
TEKLH31	486	WAT080678	D2	484.50
TEKLHA34	990, 991, 994	WAT021516	D2	889.20
TEKLH33	996	WAT57760	D2	607.10
TEKLH36X2	2487, 2488 Double life	WAS081142	D2	484.50

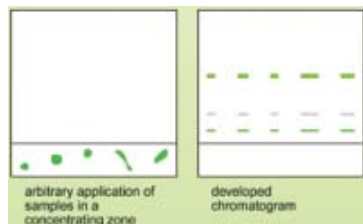
**Note:** Standard lamp warranty is 1,000 hours. If 2,000 hour lamp required, please inquire.

Lamps also available for Alltech, Amersham, ABI, ATI/Unicam, BAS, Bausch & Lomb/MiltonRoy/Spectronic, Beckman/Altex, Bio-Rad, Camag, Cole-Palmer, DuPont, Fisher, GBC, Gilford, Gilson, Gynkotec, Hach, Hitachi, IBM, Isco, Jasco, Kontron, Kratos, Linear, LKB, McPherson, Merck, Michrom BioResources, Milton-Roy, Perspective, Biosystems, Pharmacia, SSI, Unicam and Thermo Separations.

For further information, please call our Technical Support Group at 1-800-267-8103.

# MACHEREY-NAGEL TLC PLATES AND ACCESSORIES

## TLC plates with concentrating zone



SILGUR takes advantage of the completely different adsorption properties of two adsorbents in one plate. The kieselguhr concentrating zone does not adsorb most compounds.

A sample applied in the concentrating zone, and developed with a suitable eluent, always forms a narrow band at the interface of the two adsorbents. Separation begins at this point. The same substances always appear at the same height.

This focusing effect eliminates spot broadening from manual application of sample, and also gives equally sharp bands when large volumes of dilute solutions are applied rather than small concentrated spots.

### HPTLC Plates

Nano-SIL plates use the same silica as standard TLC plates. The particle size is smaller and more tightly controlled (mean particle sizes of 2-10  $\mu\text{m}$ ).

HPTLC provides:

- Shorter theoretical plates
- Sharper separations
- Shorter developing times
- Shorter migration distances
- Smaller samples of 0.01-0.1  $\mu\text{L}$  (10 - 100 nanoliters)
- More samples / plate
- Increased detection sensitivity (nanogram level, hence nano plate). With fluorescence evaluation picogram quantities can be detected.



Wheaton Reagent Sprayer  
(N279040)

## ADAMANT TLC PLATES

### The union of hardness and brilliance

- Newly developed organic binder produces an extremely hard silica layer
  - Plate can be easily marked with a lead pencil for clear identification
- Very high abrasion resistance
  - No formation of dust
- Excellent reproducibility of the layers
- Brilliant UV-indication system
- Low-noise background
- Glass plates, 0.25 mm adsorbent layer

UV Indicator	Dimensions (cm)	Qty	Product Number	Price
254	2.5 x 7.5	100	MCN821005	\$177.00
254	5 x 10	50	MCN821010	117.60
254	5 x 20	100	MCN821015	200.50
254	10 x 10	25	MCN821020	66.10
254	10 x 20	50	MCN821025	173.70
254	20 x 20	25	MCN821030	155.70
no	5 x 10	50	MCN821040	117.60
no	10 x 10	25	MCN821050	66.10
no	20 x 20	25	MCN821060	155.70

## STANDARD SILICA BASED TLC PLATES

UV Indicator	Dimensions (cm)	Qty	SILG-25	DURASIL	SILGUR
No	10x20	50	MCN809012 \$182.80	MCN812003 \$182.80	MCN810012 \$227.60
No	20x20	25	MCN809013 \$164.00	MCN812004 \$164.00	MCN810013 \$176.90
254	5x10	50	MCN809027 \$123.80	MCN812005 \$123.80	—
254	10x20	50	MCN809022 \$182.80	MCN812007 \$182.80	MCN810022 \$227.60
254	20x20	25	MCN809023 \$164.00	MCN812008 \$164.00	MCN810023 \$176.90

## SILICA BASED HPTLC PLATES — 2-10 $\mu\text{m}$ particle size

UV Indicator	Dimensions (cm)	Qty	Nano-DURASIL-20	Nano-SIL C18-50	Nano-SILGUR
no	10 x 10	25	MCN812010 \$166.30	MCN811054 \$347.90	MCN811032 \$218.20
254	10 x 10	25	MCN812013 \$166.30	MCN811064 \$347.90	MCN811042 \$218.20

## WHEATON REAGENT SPRAYER

Product Number	Description	Price
N279040	Reagent Sprayer	\$150.10

## TLC VISUALISATION REAGENTS

MCN814920	Bromcresol green spray reagent, 100 mL	\$38.10
MCN814403	Iron (III) chloride solution, 100 mL	38.10
MCN814203	Ninhydrin spray reagent, 100 mL 0.2 g Ninhydrin/100 ml Ethanol (0.2%)	38.10
MCN814923	Rhodamin B spray reagent, 100 mL	38.10

These are some of the more common TLC plates and accessories. Macherey-Nagel has a wide assortment of plates and bulk adsorbents normal phase, reverse phase, ion exchange, and chiral TLC. They also supply further visualization reagents. Please call our Technical Support Group, 1-800-267-8103 or email [tech@chromspec.com](mailto:tech@chromspec.com) for more TLC.

## THE WHATMAN TLC SYSTEM

- Wide range of chemistries and sizes to suit your application needs
  - Available with or without fluorescent indicators
  - The symbol for silica gel is K (for Kieselgel), followed by a qualifying number: K5 10-12 µm silica, of pore size 150Å
  - The High Performance silica is prefixed by the letters HP: HP-K 4.5 µm silica, pore size 60Å
  - Reversed Phase plates, with a bonded alkyl group, are represented by a K followed by the length of the alkyl chain: KC2 10-12 µm silica, 60Å, Ethyl bonded phase
  - Cellulose layers are denoted by K2
- Additional format information is provided for each plate through the following letter codes:

<b>L . .</b> Linear-K preadsorbent layer compresses each spot into a narrow horizontal line.
<b>D . .</b> Divisions. Plates have 0.2 mm gaps of clear glass separating each sample channel, preventing crossover.
<b>F . .</b> Fluorescent Indicator. These plates glow bright green under UV light. Samples which absorb UV at 254 nm are detected due to fluorescence quenching.
<b>M . .</b> Microscope Slide. Plate size 1" x 3".
<b>P . .</b> Preparative layer. These plates have 500 or 1000 µm thickness for large sample sizes.
Example: <b>LK6DF</b> = K6 silica of 60Å pore diameter featuring a channelled, fluorescent plate and the preadsorbent layer.

## Whatman TLC Plates

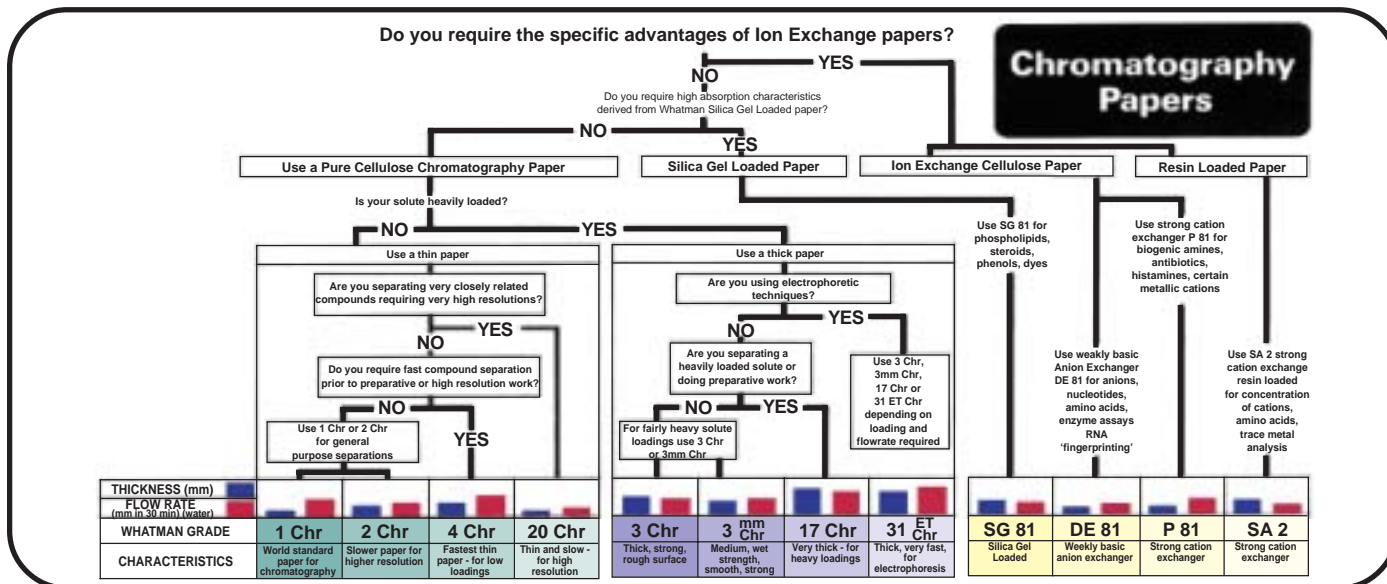
Product Number	Type	Size (cm)	Linear-K Preadsorb	Channels	Thickness	Fluor. Indic.	Quantity	Price
<b>Silica Gel 150Å</b>								
WH4850620	K5	5 x 20	-	-	250 µ	-	75	\$226.10
WH4851620	K5F	5 x 20	-	-	250 µ	Yes	75	219.50
WH4855820	LK5	20 x 20	Yes	-	250 µ	-	25	237.30
WH4856820	LK5F	20 x 20	Yes	-	250 µ	Yes	25	230.20
WH4855821	LK5D	20 x 20	Yes	19	250 µ	-	25	253.00
WH4856821	LK5DF	20 x 20	Yes	19	250 µ	Yes	25	253.00
<b>Silica Gel 60Å</b>								
WH4860820	K6	20 x 20	-	-	250 µ	-	25	172.70
WH4860620	K6	5 x 20	-	-	250 µ	-	75	206.90
WH4861820	K6F	20 x 20	-	-	250 µ	Yes	25	172.70
WH4861620	K6F	5 x 20	-	-	250 µ	Yes	75	206.90
WH4861110	MK6F	1" x 3"	-	-	200 µ	Yes	500	829.70
WH4865821	LK6D	20 x 20	Yes	19	250 µ	-	25	253.00
WH4865001	LK6D	10 x 10	Yes	9	250 µ	No	100	292.80
WH4865621	LK6D	5 x 20	Yes	4	250 µ	-	75	306.60
WH4866821	LK6DF	20 x 20	Yes	19	250 µ	Yes	25	253.00
WH4866621	LK6DF	5 x 20	Yes	4	250 µ	Yes	75	306.60
WH4410222	PE SIL G (on Polyester)	20 x 20	-	-	250 µ	Yes	25	183.70
WH4420222	AL SIL G (on Aluminum)	20 x 20	-	-	250 µ	Yes	25	179.10
<b>Reversed Phase</b>								
WH4801600	KC <sub>18</sub>	5 x 20	-	-	200 µ	-	75	624.40
WH4801800	KC <sub>18</sub>	20 x 20	-	-	200 µ	-	25	501.00
WH4803600	KC <sub>18</sub> F	5 x 20	-	-	200 µ	Yes	75	624.40
WH4803800	KC <sub>18</sub> F	20 x 20	-	-	200 µ	Yes	25	501.00
WH4804820	Multi-K CS5	20 x 20	-	-	250 µ	-	25	324.50
<b>High Performance</b>								
WH4805410	LHP-K	10 x 10	Yes	-	200 µ	-	100	890.00
WH4806410	LHP-KF	10 x 10	Yes	-	200 µ	Yes	100	890.00
WH4805710	LHP-K	10 x 20	Yes	-	200 µ	-	50	688.80
WH4806710	LHP-KF	10 x 20	Yes	-	200 µ	Yes	50	688.80
WH4802400	HP-KF	10 x 10	-	-	200 µ	Yes	100	798.20
WH4802700	HP-KF	10 x 20	-	-	200 µ	Yes	50	625.60
<b>Diamond Series</b>								
WH4500101	K6F	1" x 3"	-	-	250 µ	Yes	500	655.90
WH4500105	K6F	20 x 20	-	-	250 µ	Yes	25	150.10
WH4500305	LK6DF	20 x 20	Yes	19	250 µ	Yes	25	219.30
WH4806420	LHPKF	10 x 10	Yes	-	200 µ	Yes	25	328.60



# WHATMAN CHROMATOGRAPHY PAPER

## WHATMAN CHROMATOGRAPHY PAPER

This chart will indicate the right chromatography paper for your application



THIN PAPERS	
<b>1 Chr</b> World standard paper for chromatography Thickness: 0.18 mm Flow: 130 mm/30s	<b>4 Chr</b> Fastest thin paper Thickness: 0.21 mm Flow: 180 mm/30s
<b>2 Chr</b> Slower paper for higher resolution Thickness: 0.17 mm Flow: 115 mm/30s	<b>20 Chr</b> Thin and slow - for high resolution Thickness: 0.17 mm Flow: 95 mm/30s

THICK PAPERS FOR HEAVY LOADING	
<b>3 Chr</b> Thick, strong, rough surface. Also used for electrophoresis. Thickness: 0.36 mm Flow: 130 mm/30s	<b>17 Chr</b> Very thick paper for heavy loadings. Also used for electrophoresis. Thickness: 0.92 mm Flow: 190 mm/30s
<b>3mm Chr</b> Medium wet strength, smooth, strong. Also used for electrophoresis. Thickness: 0.34 mm Flow: 130 mm/30s	<b>31 ET Chr</b> Thick, very fast, for electrophoresis Thickness: 0.50 mm Flow: 225 mm/30s

SILICA GEL AND ION EXCHANGE PAPERS	
<b>SG 81</b> High absorption silica gel loaded paper for phospholipids, steroids, phenols, dyes Thickness: 0.27 mm Flow: 110 mm/30s	<b>P 81</b> SCX for biogenic amines, antibiotics, histamines, certain metallic cations Thickness: 0.23 mm Flow: 125 mm/30s
<b>DE 81</b> WAX for anions, nucleotides, amino acids, enzyme assays, RNA fingerprinting Thickness: 0.20 mm Flow: 95 mm/30s	<b>SA 2</b> SCX resin loaded for concentration of cations, amino acids, trace metal analysis Thickness: 0.33 mm Flow: 110 mm/30s

### Chromatography Paper

Whatman chromatography papers are the most widely used materials of their type throughout the world. This acceptance and usage reflects the purity and consistency of Whatman papers, qualities which are essential to successful reproducible chromatography.

### Simple & Economical Technique

Paper chromatography is an extremely efficient and economical method of separating the different components of a soluble sample. The different components appear, after initiating a solvent flow through the paper, as spots or bands spatially separated i.e. they will separate into different measurable positions on the sheet or strip. Whatman ion exchange cellulose, resin loaded and silica gel papers also offer a unique combination of advantages to the biochemist.

### Advantages of Paper Chromatography

- Simultaneous development of multiple samples on the same sheet and under identical conditions.
- A capability for multiple development, i.e. sequential developments of the same sample with different solvents and/or different concentrations of the same solvent.
- Suitability for two-dimensional chromatography (change in direction of the solvent front) with possible improved resolution.
- Practicability for continuous developments and elution.

Chromatography Papers						
Sheets (100 per box) * Product Is Available Upon Special Order						
Size (cm)	Grade 1 Chr	2 Chr	3 Chr	3 MM Chr	4 Chr	17 Chr
20 x 20	WH3001861 \$52.30	—	—	WH3030861 \$56.50	—	—
46 x 57	WH3001917 217.00	WH3002917 \$279.40	WH3003917 \$477.30	WH3030917 339.10	WH3004917 \$288.00	WH3017917 \$1,257.70
58 x 68	WH3001931 321.70	—	—	WH3030931 543.90	—	—

This table represents but a mere sampling. Contact our Technical Support Group for additional product numbers and pricing.

# SYRINGES

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**1-800-267-8103**



## Which needle point style works best?



### Point Style AS

Special conical style needle point designed to withstand the demands of multiple injections; exclusively used on autosampler syringes

### Point Style 2

Beveled non-coring needle point recommended for septum penetration; only needle gauges 26s – 22 are recommended for optimum septum penetration

### Point Style 3

Blunt needle point for use with HPLC injection valves and for sample pipetting

### Point Style 4

10 – 12° beveled needle point recommended for life science applications

### Point Style 5

Conical needle with side port for penetration of septa, thin-gauged vinyls and plastics without coring; minimizes septum damage.

## What are the standard point styles for each syringe?

	700	800	1000	1700	1800	7000
LTN		2	2,3,5	2		
N	2,3	2		2	2	
RN	2	2	2,3	2,3	2	
KH						2,3
SL			2	2		

## Choosing the Right Hamilton Syringe for Your Application

### Is your sample a gas or a liquid?

For a gas sample, use a GASTIGHT® syringe. GASTIGHT® 1000, 1700 and 1800 Series 10 µL to 100 mL

This type of syringe, for use with liquids and gases, features a precision-machined TEFLON® PTFE plunger tip.

For a liquid sample, choose between a MICROLITER™, MODIFIED MICROLITER™, or a GASTIGHT® syringe.

### What is your dispense or injection volume?




#### For a liquid sample

Syringe Size	600 Series	700 Series	800 Series	900 Series	7000 Series	1000 Series	1700 Series	1800 Series
0.5 – 5 µL					•			
2.5 – 5 µL	•							
5 – 10 µL				•				
5 – 250 µL		•	•					
10 – 250 µL							•	•
10 – 500 µL		•					•	
1 – 100 mL						•		

#### For a gas sample

Syringe Size	1000 Series	1700 Series	1800 Series
10 - 250 µL		•	•
10 - 500 µL		•	
1 – 100 mL		•	

#### Common Needle Gauges

Gauge	Syringe Size	Benefits
26s 	≤10 µL syringes	Low dead space, durable, low septum damage
22s 	25 -250 µL syringes	Low dead space, very durable
22 	≥500 µL syringes	Easier sample flow for large volumes

### Is the volume of fluid in the needle part of the total volume of the dispensed fluid?

When using a Hamilton syringe, the volume in the needle (called dead volume) is considered constant and the volume being dispensed is absolute. The same dead volume is maintained throughout the aspirate and dispense stages.

### Do you need a rugged syringe?

- **Syringe Guide** – easily installed on a syringe to prevent the plunger from bending or from being pulled out
- **Reproducibility (Chaney) Adapter** – easily installed on a syringe for consistent, reproducible injections; also prevents plunger damage
- **Reinforced Plungers** – Series 600, 800, 900 and 1800 syringes offer an extended barrel which prevents bent plungers

### Are the plungers for the 700 series MICROLITER™ syringes interchangeable?

No, they are not! Each plunger is fitted to a specific syringe barrel. Be very careful to keep each plunger with its original syringe in order to maximize syringe performance. GASTIGHT® syringes are Hamilton's most versatile. The plungers are replaceable if they are bent. The RN, KH, TLL or LT terminations allow you to replace bent or plugged needles.

## Which termination works best for your application?

<p><b>N (Cemented Needle)</b> A stainless steel needle cemented to the glass barrel at the zero graduation mark. These syringes cannot be heated above 50°C (122°F) and are not recommended for halogenated solvents. Not autoclavable.</p> 	<p><b>LTN (Luer Tip Needle)</b> Similar N termination, but with the needle cemented into a luer tip to connect to other equipment. Cannot be heated above 50°C (122°F) and are not recommended for halogenated solvents. Not autoclavable.</p> 
<p><b>RN (Removable Needle)</b> The RN syringe uses a removable stainless steel needle that seats to the zero graduation mark, providing the same characteristics as the N. Advantageous for laboratories with multiple users; economical since you can replace just the needle. Temperature resistant to 115°C (239°F), and can be autoclaved when disassembled. For replacement needles see page 382.</p> 	<p><b>LT (Luer Tip)</b> The LT syringe has a ground glass luer taper and is suitable for use with most hypodermic needles. Metal hubbed needles are not recommended. Fluorocarbon hubbed needles seal better, conforming tightly to the glass luer taper. The syringe can be autoclaved when disassembled.</p> 
<p><b>SL (SampleLock™)</b> On/Off syringe valve with RN needle is cemented to a syringe barrel; not autoclavable. Used for headspace, environmental sample collection and storage, pre-pressurization of gaseous samples for GC analysis, and sample spiking.</p> 	<p><b>TLL (Teflon Luer Lock)</b> The TLL syringe is exclusive to the 1700 and 1000 Series. The nickel-plated brass hub with fluorocarbon male insert is cemented to the exterior of the glass barrel. Useable with metal or fluorocarbon hubs. The syringe can be autoclaved when disassembled.</p> 
<p><b>KH (Knurled Hub)</b> The KH syringe (formerly listed as N) is exclusive to the 7000 Series Modified Microliter syringes. Rated to 6,000 psi.</p> 	<p><b>C (Chem)</b> The C syringe is exclusive to the 1700 and 1000 Series Gastight syringes. A 1/4-28 UNF-2A threaded housing with a fluorocarbon insert is cemented to the syringe. This syringe can be autoclaved when disassembled.</p> 

## GASTIGHT® Syringes



## MICROLITER™ Syringe



## Plunger Types

### Standard Microliter Plunger

Stainless steel with a stainless steel button staked to the plunger rod. This type plunger is individually fitted to the syringe barrel. Interchanging plungers between syringes will permanently damage syringes. These plungers are not sold as replacement items.

### Standard Gastight Plunger

Either stainless steel or aluminum, depending on the syringe model. Some are covered with a baked-on carbon black Teflon protective coating over the stainless steel or aluminum. The gastight seal is made by the Teflon tip. These plungers are interchangeable and can be ordered as separate items for field repair.

### 7000 Series Plunger

The 7000 Series Plunger is an integral part of the needle, plunger inner sleeve, and button screw assembly. Plunger is made of tungsten and is fitted to the inner-diameter of the syringe needle. Field repair kits are available.

### Reinforced Plungers

The plunger has two diameters. The regular diameter section stays protected in the syringe barrel, only the thicker section is exposed during aspiration. Series 600, 800, 900 and 1800.

### 7000 Series

A thin tungsten wire on the end of the plunger passes down the needle, providing positive sample displacement.

## The plunger in my syringe is stuck. What can I do to free it up?

- Frozen plungers are caused by improper care of your syringe. Here are a couple of suggestions to save your syringe:
  - Soak the syringe in alcohol, acetone or warm water. Do not soak them for longer than 5 minutes.
  - Sonic cleaners can sometimes help to free up the plunger.
- If the plunger does not start to move after this, you will need to replace the syringe.
- Proper cleaning will help prevent frozen plungers. Especially when the syringes are being used for life science applications, where sugary or protein based sample are required. We recommend using a like solvent to dissolves the sample. Rinse the syringe thoroughly and then remove the plunger and allow the syringe and plunger to air dry separately.



## Free Literature:

HPLC Manual Injection Syringes . . . . . H22  
Small Volume Syringes . . . . . H27  
Softgrip™ Pipettes . . . . . CS25



# HAMILTON SYRINGES

## HAMILTON 700 SERIES MICROLITER™ SYRINGES 10 $\mu$ L - 500 $\mu$ L



### Specifications

Model	701	702	705	710	725	750
Syringe Capacity ( $\mu$ L)	10	25	50	100	250	500
Major Graduations ( $\mu$ L)	1	2.5	5	10	25	50
Minor Graduations ( $\mu$ L)	.2	.5	1	2	5	10
Maximum Pressure Rating (psig)	2000	2000	2000	2000	1000	1000
Standard Needle Gauge	26S	22S	22S	22S	22S	22
Standard Needle Length (in.)	2	2	2	2	2	2
Standard Electro-taper	Yes	Yes	Yes	Yes	Yes	Yes

### SYRINGES

LT, Luer Tip Price	(Needles Not Included)	H80301 \$36.70	H80401 \$39.00	H80501 \$41.30	H80601 \$49.40	H80701 \$62.00	H80801 \$64.30
N, Fixed Needle Price	(Point Style #2)	H80300 \$26.40	H80400 \$36.70	H80500 \$41.30	H80600 \$44.80	H80700 \$54.00	H80800 \$58.50
N, Fixed Needle Price	(Point Style #3)	H80383 \$49.40	H80465 \$36.70	H80565 \$41.30	H80665 \$42.50	H80765 \$54.00	H80865 \$66.60
NCH, Fixed Needle/Chaney Price	(Point Style #2)	H80304 \$126.30	—	H80505 \$171.10	H80605 \$167.60	—	—
RN, Removable Needle Price	(Point Style #2)	H80330 \$49.40	H80430 \$56.30	H80530 \$58.50	H80630 \$64.30	H80730 \$80.40	H80830 \$83.80

### SIX PACKS

N (Cemented Needle) Syringe Six Pack Price	(Point Style #2)	H80366 \$124.60	—	—	—	—	—
RN (Removable Needle) Syringe Six Pack Price	(Point Style #2)	H80336 \$244.20	—	—	—	—	—

## HAMILTON 800 SERIES MICROLITER™ SYRINGES 10 $\mu$ L - 250 $\mu$ L



### Specifications

Model	801	802	805	810	825
Syringe Capacity ( $\mu$ L)	10	25	50	100	250
Major Graduations ( $\mu$ L)	1	2.5	5	10	25
Minor Graduations ( $\mu$ L)	.2	.5	1	2	5
Maximum Pressure Rating (psig)	2000	2000	2000	2000	1000
Standard Needle Gauge	26S	22S	22S	22S	22S
Standard Needle Length (in.)	2	2	2	2	2
Standard Electro-taper	Yes	Yes	Yes	Yes	Yes

### SYRINGES

N, Fixed Needle Price	(Point Style #2)	H84852 \$88.30	H84854 \$92.00	H84856 \$107.90	H84858 \$103.00	—
RN, Removable Needle Price	(Point Style #2)	H84853 \$104.20	H84855 \$104.20	H84857 \$111.60	H84859 \$114.00	H84861 \$128.70

Syringe Replacement Parts . . . . . See Page 172

[www.chromspec.com](http://www.chromspec.com)

TECHNICAL SUPPORT  
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GENERAL INQUIRIES  
[sales@chromspec.com](mailto:sales@chromspec.com)

INSTRUMENTATION  
[instrum@chromspec.com](mailto:instrum@chromspec.com)

## HAMILTON 1000 SERIES GASTIGHT® SYRINGES 1mL - 100mL



### Specifications

Model	1001	1001.25	1002	1005	1010	1025	1050	1100
Syringe Capacity (mL)	1	1.25	2.5	5	10	25	50	100
Major Graduations (mL)	.1	.125	.25	.5	1	2.5	5	5
Minor Graduations (mL)	.02	.025	.05	.1	.2	.5	1	1
Maximum Pressure Rating (psig)	200	200	200	200	200	100	100	100
Standard Needle Gauge	22	22	22	22	22	—	—	—
Standard Needle Length (in.)	2	2	2	2	2	—	—	—
Standard Electro-taper	Yes	Yes	Yes	Yes	Yes	—	—	—

### SYRINGES

LT, Luer Tip Price	(Needles Not Included)	H81301 \$57.40	H82001 \$87.20	H81401 \$54.00	H81501 \$66.60	H81601 \$81.50	—	—	—
LTN, Fixed Needle Price	(Point Style #2)	H81317 \$59.70	H82017 \$75.80	H81417 \$57.40	H81517 \$70.00	H81617 \$85.00	—	—	—
LTN, Fixed Needle Price	(Point Style #3)	H81316 \$62.00	—	H81416 \$57.40	H81516 \$68.90	—	—	—	—
LTN, Fixed Needle Price	(Point Style #5)	H81343 \$68.90	—	H81443 \$68.90	H81543 \$79.20	—	—	—	—
RN, Removable Needle Price	(Point Style #2)	H81330 \$78.10	—	H81430 \$76.90	H81530 \$87.20	H81630 \$103.30	—	—	—
RN, Removable Needle Price	(Point Style #3)	H81365 \$78.10	—	—	—	—	—	—	—
TLL, Teflon Luer Lock Price	(Needles Not Included)	H81320 \$64.30	—	H81420 \$62.00	H81520 \$63.10	H81620 \$79.20	H82520 \$202.90	H85020 \$253.80	H86020 \$389.30

## HAMILTON 1700 SERIES GASTIGHT® SYRINGES 10µL - 500µL



### Specifications

Model	1701	1702	1705	1710	1725	1750
Syringe Capacity (µL)	10	25	50	100	250	500
Major Graduations (µL)	1	2.5	5	10	25	50
Minor Graduations (µL)	.2	0.5	1	2	5	10
Maximum Pressure Rating (psig)	1000	1000	1000	1000	500	500
Standard Needle Gauge	26s	22s	22s	22s	22s	22
Standard Needle Length (in.)	2	2	2	2	2	2
Standard Electro-taper	Yes	Yes	Yes	Yes	Yes	Yes

### SYRINGES

LT, Luer Tip Price	(Needles Not Included)	H80001 \$45.90	H80201 \$45.90	H80901 \$49.40	H81001 \$52.80	H81101 \$55.10	H81201 \$52.80
N, Fixed Needle Price	(Point Style #2)	H80000 \$43.60	H80200 \$45.90	H80900 \$49.40	H81000 \$52.80	H81100 \$55.10	H81217 \$52.80
N, Fixed Needle Price	(Point Style #3)	H80075 \$43.60	H80275 \$45.90	H80975 \$49.40	H81075 \$52.80	H81175 \$55.10	—
RN, Removable Needle Price	(Point Style #2)	H80030 \$55.10	H80230 \$55.10	H80930 \$57.40	H81030 \$64.30	H81130 \$64.30	H81230 \$64.30
RN, Removable Needle Price	(Point Style #3)	H80065 \$55.10	H80265 \$55.10	H80965 \$57.40	H81065 \$64.30	H81165 \$64.30	H81265 \$64.30
TLL, Teflon Luer Lock Price	(Needles Not Included)	—	—	H80920 \$55.10	H81020 \$54.00	H81120 \$54.00	H81220 \$54.00

Syringe Replacement Parts . . . . . See Page 172

# HAMILTON SYRINGES

## HAMILTON 1800 SERIES GASTIGHT® SYRINGES 10 $\mu$ L - 250 $\mu$ L



### Specifications

Model	1801	1802	1805	1810	1825
Syringe Capacity ( $\mu$ L)	10	25	50	100	250
Major Graduations ( $\mu$ L)	1	2.5	5	10	25
Minor Graduations ( $\mu$ L)	.2	.5	1	2	5
Maximum Pressure Rating (psig)	1000	1000	1000	1000	500
Standard Needle Gauge	26S	22S	22S	22S	22S
Standard Needle Length (in.)	2	2	2	2	2
Standard Electro-taper	Yes	Yes	Yes	Yes	Yes

### SYRINGES

N, Fixed Needle	(Point Style #2)	H84875	H84878	H84881	H84884	H84887
Price		\$104.20	\$107.90	\$111.60	\$114.00	\$122.60
RN, Removable Needle	(Point Style #2)	H84877	H84880	H84883	H84886	H84889
Price		\$123.80	\$123.80	\$127.50	\$129.90	\$138.50

## HAMILTON 7000 SERIES MODIFIED MICROLITER™ SYRINGES 0.5 $\mu$ L - 5.0 $\mu$ L



### Specifications

Model	7000.5	7001	7101	7002	7102	7105
Syringe Capacity ( $\mu$ L)	0.5	1	1	2	2	5
Major Graduations ( $\mu$ L)	.05	0.1	0.1	0.2	0.2	.5
Minor Graduations ( $\mu$ L)	.01	.02	.02	.04	.04	.1
Maximum Pressure Rating (psig)	6000	6000	6000	6000	6000	6000
Standard Needle Gauge	25	25S	22S	25	23	24
Standard Needle Length (in.)	2.75	2.75	2.75	2.75	2.75	2.75
Standard Electro-taper	No	No	Yes	No	Yes	No

### SYRINGES

KH, Knurled Hub (formerly RN)	(Point Style #3)	H86250	H80100	H86200	H88400	H88500	H88000
Price		\$98.10	\$77.20	\$77.20	\$98.10	\$98.10	\$89.50
KH, Knurled Hub (formerly RN)	(Point Style #2)	H86259	H80135	H86211	H88411	H88511	H88011
Price		\$98.10	\$77.20	\$77.20	\$98.10	\$98.10	\$89.50
KHW/G, Knurled Hub/Guide	(Point Style #3)	H86254	H80107	H86207	H88407	H88507	H88007
Price		\$126.30	\$107.90	\$107.90	\$125.00	\$125.00	\$116.50
KHCH, Knurled Hub/Chaney	(Point Style #3)	H86252	H80104	H86204	H88404	H88504	H88004
Price		\$182.70	\$161.80	\$198.60	\$181.40	\$176.50	\$175.30

Syringe Replacement Parts . . . . . See Page 172

Hamilton Company is the worldwide leader in the design and manufacture of manual, semi-automated and robotic products for precision fluid measuring. For nearly 50 years, Hamilton has been satisfying customer needs by combining quality materials with skilled workmanship, ensuring the highest level of performance of every precision fluid measuring device they manufacture. Hamilton's lifelong commitment to precision, accuracy, and quality has earned them global ISO 9001 Certification.

These products are available directly through Chromatographic Specialties Inc. who stand ready to provide the best customer service and technical support. From our inception, we have served the scientific community with fairly-priced, quality products, and have made customer satisfaction through timely support our highest priority. We look forward to serving your needs, both now and in the future, with the products and services that have truly made . . . HAMILTON . . . the Measure of Excellence.

# HAMILTON SPECIAL SYRINGES AND ACCESSORIES

## HAMILTON SampleLock™ SYRINGES

Common applications for SampleLock™ syringes include environmental sample collection and storage, pre-pressurization of gaseous samples for GC analyses, and sample spiking. A 5 mL version of the syringe is also available for purge and trap applications.

- Collect, store, transport and inject liquid or gas samples
- Lock your sample in the gastight SampleLock™ syringe with the easy-to-use twist valve
- No evaporative loss or environmental contamination
- Prevent loss of sample and plunger blowout at elevated pressures with the positive rear plunger stop
- Connect SampleLock™ syringes to either male or female luer fittings with adapters designed for a multitude of applications
- Syringes are shipped with a standard 2" point style #2 needle
- SampleLock™ syringes work with Hamilton's Digital Syringe

The syringe is available in sizes ranging from 50 µL to 100 mL. A positive rear stop on the SampleLock™ syringes (250 µL to 100 mL) prevents plunger blowout and loss of sample. Optional male and female luer and male luer lock adapters thread onto the SampleLock™ valve making the syringe compatible with a multitude of connectors and fittings.

Volume	50µL	100µL	250µL	500µL	1mL	2.5mL	5mL	10mL	25mL	50mL	100mL
Model	1705	1710	1725	1750	1001	1002	1005	1010	1025	1050	1100
Max. Pressure Rating, psig	1000	1000	500	500	200	200	200	200	100	100	100
Std. Needle Gauge	22s	22s	22s	22	22	22	22	22	22	22	22
Valve Dead Volume, µL (w/o needle)	4	4	4	4	5	5	9	9	9	9	9
Positive Rear Plunger Stop	No	No	Yes	Yes	Yes	Yes	Yes***	Yes	Yes	Yes	Yes

Product Number	H80956	H81056	H81156	H81256	H81356	H81456	H81556	H81656	H86326	H86336	H86346
Price	\$118.80	\$123.80	\$148.50	\$146.10	\$184.40	\$216.60	\$212.90	\$234.00	\$386.20	\$451.80	\$599.10

\*\*\* Except for 5 mL Purge & Trap Syringe, Product Number H81570

## REMOVABLE FUSED SILICA NEEDLE SYRINGES

Product Number	Description	Price
H87402	701RNFS 10µL Microliter	\$68.70
H87404	1701RNFS 10µL Gastight	87.00
H87405	1801RNFS 10µL Gastight w/Handle	154.50

All above come with one 10cm x 0.17mm Fused Silica Needle.

## REPLACEMENT PARTS

H17737	Fused Silica Needle 10cm x 0.17mm	\$16.10
H30947	Teflon Ferrule 0.17mm ID	17.60
H30946	Spacer	10.60

## ON-COLUMN INJECTION SYRINGES

The On-column Injection Syringe is a 0.5 µL syringe with stainless steel needle. This syringe is identical to the 7000.5KH except the O.D. of the needle is 0.23mm, enabling injection into any standard capillary GC column.

Product Number	Description	Price
H86257	7000.5 OC 0.5 µL On-column Syringe	\$192.50
H86258	7000.5 OC Needle/Plunger Assembly	172.10

## HAMILTON DILUTER AND DISPENSER SYRINGES

Volume Model	25µL 1702	50µL 1705	100µL 1710	250µL 1725	500µL 1750	1mL 1001	2.5mL 1002	5mL 1005	10mL 1010	25mL 1025
Right Side (DX) Diluter	H80226 \$115.10	H80926 \$115.10	H81026 \$115.10	H81126 \$111.40	H81226 \$115.10	H81326 \$163.40	—	—	—	—
Left Side (TLL/TLLX) Diluter	H80222 \$71.20	H80922 \$67.70	H81022 \$67.70	H81122 \$65.40	H81222 \$65.40	H81323 \$76.90	H81420 \$62.00	H81520 \$63.10	H81620 \$79.20	H82521 \$174.50
Right and Left Side Dispenser										

## C (CHEM) SYRINGES



C-Type syringes attach to valves or instruments with a 1/4-28 male fitting.

Product Number	Model	Capacity	Price
H80262	1702CX	25 µL	\$92.80
H80962	1705CX	50 µL	92.80
H81062	1710CX	100 µL	90.40
H81162	1725CX	250 µL	92.80
H81262	1750CX	500 µL	92.80
H81360	1001C	1 mL	91.60
H81460	1002C	2.5 mL	84.20
H81560	1005C	5 mL	99.00
H81660	1010C	10 mL	106.50

## SYRINGE RACK

Product Number	Description	Price
D102233	Syringe Rack	\$13.20

## INERT GAS SAMPLING VALVE

H86580	Inert Gas Sampling Valve	\$91.80
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# SYRINGES FOR AGILENT GC AUTOSAMPLERS

Syringes are available for most major manufacturer's automated GC and HPLC systems, including:

- LEAP Technologies / CTC
- Perkin-Elmer®
- Shimadzu
- Varian / Chrompack
- Carlo Erba / Fisons
- and many more

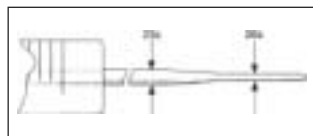
We also have a complete selection of syringes for manual injection techniques. Please inquire!

Whatever your application, CSI carries a syringe to suit your need!

*Chromatographic Specialties Inc. offers a complete line of genuine Hamilton syringes for Agilent Autosamplers.*

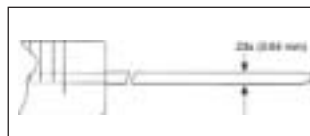


Three needle gauges are available for optimal injection performance



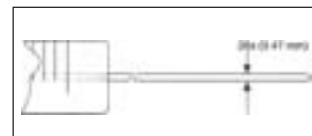
#### 23s-26s Dual Gauge

- Tapered Needle
- Split/splitless or on-column injections
- Versatility without sacrificing durability
- Most popular needle



#### 23s Gauge Needle

- Most durable needle
- Merlin Microseal™ and standard septum injections
- Packed column injections
- Split/splitless injections



#### 26s Gauge Needle

- Fine gauge offers versatility
- On-column injections
- Split/splitless injections

#### Free Guide



For free technical information on the maintenance and use of Hamilton GASTIGHT®, MICROLITER™, and specialty syringes, please contact our Technical Support Group at 1-800-267-8103 or tech@chromspec.com and request a copy of literature code **H07**.

#### TECH TIP

The life of your Hamilton syringe is directly related to its cleanliness! High purity water and acetone prove to be good solvent rinses.

			7673 Cemented Needle			7673 Removable Needle			7670, 7671, 7672 N RN	
Model	Volume	Length/ Point Style	23s	26s	23s-26s	23s	26s	23s-26s	26s	
MODIFIED MICROLITER™ Syringes										
7000.5	0.5 µL	1.71" / AS	—	—	—	H86276 \$110.30	H86274 \$101.80	—	—	—
7001	1 µL	1.71" / AS	—	—	—	H80176 \$96.90	H80175 \$100.50	—	—	—
MICROLITER™ Syringes										
75	5 µL	1.71" / AS	H87987 \$68.90	H87988 \$68.90	H87993 \$68.90	H87957 \$79.20	H87958 \$90.70	H87959 \$82.70	—	—
75	5 µL 6/pk	1.71" / AS	H87990 \$367.40	H87989 \$401.80	H87994 \$385.70	—	—	—	—	—
75	5 µL	1.71" / 2	H87991 \$75.80	H87992 \$75.80	—	—	—	—	H87900* \$42.90	
701	10 µL	1.71" / AS	H80387 \$44.80	H80388 \$44.80	H80393 \$44.80	H80357 \$63.10	H80358 \$62.00	H80359 \$64.30	—	—
701	10 µL 6/pk	1.71" / AS	H80390 \$256.00	H80389 \$256.00	H80391 \$256.00	—	—	—	—	—
701	10 µL	1.71" / 2	H80398 \$50.50	H80399 \$49.40	—	—	—	—	—	—
701	10 µL	2" / 2	—	—	—	—	—	—	H80300 \$26.40	H80338 \$73.50
701	10 µL 6/pk	2" / 2	—	—	—	—	—	—	H80366 \$124.60	—
GASTIGHT® Syringes										
175ASN	5 µL	1.71"/AS	H80074 \$62.00	—	H80076 \$63.10	—	—	H80086 \$98.70	—	—
175ASN	5 µL 6/pk	1.71/AS	H80090 \$355.90	—	H80092 \$355.90	—	—	—	—	—
1701	10 µL	1.71" / AS	H80080 \$62.00	—	H80079 \$62.00	H80087 \$68.90	H80088 \$68.90	H80089 \$68.90	—	—
1701	10 µL 6/pk	1.71" / AS	H80094 \$355.90	—	H80096 \$355.90	—	—	—	—	—
1701	10 µL	2" / 2	—	—	—	—	—	—	H80000 \$43.60	H80011 \$102.20

\* (26s/2"/2) N = Cemented (Fixed) Needle, RN = Removable Needle

# HAMILTON SYRINGES FOR HPLC INJECTORS AND AUTOSAMPLERS

## SYRINGES FOR BECKMAN/ALTEX, RHEODYNE, SCIENTIFIC SYSTEMS, VALCO VISF-2 INJECTORS

Product Number	Description	Price
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### 600 Series Removable Needle "Rheodyne"

H87942	62RNR 2.5µL 22s ga 2" Pt3	\$93.20
H87943	65RNR 5µL 22s ga 2" Pt3	89.50

### 700 Series Cemented Needle "Rheodyne"

H80365	701SNR 10µL 22s ga 2" Pt3	\$34.40
H80465	702SNR 25µL 22s ga 2" Pt3	36.70
H80565	705SNR 50µL 22s ga 2" Pt3	41.30
H80665	710SNR 100µL 22s ga 2" Pt3	42.50
H80765	725SNR 250µL 22 ga 2" Pt3	54.00
H80865	750SNR 500µL 22 ga 2" Pt3	66.60

### 1700 Series Removable Needle "Rheodyne"

H80065	1701RNR 10µL 22s ga 2" Pt3	\$55.10
H80265	1702RNR 25µL 22s ga 2" Pt3	55.10
H80965	1705RNR 50µL 22s ga 2" Pt3	57.40
H81065	1710RNR 100µL 22s ga 2" Pt3	64.30
H81165	1725RNR 250µL 22 ga 2" Pt3	64.30
H81265	1750RNR 500µL 22 ga 2" Pt3	64.30

## SYRINGES FOR LEAP / CTC LC AUTOSAMPLERS

### MICROLITER

H203073	701N 10 µL 22s ga 2" Pt3	\$94.10
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### GASTIGHT

H203194	1701N 10 µL 22s ga 2" Pt3	\$90.70
H203075	1702N 25 µL 22s ga 2" Pt3	132.00
H203235	1710N 100 µL 22s ga 2" Pt3	82.70
H203079	1725N 250 µL 22 ga 2" Pt3	83.80
H203349	1750N 500 µL 22 ga 2" Pt3	144.60
H203081	1001N 1 mL 22 ga 2" Pt3	76.90
H203083	1002N 2.5 mL 22 ga 2" Pt3	83.80
H203085	1005N 5 mL 22 ga 2" Pt3	104.50

### A200S

H203560	1701N 10 µL 22s ga 2" Pt3	\$113.40
H203563	1702N 25 µL 22s ga 2" Pt3	92.50
H203566	1710N 100 µL 22s ga 2" Pt3	95.50

## STANDARD NEEDLES FOR RHEODYNE AND LEAP/CTC HAMILTON SYRINGES

Product Number	Description	Pkg. 6 Price
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H776801	26s ga 5µL-100µL 2" Pt3	\$45.90
H777002	22 ga 5µL-100µL 2" Pt3	38.90
H778003	22s ga 250µL-10mL 2" Pt3	35.30

## SYRINGES FOR VALCO VISF-1 INJECTORS

### GASTIGHT

H80231	1701NCP 25 µL 22s ga 0.75" Pt3	\$66.60
H80931	1702NCP 50 µL 22s ga 0.75" Pt3	71.20
H81031	1710NCP 100 µL 22s ga 0.75" Pt3	71.20

A full range of syringes for VISF-1 Injector Syringes are available from Chromatographic Specialties.

Please call our Technical Support Department at 1-800-267-8103.

## REPLACEMENT RN NEEDLES FOR VISF-1

Product Number	Description	Pkg. 6 Price
H777001	22s ga 5µL-100µL 2" Pt3	\$38.90
H778004	22 ga 250µL-10mL 2" Pt3	38.90

## SYRINGES FOR AGILENT 1090A AUTOSAMPLER

H765401	25 µL 1702RN without needle	\$48.20
H765701	250 µL 1725RN without needle	57.40

## SYRINGES FOR WATERS™ U6K INJECTORS

Product Number	Description	Price
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### 800 Series Removable Needle - Waters™

H84815	801RNW 10µL 25s ga 1.97" Pt3	\$104.20
H84816	802RNW 25µL 25s ga 1.97" Pt3	104.20
H84817	805RNW 50µL 25s ga 1.97" Pt3	111.60
H84818	810RNW 100µL 25s ga 1.97" Pt3	114.00
H84819	825RNW 250µL 25s ga 1.97" Pt3	128.70

## REPLACEMENT NEEDLES FOR U6K INJECTORS

Product Number	Description	Pkg. 6 Price
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H864701	25s ga 5µL-100µL 1.97" Pt3	\$41.20
H864801	25s ga 250µL-10mL 1.97" Pt3	41.20

Note: Also available in 1700 and 1800 series.

## WATERS™ PUMP PRIMING SYRINGE

Product Number	Description	OEM #	Price
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H81610	1010W 10mL Waters™ Syringe	WAT027629	\$157.30
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See Also. .... Page 152-153

## 1700 SERIES SYRINGES - WATERS WISP™ AUTOSAMPLER FOR WATERS™ 712, 715, 717, 2690/2695, 2790/2795, LC MODULE 1

Product Number	Description	OEM #	Price
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H80020	1702WISP, 25µL	WAT073109	\$157.00
H80024	1725WISP, 250µL	WAT077343	149.80

## GUIDE TO NEEDLE TERMINATION CODES (HAMILTON)

Code	Description
------	-------------

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

*Chromatographic Specialties Inc. — The Syringe People!*

# SGE AUTOSAMPLER SYRINGES

## TECH TIP

The plunger in my syringe is stuck.  
What can I do to free it up?

Frozen plungers are caused by improper care and maintenance of the syringe. The life of a syringe is directly related to its cleanliness. When cleaning syringes, it is best to use non-alkaline, -phosphate and -detergent based solvents known to be effective in solvating the sample. Because the adhesives used to secure needles and other terminations in the syringe manufacturing process are susceptible to strong solvents, we recommend Hamilton's Organic Cleaning Concentrate, p/n H18311 (see page 172).

Routine maintenance should include rinsing the syringe thoroughly after each use. Allow the syringe to air dry. Avoid prolonged immersion of the syringe while cleaning.

## Cleaning Needles

Should a needle become clogged, do not attempt to clean it by forcing liquid or compressed air through the syringe; excessive pressure will split the glass barrel. Instead use the cleaning wires in Hamilton's Needle Cleaning Kit (p/n H76620; see page 172) to dislodge any foreign material or residue build-up, and then rinse the syringe.

## Sterilizing Syringes

Chemical sterilization is the preferred method, be sure to rinse the syringe thoroughly after sterilization is complete. Autoclaving should be avoided as the difference in heat expansion coefficients between the glass barrel and metal parts may cause the barrel to split.

## Free Literature



To obtain a free copy of the new **Hamilton Syringes Catalogue**, please contact our Customer Service Department and request literature code **H01**.

## SGE GASTIGHT SYRINGES FOR AGILENT 7673 AND 7683 AUTOSAMPLERS

Product Number	Volume (μL)	Model	Gauge	Length (mm)	Point Style	Needle*	Qty	Price
RK24789	10	10F-HP-GT-0.63	23	42	Cone	F	1	\$67.60
RK24797	10	10R-HP-GT-0.63	23	42	Cone	R	1	76.10
RK24796	10	10R-HP-GT-0.47	26	42	Cone	R	1	76.10
RK21220	10	10R-HP-0.63/0.47	23-26s	42	Cone	R	1	75.00

## SGE AUTOSAMPLER SYRINGES FOR VARIAN 8000 SERIES GCs

RK24850	10	10R-VA80-II	25	50	Dome	R		\$235.20
RK24851	10	10F-VA8X-11	25	51	Side Hole	F		235.20
RK24852	10	10R-VA8X-II	25	53	Side Hole	R		296.00
RK24853	100	100R-VA8X	25	53	Side Hole	R		241.70

## SGE AUTOSAMPLER SYRINGES FOR THERMO FINNIGAN/CTC/LEAP GCs

RK24928	0.5	0.5BNR-C/F-0.63	23	50	Cone	R	1	\$115.00
RK24926	0.5	0.5BNR-C/F-0.47	26	50	Cone	R	1	107.90
RK24921	5	5F-CF-5/0.63	23	50	Cone	F	1	81.70
RK24920	5	5F-CF-5/0.47	26	50	Cone	F	1	81.70
RK24923	10	10F-C/F-0.63	23	50	Cone	F	1	43.80
RK24932	10	10R-C/F-0.63	23	50	Cone	R	1	60.90
RK24924	10	10F-C/F-0.47C	26	80	Cone	F	1	67.30
RK24934	10	10R-C/F-8/0.47C	26	80	Cone	R	1	79.30
RK24922	10	10F-C/F-5/0.47C	26	50	Cone	F	1	43.80
RK24925	10	SK10F-C/F-5/0.47C	26	50	Cone	F	6	235.50
RK24930	10	10R-C/F-5/0.47C	26	50	Cone	R	1	70.30

## SGE AUTOSAMPLER SYRINGES FOR PERKIN ELMER AUTOSYSTEM GCs

RK24811	0.5	0.5BR-PE-0.63	23	70	Cone	R	1	\$133.20
RK24810	0.5	0.5BR-PE-0.47	26	70	Cone	R	1	123.20
RK24813	5	5F-PE-0.63	23	70	Cone	F	1	95.00
RK24815	5	5F-PE-GT-0.63	23	70	Cone	F	1	97.10
RK24812	5	5F-PE-0.47	26	70	Cone	F	1	95.00
RK24814	5	5F-PE-GT-0.47	26	70	Cone	F	1	97.10
RK24816	50	50F-PE-0.63	23	70	Cone	F	1	91.30

## SGE AUTOSAMPLER SYRINGES FOR SHIMADZU

RK24841	0.5	0.5BR-S-0.63	23	42	Cone	R	1	\$107.90
RK24840	0.5	0.5BR-S-0.47	26	42	Cone	R	1	107.90
RK24843	5	5F-S-0.63	23	42	Cone	F	1	77.50
RK24842	5	5F-S-0.47	26	42	Cone	F	1	77.50
RK24845	10	10R-S-0.63	23	42	Cone	R	1	75.70
RK24846	10	10R-S-GT-0.63	23	42	Cone	R	1	77.90
RK24844	10	10R-S-0.47	26	42	Cone	R	1	75.60
RK24847	250	250F-S-GT-0.63	23	42	Cone	F	1	105.80

## HAMILTON AUTOSAMPLER SYRINGES FOR COMBI PAL CTC SYRINGES

H203082	1000	1001N	23	51	5	F	1	\$168.50
H203141	1000	1001N	26	51	5	F	1	185.90
H203084	2500	1002N	23	51	5	F	1	169.50
H203181	2500	1002N	26	51	5	F	1	199.30
H203086	5000	1005N	23	51	5	F	1	211.60
H203182	5000	1005N	26	51	5	F	1	226.00

## REPLACEMENT NEEDLES FOR VARIAN 8000 SERIES SYRINGES

Product Number	Volume (μL)	Gauge	Length (mm)	Point Style	Qty	Price
RK24854	10	25	53	Side Hole	Each	\$49.60
RK24855	10	25	53	2	2	45.80
RK24856	10		105	OC	2	37.90
RK24857	10	23	53	Side Hole	2	61.00
RK24858	10	25	53	Side Hole	Each	55.10
RK24859	100	25	53	Side Hole	Each	47.10

\* F = Fixed Needle, R = Removable Needle

# VICI PRECISION SAMPLING SYRINGES

## SERIES A

- Integral sample storage valve — actuated by turning the nose piece
- Positive rear flange plunger stop — prevents plunger from blowing out of barrel at elevated pressure
- Modular construction — all components may be quickly disassembled for easy cleaning or replacement
- Leak-tight to 250 psi — liquids and gases
- Removable Needle: .029" x .012" x 2.25", bevelled, open end

Product Number	Description	Price
D010025	100 µL, Series A Syringe	\$74.80
D010031	250 µL, Series A Syringe	74.80
D010032	500 µL, Series A Syringe	79.20
D010033	1 mL, Series A Syringe	79.20
D010034	2 mL, Series A Syringe	79.20
D010035	5 mL, Series A Syringe	82.50
D010036	10 mL, Series A Syringe	82.50

## SERIES A-2

All the advantages of the Series A syringe plus:

- Push-button valve — allows instantaneous injection
- Smaller volumes — great for small volatile samples
- Removable Needle: .028" x .005" x 2", bevelled, open end on 25, 50 and 100 µL  
.029" x .012" x 2", bevelled, open end on all others

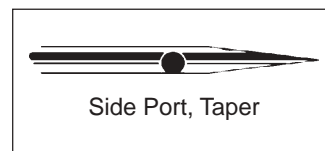
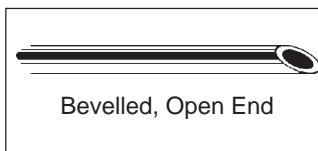
Description	Standard		Luer	
	Product Number	Price	Product Number	Price
25 µL, Series A-2 Syringe	D050023	\$71.50	D050043	\$71.50
50 µL, Series A-2 Syringe	D050024	71.50	D050044	71.50
100 µL, Series A-2 Syringe	D050025	74.80	D050045	74.80
250 µL, Series A-2 Syringe	D050031	74.80	D050051	74.80
500 µL, Series A-2 Syringe	D050032	74.80	D050052	74.80
1 mL, Series A-2 Syringe	D050033	77.00	D050053	77.00
2 mL, Series A-2 Syringe	D050034	77.00	D050054	77.00
5 mL, Series A-2 Syringe	D050035	81.40	D050055	81.40
10 mL, Series A-2 Syringe	D050036	81.40	D050056	81.40

## SERIES C

- Optional Chaney Adapter — much lower dead volume than luer-style connectors
- Perfect syringe for everyday use — all the standard features, but without a valve for pressurized sample storage
- Removable Needle: .029" x .012" x 2", bevelled, open end

Description	Standard		Luer	
	Product Number	Price	Product Number	Price
100 µL, Series C Syringe	D030025	\$49.50	D030045	\$49.50
250 µL, Series C Syringe	D030031	51.70	D030051	51.70
500 µL, Series C Syringe	D030032	51.70	D030052	51.70
1 mL, Series C Syringe	D030033	51.70	D030053	51.70
2 mL, Series C Syringe	D030034	55.00	D030054	55.00
5 mL, Series C Syringe	D030035	56.10	D030055	56.10
10 mL, Series C Syringe	D030036	60.50	D030056	59.40

## Replacement Needles



### Series A

D913050	Bevelled, Open End 0.029" x 0.012" x 2.25", Pkg. 3	\$24.20
D913052	Side Port, Taper 0.029" x 0.012" x 2.25", Pkg. 3	34.10

### Series A-2 and C

#### Standard Replacement Needles

D943050	Bevelled, Open End 0.028" x 0.005" x 2", Pkg. 3	\$24.20
D943051	Bevelled, Open End 0.029" x 0.012" x 2", Pkg. 3	24.20
D943052	Side Port, Taper 0.029" x 0.012" x 2", Pkg. 3	34.10

#### Luer Replacement Needles

D943060	Bevelled, Open End 0.028" x 0.006" x 2", Pkg. 3	\$24.20
D943061	Bevelled, Open End 0.028" x 0.016" x 2", Pkg. 3	24.20
D943062	Side Port, Taper 0.028" x 0.016" x 2", Pkg. 3	34.10

Special Needles Available Upon Request

## Chromatographic Specialties also carries the following syringe lines:

- Hamilton
- Agilent
- SGE (Restek)

Contact our  
Technical Support Group  
for more details.



# HAMILTON SYRINGE REPLACEMENT PARTS

## 1000/1700 SERIES REPLACEMENT PARTS

Product Number	Description	Price
<b>Plunger Assembly (Plunger &amp; Tip)</b>		
H13205	1701 All	27.90
H112201	1702 LT, N, RN, C	27.90
H13269	1702 TLLX, DX, CX	48.20
H116201	1705 N, RN, TLL, C, LT	27.90
H111701	1705 TLLX, CX, DX	41.90
H116202	1710 N, RN, TLL, C, LT	27.90
H111702	1710 TLLX, CX, DX	43.10
H116203	1725 TLL, RN, C, LT, N	27.90
H111703	1725 TLLX, CX, DX	43.10
H116901	1750 TLL, RN, C, LT, LTN	27.00
H112001	1750 TLLX, CX, DX	43.10
H135901	1001 TLL, C, LT, LTN, RN	27.00
H157801	1001 TLLX	46.60
H136001	1002 TLL, C, LT, LTN, RN	28.20
H13230	1005 TLL, LT, LTN, RN	29.40

## 1800 SERIES REPLACEMENT PARTS

<b>Barrel - "N"</b>				
H32175	1801N	26S	10 µL	\$59.40
H32176	1802N	22S	25 µL	38.10
H32178	1810N	22S	100 µL	62.30

<b>Barrel - "RN" (Needle not included)</b>			
H32187	1801RN	10 µL	73.60
H32188	1802RN	25 µL	73.60
H32189	1805RN	50 µL	82.10
H32190	1810RN	100 µL	82.10
H32191	1825RN	250 µL	82.10

<b>Plunger - "N"</b>	
H32193	1801N 42.10
H116001	1802N 32.60
H116101	1805N 32.60
H116102	1810N 32.60

<b>Plunger - "RN"</b>	
H32193	1801RN 42.10
H116001	1802RN 32.60
H116101	1805RN 32.60
H116102	1810RN 32.60

## 7000 SERIES REPLACEMENT PARTS (For Syringe P/N)

H86258	7000.5OC	(H86257)	\$172.10
H17187	7000.5KH Pt 3	(H86250)	53.00
H17887	7000.5KH Pt 2	(H86259)	55.20
H17188	7001KH Pt 3	(H80100)	42.40
H17888	7001KH Pt 2	(H80135)	42.10
H17190	7101KH Pt 3	(H86200)	41.20
H17890	7101KH Pt 2	(H86211)	42.10
H17191	7002KH Pt 3	(H88400)	55.40
H17891	7002KH Pt 2	(H88441)	48.30
H17192	7102KH Pt 3	(H88500)	84.80
H17193	7105KH Pt 3	(H88000)	50.70
H17893	7105KH Pt 2	(H88011)	49.50
H38063	7000.5HP 26s	(H86274)	78.00

**NOTE:** The above repair kits contain the appropriate plunger wire, needle, ferrule and instruction sheet. Separate parts are no longer available. Glass barrels are sold separately. Please inquire.

## GENERAL SYRINGE CLEANING AND MAINTENANCE

- The first rule of thumb for syringe cleaning is prevention - keep the syringe clean.
- Dust particles and oils from the user's hand are often the causes of frozen or seized plungers.
- The plunger should not be handled and should regularly be cleaned with lint-free tissue to remove skin oils and dust.
- Syringes should routinely be rinsed after use and air-dried before storage.
- Use a rinse solvent that is known to effectively solvate the sample being used.
- The rinse solvent should be non-alkaline, non-phosphatase, non-detergent and non-viscous.
- Acetone is a good, general purpose rinsing solvent, and deionized water is also commonly used.
- It's not recommended to soak a syringe in any organic solvent for more than 2 minutes.
- Blockages in the needle are best removed with needle cleaning wires.
- If it is difficult to dispense a sample, never force it through the needle. Disassemble the syringe and remove any blockage in the needle.

## HAMILTON NEEDLE CLEANING KIT

Product Number	Description	Price
H76620	Needle Cleaning Kit	\$73.70
H18300	10 Cleaning Wires 0.0035"	17.30
H18301	10 Cleaning Wires 0.00497"	17.30
H18302	10 Cleaning Wires 0.00659"	17.30
H18303	10 Cleaning Wires 0.00815"	17.30
H18304	10 Cleaning Wires 0.01207"	17.30
H18310	Cleaning Concentrate, 70cc	31.70
H18311	Cleaning Concentrate, 500cc	52.80

## SYRINGE ACCESSORIES

### Chaney Adaptor

For consistent, reproducible injections. It also prevents the plunger from bending. The adjustable stop prevents plunger damage. Easily installed. Available for the 700, 800, 900, 1700, 1800 and 7000 series.



Product Number	Description	Price
<b>Chaney Adaptors</b>		
H14700	701, 1701	\$93.30
H14725	702-750, 1702-1750, 7000 All	93.30
H32148	900 All	100.10
H14704	Flange Screw, Pkg. 6	48.20

<b>Guide Assemblies</b>		
H14806	701, 1701	41.70
H14906	702-750, 1702-1750, 7000 All	41.70

# HAMILTON STAINLESS STEEL “RN” REMOVABLE NEEDLES

## STAINLESS STEEL “RN” REMOVABLE NEEDLES

Hamilton's extensive Removable Needle package selection, made of 304 Stainless Steel, increases the value of your “RN” syringe. This RN needle line permits the use of your Hamilton syringe on a wider variety of applications and equipment. Whether for HPLC, GC, Immunology, Autosamplers, TLC, Electrophoresis, Hæmatology, or Microbiology, simply select the needle best suited for your application. It is highly recommended that you purchase a minimum of one package at a time when you purchase your RN syringe.

The following list of Removable Needle packages are suited for use with Hamilton 700, 800, 1000, 1700, and 1800 series syringes. Stainless steel spacers and Teflon ferrules are included.

The needles below are 2" long in our most commonly requested gauges. Practically any length is available as a special order, these needles are also available up to 33 gauge; please contact Technical Support at 1-800-267-8103 or tech@chromspec.com for details.

Gauge	Point Style	2.5 µL-100µL		250µL-10mL	
		Product Number	Pkg. 6 Price	Product Number	Pkg. 6 Price
26S	2	H775802	\$38.90	H777902	\$40.10
26S	5	H778407	129.60	H778403	129.60
26	2	H775804	41.20	H777904	49.50
26	5	H778408	129.60	H778404	129.60
25S	3	H864701	41.20	H80726*	17.70
22S	2	H775803	38.90	H777903	41.20
22S	3	H777001	38.90	H778003	35.30
22S	5	H778405	129.60	H778401	129.60
22	2	H775801	38.90	H777901	38.90
22	3	H777002	38.90	H778004	38.90
22	5	H778406	129.60	H778402	129.60

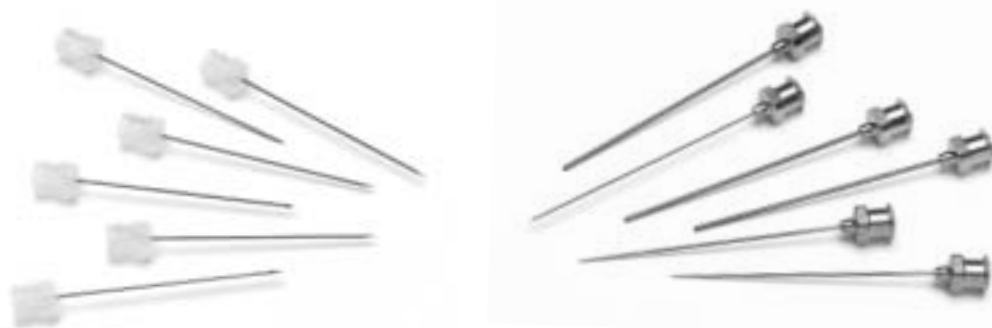
\* 1.97" for Waters™ Injection Valves, Pkg. 3

## HAMILTON SYRINGE GAUGES

Gauge	Stainless Steel			Teflon		
	OD inch (mm)	ID inch (mm)	Volume nL/mm	OD inch (mm)	ID inch (mm)	Volume nL/mm
33	0.0083 (0.21)	0.0043 (0.11)	7.9	-	-	
32	0.0094 (0.24)	0.0043 (0.11)	7.9	-	-	
31	0.010 (0.26)	0.0051 (0.13)	13.4	-	-	
30	0.012 (0.31)	0.0063 (0.16)	17.7	0.0299 (0.76)	0.0118 (0.30)	85.4
29	0.013 (0.34)	0.0071 (0.18)	24.8	-	-	
28	0.014 (0.36)	0.0071 (0.18)	24.8	0.0331 (0.84)	0.0150 (0.38)	113
27	0.016 (0.41)	0.0083 (0.21)	31.5	-	-	
26s	0.019 (0.47)	0.0051 (0.13)	10.2	-	-	
26	0.018 (0.46)	0.010 (0.26)	49.2	0.0358 (0.91)	0.0181 (0.46)	166
25s	0.020 (0.51)	0.0059 (0.15)	24.8	-	-	
25	0.020 (0.51)	0.010 (0.26)	49.2	-	-	
24	0.022 (0.57)	0.012 (0.31)	70.9	0.0402 (1.02)	0.0220 (0.56)	246
23	0.025 (0.64)	0.013 (0.34)	85.4	-	-	
22s	0.028 (0.72)	0.0059 (0.15)	17.7	-	0.028 (0.71)	374
22	0.028 (0.72)	0.016 (0.41)	131.9	0.046 (1.17)	-	
21	0.032 (0.82)	0.020 (0.51)	204.3	-	0.0339 (0.86)	581
20	0.036 (0.91)	0.024 (0.60)	264.2	0.0579 (1.47)	0.038 (0.97)	739
19	0.042 (1.07)	0.027 (0.69)	374.0	0.062 (1.57)	0.042 (1.07)	899
18	0.050 (1.27)	0.033 (0.84)	554.3	0.066 (1.68)	0.047 (1.19)	1,112
17	0.058 (1.47)	0.042 (1.07)	899.2	0.071 (1.80)	0.053 (1.35)	1,431
16	0.065 (1.65)	0.047 (1.19)	1,112	0.077 (1.96)	0.059 (1.50)	1,767
15	0.072 (1.83)	0.054 (1.37)	1,474	0.083 (2.11)	0.066 (1.68)	2,220
14	0.083 (2.11)	0.063 (1.60)	2,011	0.090 (2.29)	0.076 (1.93)	2,926
13	0.095 (2.41)	0.071 (1.80)	2,544	0.100 (2.54)	0.085 (2.16)	3,664
12	0.11 (2.77)	0.085 (2.16)	3,664	0.109 (2.77)	0.095 (2.41)	4,562
11	0.12 (3.05)	0.094 (2.39)	4,449	0.119 (3.02)	0.106 (2.69)	5,641
10	0.13 (3.40)	0.11 (2.69)	5,641	0.130 (3.30)	0.118 (3.00)	7,068
9	—	—	—	0.148 (3.76)	0.133 (3.38)	8,973
8	—	—	—	0.163 (4.14)	0.15 (3.76)	11,104
—	—	—	—	0.18 (4.52)	0.13 (3.18)	7,942
1/8"	—	—	—	0.16 (3.94)	0.0118 (0.30)	85.4

# HAMILTON NEEDLES AND TUBING — LUER HUBS

## STAINLESS STEEL NEEDLES WITH LUER HUBS



	Metal Hub <sup>1</sup> Pt 2, 2"			CTFE Hub <sup>1</sup> Pt 2, 2"			Teflon Needle Tubing - One Hub <sup>2</sup> Pt 3, 12"			Stainless Steel Needle Tubing Only - No Hubs <sup>3</sup> Pt 3, 12" Pt 3, 30"			
Gauge	Product Number	Model	Pkg. 6 Price	Product Number	Model	Pkg. 6 Price	Product Number	Model	Pkg. 6 Price	Product Number	12" Price	Product Number	30" Price
33	H90033	N733	\$90.40	—	—	—	—	—	—	H21033S	\$53.20	H21033	\$116.40
32	H90032	N732	99.00	—	—	—	—	—	—	H21032S	88.80	H21032	194.20
31	H90031	N731	70.60	H90131	KF731	\$97.80	—	—	—	H21031S	53.20	H21031	116.40
30	H90030	N730	49.50	H90130	KF730	87.90	H90630	KF30TF	\$21.00	H21030S	53.20	H21030	116.40
29	H90029	N729	60.70	H90129	KF729	91.60	—	—	—	H21029S	17.70	H21029	38.60
28	H90028	N728	42.10	H90128	KF728	86.60	H90628	KF28TF	21.00	H21028S	17.70	H21028	38.60
27	H90027	N727	50.70	H90127	KF727	66.80	—	—	—	H21027S	53.20	H21027	116.40
26s	H90039	N726s	49.50	H90139	KF726s	74.30	—	—	—	H21039S	53.20	H21039	116.40
26	H90026	N726	49.50	H90126	KF726	68.10	H90626	KF26TF	21.00	H21026S	35.60	H21026	77.80
25s	—	—	—	—	—	—	—	—	—	H21058S	17.70	H21058	38.60
25	H90025	N725	49.50	H90125	KF725	74.30	—	—	—	H21025S	53.20	H21025	116.40
24	H90024	N724	39.60	H90124	KF724	74.30	H90624	KF24TF	21.00	H21024S	17.70	H21024	38.60
23	H90023	N723	42.10	H90123	KF723	68.10	—	—	—	H21023S	53.20	H21023	116.40
22s	H90038	N722s	49.50	H90138	KF722s	86.60	—	—	—	H21038S	70.90	H21038	155.00
22	H90022	N722	38.40	H90122	KF722	56.90	H90622	KF22TF	19.80	H21022S	17.70	H21022	38.60
21	H90021	N721	45.80	H90121	KF721	63.10	—	—	—	H21021S	17.70	H21021	38.60
20	H90020	N720	39.60	H90120	KF720	53.20	H90620	KF20TF	17.30	H21020S	17.70	H21020	38.60
19	H90019	N719	45.80	H90119	KF719	53.20	H90619	KF19TF	17.30	H21019S	53.20	H21019	116.40
18	H90018	N718	38.40	H90118	KF718	53.20	H90618	KF18TF	17.30	H21018S	35.60	H21018	77.80
17	H90017	N717	45.80	H90117	KF717	52.00	H90617	KF17TF	17.30	H21017S	35.60	H21017	77.80
16	H90016	N716	38.40	H90116	KF716	53.20	H90616	KF16TF	17.30	H21016S	17.70	H21016	38.60
15	H90015	N715	47.00	H90115	KF715	48.30	H90615	KF15TF	19.80	H21015S	35.60	H21015	77.80
14	H90014	N714	85.40	H90114	KF714	82.90	H90614	KF14TF	18.60	H21014S	53.20	H21014	116.40
13	H90013	N713	82.90	H90113	KF713	59.40	H90613	KF13TF	39.60	H21013S	17.70	H21013	38.60
12	H90012	N712	82.90	H90112	KF712	74.30	H90612	KF12TF	26.00	H21012S	17.70	H21012	38.60
11	H90011	N711	127.50	H90111	KF711	112.60	H90611	KF11TF	29.70	H21011S	17.70	H21011	38.60
10	H90010	N710	82.90	H90110	KF710	79.20	H90610	KF10TF	26.00	H21010S	53.20	H21010	116.40
9	—	—	—	—	—	—	H90609	KF9TF	35.90	—	—	—	—
1/8"	—	—	—	—	—	—	H90641	KF1/8 TF	38.40	—	—	—	—
8	—	—	—	—	—	—	H90608	KF8TF	52.00	—	—	—	—
7	—	—	—	—	—	—	H90607	KF7TF	55.20	—	—	—	—

<sup>1</sup> Hamilton's standard hypodermic type needles are made from 304 full hard stainless steel tubing with either nickel plated brass standard luer taper short hubs, or CTFE hub (recommended for use with "LT" Luer Tip syringes). These needles are available in lengths from 0.375 to 15 inches (longer or shorter - please check for availability) and will be produced in any point style, see below for ordering information. Since no Hamilton needle is approved or suggested for human use, all needles are shipped unsterilized.

<sup>2</sup> Longer needles available upon request. Needles are supplied with Point Style #3 only. Tubing with two hubs, and tubing with no hubs is available.

<sup>3</sup> Above product numbers refer to Point Style #3, 304SS. Point Styles 2, 4 and 5 available on request (see page 162 for an explanation of the Point Style designations).

# VALVES AND FITTINGS

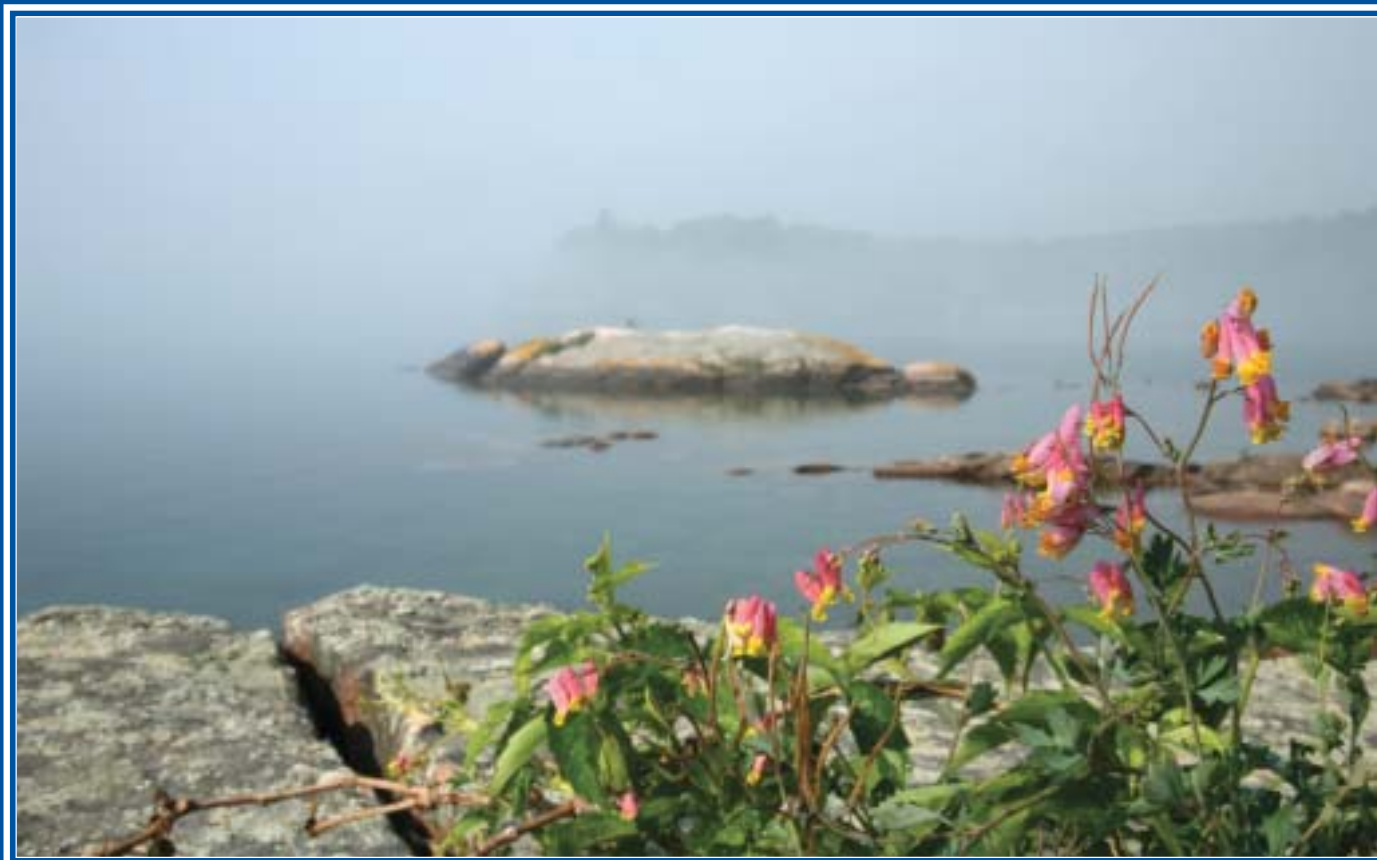
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For valve applications, please visit our website at [www.chromspec.com](http://www.chromspec.com) or contact our Technical Support Group at 1-800-267-8103.

**1-800-267-8103**





## VALCO INSTRUMENTS

For almost 37 years, Valco Instruments Co. Inc. (VICI) has been the leading designer and manufacturer of standard and custom valves and fittings for precision analytical, biomedical, and biocompatible instrumentation. Their product line also includes a wide range of related products such as pneumatic and electric actuators, tubing and sampling loops, heated enclosures, valve sequence and temperature controllers, gas purifiers, GC detectors, and digital interfaces.



### VALCO INJECTORS AND VALVES FOR GC . . . . . See pages 180-181

For over 30 years Valco valves have been the industry standard in gas chromatography. Models are available with 3, 4, 6, 8, 10, 12, or 14 ports, with 1/32", 1/16", 1/8", or 1/4" fittings, and with bore sizes from 0.25 mm (.010") to 4 mm (.156"). In addition, Valco valves offer the widest range of rotor and body materials of any valve available, with alloys and polymer composites capable of meeting virtually any system requirement. All models can be ordered in manual, pneumatic, or electrically actuated versions.



### VALCO INJECTORS AND VALVES FOR HPLC . . . . . See pages 180-181

A pioneer and industry leader in products for HPLC, Valco continues to offer the market's most diverse line in terms of options for number of ports, fitting sizes, materials of construction, and actuation. 3, 4, 6, 8, 10, 12 port versions are offered, with 1/32", 1/16", or 1/8" fittings. As with the GC line, Valco valves offer the widest range of rotor and body materials of any valves available, with alloys and polymer composites capable of meeting virtually any system requirement. All models can be ordered in manual, pneumatic, or electrically actuated versions.



### VALCO MULTIPOSITION VALVES . . . . . See pages 186-187

One inherent benefit of the Valco conical rotary design is that it allows multiple planes of ports, facilitating a variety of unique multiposition configurations useful for stream selection, column selection, or trapping. Versions are available for GC and HPLC applications, with 1/16", 1/8", or 1/4" fittings, with bore sizes from 0.40 to 4.0 mm (.016" to .156"). Multiposition valves are available for up to 16 streams (34 ports), with all of Valco's trademark flexibility in terms of actuation and material options.



### CHEMINERT INJECTORS AND VALVES FOR HPLC . . . . . See pages 184-185

New nanovolume injectors feature a uniform 100  $\mu$ m flowpath and port-to-port volume of less than 25 nl. Specially designed fittings accommodate fused silica capillary, 1/32" PEEK, or Valco electroformed nickel tubing. Also new are ultrahigh pressure valves and injectors for applications requiring pressures up to 10,000 psi. The standard line of Cheminert flat plate valves for HPLC includes 4, 6, 8, and 10 port versions plus a through-the-handle front-loading injector and a rearloading injector with a stationary centered injection port designed for use with autosamplers. Also available is a submicroliter injector with injection volume down to 20 nanoliters. Valves feature 1/16" zero dead volume fittings with bore sizes from 0.15 mm (.006") to 0.75 mm (.030"). Most models are available in manual, air, or electrically actuated versions.



### CHEMINERT INJECTORS AND VALVES FOR LOW PRESSURE APPLICATIONS . . . . . See pages 184-185

Cheminert's flat plate two position design offers 4, 6, 8, or 10 port configurations. The design features a choice of Valco 1/16" zero dead volume fittings or 1/4-28 Cheminert internal fittings for 1/16" or 1/8" OD tubing. New to the line is the Model C42, with 1/2-20 fittings and .180" ports. All models are available in manual, air, or electrically actuated versions.

## How To Select The Right Injector Or Valve

### 1) What is my general field or technique?

The first question is multiple choice:

#### Field / Technique

#### Pressure Range

#### Suitable Valve Designs

GC and Process Analysis

<1500 psi

Valco GC valves

Diaphragm valves

LC, FIA, SPE, Process Analysis

<1000 psi

Cheminert low pressure valves

HPLC and Process Analysis

<7000 psi

Valco HPLC valves

Cheminert HPLC valves

SFE and SFC

5000 - 10,000 psi

Valco HPLC valves

Cheminert HPLC valves

### 2) What flow-directing function will the valve perform?

This is a function of how many ports the valve has and how they are configured. If you're an old hand at this you may already know that you want to order a 6 port valve for sample injection or a 10 port valve for trace enrichment.

### 3) What size fitting (tubing OD) and port diameter do I need?

Valco makes standard valves with 1/32", 1/16", 1/8" and 1/4" fittings. Ideally, the ID of the tubing used in the application will dictate which valve should be used. As a general rule, the port ID (bore size) of the valve should be the same or slightly smaller than the ID of the tubing used. Many valves can be special ordered with a larger bore for high flow applications.

### 4) What about valve body material?

By far, the most common valve material is stainless steel, which will resist all but the most corrosive fluids. Other materials include: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium and Zirconium.

### 5) What about rotor material?

As with the valve body materials, we can state that in most cases the standard materials will give satisfactory results. The specifications given in the preceding pages will usually indicate the proper choice, but for applications outside standard temperature and pressure ranges, it is best to consult our technical staff.

### 6) What about specials?

VIC prides itself on being able to meet almost any analytical demand. While 99% of applications can be met with one of their 15,000+ standard products, they are willing to develop special products when all else fails.

## Valve Service and Replacement

All Valco valves are manufactured to exacting specifications and are fully tested and certified by the factory. Like all precision instruments, a valve must be operated within the factory recommended conditions to maximize its service period. Operation parameters include the temperature, pressure and actuation force as well as the chemical compatibility of the sample stream and mobile phase.

The usual cause of early valve failure is abrasive particulate that scores the rotor or scratches the valve body. The typical symptom is cross-port leakage. It is critically important to prepare metal tubing ends so that no metal pieces can break off and enter the valve. Other sources of particulates must be eliminated and installation of a frit filter assembly up stream from the valve is recommended. In general, with correct operation, we would expect Valco valves to provide thousands of cycles before service is required.

## Valve Identification

All valves are shipped with an identification tag that specifies the model number, serial number and certifies that it met specification through testing. Ideally, this tag should be saved for reference when servicing or replacing the valve.

The factory in Houston, Texas maintains production and service records for all valves. The serial number is stamped between ports and is two alpha characters followed by 4 numerals. Valves that have been serviced will be stamped with an additional 5 digit number on the inside or outside face.

## APPLICATION GUIDE

Column Type	Fitting Size	Standard Port Diameter	Column Type	Fitting Size	Standard Port Diameter
GC			HPLC		
Capillary (250 µm and 320µm ID)	1/32"	0.25 mm (.010")	Microbore	1/32" 1/16"	0.25 mm (.010") 0.25 mm (.010")
Capillary (530 µm ID)	1/16"	0.40 mm (.016")	Analytical	1/16"	0.40 mm (.016")
Capillary (pre-splitter)	1/16"	0.75 mm (.030")	Semi-prep	1/16"	0.75 mm (.030")
Packed	1/16" 1/8"	0.75 mm (.030") 0.75 mm (.030")	Prep scale	1/8"	0.75 mm (.030") optional up to 2.0 mm (.080")
			FIA		
Air Sampling	1/4"	4.0 mm (.156")	Analytical	1/16"	0.75 mm (.030")
			Solvent Selection	1/8"	1.5 mm (.060")
				1/4"	4.6 mm (.180")

# VALCO VALVE OVERVIEW

HPLC						
FEATURES	CHEMINERT NANOSCALE HPLC	CHEMINERT HPLC EXTENDED LIFE	CHEMINERT HPLC	CHEMINERT MULTIPOSITION	VALCO HPLC	VALCO MULTIPOSITION
PAGES	184-185	184-185	184-185	184-185	180-181	186-187
Application Area	Nano-scale HPLC	HPLC SFC, SFE, Process Analysis	HPLC SFC, SFE Process Analysis	HPLC FIA, LC, Process Analysis	HPLC SFC, SFE, Process Analysis	HPLC LC, SFC, SFE, FIA Process Analysis
Two Position Port Configurations	6 and 10; 4 port internal sample;	4, 6, 8, and 10; 4 port internal sample; centered port injector	4, 6, 8, and 10; 4 port internal sample; through-the-handle injector; centered port injector	—	3, 4, 6, 8, 10, 12 and 14; 4 port internal sample	—
Internal Sample Sizes	~4nL	10nL, 20nL	.01, .02, .05, .1, and .5 µL	—	.06, .1, .2, .5, 1, and 2 µL	—
Minimum External Sample Size	—	2 µL	2 µL	—	1/16" - 2 µL 1/8" - 5 µL	—
Multiposition Configurations	—	—	—	4, 6, 8, and 10 positions	—	SD, ST; 4, 6, 8, 10, 12 and 16 positions
Fitting Sizes	1/32" Nanovolume connectors	1/16" Valco ZDV	1/16" Valco ZDV	1/16" Valco ZDV	1/16" and 1/8" Valco ZDV	1/16", 1/8" Valco ZDV
Port Sizes	0.10 mm (.004") 0.15 mm (.006")	0.15 mm (.006") 0.25 mm (.010") 0.40 mm (.016") 0.75 mm (.030")	0.15 mm (.006") 0.25 mm (.010") 0.40 mm (.016") 0.75 mm (.030")	0.40 mm (.016") 0.75 mm (.030")	0.25 mm (.010") 0.40 mm (.016") 0.75 mm (.030") 1.0 mm (.040") 1.3 mm (.050") 1.7 mm (.067")	0.40 mm (.016") 0.75 mm (.030")
Maximum Temperature	up to 75°C	up to 75°C	up to 75°C	up to 75°C	up to 75°C	up to 75°C
Actuation Options	Manual, air, microelectric	Manual, air, microelectric standard electric	Manual, air, microelectric standard electric	Manual, air, microelectric standard electric	Manual, air, microelectric standard electric	Manual, air, microelectric standard electric
Available Body Materials	PAEK	N60 stainless Titanium PAEK	N60 stainless PAEK Titanium	N60 stainless PAEK Titanium	N60 stainless Type 316 SS Hastelloy C Inconel 600 Monel 400 Nickel 200 Nitronic 50 Titanium Zirconium	N60 stainless Type 316 SS Hastelloy C Inconel 600 Monel 400 Nickel 200 Nitronic 50 Titanium Zirconium
Available Rotor Materials	PAEK	Valcon E (-225°C) Valcon H (-75°C)	Valcon E (-225°C) Valcon H (-75°C)	Valcon E (-225°C) Valcon H (-75°C)	Valcon E (-225°C) Valcon H (-75°C)	Valcon E (-225°C) Valcon H (-75°C)

# VALCO VALVE OVERVIEW

GC and Liquid Handling					
FEATURES	VALCO GC	DIAPHRAGM	VALCO MULTIPOSITION	CHEMINERT LOW PRESSURE TWO POSITION	CHEMINERT LOW PRESSURE MULTIPOSITION
PAGES	180-181	183	186-187	184-185	184-185
Application Area	GC LC, FIA Process Analysis	GC Process Analysis	GC LC, SFC, SFE, FIA Process Analysis	Liquid Handling LC, FIA, Process Analysis	HPLC FIA, LC, Process Analysis
Two Position Port Configurations	3, 4, 6, 8, 10, 12 and 14; 4 port internal sample	6 and 10; 4 port internal sample	—	4, 6, 8, and 10; 4 port internal sample injector	—
Internal Sample Sizes	.06, .1, .2, .5, 1, and 2 µL	.5 and 1 µL	—	.2, .5, and 1 µL	—
Minimum External Sample Size	1/16" - 2 µL 1/8" - 5 µL	2 µL	—	20 µL	—
Multiposition Configurations	—	—	SD, SC, SF, ST, STF; 4, 6, 8, 10, 12 and 16 positions	—	4, 6, 8, 10, 14 20, 24, and 26 positions
Fitting Sizes	1/32", 1/16", 1/8", and 1/4" Valco ZDV	1/32" and 1/16" Valco ZDV	1/16", 1/8", and 1/4" Valco ZDV	1/16" Valco ZDV 1/4-28 Cheminert 1/2-20 Cheminert	1/16" Valco ZDV 1/4-28 Cheminert 1/2-20 Cheminert
Port Sizes	Extensive variety of port sizes available	0.25 mm (.010") 0.40 mm (.016") 0.75 mm (.030")	Extensive variety of port sizes available	Extensive variety of port sizes available	0.75 mm (0.030") 1.0 mm (0.040") 1.5 mm (0.060") 3.0 mm (0.12") 4.6 mm (0.18")
Maximum Temperature	up to 350°C	200°C	up to 300°C	up to 75°C	up to 75°C
Actuation Options	Manual, air microelectric, standard electric	Air (integral) standard electric	Manual, air, microelectric standard electric	Manual, air, microelectric, standard electric	Manual, air, microelectric standard electric
Available Body Material	N60 stainless Type 316 SS Hastelloy C Inconel 600 Monel 400 Nickel 200 Nitronic 50 Titanium Zirconium	N60 stainless Type 316 SS Hastelloy C	N60 stainless Type 316 SS Hastelloy C Inconel 600 Monel 400 Nickel 200 Nitronic 50 Titanium Zirconium	PPS CTFE PVDF	PPS CTFE PVDF
Available Rotor Materials	Valcon E (-225°C) Valcon M Valcon P (-175°C) Valcon R (-75°C) Valcon T (-350°C)	Polyimide	Valcon E (-225°C) Valcon E2 (75°C) Valcon H (75°C) Valcon M Valcon P (-175°C)	Valcon E2 (75°C) Valcon M	Valcon E2 (75°C) Valcon M Valcon TF



# VALCO 2 POSITION VALVES

## VALCO 2 POSITION VALVES

### Injection, Switching and Stream Selection

Two position valves switch back and forth from one position to the other, as from LOAD to INJECT, or from position A to position B. The "W" and "UW" valve types differ in size (of valve body, rotor, port diameter, and fittings), and the series designations refer to rotor material and specifications. Lifetime is increased by a one-point seal loading design, and rotor replacement is as simple as replacing a fitting or changing a septum. They are supplied with an "L" shaped mounting bracket and are closemounted to a manual handle. WT and UWT models are supplied with a 4" standoff and mounting ring. For an actuated valve, simply place the appropriate letter at the end of our product number (A = Air, E = Electric, ET = Microelectric High Torque, EH = Microelectric High Speed).

### W SERIES

Product Number	Model	Number of Ports	Fitting Size	Price
W Series		5000 psi	Liquid	75°C
VE103N	4N3W	3	1/32"	\$729.00
VE104N	4N4W	4	1/32"	729.00
VE106N	4N6W	6	1/32"	758.00
VE108N	4N8W	8	1/32"	845.00
VE110N	4N10W	10	1/32"	845.00
VE103C	C3W	3	1/16"	583.00
VE104C	C4W	4	1/16"	583.00
VE106C	C6W	6	1/16"	641.00
VE108C	C8W	8	1/16"	700.00
VE110C	C10W	10	1/16"	700.00
WE Series		400 psi	Gas	225°C
VE703N	4N3WE	3	1/32"	\$729.00
VE704N	4N4WE	4	1/32"	729.00
VE706N	4N6WE	6	1/32"	787.00
VE708N	4N8WE	8	1/32"	845.00
VE710N	4N10WE	10	1/32"	845.00
VC3WE	C3WE	3	1/16"	583.00
VE704C	C4WE	4	1/16"	583.00
VE706C	C6WE	6	1/16"	641.00
VE708C	C8WE	8	1/16"	700.00
VE710C	C10WE	10	1/16"	700.00
WP Series		400 psi	Gas	175°C
VE203N	4N3WP	3	1/32"	\$700.00
VE204N	4N4WP	4	1/32"	700.00
VE206N	4N6WP	6	1/32"	758.00
VE208N	4N8WP	8	1/32"	816.00
VE210N	4N10WP	10	1/32"	816.00
VE203C	C3WP	3	1/16"	583.00
VE204C	C4WP	4	1/16"	583.00
VE206C	C6WP	6	1/16"	641.00
VE208C	C8WP	8	1/16"	700.00
VE210C	C10WP	10	1/16"	700.00
WT Series		300 psi	Gas	350°C
VE303N	4N3WT	3	1/32"	\$729.00
VE304N	4N4WT	4	1/32"	729.00
VE306N	4N6WT	6	1/32"	787.00
VE308N	4N8WT	8	1/32"	845.00
VE310N	4N10WT	10	1/32"	845.00
VE303C	4C3WT	3	1/16"	612.00
VE304C	4C4WT	4	1/16"	612.00
VE306C	4C6WT	6	1/16"	671.00
VE308C	4C8WT	8	1/16"	729.00
VE310C	4C10WT	10	1/16"	729.00

### UW SERIES

Product Number	Model	Number of Ports	Fitting Size	Price
UW Series		5000 psi	Liquid	75°C
V2C3UW	2C3UW	3	1/16"	\$612.00
V2C4UW	2C4UW	4	1/16"	612.00
V2C6UW	2C6UW	6	1/16"	688.00
VE408C	C8UW	8	1/16"	660.00
V2C10UW	2C10UW	10	1/16"	729.00
V23UW	23UW	3	1/8"	612.00
V24UW	24UW	4	1/8"	612.00
V26UW	26UW	6	1/8"	671.00
VE408B	8UW	8	1/8"	660.00
V210UW	210UW	10	1/8"	700.00
UWE Series		400 psi	Gas	225°C
VEA03C	C3UWE	3	1/16"	\$525.00
VEA04C	C4UWE	4	1/16"	525.00
VEA06C	C6UWE	6	1/16"	583.00
VEA08C	C8UWE	8	1/16"	641.00
VEA10C	C10UWE	10	1/16"	641.00
VEA03B	3UWE	3	1/8"	525.00
VEA04B	4UWE	4	1/8"	525.00
VEA06B	6UWE	6	1/8"	583.00
VEA08B	8UWE	8	1/8"	641.00
VEA10B	410UWE	10	1/8"	671.00
UWP Series		400 psi	Gas	175°C
VE503C	C3UWP	3	1/16"	\$525.00
VE504C	C4UWP	4	1/16"	525.00
VE506C	C6UWP	6	1/16"	583.00
VE508C	C8UWP	8	1/16"	641.00
VE510C	C10UWP	10	1/16"	641.00
VE503B	3UWP	3	1/8"	525.00
VE504B	4UWP	4	1/8"	525.00
VE506B	6UWP	6	1/8"	583.00
VE508B	8UWP	8	1/8"	641.00
VE510B	410UWP	10	1/8"	671.00
UWT Series		300 psi	Gas	330°C
VE603C	4C3UWT	3	1/16"	\$554.00
VE604C	4C4UWT	4	1/16"	554.00
VE606C	4C6UWT	6	1/16"	612.00
VE608C	4C8UWT	8	1/16"	671.00
VE610C	4C10UWT	10	1/16"	671.00
VE603B	43UWT	3	1/8"	554.00
VE604B	44UWT	4	1/8"	554.00
VE606B	46UWT	6	1/8"	612.00
VE608B	48UWT	8	1/8"	671.00
VE610B	410UWT	10	1/8"	671.00

Sample Loops, See . . . . . Page 182  
 Rotor Only . . . . . Add suffix "R" to Valve Number  
 Port Diameter 1/32" = 0.010"/0.25mm  
 W Type 1/16" = 0.016"/0.4mm

Actuators, See . . . . . Pages 188-189  
 Driver Only . . . . . Add suffix "D" to Valve Number  
 Port Diameter 1/16" = 0.030"/0.75mm  
 UW Type 1/8" = 0.030"/0.75mm

## VALCO 2 POSITION VALVES

### Internal, Fixed Volume Injection

Internal volume sample injectors are for applications in which the sample size must be smaller than the volume attainable with an external loop. The sample "loop" is actually an engraved slot on the rotor, which connects two ports and is sized to contain an exact, specified amount of sample. When the rotor is switched to its other position, the sample in the slot is captured and injected into the column. Sample sizes are available from 0.06µL to 0.5µL in W type valves, and from 0.2µL to 2.0µL in UW type valves. Pressure/temperature specifications are different from external loop valves.

All internal sample valves can be ordered with two sample sizes on one rotor. The rotor can easily be removed, rotated 180°, and reinserted in the valve with the second sample size operational. There is an extra charge for this feature. They are supplied with an "L" shaped mounting bracket and are closel-mounted to a manual handle. WT and UWT models are supplied with a 4" standoff and mounting ring.

#### W SERIES

Product Number	Model	Number of Ports	Fitting Size	Price
<b>W Series</b>		<b>5000 psi</b>	<b>Liquid</b>	<b>75 °C</b>
VK1N06	2NI4W	0.06 µL	1/32"	\$787.00
VK1N1	2NI4W	0.1 µL	1/32"	787.00
VK1N2	2NI4W	0.2 µL	1/32"	787.00
VK1N5	2NI4W	0.5 µL	1/32"	787.00
VK1C06	CI4W	0.06 µL	1/16"	641.00
VK1C1	CI4W	0.1 µL	1/16"	641.00
VK1C2	CI4W	0.2 µL	1/16"	641.00
VK1C5	CI4W	0.5 µL	1/16"	641.00
<b>WE Series</b>		<b>1000 psi</b>	<b>Liquid</b>	<b>175 °C</b>
VK7N06	4NI4WE	0.06 µL	1/32"	\$787.00
VK7N1	4NI4WE	0.1 µL	1/32"	787.00
VK7N2	2NI4WE	0.2 µL	1/32"	787.00
VK7N5	4NI4WE	0.5 µL	1/32"	787.00
VK7C06	CI4WE	0.06 µL	1/16"	641.00
VK7C1	CI4WE	0.1 µL	1/16"	641.00
VK7C2	CI4WE	0.2 µL	1/16"	641.00
VK7C5	CI4WE	0.5 µL	1/16"	641.00
<b>WP Series</b>		<b>1000 psi</b>	<b>Liquid</b>	<b>175 °C</b>
VK2N06	4NI4WP	0.06 µL	1/32"	\$787.00
VK2N1	4NI4WP	0.1 µL	1/32"	787.00
VK2N2	4NI4WP	0.2 µL	1/32"	787.00
VK2N5	4NI4WP	0.5 µL	1/32"	787.00
VK2C06	CI4WP	0.06 µL	1/16"	641.00
VK2C1	CI4WP	0.1 µL	1/16"	641.00
VK2C2	CI4WP	0.2 µL	1/16"	641.00
VK2C5	CI4WP	0.5 µL	1/16"	641.00
<b>WT Series</b>		<b>300 psi</b>	<b>Gas</b>	<b>350 °C</b>
VK3N06	4NI4WT	0.06 µL	1/32"	\$787.00
VK3N1	4NI4WT	0.1 µL	1/32"	787.00
VK3N2	4NI4WT	0.2 µL	1/32"	787.00
VK3N5	4NI4WT	0.5 µL	1/32"	787.00
VK3C06	4CI4WT	0.06 µL	1/16"	671.00
VK3C1	4CI4WT	0.1 µL	1/16"	671.00
VK3C2	4CI4WT	0.2 µL	1/16"	671.00
VK3C5	4CI4WT	0.5 µL	1/16"	671.00

#### UW SERIES

Product Number	Model	Number of Ports	Fitting Size	Price
<b>UW Series</b>		<b>5000 psi</b>	<b>Liquid</b>	<b>75 °C</b>
V2CI4UW02	2CI4UW	0.2 µL	1/16"	\$671.00
V2CI4UW05	2CI4UW	0.5 µL	1/16"	671.00
V2CI4UW1	2CI4UW	1.0 µL	1/16"	671.00
V2CI4UW2	2CI4UW	2.0 µL	1/16"	729.00
V2I4UW02	2I4UW	0.2 µL	1/8"	671.00
V2I4UW05	2I4UW	0.5 µL	1/8"	671.00
V2I4UW1	2I4UW	1.0 µL	1/8"	671.00
V2I4UW2	2I4UW	2.0 µL	1/8"	729.00
<b>UWE Series</b>		<b>1000 psi</b>	<b>Liquid</b>	<b>175 °C</b>
VK9C2	CI4UWE	0.2 µL	1/16"	\$583.00
VK9C5	CI4UWE	0.5 µL	1/16"	583.00
VK9C10	CI4UWE	1.0 µL	1/16"	583.00
VK9C20	CI4UWE	2.0 µL	1/16"	583.00
VK9B2	I4UWE	0.2 µL	1/8"	583.00
VK9B5	I4UWE	0.5 µL	1/8"	583.00
VK9B10	I4UWE	1.0 µL	1/8"	583.00
VK9B20	I4UWE	2.0 µL	1/8"	583.00
<b>UWP Series</b>		<b>1000 psi</b>	<b>Liquid</b>	<b>75 °C*</b>
VK5C2	CI4UWP	0.2 µL	1/16"	\$583.00
VK5C5	CI4UWP	0.5 µL	1/16"	583.00
VCI4UWP1	CI4UWP	1.0 µL	1/16"	583.00
VK5C20	CI4UWP	2.0 µL	1/16"	583.00
VK5B2	I4UWP	0.2 µL	1/8"	583.00
VK5B5	I4UWP	0.5 µL	1/8"	525.00
VK5B10	I4UWP	1.0 µL	1/8"	583.00
VK5B20	I4UWP	2.0 µL	1/8"	583.00
<b>UWT Series</b>		<b>300 psi</b>	<b>Gas</b>	<b>330 °C</b>
VK6C2	4CI4UWT	0.2 µL	1/16"	\$612.00
VK6C5	4CI4UWT	0.5 µL	1/16"	612.00
VK6C10	4CI4UWT	1.0 µL	1/16"	612.00
VK6C20	4CI4UWT	2.0 µL	1/16"	612.00
VK6B2	4I4UWT	0.2 µL	1/8"	612.00
VK6B5	4I4UWT	0.5 µL	1/8"	612.00
VK6B10	4I4UWT	1.0 µL	1/8"	612.00
VK6B20	4I4UWT	2.0 µL	1/8"	612.00

**NOTE:** All WT and UWT valves come with a standard 4" standoff.

**\*OPTIONAL:** Can be tensioned for 400psi/175°C.

# VALCO SAMPLE LOOPS

## VALCO EXTERNAL SAMPLE LOOPS - TWO POSITION VALVES

Valco sample loops are accurately sized for each valve type. The volume tolerance matches the ID tolerance of the tubing, which is typically  $\pm 0.001$ " for Valco tubing. This results in a variance ranging from 20% variance with tubing of 0.005" diameter (0.001" is 20% of 0.005") to 2.5% for loops made from tubing 0.040" in diameter. For applications requiring more accurately known loop volumes, a loop calibration service is available.

Metal loops are electrolytically cut and electrochemically polished to insure square, burr-free ends, then cleaned with microfiltered steam from research grade deionized water. Standard material is stainless steel, but loops made of Nickel 200, Electroformed Nickel, Hastelloy C, Titanium, PTFE, FEP and PEEK are also available.

Each loop is made from 316 stainless steel (SS) and includes two stainless steel nuts and two ferrules of the same material as the tubing.  
If special fittings are required, they must be ordered separately.  
The 500 $\mu$ L loop is about 8 feet long.

### Stainless Steel, To Fit 1/32" Valves, W Series

Product Number	Description	Loop Volume	Price
VSL2NW*	SL2NW	2 $\mu$ L	\$22.00
VSL5NW*	SL5NW	5 $\mu$ L	22.00
VSL10NW	SL10NW	10 $\mu$ L	22.00
VSL15NW	SL15NW	15 $\mu$ L	22.00
VSL20NW	SL20NW	20 $\mu$ L	22.00
VSL25NW	SL25NW	25 $\mu$ L	22.00
VSL50NW	SL50NW	50 $\mu$ L	24.20
VSL100NW	SL100NW	100 $\mu$ L	24.20
VSL250NW	SL250NW	250 $\mu$ L	27.50
VSL500NW	SL500NW	500 $\mu$ L	33.00

### Stainless Steel, To Fit 1/16" Valves, W Series

Product Number	Description	Loop Volume	Price
VSL2CW*	SL2CW	2 $\mu$ L	\$19.80
VSL5CW*	SL5CW	5 $\mu$ L	19.80
VSL10CW	SL10CW	10 $\mu$ L	19.80
VSL15CW	SL15CW	15 $\mu$ L	19.80
VSL20CW	SL20CW	20 $\mu$ L	19.80
VSL25CW	SL25CW	25 $\mu$ L	19.80
VSL50CW	SL50CW	50 $\mu$ L	19.80
VSL100CW	SL100CW	100 $\mu$ L	19.80
VSL250CW	SL250CW	250 $\mu$ L	24.20
VSL500CW	SL500CW	500 $\mu$ L	27.50
VSL1KCW	SL1KCW	1 mL	30.80
VSL2KCW	SL2KCW	2 mL	39.60
VSL5KCW	SL5KCW	5 mL	46.20
VSL10KCW	SL10KCW	10 mL	60.50



### Stainless Steel, To Fit 1/16" Valves, UW Series

Product Number	Description	Loop Volume	Price
VSL5CUW*	SL5CUW	5 $\mu$ L	\$19.80
VSL10CUW	SL10CUW	10 $\mu$ L	19.80
VSL15CUW	SL15CUW	15 $\mu$ L	19.80
VSL20CUW	SL20CUW	20 $\mu$ L	19.80
VSL25CUW	SL25CUW	25 $\mu$ L	19.80
VSL30CUW	SL30CUW	30 $\mu$ L	24.20
VSL50CUW	SL50CUW	50 $\mu$ L	19.80
VSL100CUW	SL100CUW	100 $\mu$ L	19.80
VSL250CUW	SL250CUW	250 $\mu$ L	24.20
VSL500CUW	SL500CUW	500 $\mu$ L	27.50
VSL1KCUW	SL1KCUW	1.0 cc	30.80
VSL2KCUW	SL2KCUW	2.0 cc	39.60
VSL5KCUW	SL5KCUW	5.0 cc	46.20
VSL10KCUW	SL10KCUW	10.0 cc	60.50

### Stainless Steel, To Fit 1/8" Valves, UW Series

Product Number	Description	Loop Volume	Price
VSL5UW*	SL5UW	5 $\mu$ L	\$30.80
VSL10UW	SL10UW	10 $\mu$ L	30.80
VSL15UW	SL15UW	15 $\mu$ L	30.80
VSL20UW	SL20UW	20 $\mu$ L	30.80
VSL25UW	SL25UW	25 $\mu$ L	30.80
VSL30UW	SL30UW	30 $\mu$ L	36.30
VSL50UW	SL50UW	50 $\mu$ L	30.80
VSL100UW	SL100UW	100 $\mu$ L	24.20
VSL250UW	SL250UW	250 $\mu$ L	24.20
VSL500UW	SL500UW	500 $\mu$ L	30.80
VSL1KUW	SL1KUW	1 mL	26.40
VSL2KUW	SL2KUW	2 mL	28.60
VSL5KUW	SL5KUW	5 mL	35.20
VSL10KUW	SL10KUW	10 mL	49.50

\* Please indicate numbers of ports.

## VALCO MICROVOLUME MINI DIAPHRAGM VALVES



### Model DV22 - Designed Specifically For Heavy Duty Cycle Applications

- Ultra compact design
- Only 34mm in diameter
- 4, 6, or 10 ports
- >1,000,000 cycle lifetime
- 300 psi at 200°C
- Simplified maintenance
- Integral air actuator

Product Number	Model	Number of Ports	Fitting Size	Bore Size	Price
VDV1211145	0.5 µL Internal Sample	4	1/32"	0.010"	\$1,225.00
VDV1211141	1.0 µL Internal Sample	4	1/32"	0.010"	1,225.00
VDV121116	Sampling/Switching	6	1/32"	0.010"	1,225.00
VDV121110	Multifunctional	10	1/32"	0.010"	1,400.00
VDV2221145	0.5 µL Internal Sample	4	1/16"	0.016"	1,050.00
VDV2221141	1.0 µL Internal Sample	4	1/16"	0.016"	1,050.00
VDV222116	Sampling/Switching	6	1/16"	0.016"	1,050.00
VDV222110	Multifunctional	10	1/16"	0.016"	1,225.00
VDV2231145	0.5 µL Internal Sample	4	1/16"	0.030"	1,050.00
VDV2231141	1.0 µL Internal Sample	4	1/16"	0.030"	1,050.00
VDV223116	Sampling/Switching	6	1/16"	0.030"	1,050.00
VDV223110	Multifunctional	10	1/16"	0.030"	1,225.00

## STAINLESS STEEL SAMPLE LOOPS TO FIT 1/16" DIAPHRAGM VALVES

Product Number	Description	Loop Volume	Price
VCSL2	CSL2	2 µL	\$19.80
VCSL5	CSL5	5 µL	19.80
VCSL10	CSL10	10 µL	19.80
VCSL20	CSL20	20 µL	19.80
VCSL50	CSL50	50 µL	19.80
VCSL100	CSL100	100 µL	22.00
VCSL250	CSL250	250 µL	27.50
VCSL500	CSL500	500 µL	27.50
VCSL1K	CSL1K	1 mL	30.80
VCSL2K	CSL2K	2 mL	39.60
VCSL5K	CSL5K	5 mL	46.20
VCSL10K	CSL10K	10 mL	60.50

### Specifications

- 300 psi gas
- 200°C max.
- Valve body: Nitronic 60 Stainless
- Diaphragm: Polyimide

### Options:

Material: Hastelloy C 316 Stainless

(For 1/32" sample loops, use those found in the appropriate table on Page 182)



# VALCO CHEMINERT VALVES

## CHEMINERT FLAT PLATE ROTARY VALVES — HIGH PRESSURE



### Model C2

A Model C2 valve can be used as a switching valve or as an injector with the addition of one or more loops (depending on the number of ports in the valve). C2 valves are available with 4, 6, 8, or 10 ports. A 20 $\mu$ L loop of material similar to the stator is furnished with the 6 port valve, but a wide variety of loop sizes are available in several different materials. A VISF-1 or VISF-2 syringe adapter, or the loop filler port kit, is required if the sample is to be injected with a syringe. An optional position feedback is available for the Model C2 valve.



### Model C4

The Model C4 is an internal volume sample injector for applications in which the sample size must be smaller than the volume attainable with an external loop. The sample "loop" is actually an engraved slot on the rotor which connects two ports and is sized to contain an exact, specified amount of sample. When the rotor is switched to its other position the sample in the slot is injected to the column. Sample sizes available are 0.1, 0.2 and 0.5 $\mu$ L. An optional position feedback is available for the Model C4 valve.



### Model C5

The Model C5, available in 4, 6, 8 or 10 positions, is a multiposition valve used for stream selection. This model has a dead end flowpath resulting in one stream at a time flowing to a detector, another valve, etc. It can also be used for sending one stream to a number of different outlets.

## CHEMINERT FLAT PLATE ROTARY VALVES — LOW PRESSURE



### Model C22Z

The Model C22Z is a conventional two position sample injector and switching valve with 4, 6, 8 or 10 ports. PEEK zero volume nuts and ferrules are included. Standard specifications are 100 psi gas / 250 psi liquid at 75°C. On request the pressure rating can be as high as 600 psi liquid.



### Model C25Z

The Model C25Z is available in 4, 6, 8, 10 and 14 position models. PEEK zero dead volume nuts and ferrules are included. Standard specifications are 100 psi gas / 250 psi liquid at 75°C

*Chromatographic Specialties Inc. — The Valve People!*

## CHEMINERT VALVES — HIGH PRESSURE

Description		Microbore 0.010" (0.25mm) port diameter			Analytical 0.016" (0.4mm) port diameter		
Model	Stator → Rotor →	SS Valcon H	Ti Valcon H	PAEK Valcon E	SS Valcon H	Ti Valcon H	PAEK Valcon E
<b>C2</b> - two position - sampling/switching - 1/16" - 5,000 psi	4 port	VC21004 \$583.00	VC21034 \$875.00	VC21344 \$700.00	VC22004 \$408.00	VC22034 \$700.00	VC22344 \$525.00
	6 port	VC21006 \$583.00	VC21036 \$875.00	VC21346 \$700.00	VC22006 \$408.00	VC22036 \$700.00	VC22346 \$525.00
	8 port	VC2H1008 \$641.00	VC2H1038 \$933.00	VC2H1348 \$758.00	VC2H2008 \$466.00	VC2H2038 \$758.00	VC2H2348 \$583.00
	10 port	VC2H1000 \$700.00	VC2H1030 \$991.00	VC2H1340 \$816.00	VC2H2000 \$525.00	VC2H2030 \$816.00	VC2H2340 \$641.00
<b>C4</b> - internal sample - fixed volume - 1/16" - 5,000 psi	0.1µL	VC410041 \$583.00	VC410341 \$875.00	VC413441 \$700.00			
	0.2µL	VC410042 \$583.00	VC410342 \$875.00	VC413442 \$700.00			
	0.5µL	VC410045 \$583.00	VC410345 \$875.00	VC413445 \$700.00			
<b>C5</b> - multiposition - stream selection - 1/16" - 5,000 psi - 10 position C5 valves are available, inquire	4 position			VC51344 \$770.00	VC52004 \$496.00	VC52034 \$787.00	VC52344 \$612.00
	6 position			VC51346 \$770.00	VC52006 \$496.00	VC52036 \$787.00	VC52346 \$612.00
	8 position			VC5H1348 \$845.00	VC5H2008 \$554.00	VC5H2038 \$845.00	

## CHEMINERT VALVES — LOW PRESSURE

Description		Analytical 0.030" (0.75mm) port diameter
Model	Stator → Rotor →	PPS (Polyphenylene Sulphide) Valcon E2
<b>C22Z</b> - two position - sampling/switching - 1/16"	4 port	VC22Z3184 \$274.00
	6 port	VC22Z3186 \$274.00
	8 port	VC22Z3188 \$309.00
<b>C25Z</b> - multiposition - stream selection - 1/16"	4 position	VC25Z3184 \$292.00
	6 position	VC25Z3186 \$315.00
	8 position	VC25Z3188 \$362.00

The charts describe manual valves only. Pneumatic, electric and micro electric actuators are available. Please inquire regarding automation of these valves.

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Please contact our Technical Support Department at 1-800-267-8103 for more information.

# VALCO MULTIPOSITION VALVES

## VALCO MULTIPOSITION VALVES — P TYPE



**Valco P Type** (referring to valves with external, visible spring hardware) multiposition valves can be ordered with **4, 6, 8, 10, 12 or 16 positions**. The number of positions is different from the actual number of ports, unlike two position valves.

In the SD, ST, and STF flowpath configurations, 1/16" valves have 0.030" ports and 1/8" valves have 0.040" ports. All SC and SF valves have 0.040" ports standard. Connections are made with standard Valco 1/16" or 1/8" zero dead volume fittings, with nuts and ferrules supplied. The standard P type valve body is stainless steel, but valves may be ordered with any of the optional body materials. The rotor material letter designates the valve series (E, P, T, R, etc.), with specifications for the most common series in their various configurations at right.

### Standard Specifications By Flowpath Configuration — P Type —

Flow-Path	Series (Rotor)	Fitting Size	Number of Positions	Standard Pressure (psi)	Standard Temperature (°C)
SD	P	1/16"	4 - 16	400	175
		1/8"	4, 6, 8	400	175
			10, 12, 16	200	175
	E	1/16"	4 - 16	400	200
		1/8"	4, 6, 8	400	200
			10, 12, 16	200	200
	T	1/16"	4 - 16	300	300
		1/8"	4, 6, 8	300	300
			10, 12, 16	200	300
SC and SF	P	1/16"	4 - 16	400	175
	E	1/8"	4, 6, 8	400	175
	T		10, 12, 16	200	175
ST and STF	P	1/16"	4 - 16	200	175
		1/8"	4 - 16	200	175
	E	1/16"	4 - 16	200	200
		1/8"	4 - 16	200	200
	T	1/16"	4 - 16	200	300
		1/8"	4 - 16	200	300

## VALCO MULTIPOSITION VALVES — UW TYPE



**UW Type** multiposition valves are smaller than P type valves, and are tensioned with a preload assembly like the two position valve design. They are available with 1/16" fittings and 0.016" port diameters, and with 1/8" fittings and 0.030" ports. Because UW type valves are smaller than P type valves, there is only room for two planes of ports, so not all of the configurations available in P type valves can be duplicated in the UW type.

The standard UW type valve body is HPLC grade stainless steel, but valves may be ordered with any of the optional body materials except Tantalum. The UW in combination with the rotor material letter designate the valve series (UW+E=UWE, UW+P=UWP, UW+T=UWT, etc.), with specifications for the various series in the box at right.

(There is one exception: H is the default - if no other letter follows the UW, the valve will be a UW series with Valcon H rotor material.)

### Standard Specifications By Flowpath Configuration — UW Type —

Flow-Path	Series (Rotor)	Fitting Size	Number of Positions	Standard Pressure (psi)	Standard Temperature (°C)
SD	UW	1/16"	4 - 12	5000	75
		1/8"	4, 6, 8	5000	75
	UWP	1/16"	4 - 16	400	175
		1/8"	4, 6, 8	400	175
	UWE	1/16"	4 - 16	400	200
		1/8"	4, 6, 8	400	200
	UWT	1/16"	4 - 16	300	330
		1/8"	4, 6, 8	300	330
ST	UW	1/16"	4 - 6	5000	75
	UWP	1/16"	4 - 6	400	175
	UWE	1/16"	4 - 6	400	200
	UWT	1/16"	4 - 6	300	330

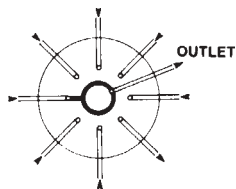
\* Higher pressure ratings are available for most rotor materials at a small additional charge. However, there is an inverse relationship between temperature and pressure specifications. Please enquire for special applications.

### MULTIPOSITION VALVES

Once you have selected the valve with all desired specifications, please call for part numbers, prices and availability.

## VALCO MULTIPOSITION VALVES

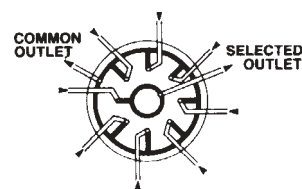
### Dead End Flowpath SD Type (n + 1 ports)



"SD" type valves allow selection of any one of 4-16 dead-ended streams. One stream at a time flows to a sample valve, pressure sensor, detector, etc. This configuration may also be used for directing one stream to a number of outlets in applications such as fraction collection. Since this flow path has the least number of ports employed, allowable pressures and temperatures are usually higher than other versions. See the "ST" flow path for a doubled version of the "SD" type.

**P Type and UW Type**

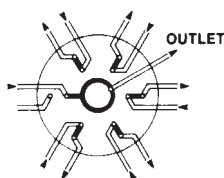
### Common Outlet Flowpath SC Type (n + 2 ports)



"SC" type valves are similar to the "SD" type except that the outlets for each stream are common-connected to one port inside the valve, making it ideal for air quality monitoring (EPA and OSHA regulatory requirements). In this version, all streams are continuously flowing (common) from remote sampling points to the monitor. Only the stream being analyzed is isolated. Flow rates are limited to 5 liters/min. using 1/8" versions.

**P Type Only**

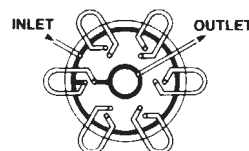
### Flow-through Flowpath SF TYPE (2n + 1 ports)



"SF" type valves permit selection of any one of 4-16 flowing streams. The streams not connected to the sample valve, however, flow constantly through individual outlets. This feature allows minimum purging time between samples in stream selection/sample injection operations. When multiple points must be sampled and stream pressures vary, the "SF" type provides for the isolation of the streams from each other in addition to their constant flow. The individual outlets can be plugged (ZP1 or ZP2) for quick conversion to dead-ended operation.

**P Type Only**

### Trapping Flowpath ST Type (2n + 2 ports)



"ST" configurations may be used for multi-column, multi-sample or multi-trap operations. Used in combination with a manual sampling valve such as a C6P, each loop may be filled with a different sample. After the six-port valve is switched, each loop may be injected in predetermined sequence into a GC or LC for automated lab analysis. The same hook-up allows trapping of individual GC "peaks" in separate chilled loops or short columns for subsequent heating and individual purging into a mass spectrometer. Programming an "ST" type valve and an auto-injection valve can transform an analytical GC or LC into a preparative chromatograph.

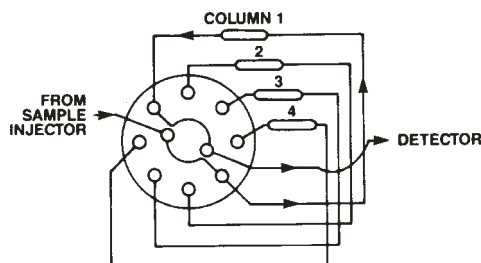
A special "STT" version (2n+ 4 ports) with a second inlet-outlet set permits adjacent loops to flow at the same time.

**P Type and UW Type**

## HPLC Column Selection

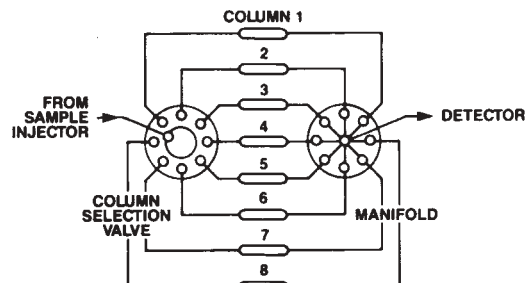
The CSTUW type selects both column ends with a maximum of 6 columns

### CST4UW



The CSDUW type selects only column inlets with a maximum of 12 columns. The column outlets are connected via a low-volume manifold to the detector.

### CSD8UW





# VALCO VALVE ACTUATORS

## VALCO MICRO-ELECTRIC ACTUATORS



- Manual control with position indication
- Remote control by contact closures or TTL level logic signals
- RS-232 bidirectional communication
- Universal power supply, 110/220VAC to 24 VDC

### Initialization

During initialization, the actuator measures the angle of valve rotation while slowly rotating the valve, waiting to sense the stall. Once the distance has been measured and confirmed by repetition, the angle is memorized. That's all there is to it - there's nothing more to do as long as the valve stays mounted on the actuator. If the valve is ever removed and reinstalled, or if you want to mount a valve with a different angle of rotation the initialization sequence can be prompted by cycling the actuator without a valve.

### Interface Connections

There are four connectors on the controller - input power, motor driver output, digital input/output signals, and RS232 interface, all keyed and sized so that wrong connections are impossible.

Each micro-electric actuator includes:

- power supply
- mounting bracket
- manual switching interface with remote cable for TTL control

Product Number	Description	Price
VEH	EH, High Speed, 2 position*	787.30
VET	ET, High Torque, 2 position**	845.60
VEMH	EMH, High Speed, Multiposition*	1,032.20
VEMT	EMT, High Torque, Multiposition**	1,090.50
VI22697	RS232 Interface Cable	29.20

\* W style GC valves and all Cheminert

\*\* High pressure W, UW, and GC style UW

### Electric vs. Air Actuators

Both microelectric and standard electric actuators can be operated manually with a controller assembly that features position-indicating LEDs and a toggle switch, but one of the biggest advantages of electric actuators over air is the ease with which they can be connected to an external data system for fully automated control.

## VALCO ELECTRIC ACTUATORS



- Models for 30°, 36°, 45°, 60° and 90° two position valve
- Models for multiposition (4-16) valves
- All models start from either a contact closure or negative true logic level, momentary or continuous
- Compatible with all Valco close coupling or standoff assembly hardware
- Recommended for non-hazardous applications where air actuation is unnecessary
- LED position indication on two position models, and digital readout on 4-16 position models
- Sinusoidal power output and rotational speed for maximum lifetime
- Optical position sensing on all models for long actuator lifetime
- High output torque for operation of all Valco valves, even high temperature, high pressure types
- BDC position output on multiposition models
- Positions may be random accessed on multiposition models
- All models use separate line voltage supply and require no power from instrument with which they are used

Product Number	Model	For Use With UW & W Series . . .	Price
C33538	E90	3 & 4 Port Valves	\$600.70
C33540	E60	6 Port Valves	600.70
C33536	E45	8 Port Valves	600.70
C33534	E36	10 Port Valves	600.70
C33533	E30	12 Port Valves	600.70
Inquire	EMPV-24DC	Multi Position Valves*	Inquire

\* Valco Standard Electric Actuators for Multi Position Valves are now supplied with a 24V DC motor and class 2 110/220 power supply to meet CSA standards. Please contact our Technical Support Team for assistance in choosing the correct actuator for your application.

## VALCO AIR ACTUATORS



The helical air actuator permits the application of controlled, constant torque for the actuation of rotary devices with maximum power/volume ratio. Minimum actuation pressure is typically less than 40 psi for operation of Valco valves. Up to 70 psig may be used without damaging valve or actuator. Low internal leakage permits either pulsed or continuous low gas consumption. Valves intended for mounting in ovens are used with a stand-off assembly which locates the actuator out of the heated zone. (Standoff lengths shown in table). A high temperature model (150°C) is available.

### Specifications

Temperature Range — Standard air actuator (A) 0-70°C,  
High temp. air actuator (AT) 50-150°C  
Air pressure required — 30 to 60 psig range for all Valco Valves.  
20 psig for "W" models.

Inlet ports are 10-32 Valco zero volume detail in aluminum end caps. All units are supplied with Humphrey products TCF connector, 10-32 to 5/16-20 compression fitting for 1/8" OD tubing. 1/16" zero volume nuts and ferrules are not supplied but may be used for 1/16" OD tubing connections. Valve connection is direct coupled using a universal coupling and clamp ring. Stand-off assembly connection using clamp ring.

### Helical Air Actuator Only

Product Number	Model	Travel	For Use With UW & W Series . . .	Price
C33550	A90	90°	3 & 4 Port Valves	\$291.60
C33548	A60	60°	6 Port Valves	291.60
C33592	A45	45°	8 Port Valves	291.60
C33591	A36	36°	10 Port Valves	291.60
C33590	A30	30°	12 Port Valves	291.60
C33551	AT90	90°	3 & 4 Port Valves	291.60
C33549	AT60	60°	6 Port Valves	291.60
C33595	AT45	45°	8 Port Valves	291.60
C33594	AT36	36°	10 Port Valves	291.60
C33593	AT30	30°	12 Port Valves	291.60

The above compatibility table is for "W" series valves only. If using older "P" and "T" series, please inquire for the proper actuator.

### Standoff Assemblies

Product Number	Description	Code	Price
C33559	0" Closemount Assembly	0	\$23.30
C33552	2.0" Standoff Assembly	2	46.70
C33554	3.25" Standoff Assembly	3	46.70
C33556	4.125" Standoff Assembly	4	46.70
C33558	6.0" Standoff Assembly	6	46.70
C33568	Slotted Coupling	-	4.70

### Actuator Accessories

Product Number	Description	Price
C33545	Actuator O-Ring Rebuild Kit (75°C)	\$14.00
C33546	Actuator O-Ring Rebuild Kit (175°C)	16.30
C33565	Humphrey TCF Fittings (ea)	7.00

## AIR SWITCHES



4-Way (41E1)



3-Way (31E1-MSVA)

The 41E1, a four-way solenoid air valve with 1/8" tube fittings, is the simplest method of controlling Valco Helical-Drive air actuators. Air is continuously applied to the actuator. Energizing the solenoid steps the valve to its next position. De-energizing the solenoid resets the mechanical ratchet system on a multiposition valve, or returns a two position valve to its original position.

Product Number	Description	Price
C33650	41E1, 110V air solenoid	\$93.30
C33655	41E1, 12VDC air solenoid	93.30
C33660	41E1, 24VDC air solenoid	93.30

The MSVA is a block-mounted pair of 3-way solenoid air valves with 1/8" tube connections. The recommended way to operate 2 position air actuated valves is to "pulse" the 3-way solenoid valves. This will apply air to the actuator only during switching, and alleviates problems associated with continuous air pressure. The "pulsed operation" procedure simulates switching by hand while providing advantages of powered operation.

Product Number	Description	Price
VD1320	31E1-MSVA, 120V air solenoid	\$192.40
VD1324	31E1-MSVA, 24VDC air solenoid	180.70

# VALCO VALVE FITTINGS

Valco has been involved in the development and use of zero volume compression fittings for over 25 years. Valco's sophisticated machining techniques make the manufacture of special fitting designs possible in virtually all materials - even traditionally difficult metals such as high nickel content alloys and tantalum.

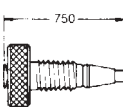
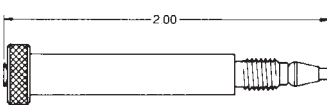
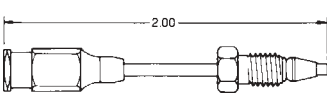
Valco zero volume compression fittings are designed for close tolerance heavy wall tubing most often found in high performance chromatography. They do not "swage" or deform the tube, so ferrules are easily removed from the fittings. There is no reliance on crimping or necking at the bore - even when maximum operating pressures exceed 10,000 psi.



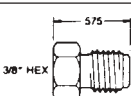
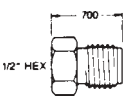
The Valco ferrule is universally usable and can improve virtually all fitting connections. Since the angle of the Valco fitting seat is the industry standard, Valco parts may, when necessary, be interchanged with other brands, although with possible loss of some desirable features.

Material availability may cause alteration of some dimensions, e.g. round stock with machined flats is used for tantalum and Hastelloy C, instead of the hexagonal shape shown.

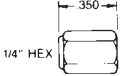

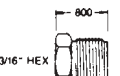
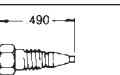
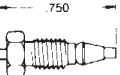
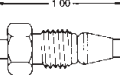
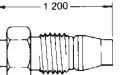
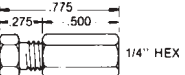
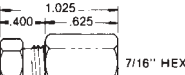
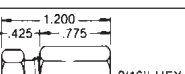
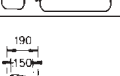
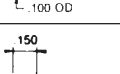
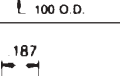
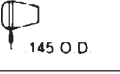

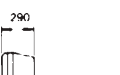
All 1/32" fittings are optimized for capillary GC and micro HPLC. C versions of larger fittings are designed for low flow rate systems. T versions permit tubes to be butted together for either high or low flow applications. L versions are large bore and are for high flow applications.

INJECTOR/DETECTOR ADAPTORS	Product Number	Model	Bore	Description	Price
	C35476	ZLTA41	1/16"	Long 1/4" tube to 1/16" zero dead volume tube adaptor (incl. nuts and ferrules)	\$14.00

SYRINGE ADAPTORS	Product Number	Model		Description	Price
	C34208	VISF-1		Fill port for 0.750" 22g needles on 1/16" fittings. May be used with any 22g needles with Valco valves having <0.025" port diameter.	\$9.30
	C34196	VISL-1		Replacement Liner for VISF-1, Pkg. 2	5.00
	C34207	VISF-2		Fill port for 22g 2" length needles for 1/16" fittings	15.20
	C34195	VISL-2		(1/32" and 1/8" also available) Replacement Liner For VISF-2, Pkg. 2	5.00
	C34209	ZLA-1		Female Luer adaptor to 1/16" zero volume fittings	14.00
				(1/32" and 1/8" also available)	

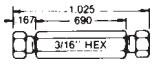
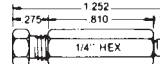
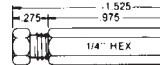
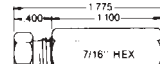
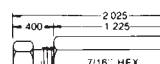






VALCO ZERO VOLUME FITTINGS	Product Number	Model	Size	Description	Qty	Price
	C35300	ZN.5	1/32"	Standard Zero Volume Nut	10	\$29.20
	C34200	ZN1	1/16"	Standard Zero Volume Nut (A longer version (.750") of this nut is also available. C35302 - Please inquire.)	10	17.50
	C34212	ZN2	1/8"	Standard Zero Volume Nut	10	21.00
	C34230	ZN4	1/4"	Standard Zero Volume Nut (Longer versions of this nut are also available. C35304 = .825" and C35306 = 1.075" Please inquire.)	10	25.70

# VALCO VALVE FITTINGS

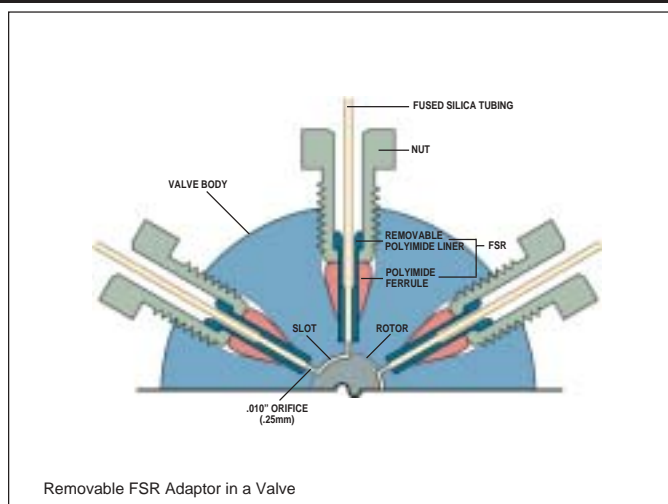
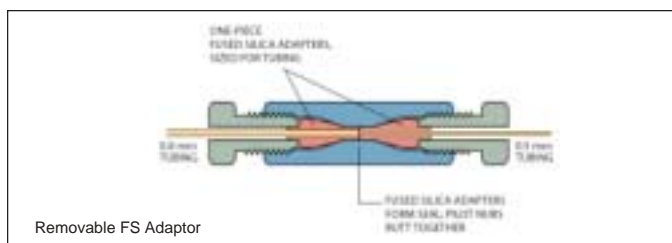
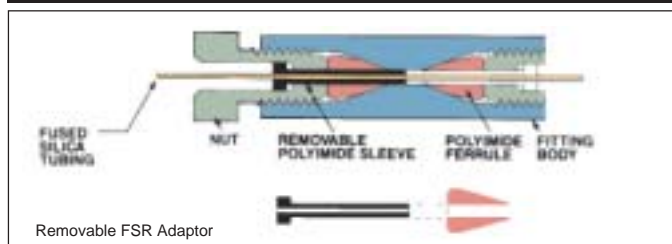
VALCO ZERO VOLUME FITTINGS	Product Number	Model	Size	Description	Qty	Price
	C35340	EN1	1/16"	Standard External Nut	10	\$26.00
	VZN610	ZN6	3/8"	Standard Zero Volume Nut	10	36.00
	C35310	ZN8	1/2"	Standard Zero Volume Nut	10	45.50
	C35320	ZP.5	1/32"	Zero Volume Plug	1	8.40
	C35322	ZP1	1/16"	Zero Volume Plug	1	6.00
	C35324	ZP2	1/8"	Zero Volume Plug	1	6.00
	C35326	ZP4	1/4"	Zero Volume Plug	1	8.40
	C34206	ZC1	1/16"	Zero Volume Cap	1	9.60
	C34218	ZC2	1/8"	Zero Volume Cap	1	9.60
	C35332	ZC4	1/4"	Zero Volume Cap	1	12.00
	C35350	FS.4	0.4mm	Zero Volume Vespel Ferrule	5	30.00
	C35352	FS.5	0.5mm	Zero Volume Vespel Ferrule	5	30.00
	C35354	ZF.5	1/32"	Zero Volume S. S. Ferrule	10	30.00
	C34202	ZF1	1/16"	Zero Volume S. S. Ferrule	10	21.60
	C35356	ZF1TF	1/16"	Zero Volume PTFE Ferrule	10	18.00
	C35358	ZF1GV	1/16"	Zero Volume Graphite Vespel Ferrule	5	24.00
	VZF210	ZF2	1/8"	Zero Volume S. S. Ferrule	10	19.20
	C35360	ZF2TF	1/8"	Zero Volume PTFE Ferrule	10	24.00
	C35364	ZF4TF	1/4"	Zero Volume PTFE Ferrule	10	24.00
	C35368	ZF6	3/8"	Zero Volume S. S. Ferrule	10	30.00



# VALCO VALVE FITTINGS

VALCO ZERO VOLUME FITTINGS	Product Number	Model	Bore	Description	Price
	C35380 C35382	ZU.5 ZU.5T	0.25mm (0.010") 0.8mm (1/32")	1/32" zero volume union (incl. nuts and ferrules)	\$26.80 26.80
	C35384 C35386	ZRU1.5 ZRU1.5T	0.25mm (0.010") 0.8mm (1/32")	1/16" to 1/32" zero volume reducing union (incl. nuts and ferrules)	26.80 26.80
	C34204 C35388 C35390	ZU1 ZU1C ZU1T	0.75mm (0.029") 0.25mm (0.010") 1/16"	1/16" zero volume union (incl. nuts and ferrules)	17.50 22.20 17.50
	C34224 C35392 C35394	ZRU21 ZRU21C ZRU21T	0.75mm (0.029") 0.25mm (0.010") 1/16"	1/8" to 1/16" zero volume reducing union (incl. nuts and ferrules)	16.30 22.20 16.30
	C34216 C35396 C35398	ZU2 ZU2L ZU2T	0.75mm (0.029") 2mm (0.080") 1/8"	1/8" zero volume union (incl. nuts and ferrules)	15.20 15.20 15.20
	C35406 C35408 C35410	ZU4 ZU4L ZU4T	0.75mm (0.029") 2mm (0.080") 1/4"	1/4" zero volume union (incl. nuts and ferrules)	16.30 16.30 16.30
<b>FUSED SILICA UNIONS</b>					
	C35430 C35432 C35434	ZU.5 FS.4 ZU.5 FS.5 ZU1C FS1-.8	0.25mm (0.010") 0.25mm (0.010") 0.25mm (0.010")	1/32" Union with FS.4 Ferrules 1/32" Union with FS.5 Ferrules 1/16" Union with FS1-.8 Ferrules	40.40 40.40 35.50
	C35350	FS.4	0.4mm (1/32" detail)	0.4mm Vespel Ferrules, Pkg. 5 Fits Narrow Bore Columns (0.25mm I.D.)	29.20
	C35352	FS.5	0.5mm (1/32" detail)	0.5mm Vespel Ferrules, Pkg. 5 Fits Wide Bore Columns (0.32mm I.D.)	29.20
	C35488	FS1-.8	0.8mm (1/16" detail)	0.8mm Vespel Ferrules, Pkg. 5 Fits Megabore Columns (0.53mm I.D.)	29.20
	C35450	IZR1.5	0.25mm (0.010")	1/16" to 1/32" zero volume reducer (incl. nuts and ferrules)	22.20
	VF3660	IZR1.5L	0.50mm (0.20")		19.80
	VF3665	IZR1.5LF	0.50mm (0.020")	1/16" to 1/32" zero volume reducer	25.70
	C34226 C35452 VF3765	IZR21 IZR21C IZR21L	0.5mm (0.020") 0.25mm (0.010") 1mm (0.040")	1/8" to 1/16" zero volume reducer (incl. nuts and ferrules)	12.80 15.20 12.80
	C35456	IZR42	1mm (0.040")	1/4" to 1/8" zero volume reducer	14.00
	C35462	EZRU21	0.75mm (0.029")	1/8" external (Parker or Swagelok) to 1/16" zero volume union (incl. nuts and ferrules)	19.80
	C35464	EZRU41	0.75mm (0.029")	1/4" external (Parker or Swagelok) to 1/16" zero volume union (incl. nuts and ferrules)	21.00
	C35466	EZRU42	1mm (0.040")	1/4" external (Parker or Swagelok) to 1/8" zero volume union	22.20

## VALCO FUSED SILICA ADAPTORS



VALCO 1/32" FUSED SILICA ADAPTORS	Description Polyimide - Valcon	Product Number	Model	Fits Tubing OD	Qty.	Price
	One Piece FS Adaptors	C35348	FS.25	$\leq 0.25\text{mm}$	5	\$29.20
		C35350	FS.4	$0.25 \leq 0.4\text{mm}$	5	29.20
		C35352	FS.5	$0.4 \leq 0.5\text{mm}$	5	29.20
	Removable FSR Adaptors	C33498	FSR.25	$\leq 0.25\text{mm}$	5	70.00
		C33494	FSR.4	$0.25 \leq 0.4\text{mm}$	5	70.00
		C33496	FSR.5	$0.4 \leq 0.5\text{mm}$	5	70.00
	Replacement Liner - FSR	C33499	FSL.25	$\leq 0.25\text{mm}$	5	46.70
		C33495	FSL.4	$0.25 \leq 0.4\text{mm}$	5	46.70
		C33497	FSL.5	$0.4 \leq 0.5\text{mm}$	5	46.70
	1/32" Standard Polyimide Ferrule	C35355	ZF.5V	_____	5	29.20

VALCO 1/16" FUSED SILICA ADAPTORS	Description Polyimide - Valcon	Product Number	Model	Fits Tubing OD	Qty.	Price
	One Piece FS Adaptors	VFS1255	FS1.25	$\leq 0.25\text{mm}$	5	\$29.20
		VFS145	FS1.4	$0.25 \leq 0.4\text{mm}$	5	29.20
		VF3835	FS1.5	$0.4 \leq 0.5\text{mm}$	5	29.20
		C35488	FS1.8	$0.5 \leq 0.8\text{mm}$	5	29.20
	Removable FSR Adaptors	C35495	FS1R.2	$\leq 0.2\text{mm}$	5	87.50
		C35493	FS1R.4	$0.2 \leq 0.4\text{mm}$	5	87.50
		C35489	FS1R.5	$0.4 \leq 0.5\text{mm}$	5	87.50
		C35490	FS1R.8	$0.5 \leq 0.8\text{mm}$	5	87.50
	Replacement Liner - FSR	VF3668	FS1L.2	$\leq 0.2\text{mm}$	5	52.50
		VF3670	FS1L.4	$0.2 \leq 0.4\text{mm}$	5	52.50
		C35483	FS1L.5	$0.4 \leq 0.5\text{mm}$	5	52.50
		C35491	FS1L.8	$0.5 \leq 0.8\text{mm}$	5	52.50
<p><b>NOTE:</b> Standard 1/16" ZN1 Nut cannot be used with the FS1R.8 and FS1R.5 adaptor.</p>	1/16" Counter-Bored Zero Volume Nut	C35492	ZCN1	_____	10	29.20
	1/16" Standard Polyimide Ferrule	C35358	ZF1V	_____	5	23.30

**NOTE:** PEEK® Adaptors also available. Please inquire.

# VALCO VALVE ENCLOSURES

## VALCO HEATED VALVE ENCLOSURES

These insulated enclosures allow valves to be operated at temperatures independent of other controlled zones. The compact construction and minimal power dissipation enable them to be mounted within larger, lower temperature zones without significantly raising the larger oven's minimum temperature or impairing its programmability.

*Due to new electrical regulations, all Valco Heated Valve Enclosures are now sold as a complete, preassembled package.*

*Included is the electronic temperature controller, thermocouple, and the enclosure itself.*



Enclosures	Product Number	Model	Number of Valves	Type of Valve	Max. Temp. in 20 min.	Heater	Price
	C34980	HVEAN	1	NW	350°C	65W	\$1,510.00
	C34920	HVEA	1	W	350°C	65W	1,510.00
	C34990	HVEBN	1	NW	350°C	65W	1,510.00
	C34930	HVEB	1	W, UW	350°C	65W	1,510.00
	C34940	HVEC	1	All	350°C	100W	1,631.00
	C34950	HVE2	2	All	350°C	125W	1,573.00
	C34960	HVE3	3	All	350°C	150W	1,615.00
	C34970	HVE6	6	All	350°C	300W	1,799.00

# HAMILTON INERT VALVES

**HAMILTON MINIATURE INERT PLUG VALVES** provide an economical and variable method of custom-building a fluid or gas flow control system, from a simple on/off valve to a more complex multi-valve arrangement, using a combination of loop and distribution valves. The small aluminum cube with its chemically inert flow path is ideally suited for low pressure applications.

Hamilton fittings and adapters do not require special tools for installation and are hand-threaded into the valve ports, providing a leak-tight seal to the valves' maximum pressure rating of 100 psi.

## THE VALVES

**HV**



- 0.059" (1.5mm) plug orifice
- Smallest valve design

**HVP**



- 0.059" (1.5mm) plug orifice
- Valves can be panel mounted

**HVX**



- 0.118" (3.0mm) plug orifice
- Valves can be panel mounted

Flow Diagram	Valve Description	Valve Model	HV	HVP	HVX
	180° Flow Path 2 ports	1-1	H86725 \$88.20	H86775 \$95.40	H86901 \$186.00
	90° Flow Path 2 ports	2-2	H86726 \$114.80	H86776 \$235.60	H86902 \$118.40
	"T" Flow Path 3 ports	3-3	H86727 \$95.40	H86777 \$102.70	H86903 \$157.00
	90° Flow Path 3 ports	3-2	H86728 \$95.40	H86778 \$94.20	H86904 \$195.70
	Loop Flow Path 4 ports	4-4	H86729 \$118.40	H86779 \$102.70	H86905 \$196.90

Other valve configurations are available. Please contact Technical Support for further information.



# INSTRUMENTATION

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1-800-267-8103



## OUR HISTORY OF SERVICE AND SUPPORT

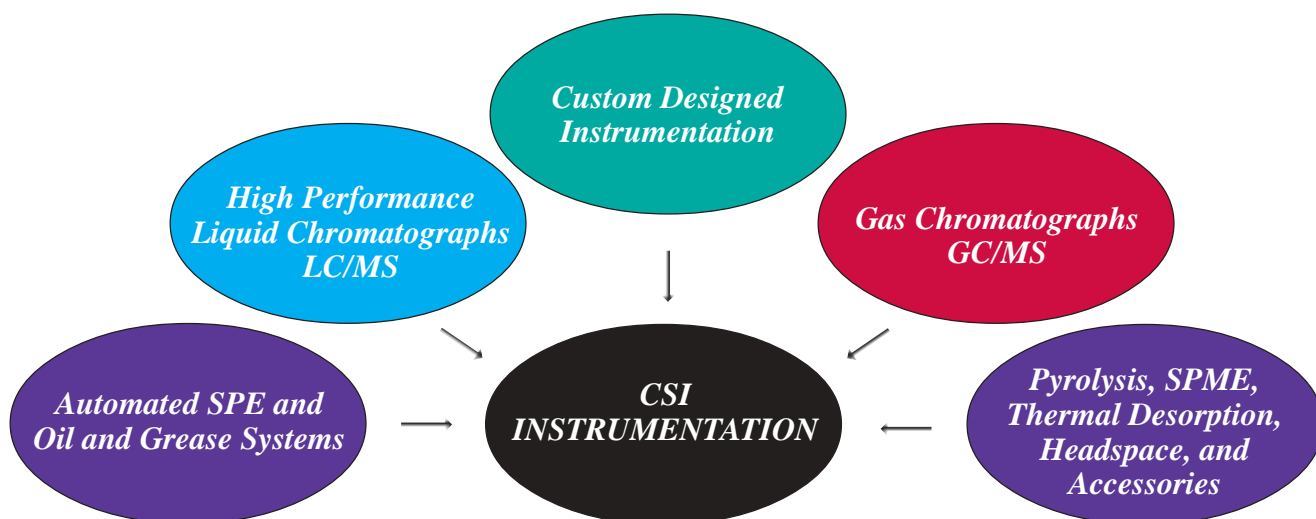
Chromatographic Specialties' Instrumentation Department provides uncompromised Service and Technical Support for all products we distribute. Our goal is to provide expert assistance in the identification of your instrumentation requirements and rapid response to your support needs.

### Your Satisfaction Determines Our Future Success

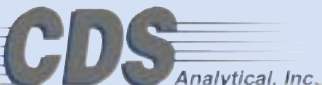







Our experienced in-house staff is available to provide a full range of services including toll free telephone support, new product installation, and on-site service and training. We also offer in-house and factory repair services for the instrumentation products that we represent.

Chromatographic Specialties Inc. has a continuously growing network of suppliers and engineering support services designed to provide the highest quality instruments available on the market.

Contact one of our Instrumentation Specialists today. They may be reached toll free at 1-800-267-8103 or by e-mail at [instrum@chromspec.com](mailto:instrum@chromspec.com).



Here is a brief overview of the instrument companies we represent and the analytical and automation tools available:

 <ul style="list-style-type: none"> <li>• GC Pyrolyzers and Accessories</li> <li>• Universal GC Sample Preparation System</li> <li>• Thermal Desorber</li> </ul>	 <ul style="list-style-type: none"> <li>• Automated liquid diluting and dispensing systems</li> <li>• Canadian Authorized Service Centre</li> </ul>	 <ul style="list-style-type: none"> <li>• Large volume automated environmental sample SPE</li> <li>• Automated concentrating system</li> </ul>
 <ul style="list-style-type: none"> <li>• High-end HPLC systems and components</li> <li>• Osmometers</li> <li>• Amino Acid Analyzer</li> </ul>	 <ul style="list-style-type: none"> <li>• Multimode GC/LC Autosamplers</li> <li>• Gas Chromatographs</li> <li>• GC/MS</li> </ul>	 <ul style="list-style-type: none"> <li>• Gas Generators, including:               <ul style="list-style-type: none"> <li>- Hydrogen Generators</li> <li>- Zero Air Generators</li> <li>- Nitrogen Generators</li> <li>- and others</li> </ul> </li> </ul>
 <ul style="list-style-type: none"> <li>• HPLC Autosamplers</li> <li>• 96 Well Plate Samplers</li> <li>• Automated SPE-HPLC, SPE-HPLC-MS (Prospekt II)</li> </ul>	 <ul style="list-style-type: none"> <li>• Low cost turn-key GCs and HPLCs for lab and mobile use</li> <li>• Stand-alone Detectors for any GC</li> <li>• Data Acquisition Systems for any GC or LC</li> </ul>	 <ul style="list-style-type: none"> <li>• Specialized GC Detectors</li> <li>• Trace Gas Analytical Systems</li> <li>• Valve Injection and Switching Systems</li> </ul>

To contact one of our Instrumentation Specialists  
or to learn more about our product lines:

CALL . . . . . 1-800-267-8103  
FAX . . . . . 1-613-342-1144

E-MAIL . . . . . [instrum@chromspec.com](mailto:instrum@chromspec.com)  
VISIT OUR WEBSITE . . . . . [www.chromspec.com](http://www.chromspec.com)

# KNAUER *Smartline* HPLC SYSTEMS

## Introducing the New *Smartline* HPLC System from Knauer . . .

Combining cutting edge technology with the experience gained from more than three decades of manufacturing HPLC instrumentation, Knauer introduces the *Smartline* HPLC system. Knauer's modular design enables you to build exceptionally compact HPLC systems; with a width of less than 23 cm, the unit occupies only a very small amount of your valuable laboratory bench space. Throughout its conception and development, the needs of today's liquid chromatographers were carefully considered and implemented.

### *Smartline* Technology

- Compact HPLC systems with a width of less than 23cm
- Modules can be used as stand-alone or fully controlled via software
- Excellent performance
- Simple to use
- GLP features such as Operation Qualification
- Service-friendly
- Outstanding price/performance ratio

Knauer manufactures a variety of HPLC system components to fit your specific needs and price range.

### HPLC Pumps

*Smartline* dual piston pump offers outstanding flow rate precision (RSD< 0.1%) and accuracy and an optimized drive mechanism for improved reliability and lifespan. The entire range from micro to semi-preparative is covered with an assortment of different pump heads: 10, 50, 100, 250, 500 and 1000 mL. with either ceramic, titanium or stainless steel inlays.

### Detectors

Knauer offers a variety of detectors for all your detection needs: single wavelength UV, refractive index, light scattering conductivity, amperometric and even mass spec single quad. All flow cells and eluent connectors are conveniently positioned behind the front panel for easy access.

### Column Heater and Chiller

The *Smartline* Column Thermostat 4000 provides programmable column heating and cooling from 5 to 85°C.

### Autosampler Options

Compact *Smartline* autosamplers can be customized to configure the autosampler precisely to your requirements: sample injection, sample dilution and sample derivatization. Optional sample carousels are available for a variety of different vial configurations.

### Control Software

Two software options are available. Both are 21CFR part 11 compliant:

- Clarity Chrom is a stand alone software package with all the features including PDA 3D data handling, system suitability and more. Ideal for small companies and research facilities.
- ChromGate®, based on the well known E-Z Chrom Elite kernel, has it all, fully client server compatible, easy to use wizard, PDA 3D data handling, system suitability, GPC and SEC options, drivers available to control most other brands of HPLC systems. ChromGate® is an ideal solution for both large and small laboratories.



For more information on Knauer's *Smartline* HPLC system, application assistance or CUSTOM modification, please contact our Instrumentation Department at 1-800-267-8103 or by email at [instrum@chromspec.com](mailto:instrum@chromspec.com).

## Suitable for semi-preparative (50mL/min.) to industrial scale (250 LPM) work

The Knauer Preline system can be operated either manually or with software for fully automated control. Preline systems offer flow rates of up to 1000mL/min; for even higher flow rate applications, Knauer works with Technikrom, a leader in industrial chromatography. Preline systems offer pressure stability up to 400 bar, various detection principles and optional solvent recycling. The fraction collection can either be based on time, signal level, signal slope, spectral similarity, or any combination of these parameters. It is also possible to add multiple detector signals to optimize the fractionation, as well as a virtual simulation mode to finely tune the collection algorithm.

**The Preparative HPLC Pump 1800** can be equipped with 5 different pump heads to handle flow rates ranging up to 100, 250, 500 and 1000 mL/min. There is even a special 8 fold head good for 400ml/min at 200 bar (3000 psi). The heads are available in either stainless steel or titanium for biocompatible applications.

**Smartline UV Detector** can be fitted with flow cells to accommodate 1/16", 1/8" or 1/4" connections. These flow cells are available in either stainless steel or PEEK and have an optical path length of either 3mm fixed or adjustable to 0.5, 1.25 or 2mm. Flow cells with fiber optic connections allow you to separate the cell from the detector enabling operation right at the column outlet or in hazardous environments.

**The Preparative Module 6100** consists of a feed pump, an injection valve and a fractionation/solvent recycling valve.

**Software** is fully GLP and 21 CFR part II compliant. Based on ChromGate, the preparative option provides control of all the features as well as a simulation mode.



### Extension to the basic preparative system

Thanks to its modular design, the Preline system can be modified at anytime to accommodate changing requirements...

- It can be converted to gradient operation
- It can be converted to either low or high pressure gradient
- Sample injection can even be performed by loading the sample directly into the column for maximum versatility
- Increase the number of fraction collection positions by adding cascading valves or a fraction collector
- An autosampler can be added for automated separation of 24 samples of up to 10mL each

## Simulated Moving Bed Technology the Next Step in Chromatography

Preparative chromatography (Simulated Moving Bed) is increasingly applied as a separation technique in the pharmaceutical industry, production of fine chemicals, and in the field of bioengineering.

Simulated Moving Bed is a method in process chromatography that enables substance mixtures to be continuously separated and extracted in two fractions. By repeated use of the SMB process each partial fraction can be separated into a further fraction - up to binary substance mixtures. Typically, the SMB process is set up in advance for a two component mixture. Following this, both substances can be immediately extracted in pure form - up to 1,000 kg per year.

For assistance in selecting the Preline system that best fits your needs,  
contact our Instrumentation Team at 1-800-267-8103 or by email at [instrum@chromspec.com](mailto:instrum@chromspec.com)



# Smartline GPC CLEAN UP UNIT 6500

The GPC Clean Up Unit 6500 has been developed and optimized for sample preparation in pesticide analysis, including

- AOAC method No. 984.21
- USEPA SW-846 method 3640A
- EN 12393, EN 1528 and L00.00-34 method in accordance with 35 LMBG

Furthermore it is the perfect choice to perform general clean up on a wide variety of matrices including food stuffs, tissues, and environmental samples. High molecular weight compounds such as lipids, polymers, proteins, natural resins and cellular components are easily dispersed and eliminated.

The GPC Clean Up Unit 6500 combines a highly flexible modular design with intelligent, easy-to-use software. The system can be easily adapted to perform a large variety of predetermined GPC sample preparation methods. Its small footprint requires only a small amount of bench space.

The versatile dual piston pump design provides for pulse-free flow and outstanding flow rate precision and accuracy. The active back seal washing process minimizes downtime and routine maintenance.

For automatic injection the system is equipped with a valve containing 15 separate sample loops, one for each sample. A wash protocol between samples ensures that no carry over occurs.

Each sample can be processed separately, allowing specific elution and collection protocols to be defined for each of the samples. It is also possible to use sample loops of varying volumes on each of the positions.

A fixed wavelength detector is placed in the system for easy calibration and real time visualization of the elution profile.

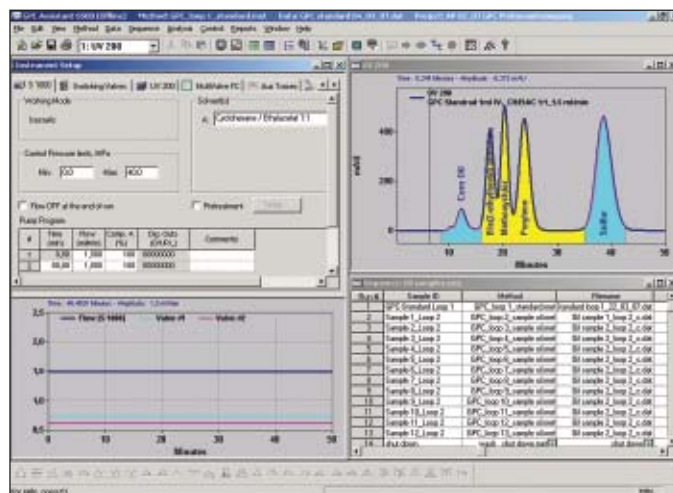
The fraction collector uses a 17 port 1 channel valve.



## Technical data:

Pump: Flow range: 0.01 to 9.999mL/min  
Flow precision: RSD < 0.1mL/min  
Pulsation < 0.5%

Detector: Wavelength 254nm Deltalambda 20nm  
Noise  $3 \times 10^{-5}$  AU  
Linearity 0-2.5 AU



Kra5004 V20: Smartline GPC cleanup 6500 includes: 15 x 1mL loops, UV detector and software  
Krb40: Biobeads S-x3, 500 x 40 mm, glass column ( for USEPA method 3640A)

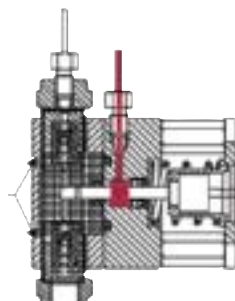
## Smartline PUMP 1000

The Smartline Pump 1000 offers many valuable features including an optimized pump drive for improved reliability and lifespan. Improved pump head design features an automatic piston back flush system



### Specifications:

Delivery system: double piston with electronic residual pulsation suppression  
 Pump heads: 10 or 50mL/min. in stainless steel or titanium  
 Flow rate accuracy: deviation <0.5%  
 Flow rate precision: RSD <0.1%  
 Control: RS-232, touchpad or remote control strip



Schematic of Smartline Pump 1000 provides an internal view of the additional solvent chamber that washes the piston as it withdraws.

## Smartline PRELINE PUMP 1800

The Preline Pump 1800 is the smallest preparative pump in its class with flow rates of up to 1LPM, automatic piston back flush and component design for continuous operation; an optional cooling/heating device can also be mounted on the pump head.

### Specifications:

Delivery system: double piston with active residual pulsation suppression  
 Pump heads: 100, 250, 500 and 1000mL/min. in stainless steel or titanium  
 Flow rate accuracy: RSD <0.1%  
 Flow rate precision: RSD +/- 2% within 5-50% of flow range  
 Control: RS-232, touchpad or remote control strip  
 Gradient: low pressure unit or high pressure with slave pumps



**Both Smartline and Preline Pump Heads** feature an internal chamber behind the high pressure seal to continuously wash the back of the piston, resulting in minimal failure of the seal/piston even with highly buffered mobile phases.

## Smartline MANAGER 5000

The Smartline Manager 5000 provides maximum flexibility in a minimum amount of space. Depending on your requirements, the Smartline Manager can be customized with a low pressure gradient module (LPG), a degasser module and an interface module. (4 channel A/D converter and relay board to integrate any third party instrument).



For technical data and order information on these Smartline components, contact our Instrumentation Department at 1-800-267-8103 or by email at [instrum@chromspec.com](mailto:instrum@chromspec.com).

# KNAUER *Smartline* HPLC DETECTORS

## *Smartline* PDA Detector 2800

The *Smartline* Photo Diode Array Detector 2800 is based on advanced fiber optics technology and delivers the best results in terms of sensitivity, noise and drift. Due to its unique design the *Smartline* PDA Detector 2800 has no moving parts, operates without a reference channel and does not require a time consuming cold start calibration. Maintenance and exchange of the measuring cell is made simple by having direct access to it from the front panel.

### Specifications

**Detector Type:** Diode array detector  
**Number of Diodes:** 1,024 (0.8nm/diode)  
**Wavelength Range:** (UV/VIS/NIR) 190-1,020nm  
**Wavelength Range:** (UV) 190-600nm  
**Wavelength Accuracy:**  $\leq 0.5\text{nm}$   
**Wavelength Precision:**  $\leq 0.1\text{nm}$   
**Lamp:** Deuterium and tungsten-halogen (UV/VIS/NIR)  
           Deuterium (UV)  
**Noise** (ASTM E1657-94):  $\leq 1 \times 10^{-5}$  AU  
**Drift** (ASTM E1657-94):  $\leq 5 \times 10^{-4}$  AU/h  
**Linearity:** 0-2.0 AU  
**Connection of Flow Cell:** Via fiber optics, optional extension available for external use of flow cell  
**Digital Control & Output:** Ethernet  
**Analog Output:**  $2 \times \pm 10$  V (scalable)  
**Wavelength Verification:** Optional with holmium oxide filter cell  
**Power Supply:** 115/230 V, 50-60 HZ, 100W  
**Dimensions/Weight:** 226 x 185 x 390mm (W x H x D) / 8.5 kg



Product Number	Description	Price
KRA5250	Smartline PDA Detector 2800 UV/VIS/NIR includes lamps	\$26,799.00
KRA5251	Smartline PDA Detector 2800 UV includes deuterium lamp	22,615.00

## *Smartline* S2600 PDA DETECTOR

The *Smartline* UV Detector 2600 is a completely new multi-wavelength spectrophotometer based on diode array technology. This instrument unites the advantages and price of an outstanding 4-channel spectrophotometer with the quality and functionality of a diode array detection system.

The flow cell which is located behind the integrated touchpad on the front panel is well protected from outside influence and yet it is easily accessible.

Fiber optic flow cells are also available for any work requiring remote detection.

### Specifications

**Detector Type:** Diode array spectrophotometer  
**Number of Diodes:** 256 (1.25nm/diode)  
**Wavelength Range/Channels:** 190-510nm/4 (data recording)  
**Wavelength Accuracy:**  $\leq 1$  nm (254nm)  
**Spectra Scan:** Max. 10 scans per second  
**Lamp:** Deuterium (UV)  
**Bandwidth:** 4-25 nm (selectable)  
**Noise/Drift** (ASTM E1657-94):  $\leq 1 \times 10^{-5}$  AU /  $\leq 5 \times 10^{-4}$  AU/h  
**Time Constants:** 0.1/0.2/0.5/1.0/2.0/5.0/10.0 s  
**Analog Output:**  $4 \times \pm 1$  V (scalable), 20 bit  
**Control:** RS-232, remote control strip, touchpad  
**Programming:** Max. 20 programs  
**GLP Report:** Detailed including lamp ignition/operation time  
**Wavelength Verification:** Automatic via internal holmium oxide filter  
**Display:** LCD, 2 lines, 24 characters  
**Power Supply:** 90-260 V, 47-63 HZ  
**Dimensions/Weight:** 226 x 135 x 390mm (W x H x D) / 5.7



KRA5200	Smartline UV Detector 2600, excludes flow cell	\$13,859.00
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## *Smartline* UV DETECTOR 2500

The *Smartline* UV Detector 2500 combines the attractive and functional KNAUER *Smartline* design with their effective photometric detection system. The unit is compatible with the entire range of KNAUER flow cells and U-Z View micro flow cells.

### Specifications

**Detector Type:** Monochromator spectrophotometer

**Wavelength Range/ Bandwidth:** 190-740nm /  $\pm 8$ nm

**Wavelength Accuracy:**  $\pm 2$ nm / 370nm

**Spectral Scan:** "Stop-flow"

**Lamp:** Deuterium, tungsten- halogen is optional

**Sensitivity:**  $2 \times 10^{-5}$  AU at 240nm, 1.0s

**Noise/Drift (M E1657-94):**  $< 1 \times 10^{-5}$  AU /  $1.5 \times 10^{-4}$  AU/h



Product Number	Description	Price
KRA5140	Smartline UV Detector 2500*	\$8,269.00
KRA5141	Smartline UV Detector 2500 with fiber optics*	9,704.00

\*Excludes flow cells

## *Smartline* RI DETECTOR MODELS 2300 & 2400

Both *Smartline* refractive index detectors can be used as stand-alone units or integrated into a *Smartline* Tower. The *Smartline* RI Detector 2300 is suitable for analytical applications with flow rates up to 5 mL/min. The *Smartline* RI 2400 was designed for semi-preparative applications requiring flow rates up to 100 mL/min.

### Specifications

**Detector Type:** Refractometer

**Light Source/Wavelength:** LED /  $950 \pm 30$ nm

**Sensitivity:** 2300 -  $3 \times 10^{-8}$  RIU, 2400 -  $4 \times 10^{-7}$  RIU

**Noise:** 2300 -  $\leq 1.5 \times 10^{-8}$  RIU, 2400 -  $\leq 2 \times 10^{-7}$  RIU

**Refractive Index Range:** 1.00-1.75 RIU

**Maximum Flow Rate:** 2300 - 5mL/min, 2400 - 100mL/min

**Measurement Angle:** 2300 -  $45^\circ$ , 2400 -  $15^\circ$

**Cell Volume:** 2300 - 9 $\mu$ L, 2400 - 12 $\mu$ L



KRA5160	Smartline RI Detector 2300	\$7,783.00
KRA5161	Smartline RI Detector 2400	7,783.00

## KNAUER LIGHT SCATTERING DETECTOR ELSD 3300

Sensitive, Universal HPLC Detector, Independent of Eluent Composition

The Light Scattering Detector ELSD 3300 has a wide range of applications in routine analysis and research. Common fields of application for the ELSD 3300 include the analysis of non-UV active compounds such as: sugars, fats, surfactants, polymers, pharmaceuticals, amino acids/peptides, natural compounds.

### Specifications

**Light Source:** Laser diode with collimating optics, 650 nm, 30 mW output, class IIIb

**Detector:** Silicon photo diode

**Sensitivity:** (Limit of Detection, LOD) butyl paraben, 25 ng

KRA09251	KNAUER Light Scattering Detector ELSD 3300	Inquire
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# KNAUER AUTOSAMPLERS 3800, 3900, 3950



## BASIC MARATHON AUTOSAMPLER 3800

The compact and robust Basic Marathon Autosampler 3800 is the ideal choice for handling large number of samples. The large sample carousel accommodates 96 standard 1.8mL vials. Maximum injection accuracy and reproducibility are ensured by using full loop sample filling.

### Specifications

- Full loop injection mode
- Injection volume range: 5-5000 $\mu$ L (injection volume is changed by changing the loop size)
- Needle wash: selectable, 50 $\mu$ L fixed volume between vials
- Carry over is <0.2% (when needle wash enable)

Product Number	Description	Price
SHSP816000	Basic Marathon	\$10,983.00
SHSP816001	Basic Marathon Cool	15,151.00

## MIDAS AUTOSAMPLER 3900

The MIDAS Autosampler 3900 is ideal for laboratories performing a variety of analyses from bioanalytical to preparative. Additional factory installed COOL, BIO and/or PREP options to configure autosampler precisely to your requirements. With the COOL option the sample tray can be maintained at 4°C by a thermoelectric Peltier device. The PREP option enables injection volumes of up to 5000  $\mu$ L and a tray for larger 10 mL vials.

### Specifications

- 3 selectable injection modes: flushed loop, partial loop fill and  $\mu$ L pick up
- Injection volume range: 1-5000  $\mu$ L
- Programmable needle wash
- Carry over is less 0.2% when needle wash is enabled
- Built-in column oven with a temperature range 5-60°C
- Standard 84 x 1.8mL vial tray with optional interchangeable 96 x 1.8mL and 24 x 10mL vial trays available

SHSP830000	MIDAS	\$15,343.00
SHSP830001	MIDAS COOL	19,824.00
SHSP830200	MIDAS PREP	18,794.00
SHSP830201	MIDAS PREP COOL	23,272.00
SHSP830002	MIDAS BIO	16,437.00
SHSP830003	MIDAS BIO & COOL	20,917.00

## ALIAS™ AUTOSAMPLER 3950

The ALIAS™ Autosampler 3950 includes technology such as positive headspace pressure, extensive wash routines for minimal carry over and 3 injection modes including micro liter pick-up mode for zero sample loss. Offering space to 2 deep well, shallow well or vial rack adapter plates, the ALIAS™ is suited to be integrated in a wide range of HPLC, LC-MS systems and other analytical systems requiring fast automated liquid sample injection.

### Specifications

- Cycle time of less than 60 sec. with needle wash
- Stackable (HPLC System can be placed on top for minimal bench space)
- 3 selectable injection mode: flushed loop, partial loop fill and  $\mu$ L pick up
- Injection volume range: 0.1 $\mu$ L - 5mL
- Needle wash: selectable
- Carry over is <0.05% (when needle wash enable)
- Can handle 2 - 48 vials, 2 - 96 well plate or 2 - 384 well plate

KRA5005	ALIAS™	\$18,192.00
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## Chromgate®

Based on the well known E-Z Chrom® elite kernel, Chromgate® is the perfect solution for all your chromatography data management needs, it is suitable for the complete control of all Knauer instruments and many other suppliers.

Even in its basic configuration, Chromgate® offers a diversity of functions that satisfy almost every need, including an excellent array of tools for the precise evaluation of your data.

### Features

- Chromgate® provides the highest available level of data security and GLP compliance, it fully implements the guideline specified by FDA 21 CFR part 11
- System integrity test of the software by validation tool, control of user privilege, various access levels, method parameters are saved in original data file and are protected against manipulation through checksum
- OQ, operational qualification procedure for all the Knauer instruments is integrated, a wizard guides you through each step, the results are then automatically analyzed and reported
- Solvent control: Chromgate® calculates the expected eluent consumption and asks for verification before starting the run
- 2 system configurations: stand alone or client server
- Data import and export: ASCII, ANDI standard, OLE (object linking and embedding) and ODBC for exchange with Windows® based LIMS or database
- Integration: real time analysis of peaks, automatic or manual integration and baseline correction
- PDA (photodiodes array) spectra library and search tools
- Preparative version available



Product Number	Description	Price
KRA14566	Chromgate® Stand Alone	\$8,908.00
KRA14586	Chromgate® Off-line Processing License	980.00
KRA14606	Chromgate® Photodiode Array Licence	3,624.00
KRA14616	Chromgate® System Suitability License	1,447.00

## ClarityChrom®

### A clear solution for the small chromatography lab

Knauer ClarityChrom® is an economical alternative to our ChromGate®, it is an easy to use chromatography software for instrument control, data acquisition and data processing. Up to 4 chromatographs (instruments with up to 4 detectors (channels) can be controlled at one time. No client server possibility.

Our single instrument license for ClarityChrom® includes the option for the whole HPLC system including the autosampler, additional licenses are available for offline data evaluation, for controlling additional instruments (HPLC and GC), PDA data processing and GPC.

### Features

- Fully 21CFR part 11 compliant
- 27 possible integration parameters
- 6 types of calibration curve with up to 20 levels
- Automation of sequence and selected commands and post run batch
- Data export: ASCII, AIA, Dbase
- Data import: ASCII, AIA, CSW17, CSW32
- Easy offline data sharing (at the file level) among all stations in a local network



KRA16701	ClarityChrom® Single Instrument License	\$4,428.00
KRA16761	ClarityChrom® Photodiode Array License	2,181.00
KRA16741	ClarityChrom® Off-line Processing License	913.00

# OSMOMETERS

## FREEZING POINT OSMOMETER K-7400

**Application:** Determination of the osmolality of biological fluid by measuring the freezing point depression



### Advantages

- Simple handling
- Short measurement time (2-3 minutes)
- Fully automated measurement
- Automatic storing of the measurement values
- Air cooling
- Cooling process is thermistor controlled
- Cooling chamber will not freeze
- Printer available
- Will measure glass or plastic vials

### Specifications

- Measurement accuracy: <1%
- Measurement precision: RSD<1%
- Calibration points: minimum 2, maximum 4
- Range: 0-2000 mOsmol

KRA3707 Freezing Point Osmometer

\$6,818.00

## VAPOR PRESSURE OSMOMETER K-7000

**Application:** Determination of the average molecular weight of polymer in organic and aqueous solvent, determination of osmolality in most solvents



### Advantages

- Simple handling
- Measurement time of 5-7 minutes
- Fully automated measurement
- Printer available
- Software available

### Specifications

- Molecular weight range: 40 - 35,000g/mol in organic solvent
- Molecular weight range: 1 - 10,000 g/mol in water
- Temperature range: 20-130°C
- Temperature accuracy: +/- 1/1000°C
- Sensitivity in toluene:  $3.3 \times 10^{-5}$  mol/kg
- Sensitivity in water:  $1.7 \times 10^{-4}$  mol/kg

KRA3701 Vapor Pressure Osmometer

\$12,898.00

### *We Specialize in Customization . . .*

*Do you have a unique application or installation requirement?*

*You no longer have to compromise or make do with your current setup.*

*Our knowledgeable and experienced Instrumentation Specialists can customize your instrument to fit your application needs.*

Chromatographic Specialties' Instrumentation Department provides uncompromised Service and Technical Support for the all the products we distribute. Our professional in-house instrumentation specialists are available to provide a full range of services, including toll free telephone support, new product installation, on-site service and training as well as instrument customization.

Our custom capabilities include:

- Custom configurations for almost any application
- Retrofit of almost any GC with new detectors or injectors
- Automation solutions for lab, industrial, and field analyses
- Miniaturization of systems

**Contact our Instrumentation Specialists, toll free 1-800-267-8103 or by email [instrum@chromspec.com](mailto:instrum@chromspec.com), to discuss your custom solution.**



Valco Pulse Discharge Detector on SRI 8610 GC



Vertical Mount Autosampler on SRI 8610 GC



### PROFESSIONAL GAS GENERATOR INSTALLATION SERVICES

Whether you have a single GC or a complete laboratory to outfit, Chromatographic Specialties can install and service every gas generator, no matter the make. You no longer have to deal with different companies to have your system plumbed. Our experts can also recommend the best system for your application.

Our instrumentation and installation professionals are chromatographers who know the importance of a quality, clean, leak-free installation.

Installation services options:

- Generator and air compressor installation
- Accumulator tanks
- Non-electric back up system
- Extended warranty and service contract available

### ***DID YOU KNOW THAT CHROMATOGRAPHIC SPECIALTIES INC. IS CANADA'S ONLY HAMILTON DILUTER/DISPENSER REPAIR AND CALIBRATION CENTER?***

All Hamilton Diluter/Dispenser models are repaired in-house and include a NIST traceable certificate of calibration.

All calibrations are NIST traceable with a fast turnaround time.

According to both the manufacturer and multiple regulatory agencies (eg. FDA, ISO, CAEAL), laboratory diluters and dispensers need to be periodically recalibrated.



# AUTOMATED SAMPLE PREPARATION AND EXTRACTION SYSTEM

Horizon Technology's SPE-DEX® 4790 automated extraction system is designed for all U.S. EPA solid phase extraction (SPE) applications for aqueous samples, including: drinking water, waste water, solid waste, foods, explosives, pesticides and pharmaceutical effluent.

## Automation, modularity, versatility

The SPE-DEX® 4790 processes the sample directly from the sample bottle, eliminating the need for multiple transfer steps. The system automatically rinses the bottle with extraction solvent to ensure consistently high analyte recovery.

### Completely automated:

- Conditions the SPE disk
- Loads the sample
- Controls all the critical air dry and soak times
- Thoroughly rinses the sample bottle
- Purges the extractor in preparation for the next sample

### Modularity:

The modular design of the SPE-DEX® 4790 series controller can serve up to eight individual extractors. The modular design allows the laboratory to start with a single extraction station and add additional ones as sample workload increases.

### Versatility:

The controller downloads methods to each extractor individually, providing the ability to run different methods simultaneously, all supplied by the same solvent system, minimizing bench space. The system will accept 47, 50 and 90 mm SPE extraction disks.



The SPE-DEX® 4790 series extractor increases productivity by allowing laboratory personnel to perform other task while samples are being processed. Automation provides consistent results regardless of variability between chemists.

All sample pathways, including the internal valve and tubing are made of inert PTFE to eliminate internal and cross-over contamination. Kalrez® valves and peek compression fitting provide the system with the chemical resistance and durability required for multiple solvent usages in a wide range of analyte extractions. Separate waste line and containers for solvent and sample help to minimize solvent disposal costs.

Product Number	Description	Price
HZ479001	SPE-DEX® Extractor Single Station (includes 1 controller, 1 extraction station and all the lines and bottles)	\$19,262.00
HZ4790	Additional Extractor Station (includes solvents lines)	10,820.00

# AUTOMATED OIL AND GREASE ANALYSIS

## EPA 1664A OIL AND GREASE ANALYSIS

Horizon Technologies' SPE-DEX® 3000XL automated extraction system is designed to extract oil and grease from a variety of clean and dirty aqueous samples using the newly approved EPA method 1664A. The system utilizes advanced liquid handling technology and dedicated solid phase extraction disks to analyze the sample quickly, easily and automatically.

Oil and grease samples are typically dirty, with high levels of particulate matter; the SPE-DEX® 3000XL is capable of accepting either 47 or 90 mm extraction disks, allowing the user the opportunity to select the most economical disk for the particular sample.

Since the SPE-DEX® uses technology that does not require shaking of the sample, problematic emulsions are virtually eliminated. A typical sample can be processed in less than 20 minutes.

The SPE-DEX® 3000XL processes the sample directly from its storage bottle, eliminating the need for multiple transfer steps. The unit also rinses the bottle with extraction solvent, ensuring high analyte recovery and reproducibility.

Completely automated, once programmed, the SPE-DEX® will:

- Condition the SPE disk
- Load the sample
- Control all the critical air dry and soak times
- Thoroughly rinse the sample bottle
- Purge the extractor in preparation for the next sample

The SPE-DEX® allows you to reduce your cost per sample in a number of ways:

- Use less solvent than typical liquid/liquid extractions
- Extract using hexane rather than expensive Freon 113
- Load and go; increase productivity by allowing laboratory staff to perform other duties while samples are being automatically processed
- Remove variability between chemists

Easy maintenance:

- All wetted parts are made of Teflon to minimize carry over and cross contamination
- The removable sample valve can be disassembled for cleaning
- No complicated solvent delivery system: air pressure driven
- No complicated sample delivery system: gravity fed



Oil and Grease 1000XL



Oil and Grease 3000XL

## SPEED-VAP III EVAPORATION SYSTEM

The Speed-Vap solvent evaporation system provides safe and efficient evaporation of oil and grease extract using method 1664A for either solid phase or liquid/liquid extraction.

The Speed-Vap uses precision controlled low temperature heating and vacuum to ensure a consistent and gentle processing of all samples.

Please contact our Instrumentation Team to discuss how the SPE-DEX® 3000XL and Speed-Vap III can simplify your oil and grease analyses.



Speed-Vap III Evaporation System

# HORIZON DryVap™ AUTOMATED CONCENTRATOR SYSTEM

The first fully automated system to combine new solvent drying technology, rapid solvent evaporation and gentle nitrogen blow down to 0.9 mL directly in a vial, ALL unattended.

The DryVap™ concentrator is designed to emulate the traditional Kuderna Danish (KD) method that is globally accepted as the standard concentration technique. The DryVap™ system provides all of the benefit of the KD method by controlling solvent condensation to maintain high recoveries of the more volatile compounds and also incorporate the nitrogen blow down directly to a vial.

**Processing samples for GC/GC-MS analysis is now as easy as 1-2-3...**



## Benefits of the DryVap™ System

- Provide completely unattended operation including end point detection at precisely 0.9mL
- Consistently maintains high recoveries of volatile compound
- Dries and concentrate sample in < 30 minutes — optional in line drying with DryDisk™ (see below)
- No cross contamination or loss of analytes with individually sealed concentrator tubes
- Easy viewing of the evaporation process
- Allows dirty and opaque samples to be processed
- Totally sealed vessels allow for bench top operation and all the solvent vapours can be recovered with optional solvent recovery system

Product Number	Description	Price
HZ500916	DryVap™ System	\$21,742.00
HZ500914	DryDisk™ Holder for use with DryVap™ System	295.50

For a single sample glassware processing system (HZSDS1011922), please see page 291.

## DryDisk™ SEPARATION MEMBRANE

The DryDisk™ separation membrane is a hydrophobic membrane utilizing GORETEX® filtration membrane that has been specifically designed to remove residual water from organic solvent. By eliminating the need for chemical drying with sodium sulfate, DryDisk™ reduces laboratory waste and eliminates the tedious multi step process associated with chemical drying.

- Faster processing time
- Unlimited capacity for water (physical barrier)
- No oven drying or special preparation
- Higher sample throughput
- Reduce laboratory waste
- Works on emulsions



HZ40705HT	DryDisk™ Membrane, Pkg. 50	\$271.00
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## HAMILTON DIGITAL DILUTERS AND DISPENSERS . . .

### A VIABLE ALTERNATIVE TO VOLUMETRIC FLASK AND PIPETTE DILUTIONS

Hamilton diluters and dispensers dramatically improve the time, effort and accuracy of manual dilutions by incorporating the use of Hamiltons microliter syringes with high precision stepper motors. Now difficult dilutions can be done quickly, easily, accurately and reproducibly. An optional mini-printer simplifies EPA, FDA and ISO compliance.

Microlab 500 diluters and dispensers simplify and improve sample preparation by:

- Dramatically cutting preparation time
- Improving accuracy and precision (accuracy within  $\pm 1.0\%$ , precision  $\pm 0.5\%$  traceable to NIST)
- Eliminating technician-to-technician variability
- Putting out of reach dilution (1/100, 1/66 or any other you like) at your convenience
- Reducing solvent and sample consumption (samples can be prepared directly into autosampler vials)



Hamilton Microlab 500A Series



Hamilton Microlab 500B Series

- Program and retain one method while power is on
- Syringe speeds from 1 to 20 seconds per stroke
- Screens and manuals in five languages (English, French, German, Portuguese and Spanish)
- **Method types: simple dilutions and dispensing**

- Program and store up to 20 methods
- Syringe speeds from 1 to 250 seconds per stroke
- French and English screens and manuals are available
- Print option
- **Method types: dilutions (simple, serial, multisample/reagent, IS addition and air gap)**

Product Number	Model	Price
HML503115	503A Dual Diluter	\$4,370.00
HML501115	501A Single Dispenser	3,605.00
HML504115	504A Dual Dispenser	4,499.00

Product Number	Model	Price
HML530115	530B Dual Diluter	\$5,048.00
HML510115	510B Single Dispenser	4,271.00
HML540115	540B Dual Dispenser	5,179.00

- NOTE:**
- Syringes for Diluters and Dispensers — See Page 167
  - Dual Diluters and Dispensers include 2.5 mL and 250  $\mu$ L syringes (one each)
  - Single Dispenser units include a 1.0 mL syringe

### ***DID YOU KNOW THAT CHROMATOGRAPHIC SPECIALTIES INC. IS CANADA'S ONLY HAMILTON DILUTER/DISPENSER REPAIR AND CALIBRATION CENTER?***

All Hamilton Diluter/Dispenser models are repaired in-house and include a NIST traceable certificate of calibration.

All calibrations are NIST traceable with a fast turnaround time.

According to both the manufacturer and multiple regulatory agencies (eg. FDA, ISO, CAEAL), laboratory diluters and dispensers need to be periodically recalibrated.



# KONIK GAS CHROMATOGRAPH

## KONIK HRGC 4000B SERIES PEAK POWER GAS CHROMATOGRAPH

### High Resolution Modular System Integrated into One Structural Unit



#### **Modularity, Versatility, Ergonomics and the Lowest Obsolescence GC on the Market**

The Konik HRGC 4000B's unique design allows for continual upgrading and modernization without modifying its external appearance or requiring the purchase of a new instrument. Konik guarantees total compatibility of the new modules with old ones; 20 years of spare parts guaranteed.

#### **Highest precision oven for ultra fast chromatography**

High performance low thermal inertia oven design with expanded temperature from -90°C with cryo option to 490°C in 0.1°C increments.

#### **Cold septum, purge-less multimode injector prevents any discrimination of volatiles while optimizing fast transfer of the analytes to the column**

The ColdSeptum® (patent pending) capillary (split/split-less) / packed column multimode injector introduces a forced flow concept, with interchangeable liners of different volumes available. Only the needle tip surface piercing the septum is in contact with the injector chamber eliminating bleeding into the chamber

#### **Full range of modular and interchangeable detectors**

FID, TCD, ECD, NPD, FPD, FPD/FID, PID, DID, HECD, OLFACTORY, PDHID/PDECD, MASS

#### **High Residual and Permanent Value**

### **Features**

#### **Pneumatic System**

Choice of Manual (MPC) or Electronic (EPC).

Choice of programming pressure (0 to 60 psi in 0.1 steps) or true flow (0 to 200 cm<sup>3</sup>/min He in 0.1 steps).

Positive and Negative ramps. Free choice of carrier gas type and column dimensions. Column flow automatically set.

#### **Sample Introduction**

Cold septum, purge-less multimode and universal injector, packed, PTV. Temperature: 25 to 490°C in 0.1°C increments (450°C advisable) Accuracy: 0.1°C PID controlled Purge-less capillary injector with 5 operational modes: capillary, on-column glass, Headspace, Pyrolysis, PTV, GSV, LSV Programmable splitless time and ratio. Control RAC® (Ready Active Control).

#### **Oven**

Fastest heating and cooling oven (from -90°C with cryo option to 490°C in 0.1°C steps).

Up to 15 ramps from 0.1°C/min to 40.0°C/min in 0.1°C/min steps upon request. 5 usual ramps.

Temperature resolution: ± 0.01°C and accuracy: ± 0.1°C PID controlled.

#### **Microprocessor Module**

User friendly with 3 password levels, power fail memory protection, auto-diagnostics and self-testing.

Temperature program and output chromatograms displayed in real time.

10 methods storage and method linking and unlimited number of methods in PC hard disk.

#### **Detectors**

Full range of digital detectors: Modular and interchangeable with digital electrometers / amplifiers for any type of column.

Independent temperature programming from ambient to 490°C in 0.1°C steps.

Overheating protection. RAC® control. Automatic autozero.

#### **Automation and Chromatography Data System**

KoniKontrol® and KoniKROM® software for system control and data treatment.

Control of up to 2 GSV or LSV and 3 column switching valves and lateral interface for multidimensional systems.

Turn-key solutions for RGA, LPG, BTX, Natural Gas, Transformer Oil, etc.

Konik GC Gas Chromatographs can be custom configured to meet your current needs.

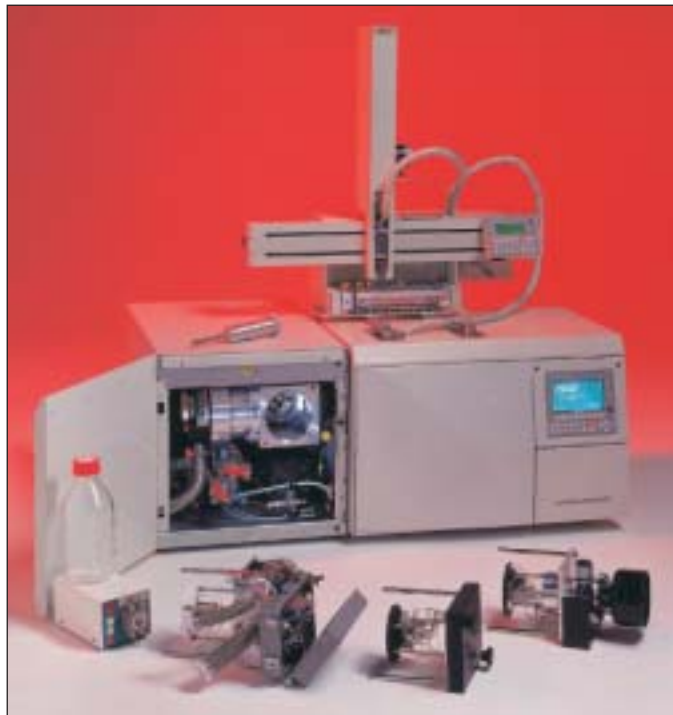
The unique modular design allows for future expansion as your requirements grow!

For more information contact our Instrumentation Department toll free: 1-800-267-8103 or by email at: [instrum@chromspec.com](mailto:instrum@chromspec.com).

## KONIK Q12 MASS SPECTROMETER

The Ultimate Research Tool!

*The Revolutionary Concept Of The Konik Q12 Mass Spectrometer System Allows You To Switch Easily From GC/MS To LC/MS In Less Than 15 Minutes.*



- 3 mass-spectrometers in one: HRGC HPLC, DIP-MSQ
- Modular, easily retrofitted
- Best sensitivity in all ionization modes
- Three different interchangeable Quadrupole mass filters
- Acquisition instrument control and software upgrade through LAN or internet
- New and unique mass detector, modularly retrofitted, for GC, HPLC and direct probe (DIP)

The Konik Q12 Mass Spectrometer is an innovative MS platform allowing three different inlets and twelve ionization modes for HRGC, HPLC and DIP/DEP in a single compact benchtop quadrupole mass spectrometer.

### Choice of 3 Ion Sources

EI/CI Sources for both positive and negative ions are included as standard in the GC/MS mode

ESI/APCI Source- a new microvolume orthogonal source, with funneling effect ion optics, ensures the best sensitivity in both ionization modes.

Direct Insertion Probe (DIP) and Direct Exposure Probe (DEP) Source for direct introduction of solid or liquid samples.

### Unlimited Mass Power

Three easily interchangeable Quadrupole mass filters: 2-1000+, 2-1500+ and 2-2000+ amu. Each one optimized for high sensitivity HRGC-MS, dual HRGC/HPLC-MS and dedicated HPLC-MS applications. Plug-in pre-filters enhance mass transmission and prevent direct contamination of the quadrupole. The mass resolution is fully adjustable over the mass range to 2.5M at m/z 1000 and to 1.8M between m/z 1000 and 2000.

Two low noise air cooled hybrid turbomolecular drag pumps 200L/s, backed by a dual stage 5m<sup>3</sup>/h Rotary Vane pump improves overall instrument performance while enhancing mass transmission. Optional Drypumps eliminate oil backstreaming, producing a totally clean hydrocarbon-free working vacuum. Working vacuum achieved in 3 minutes after opening sources.

Standard gas-sealed, long-life Photo Multiplier detector for positive and negative ions and dynode conversion. Optional Electron Multiplier detector increases sensitivity while reducing noise.

### KoniKROM® MS Software

This new powerful user-friendly Windows™-based software allows full instrument control, data acquisition, qualitative analysis, quantitation and reporting in an intuitive and interactive environment. Automatic and manual tuning, GC and HPLC and peripheral parameters set up, data processing, library search, compound comparison, calibration and reporting are performed easily and fast by browsing through different menus from the starting software home page.

For more information on applications and/or pricing, contact our Instrumentation Department  
Toll Free: 1-800-267-8103 or by email: [instrum@chromspec.com](mailto:instrum@chromspec.com)

# KONIK ROBOKROM® AUTOSAMPLER

## ROBOKROM® MULTIMODE AUTOSAMPLER

### *Fits any GC or HPLC*

#### **Features:**

##### **8 operational modes**

- HRGC + HRGC-MS
- HPLC + HRGC-MS
- Static Headspace
- Purge and Trap
- SPME
- Fraction Collector
- Sample Preparation
- Thermal Desorption

#### **Expanded to a Micro-chemical Station**

The ROBOKROM® can be expanded with a second arm to a Micro-chemical Station combining heating, stirring, standards and reagents addition, evaporation, dosing, concentration, drying and injecting in a single autosampler.

#### **3 Interchangeable Vial Trays**

32 vials of 6, 10 and 20mL

105 vials of 2mL

171 vials of 1mL

#### **Vertical Arm**

Holds all the needles and syringes

#### **Optional Tray Temperature Control**

All vials can be heated or cooled from 5°C to 70°C in standby mode

#### **Easy Menu Driven Interactive Programming**

or through KoniKontrol software via KoniKROM® 32 software



ROBOKROM® Multimode Autosampler and Accessories

### **HRGC and HPLC Autosampler**

The Konik ROBOKROM® is a powerful multimode autosampler that meets the most demanding requirement of sensitivity, performance, accuracy and precision. It is totally innovative with capacity to be configured in less than 15 minutes in eight operational modes for its optimized applications: HS, P&T, SPE, Thermal Desorption, Fraction Collection, SPME, HRGC and HPLC. At the same time, with one optional kit, the ROBOKROM can be converted into an advanced microchemical station.

The ROBOKROM® autosampler also accepts a wide range of syringes: 0.5 to 500µL. Programmable injection volume from 0.1 to 500µL. Injection of solvent or air plug before or after sample injection. Programmable plunger speed from 1µL/s to 5000µL/s depending on the syringe type. Handles wide range of sample viscosity. Adjustable plunger speed for syringe cleaning and injection. Programmable needle introduction speed for septum protection.

### **KoniKROM® 32**

The KoniKROM® 32 is a high performance 32-bit multi-channel, multi-user station for the acquisition and processing of data from any chromatographic detector with a voltage output. Suitable for all 32 bit Windows Operating Systems: Win95, Win98, ME, NT4, 2000 and XP. Multitasking software allows you to process/evaluate data while acquisition is running. Features: multi-channel from 1-4 detectors or systems, ability to customize acquisition, calibration, chromatogram and report display parameters. GLP compliant: access rights and password to protect data, printed reports with date and time of analysis, system suitability test, documentation concerning acquisition and evaluation of data conditions and changes.

For more information on applications and/or pricing, contact our Instrumentation Department  
Toll Free: 1-800-267-8103 or by email: [instrum@chromspec.com](mailto:instrum@chromspec.com)



## Affordable, Full Featured, Flexible Data Acquisition

### KONIKROM® 32

HIGH PERFORMANCE, 32-BIT, MULTICHANNEL AND MULTI-USER STATION FOR ACQUISITION AND DATA PROCESSING OF CHROMATOGRAPHIC DATA

#### Specifications

- For all 32bit + Windows operating systems
- Multi-channel: from 1 to 4 detectors (or systems)
- KonikKrom 32 controls several leading GC/HPLC and Auto-Sampler systems
- System: PC, internal A/D converter board (PCI) or external A/D and appropriate software

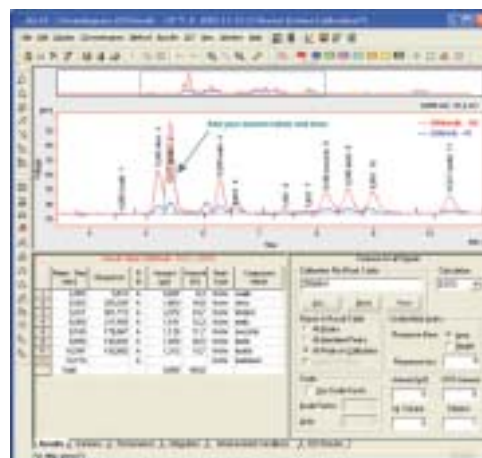


#### Acquisition

- From any chromatographic detector with voltage output
- Analysis conditions documented in the "Method File"
- Customization of Acquisition parameters
- Customization of Integration parameters
- Customization of Calculation parameters
- Single RUN analysis / sequence analysis
- Automatic numbering option for creating chromatograms names
- Monitoring detector signal any time (during or not a run)
- Simultaneous measurements in all channels
- Continuous measurement processing (snapshot command)
- Method editing during a run (ex. Run time)
- Total Customization for displaying chromatograms
- Any section can be zoomed on/off

#### Data Processing

- Automatic integration as integration method parameters
- Automatic analytical results: peak height and area, amount of compound,...)
- Calculation of parameters describing quality of the chromatographic system (asymmetry, plate number,...)
- Easy reintegration with useful commands (end/start, tangent, valley, groups...)
- Special calculations with user-created calculation formulas
- Displaying unlimited chromatograms simultaneously
- Mathematics operations with the chromatograms: shifting, scaling, sum, difference,...

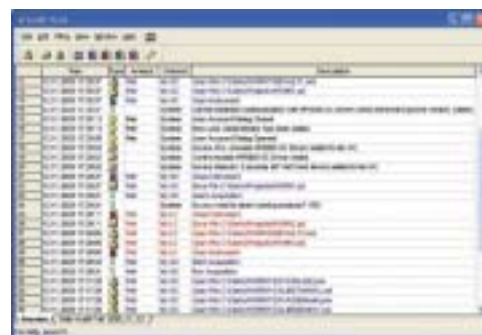


#### Calibration

- Qualitative and quantitative evaluation of analysis
- 20 levels of calibration with unlimited points per level
- One external Standard method and three internal standard methods
- Individual windows for each calibrated peak (with calibration curve and data)
- Summary table for all compounds
- Customizable parameters: response type, curve type, force to origin,...)

#### GLP

- FDA 21 CFR part 11 compliant
- Protection of data: access rights and passwords to protect data
- Documentation concerning Acquisition and Evaluation of Chromatographic data: about conditions, changes,...
- Printed reports: date and time of the analysis and report
- System Suitability Test: allows to the user to monitor the function, reproducibility and accuracy of the obtained data



For more information contact our Instrumentation Department at 1-800-267-8103 or [instrum@chromspec.com](mailto:instrum@chromspec.com).



# CDS ANALYTICAL PYROLYSIS UNITS



CDS Model 5000 Pyrolyzer  
with Model 1500 Interface

## Why Pyrolysis?

GC/MS, direct MS and FT-IR permits the extension of these techniques to the analysis of samples which were previously unsuitable for them. It is now possible to use these tools to study complex polymeric materials, even if they are compounded as co-polymers, contain fillers, are opaque, thermoset, crosslinked and completely insoluble. A few of the materials which have been successfully analyzed using pyrolysis, including paint, adhesives, tapes, caulking, food packaging, rubber, plastic bottles, paper, ink, coatings and a full range of household and consumer products. A highly reproducible technique, analytical pyrolysis may be used for both qualitative and quantitative analysis.

## CDS Model 5000

Platinum filament pyrolyzer for pulse-pyrolysis and programmed pyrolysis  
Multi-step analysis  
GC mounted valve interface  
PC control  
Three modes of operation  
Run, Dry, Clean



CDS Model 5150/5200  
with Built-in Valve Interface

## CDS Model 5150

Platinum filament pyrolyzer for pulse-pyrolysis and multistep, programmed pyrolysis  
Programmable interface  
Easy Transfer line connection to GC  
PC control  
Three modes of operation  
Run, Dry, Clean  
Auxiliary heated zones  
Heated valve oven  
Automatic valve operation  
Five steps and five GC starts automatically

## CDS Model 5200

All of the features of the 5150 plus:  
Built-in trapping zone for  
Thermal desorption  
Reactant gas operation  
Slow rate pyrolysis with trapping  
Interface directly to GC or to trap



CDS Model 5250  
36 Position Autosampler

## CDS Model 5250

Increase the throughput of your pyrolysis laboratory by using the AS5250 Pyroprobe® Autosampler. The AS5250 provides hands-free analysis of up to 36 samples and enhances operational capacity allowing unattended operation over a weekend or holiday period. Solid, viscous liquid and powder samples are analyzed directly, eliminating the need to perform lengthy sample extractions or derivatizations. A patented heating method provides the flexibility to perform both high performance thermal desorption and pyrolysis on the same sample. Microsoft Windows® compatible software facilitates methods development and allows for standard operating procedures to be written for GLP/GMP compliance.

# CDS ANALYTICAL SAMPLE CONCENTRATION SYSTEMS

For over 30 years, CDS Analytical, Inc. has been providing analytical instruments worldwide for the analysis of complex samples by GC, GC/MS, and FT-IR. Products include pyrolyzers, thermal desorbers, autosamplers and sample concentrators for pyrolysis, thermal desorption, dynamic headspace, purge and trap, and trace analysis. With an emphasis on providing application specific solutions, backed by the best service and support in the industry.

The CDS 8000 Sample Concentrator is the first universal GC sample preparation system designed with today's analytical lab personnel in mind. The 8000 is designed to allow Pyrolysis, Purge & Trap, Dynamic Headspace, and Thermal Desorption with one instrument. Easily interchangeable sampling modules provide the maximum in sample flexibility and the quickest setup and preparation times.

No matter what type of sample needs to be analyzed, liquid, solids, pastes, or powders, the 8000 can prepare them for introduction into a GC or GC/MS system. Unique features offer benefits that make the 8000 even more powerful.

#### The standard Model 8000 includes the following features:

- Temperature controlled pneumatics oven
- Injection port for the trap
- Injection port for GC
- Heated transfer line to GC
- Ambient sorbent trap
- Computer controlled programming
- Remote start communication
- Water Elimination Trap

#### Optional equipment available includes:

- Cryogenic refocusing at gas chromatograph
- Heated sparging of liquids
- Foam Sensor for sparger
- 95 mm Headspace chamber
- 36 mm Headspace vessel
- Sorbent Tube desorber
- Pyroprobe Interface
- Reactant Gas
- Windows based PC interface

#### New! For CDS Model 8000

**Cryo Trap Option:** Permits subambient sample collection on the absorbent trap using liquid nitrogen, with 1°C setpoints from 180°C to 350°C. Trap packed with glass beads.

#### Autosampler

The Model 8400 is a four-position autosampler for dynamic headspace. The instrument runs in multi-vessel mode, where each vessel is assigned its own time and temperature parameters.

Pushing the start key automatically activates a synchronized GC cycle time, so samples that follow do not remain on the trap for a prolonged period. Bake cycles can be delayed. Options include cryofocusing at the GC injection port and reactant gas.

*Up to four different sampling methods on one instrument!*



CDS Model 8000



CDS Model 8400

For more information or application notes from CDS' extensive library, please contact our Instrumentation Department at 1-800-267-8103 or [instrum@chromspec.com](mailto:instrum@chromspec.com)

# DYNATHERM THERMAL DESORPTION AND AIR MONITORING



Dynatherm Model 9300/9305  
Thermal Desorber

## DYNATHERM MODEL 9300/9305 THERMAL DESORBER

### Air Monitoring and Sample Concentration for:

- Chemical Exposure
- Industrial Hygiene
- Chemical Weapons Demilitarization
- Environmental Methods
- Homeland Security

The 9300 is a single tube Thermal Desorption system, while the 9305 uses a vacuum pump and mass flow controller to allow for near real-time sampling. Instruments include a high volume sampling tube available in 6, 8 or 10 mm sizes with the capacity to trap analytes from litres of air for trace analysis, desorbing to an ambient temperature capillary focusing trap for GC analysis. No cold-trapping or sub-ambient column cooling required.

New features include use of an accessible 4 1/2" focus trap, larger valve box, better temperature controls, optional injection port for calibration standards, and software for PC control as well as a handheld controller for manual operation.



Dynatherm Model 9600 Tube Conditioner

## DYNATHERM MODEL 9600 TUBE CONDITIONER

Dynatherm offers both a single-tube and a six-tube conditioner to restore tubes to their original purity. In the six-tube model, individual temperatures and flows can be set for each tube, and are sensor-controlled to 1°C. Heaters and fittings can be mixed and matched to accommodate tubes with different outer diameters and lengths, then can be conditioned simultaneously on the Model 9600 Six-Tube Conditioner.

The 9600 comes with a handheld controller, which stores up to 20 methods, and optional DCI software, letting the user program each tube chamber in 1°C increments and condition in 0.1 minute increments. Both models offer an injection port option that lets users spike tubes with an internal standard.

## DYNATHERM TDA 9300 THERMAL DESORPTION AUTOSAMPLER

- 18 Tube Autosampler
- Can desorb any size standard Thermal Desorption Tube
- Automatic Leak Checking
- Computer Control
- Ability to desorb same tube at multiple temperatures
- No Special End Caps Required
- Cryogen-free Focusing



Dynatherm TDA 9300 Thermal  
Desorption Autosampler

CDS Analytical has re-imagined the Thermal Desorption Autosampler. Announcing the Dynatherm TDA 9300, the first cryogen-free Thermal Desorption Autosampler on the market able to handle any size standard thermal desorption tube. The new Dynatherm TDA 9300 can be equipped with a variety of sample tube sizes to optimize the process for different applications. Sorbent tubes filled with a variety of sorbent materials, may be analyzed utilizing different desorption times and temperatures for each tube controlled independently. The autosampler is perfect for replacing old Tekmar 6016 units and Nutech VOST units, automating chemical agent monitoring, and implementing product emissions testing in an R&D lab. Additionally, it enhances your lab's analytical flexibility by being able to run numerous types of tubes on one instrument.

For more information on these Dynatherm Instruments or Applications,  
contact our Instrumentation Department  
Toll Free at 1-800-267-8103 or [instrum@chromspec.com](mailto:instrum@chromspec.com).

# PARKER BALSTON GAS GENERATORS

Compressed gases are used in many applications in the laboratory, including GC carrier gas, purge gas and fuel gas for instruments such as FTIR, spectrophotometers, gas and liquid chromatographs, NMR spectrometers and Mass Spectrometers.

The use of gas generators eliminates the inconvenience and potential danger associated with high pressure cylinders.

## Zero Air Generator:

- Produce UHP zero air from house compressed air
- Increase the accuracy of analysis and reduce the cleaning requirement of the detectors
- Recommended and used by many GC instrument and column manufacturers
- Payback period is typically less than 1 year
- Silent operation and minimal operator attention required
- Models available from 1 LPM up to 30 LPM



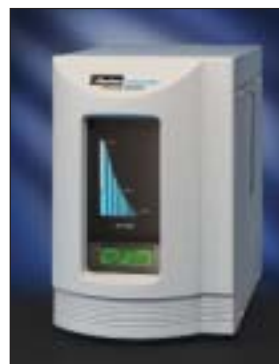
## Hydrogen Generator:

- Unique electron beam palladium technology
- Safe, produce only as much gas as is required
- Produce a continuous supply of 99.99999+% pure hydrogen gas
- Compact and reliable, fits under most lab benches, these units are designed to run continuously
- Simple annual maintenance, no desiccant cartridge
- Certified for laboratory use by CSA, UL and CE
- Payback period of typically less than 1 year
- Models available to produce gases from 90 to 1200mL/min.



## FID Gas Station:

- Specifically designed with GC in mind
- Unit is both a zero air and hydrogen generator in one
- 2 models to choose from:
  - FID 1000 for 1-2 GCs
  - FID 2500 for up to 6 GCs



## Nitrogen Generator:

- Useful for MS applications and sample evaporations
- Ideal for all derivatives of ESI and APCI modes
- Membrane technology will not suppress corona needle discharge
- Most models do not require electricity
- Available with built-in oil-less compressor
- Phthalate-free, no organic vapours
- Payback period of typically less than 1 year
- Flows from 1 LPM up to 450 LPM



*Chromatographic Specialties Inc. also offers installation service for all makes of gas generators. Please contact [instrum@chromspec.com](mailto:instrum@chromspec.com) for details.*



# SRI GAS CHROMATOGRAPHS



*The Most Affordable, Reliable and Versatile Gas Chromatographs on the Market.  
Available in Canada from Chromatographic Specialties Inc.*

## Advantages of SRI Gas Chromatographs:

- Economical – Inexpensive to purchase and maintain
- Compact – Smaller footprint than most Gas Chromatographs
- Versatile – Can be configured for almost any GC analysis
- PC Programmable – Data interface and software included
- Support – Free technical support and software upgrades
- Reliable – Backed by a Two Year Warranty

## Every SRI Base GC Comes Complete With:

- Single on-column injector for 0.53 ID capillary or 1/8" packed columns
- Electronic Pressure Control (EPC) for all gases
- Temperature programmable oven from ambient to 400 C
- Digital pressure readout
- Digital temperature readout
- Built-in data system with PeakSimple Windows 9x/NT software
- Spare parts kit including a 10ul syringe
- Operating/Service manual for all options
- Heavy duty reusable shipping container

## Available Models of SRI Gas Chromatographs:

- Model 110 Stand-alone Detector/Virtual Oven GC
- Model 310 Compact GC
- Model 8610C Single Oven GC
- Model 8610D Dual Oven GC

Product Number	Description	Price*
SR01100003	Basic Model 110	\$2,179.00
SR03101003	Basic Model 310	6,507.00
SR86101003	Basic Model 8610C	6,507.00
SR86101004	Basic Model 8610D	9,468.00

*\*Prices are for mainframe only; refer to following pages for options and pricing.*

For more information please contact our Instrumentation Department at  
1-800-267-8103 or email: [instrum@chromspec.com](mailto:instrum@chromspec.com)

## 7 Great Reasons to buy an SRI GC:

- 1) SRI GC's are typically **60% of the price** of comparable units from other manufacturers.
- 2) SRI GC's are small enough to ship as **airline baggage**, and they come with a rugged, reusable shipping container.
- 3) Choose from **fourteen** GC detectors, and mount four simultaneously. SRI offers more detector choices.
- 4) Choose from **ten different** injector types and mount up to five simultaneously. Perform more different types of analyses on a single GC than you thought possible.
- 5) Built-in **PeakSimple** for Windows chromatography data system connects to your **notebook** or desktop computer using a serial port cable. Software updates are **FREE**.
- 6) **Two Year** Warranty and free Technical Support. When you call Chromatographic Specialties Inc. you reach a knowledgeable technician immediately, not voice mail.
- 7) Easy hardware **upgrades**. We can install an additional detector or injector on your existing GC in days.

## Specifications

### Model 8610C

- Oven Size: 7.5" W x 7.6" D x 3" H
- Oven: Ambient to 400°C Multi Ramp Programmable
- Dual oven: The 8610D has dual ovens to accommodate a 4" column cage
- Columns: 7" cage for capillary columns or 1/4" and 1/8" packed columns
- Detectors: Can accommodate up to 4 detectors per GC
- Injection: On-column injection included, 10 injection options available
- Software: PeakSimple 9x/NT included (updates are free)
- Dimensions: 18.5" W x 14.5" D x 13" H
- Weight: 45-80 lbs. (20.5-36.4 kg)
- Warranty: Two years parts and labor



SRI Model 8610C

### Model 310

- Oven Size: 5"W x 5"D x 3"H
- Oven: Ambient to 400°C Multi-Ramp Programmable
- Columns: 4" cage for capillary columns or 1/4" and 1/8" packed columns
- Detectors: Can accommodate up to 4 detectors per GC
- Injection: On-column injection included, 10 injection options available
- Software: PeakSimple 9x/NT included (updates are free)
- Dimensions: 12.5" H x 14.5" D x 13" H
- Weight: 40-70 lbs. (18.2-31.8 kg)
- Warranty: Two years parts and labor



SRI Model 310

### Model 110 Standalone Detector/ Virtual™ Oven GC

- Oven: Can be used as a Virtual™ Oven with heated injector/detector
- Column: Uses 4" packed column when used as Virtual™ Oven GC
- Detectors: Accommodates one stand-alone or Virtual™ Oven Detector\*
- Transfer Line: Heated transfer line to 200°C for stand-alone detectors
- Injection: Heated on-column or Purge and Trap stand-alone
- Software: PeakSimple 9x/NT included (updates are free)
- Option: Gas-less™ GC option with CCD Detector and Air Compressor
- Power: Optional 12 volt power adapter for portability
- Dimensions: 8.5" W x 14.5" D x 13" H



SRI Model 110 Virtual™ Oven GC

**NOTE:** Not all Detector/Injector options are available for the Model 110

The GC Chassis listed above can be custom configured with up to four different detectors and five different injectors. There are also 15 pre-configured GC options from which you can choose.\*

### More options, less money.....

See how many options you can put under the **RED** lid. We can help you choose a configuration that will allow you to perform almost any GC analysis.

### Have a unique application?

No problem, we can have a GC custom built to fit your requirements. Drop us a note.  
email: [instrum@chromspec.com](mailto:instrum@chromspec.com)

Contact our Instrumentation Department for assistance in finding the right options to suit your needs.

**Toll Free: 1-800-267-8103**



## POPULAR SRI GC SYSTEMS



SRI has pre-configured a number of GCs for popular applications. In some cases, the pre-configured GCs are less expensive than the identical hardware assembled "à la carte".

All SRI Pre-Configured GCs come with the following:

- EPC control for all gases
- Temperature programmable oven to 400 Deg. C
- Columns suitable for the method(s)
- Built-in PeakSimple Data System and Software
- Free software updates
- 2 Year Warranty

- 1) **Capillary FID GC** (the basic general purpose GC)
- 2) **Breath Analyzer GC** (for medical research and diagnosis)
- 3) **BTEX and Environmental GC** (does most EPA series 8000 methods)
- 4) **TO-14 GC** (for EPA air monitoring methods)
- 5) **BTU Gas Analyzer GC** (for BTU content of natural gas)
- 6) **Multiple Gas Analyzer #1 GC** (for fixed gases and light hydrocarbons)
- 7) **Multiple Gas #1 + Sulfur Gas GC** (for H<sub>2</sub>S, SO<sub>2</sub>, fixed gases and C<sub>1</sub>-C<sub>20</sub> hydrocarbons)
- 8) **Multiple Gas Analyzer #2 GC** (for fixed gases and hydrocarbons to C<sub>20</sub>)
- 9) **Mud-logging GC** (for total hydrocarbons plus detailed C<sub>1</sub>-C<sub>6</sub> content)
- 10) **Method 25** (methane/non-methane hydrocarbons)
- 11) **Sulfur GC** (low level sulfur gases)
- 12) **Explosives GC** (nitro-aromatic and nitramine explosives in the field)
- 13) **Educational TCD GC** (for general academic uses)
- 14) **Educational FID GC** (for advanced academic uses)
- 15) **Gas-less™ Educational GC** (for academic situations where no gas is available)

**Call for Special Pricing on Educational GC Configurations!**

**NOTE:** Most of the above GC configurations can be operated without gas if the optional Hydrogen Generator is installed

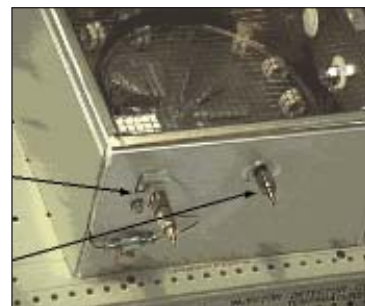
For further information on the SRI Pre-Configured GC Systems,  
contact our Instrumentation Department  
Toll Free: 1-800-267-8103 or email [instrum@chromspec.com](mailto:instrum@chromspec.com)



*Choose from over 15 different Pre-Configured GC Systems  
or  
Customize a Model 8610C with the following options!*

## Choose from the following injector options

Product Number	Description	Price
SR86900023	Additional On-column (capillary & packed)	\$1,610.30
SR86900025	Heated Flash (SPME)	965.30
SR86900034	Heated Split/Splitless	1,815.20
SR86400010	Model 8640 29 Vial ALS Built-in	10,003.00
SR86900063	10 Port Gas Sampling Valve (Manual)	1,450.90
SR86900065	10 Port Gas Sampling Valve (Automatic)	2,422.20
SR86900088	Thermostatted Valve Oven Option	965.30
SR86900045	Heated Static Headspace	7,279.00
SR86901088	Thermal Desorber	4,244.00
SR86900051	EPA 5030 Built-in Purge & Trap	7,866.00
SR86900052	EPA 5035 Compliant Built-in Purge & Trap	9,707.00
SR86900053	5030 Purge & Trap Autosampler (10 Tube)	8,493.00
SR86900075	On-line continuous Sampler for Purge & Trap	4,346.00



Heated Split/Splitless and Direct injection



Dual FID/Single PID

## Choose from 14 detectors (up to 4 per GC)

SR86900007	Thermal Conductivity	\$2,422.20
SR86900030	Helium Ionization Detector	4,244.00
SR86900010	Flame Ionization Detector	2,422.20
SR86900020	Electron Capture Detector	7,279.00
SR86900040	Photoionization Detector	4,244.00
SR86900080	Flame Photometric Detector	4,851.00
SR86900015	Nitrogen Phosphorus Detector	3,636.00
SR86900017	Thermionic Ionization Detector	3,636.00
SR86902007	Catalytic Combustion Detector	1,450.90
SR86902026	FID/Dry Electrolytic Conductivity Detector	6,065.00
SR86901080	FPD/FID	6,065.00
SR86900085	Dual FPD	9,707.00

## Choose from the following accessories

SR86800353	Hydrogen Generator	\$4,305.00
SR86900081	Methanizer	1,208.10
SR86900072	Vacuum Pump Interface	1,139.70
SR86900070	Built-in Compressor	775.50
	Maintenance Kit	Please Inquire
	Installation Kit	Please Inquire



Hydrogen Generator H<sub>2</sub>50

For further information on available configurations, contact our Instrumentation Department  
Toll Free: 1-800-267-8103 or email [instrum@chromspec.com](mailto:instrum@chromspec.com)





**SRI's PeakSimple** Chromatography Data System is included with every SRI GC and HPLC system, and is also available as a convenient stand-alone data system for any other manufacturer's chromatography system. PeakSimple software has been continuously developed, refined and improved since 1988 by the same dedicated team of working chromatographers who use the software on a daily basis. New features are added several times per year and the latest version is always FREE to download online, along with helpful tutorials.

**Model 203** has one channel capable of acquiring data at up to 50Hz. Its eight TTL outputs can be optionally wired to a bank of eight single-pole, dual-throw mechanical relays with screw terminals for easy connection to any user device which operates from a contact closure. A remote start input allows run initiation from the user's GC or HPLC system. The 220VAC system is supplied with a UL, CSA, and CE/VDE approved universal voltage input which will operate on any 100- 250 volt power supply.

**Model 302** is for analysts who prefer the hot-swappable, plug-and-play capabilities of Universal Serial Bus devices. Four remote start inputs allow run initiation from the user's GC or HPLC system. The six channels of data can be randomly assigned to one of four time bases which provides independent start and stop times for 4 entirely separate instruments. Data can be acquired at up to 50Hz per channel with 4 channels active, and up to 20Hz with all 6 channels activated and acquiring data. The plug-and-play peripheral connection of choice, USB is supported by Microsoft Windows 98, 98SE, ME, XP, and 2000.

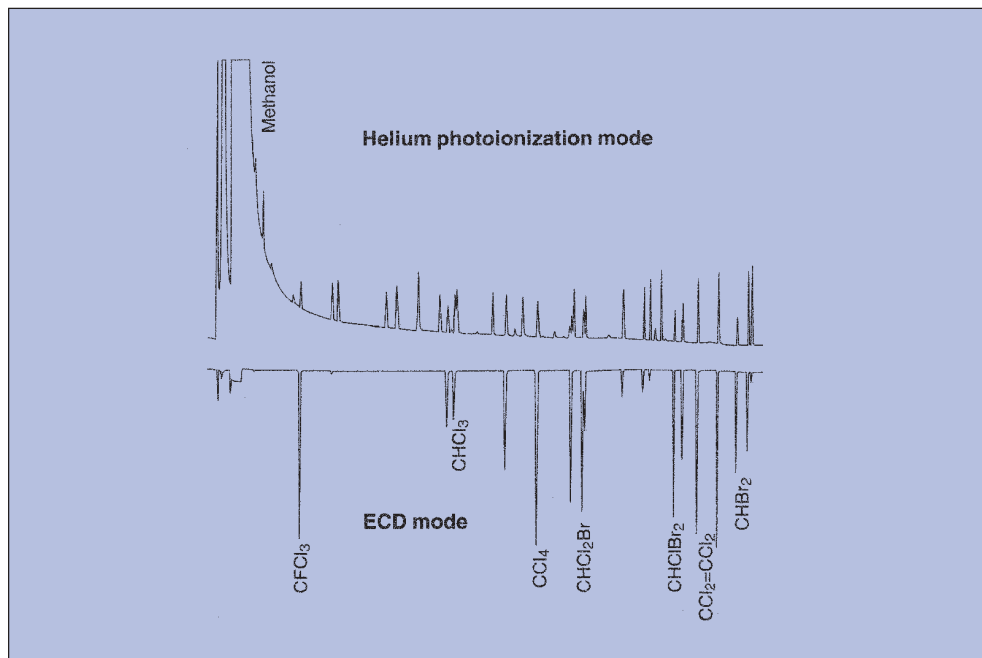
**Model 202** has four channels. Data can be acquired at up to 50Hz with one channel active, 10Hz with two channels, or 5Hz with all four channels activated. The four channels of data can be randomly assigned to one of two time bases to allow independent start and stop times for two entirely separate instruments. Two remote start inputs allow run initiation from the user's GC or HPLC system. Model 202 includes the bank of eight single-pole, dual-throw mechanical relays with screw terminals for easy connection to any device that operates from a contact closure.

Product Number	Description	Price
SR86001055	Model 203 Single Channel Data System	\$1,815.20
SR86004055	Model 202 Four Channel Data System	3,252.00
SR86006055	Model 302 Six Channel USB Data System	3,643.00

For more information please contact our Instrumentation Department at 1-800-267-8103 or email: [instrum@chromspec.com](mailto:instrum@chromspec.com)

## VALCO PULSED DISCHARGE DETECTOR

### Non-Radioactive ECD replacement!



**Figure 1.** A mix of halogenated alkanes is analyzed using two different modes, helium photoionization (upper) and electron capture (lower), demonstrating how the detector can be tuned to enhance or diminish response to certain types of compounds.

#### Models

<b>D2</b>	Mode-selectable.	Stand alone universal detector system.
<b>D3</b>	Helium photoionization.	Plug-and-play for Agilent 6890.
<b>D4</b>	Helium photoionization.	Plug-and-play models for HP 5890, Shimadzu GC 14 and GC 17, Thermo Trace GC, and Varian 3800, plus a universal retrofit model.
<b>D5</b>	Electron capture.	Plug-and-play for Agilent 6890.
<b>D6</b>	Electron capture.	Plug-and-play models for HP 5890, Shimadzu GC 14 and GC 17, Thermo Trace GC, and Varian 3800, plus a universal retrofit model.

Voltage	110VAC		230VAC	
Description	Product Number	Price	Product Number	Price
D2	VD2	\$6,415.00	VD2220	\$6,415.00
D3	VD3IHP	6,298.00	VD3IHP220	6,298.00
D4 HP 5890	VD4IHP58	6,065.00	VD4IHP58220	6,065.00
D4 Shimadzu GC14*	VD4ISH14R	4,549.00	VD4ISH14R220	4,549.00
D4 Shimadzu GC17*	VD4ISH17R	4,549.00	VD4ISH17R220	4,549.00
D4 Thermo Trace*	VD4ITQR	4,549.00	VD4ITQR220	4,549.00
D4 Varian 3800*	VD4IVA38R	4,549.00	VD4VA38R220	4,549.00
D4 All other GCs	VD4I	5,948.00	VD4I220	5,948.00
D5	VD56890	8,164.00	VD56890220	8,164.00
D6 HP 5890	VD6HP58	7,931.00	VD6HP58220	7,931.00
D6 Shimadzu GC17*	VD6SH17R	6,648.00	VD6SH17R220	6,648.00
D6 Thermo Trace*	VD6TTR	6,648.00	VD6TTR220	6,648.00
D6 Varian 3800*	VD6VA38R	6,648.00	VD6VA38R220	6,648.00

\* Uses existing GC FID electrometer

*No AECB  
license required!*



In the **electron capture** mode, the PDD is a selective detector for monitoring high electron affinity compounds such as freons, chlorinated pesticides, and other halogen compounds. For this type of compound, the minimum detectable quantity (MDQ) is at the femtogram ( $10^{-15}$ ) or picogram ( $10^{-12}$ ) level. The PDD is similar in sensitivity and response characteristics to a conventional radioactive ECD, and can be operated at temperatures up to 400°C. For operation in this mode, He and  $\text{CH}_4$  are introduced just upstream from the column exit.

In the **helium photoionization** mode, the PDD is a universal, non-destructive, high sensitivity detector. The response to both inorganic and organic compounds is linear over a wide range. Response to fixed gases is positive (increase in standing current), with an MDQ in the low ppb range.

The PDD in helium photoionization mode is an excellent replacement for flame ionization detectors in petrochemical or refinery environments, where the flame and use of hydrogen can be problematic. In addition, when the helium discharge gas is doped with a suitable noble gas, such as argon, krypton, or xenon (depending on the desired cutoff point), the PDD can function as a specific photoionization detector for selective determination of aliphatics, aromatics, amines, as well as other species.

**Need more information?**  
**Contact our Instrumentation Dept.**  
**Toll Free: 1-800-267-8103**  
**email: [instrum@chromspec.com](mailto:instrum@chromspec.com)**

# ACCESSORIES



## JONES MODEL 7990-7995 HPLC COLUMN HEATER/HEATER-CHILLER

- Ultra compact
- Accurate control at ambient temperature  $\pm 0.5^{\circ}\text{C}$
- Temperature stability of  $\pm 0.2^{\circ}\text{C}$
- Quiet operation
- Heater range 30-75°C
- Heater/chiller range 10-50°C

Product Number	Description	Price
JC7990R1S	Heater for columns up to 15 cm	Inquire
JC7990R1L	Heater for columns up to 25 cm	Inquire
JC7995R1S	Heater/Chiller for columns up to 15 cm	Inquire
JC7995R1L	Heater/Chiller for columns up to 25 cm	Inquire



## RESTEK'S IMPROVED PORTABLE LEAK DETECTOR

- Affordable thermal conductivity leak detector — every analyst should have one
- Compact, portable, ergonomic design — easy to hold and operate
- Sensitive — detects helium, hydrogen, or nitrogen at  $1 \times 10^{-4}\text{cc/sec}$  (measured using helium)
- Fast results — responds to leaks in less than 2 seconds, zeros with the touch of a button
- Built-in rechargeable battery — charging adaptor included

RK22451	Leak Detector	\$1,009.00
---------	---------------	------------

## DIGITAL GAS FLOWMETER

- Chromatographic Specialties Inc. has a wide range of digital flowmeters
- SCCM or mL/min.
- 0.05 to 1000 mL/min.
- For more details see pages 74-75

### FLOWMETER RECALIBRATION SERVICE

- NIST traceable
  - Fast turnaround
  - Most makes/models
- Contact [instrum@chromspec.com](mailto:instrum@chromspec.com) for more details



## BOC EDWARDS ROTARY PUMPS

BOC Edwards has an unrivalled line of rotary pumps which are rugged and reliable, versatile, compact and unobtrusive.

BEA65207906	E-LAB 2 Rotary Pump	\$3,938.00
BER14000001	RV3 Rotary Vane Pump	3,241.00

## BOC EDWARDS DIAPHRAGM PUMPS

Vacuum versions of the diaphragm pump are small, lightweight devices typically offering an ultimate pressure of between 0.5 and 100 mbar. Pumping speeds are generally low, about 1 or 2 cubic metres per hour.

BEA48017941	D-LAB Diaphragm Pump	\$2,196.00
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## AGILENT QUIET COVER FOR LC/MS SYSTEMS

Is your LC/MS rough pump noisy, dirty and difficult to drain? If so, the Agilent Quiet Cover may be just what you need to bring peace and tranquility back to your lab. Contact our Technical Support Specialists toll free at 1-800-267-8103 for details.

See Page 146



For further information on other models of vacuum pumps, contact our Instrumentation Department  
Toll Free: 1-800-267-8103 or email [instrum@chromspec.com](mailto:instrum@chromspec.com)



# STANDARDS AND REAGENTS

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**1-800-267-8103**





## The AccuStandard Advantage

AccuStandard is the world's largest independent company specializing in chemical reference standards. They offer over 35,000 products, including over 3,500 pesticides, all 209 PCB congeners and a wide range of organic, inorganic and petrochemical standards. Their chemical reference materials meet or exceed the specifications listed in the American Chemical Society 9<sup>th</sup> Edition "Analytical Reagent Specifications", where applicable.



The list on the right is a sampling of AccuStandard's inventory of over 35,000 standards. Their International Catalogue (pictured above) provides detailed descriptions of a wide range of their products. For a copy of our own, request literature code A01. EPA and 2006 supplements are also available. Contact our Technical Support Department for copies. The next several pages highlight popular products.

*ISO 9001:2000 accredited  
and  
ISO 17025:2005 Registered*

AccuStandard Inc. has been unconditionally approved for ISO 9001 Certification by Perry Johnson, Registrar. This is quite an accomplishment since less than 10% of companies that undergo this process are unconditionally certified on their first attempt.

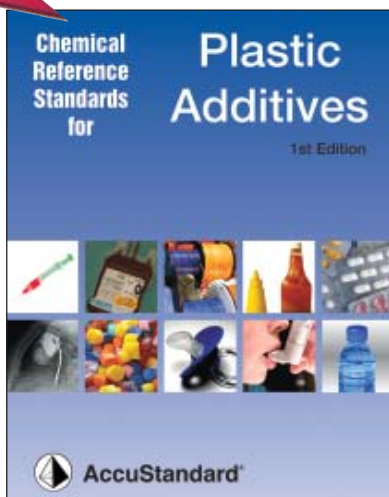
Accuracy™ Performance Evaluation Samples  
AllergenCheck™  
Allergens and Personal Care Product Standards  
Arochlors®, PCBs (Test Mixtures), PCTs, PCNs  
Biodiesel Standards  
Bromodiphenyl Ethers  
Calibration Standards [complete curve sets for EPA protocols](#)  
**Canadian Standards** [CCME, MISA, Quebec MOE, Atlantic RBCA](#)  
Capillary GC/MS Calibration Mixtures  
Chemical Kits ([Polystandard](#), [Theta](#), [Accu](#), and [Fabrikits™](#))  
Contract Laboratory Program (CLP) Standard Mixtures  
Dioxins and Furans  
Endocrine Disruptors  
EPA — CRADA [Multicomponent, QC Samples, Neats](#)  
EPA Method 500 Series [Drinking Water](#)  
EPA Method 600 Series [Waste Water](#)  
EPA Method 1311, 1312 [Toxicity Characteristic Leaching Procedure \(TCLP\)](#)  
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EPA Method 8000 Series [Solid Waste \(SW-846\)](#)  
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Fuel Characterization  
Inorganic Reference Material  
Inorganic Wet Chemistry Standards  
Ion Chromatography Standards  
LUFT/LUST Total Petroleum Hydrocarbon Standards  
Nitrosamines — EPA 521  
Nonylphenol and Ethoxylates  
Odour Standards  
PAHs and Derivatives  
PBDE Congeners and Metabolites  
PCB and PBB Congeners  
Perchlorates  
Pesticides [Individual Neat, Solutions, Mixtures and Kits](#)  
PFOAs  
Plastic Additives  
RoHS and other EU Directives  
Special Formulations: [USP467, Refrigerants, Hazardous Waste](#)  
Water Supply/Water Pollution (WS/WP) PT Check Standards

### Custom Standards

AccuStandard's dedication in this area has given them the experience to serve your needs quickly with the same consistency and accuracy expected from their Quality Program. At no additional charge, a Certificate of Product Data will be supplied for all specially prepared standards.

**To obtain a quotation for a custom standard contact  
Chromatographic Specialties Technical Service Team  
at 1-800-267-8103 or email [tech@chromspec.com](mailto:tech@chromspec.com).**

## Special Catalogues and Technical Updates



Contains the most comprehensive list of Plastic and other polymeric standards, such as Accelerants, Antidegradants, Antifoams, Antioxidants, Flame Retardants, Plasticizers, Processing Aids, Retarders, Vegetable Oils, Dyes and Breakdown Products and Deuterated Phthalates, etc.

Request Literature Code **A12** or download from  
[www.chromspec.com/literature/index.html](http://www.chromspec.com/literature/index.html)



Latest list of PBDEs (over 170 congeners including EPA Method 1614 Mixes, plus over 40 metabolites).

Request Literature Code **A05** or download from  
[www.chromspec.com/literature/index.html](http://www.chromspec.com/literature/index.html)



### Explosives and Metabolites

Technical update, Standards including TATP, HMTD, HMS and others, EPA Method 8330 and 8095, Custom Standards and Synthesis

Request Literature Code **A04** or download from  
[www.chromspec.com/literature/index.html](http://www.chromspec.com/literature/index.html)



### Allergens in Cosmetics & Personal Care Products

Technical update, EU Directive Lists, CFR Reg. Lists, Phthalates, Parabens, Nitrosamines, Metals, Others

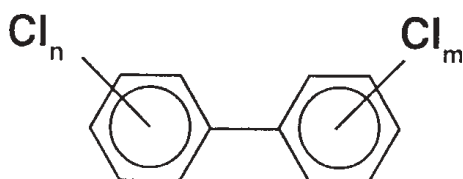
Request Literature Code **A08** or download from  
[www.chromspec.com/literature/index.html](http://www.chromspec.com/literature/index.html)

# ACCUSTANDARD — PCB CONGENERES

## STANDARDS FOR CONGENER SPECIFIC PCB ANALYSIS

- AccuStandard is the **only** manufacturer of all 209 congeners
- New mixtures for Canadian methods
- Each congener available separately, neat or in solution
- Individual internal standards
- Mixture of PCB congeners "contained in" or "absent from" Aroclors
- Mixtures containing all 209 congeners
- Instrument test solutions
- Congener specific matrices solutions

### AccuStandard Has Synthesized All 209 Pure PCB Congeners!



- All 209 possible congeners are available in Neat or Solution form
- All congeners are 99+% pure by GC/FID & GC/MS

### Mixtures for Congener Specific PCB Analysis

- Formulations for Toxicity and Abundance Studies
- Method 1668 Congener Set
- PCB Congeners (Canadian Methods) including Quebec Ministry of the Environment Congener Mix

### PCB Congener Calibration Mixtures

- PCB Congeners contained in Aroclors 1242, 1254 and 1260
- PCB Congeners absent in Aroclors
- Congener Calibration Solution Sets

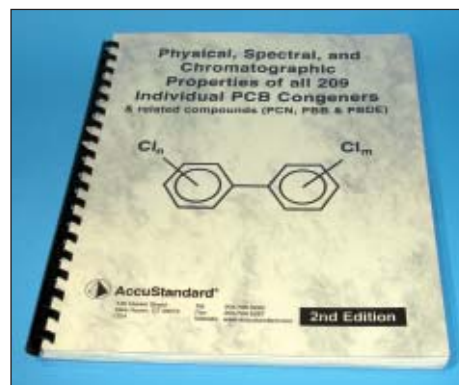
### PCB Congener Test Mixtures

- Instrument Test Solutions
- DCMA-PCB Congener Method
- Congener Specific Matrices Solutions
- Method 680
- World Health Organization

### Standards for the Analysis of Aroclors

- Aroclor Kits
- Aroclors in PCB-Free Transformer Oil
- Neat Individual Aroclors
- Polychloro Naphthalenes

To order individual congeners, please call our Technical Service Department at 1-800-267-8103.



### Analytical Convenience

To obtain meaningful analytical data, the congeners need to be formulated into groupings of solutions that are all resolved on a gas chromatographic column. The "holy grail" of columns, the one column by which all 209 congeners are separated has, to this date, eluded all GC column manufacturers.

There are 2 columns that are closest to achieving the "holy grail" status: J&W's DB-XLB and DB-5MS, both available from Chromatographic Specialties Inc.

George Frame and his co-workers at General Electric Company have coordinated a seminal study of specially formulated PCB groups - five of which are composed of the congeners contained in Aroclors. The remaining four mixtures contain those congeners generally absent in Aroclors. AccuStandard prepared and supplied the nine mixtures used in Dr. Frame's study from its inventory of the 209 pure congeners.

These nine mixtures were then tested on 17 different columns by independent laboratories and column manufacturers. The resulting chromatographic retention time and response data was compiled and published. Chromatographic data from George Frame's study is available in the Analytical Standards and Reference Material for all 209 PCB Congeners Book.

Product Number	Description	Price
AS3571	Analytical Standards and Reference Material for all 209 PCB Congeners Book	\$41.10

### For Further Information:

- See the AccuStandard Catalogue (literature code A01)
- Visit Chromatographic Specialties Inc. on-line at [www.chromspec.com](http://www.chromspec.com) to request a catalogue
- Call Chromatographic Specialties Inc. at 1-800-267-8103 to request a copy





## PCB CONGENERES



AccuStandard is the only manufacturer to synthesize and purify all 209 PCB congeners. These congeners are available in neat, single solution, multicomponent and custom formulations to meet your individual needs. Contact our knowledgeable Technical Support Team at 1-800-267-8103 to discuss your requirements.

A set of four formulations has been selected by the Institute for Biological Sciences of Canada and can be purchased individually or as a complete set (ACCANSET). The concentration levels for these formulations are such that 1mL of standard diluted to 100mL will show equal response by ECD.

### PCB Congeners Mix #1 (Canadian RM)

Product Number	Description	Qty	Price
ACCAN01	Number Of Components: 14 Solvent: IsoOctane	1 mL	\$74.00
Component	CAS	Units: µg/mL	
2,2',3,3'-Tetrachlorobiphenyl	38444-93-8	4.9	
2,2',3,4,5'-Pentachlorobiphenyl	38380-02-8	4.2	
2,2',3,4,5-Pentachlorobiphenyl	55312-69-1	2.9	
2,2',3,5'-Tetrachlorobiphenyl	41464-39-5	5.9	
2,2',4,4',5,5'-Hexachlorobiphenyl	35065-27-1	2.1	
2,2',4,5'-Tetrachlorobiphenyl	41464-40-8	7.6	
2,2',5-Trichlorobiphenyl	37680-65-2	11.8	
2,2',6,6'-Tetrachlorobiphenyl	15968-05-5	16.6	
2,3',4,5',6-Pentachlorobiphenyl	56558-18-0	3.1	
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	1.5	
2,3,3',4,5,5'-Hexachlorobiphenyl	39635-35-3	1.2	
2,4',5-Trichlorobiphenyl	16606-02-3	6.6	
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	5.5	
Decachlorobiphenyl	2051-24-3	1.7	

### PCB Congeners Mix #2 (Canadian RM)

Product Number	Description	Qty	Price
ACCAN02	Number Of Components: 15 Solvent: IsoOctane	1 mL	\$74.00
Component	CAS	Units: µg/mL	
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	52663-79-3	3.8	
2,2',3,3',4,4'-Hexachlorobiphenyl	38380-07-3	4.9	
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	52663-77-1	2.4	
2,2',3,3',4,5,6-Heptachlorobiphenyl	68194-16-1	2.3	
2,2',3,3',5,5',6,6'-Octachlorobiphenyl	2136-99-4	3.6	
2,2',3,4,4',5,6-Heptachlorobiphenyl	60145-23-5	3.8	
2,2',3,4,5,6'-Hexachlorobiphenyl	68194-15-0	5.7	
2,2',4,4',5,6'-Hexachlorobiphenyl	60145-22-4	6.2	
2,2',4,5',6-Pentachlorobiphenyl	60145-21-3	10.8	
2,2',5,5'-Tetrachlorobiphenyl	35693-99-3	15.2	
2,3,3',4,4',5,5',6-Octachlorobiphenyl	74472-53-0	3.2	
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	4	
2,3,4,4'-Tetrachlorobiphenyl	33025-41-1	3.9	
4,4'-Dichlorobiphenyl	2050-68-2	91.9	
Decachlorobiphenyl	2051-24-3	2.8	



AccuStandard has also synthesized a wide variety of PCB metabolites such as hydroxy, methoxy and methylsulphonyl derivatives.

AccuStandard was the first, and so far the only, manufacturer to make all 209 PCB congeners.

#### TECH TIP

Before opening a new ampoule of standard, carefully inspect the contents using back lighting to determine if anything has come out of solution. If there is evidence of a precipitate or crystals floating in the solvent gently warm the unopened ampoule in a beaker of warm water with some agitation. If solid material is still evident, the unopened ampoule may be sonicated in an ultrasonic bath for up to 15 minutes. Invert the sample several times to achieve homogeneity, allow the sample to return to room temperature.

If there are no solids evident, the standard is ready for use. If the solids reappear, call Chromatographic Specialties Technical Support Group for assistance.





## PCB CONGENERS



### PCB Congeners Mix #3 (Canadian RM)

Product Number	Description	Qty	Price
ACCAN03	Number Of Components: 15 Solvent: IsoOctane	1 mL	\$74.00
Component	CAS	Units: µg/mL	
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	40186-72-9	6.7	
2,2',3,3',4,4',6-Heptachlorobiphenyl	52663-71-5	5.2	
2,2',3,3',4,5',6,6'-Octachlorobiphenyl	40186-71-8	4.8	
2,2',3,3',4,5-Hexachlorobiphenyl	55215-18-4	8.3	
2,2',3,3',4,5,5',6'-Octachlorobiphenyl	52663-75-9	7	
2,2',3,4,4',5,6-Heptachlorobiphenyl	52663-69-1	6.6	
2,2',3,4,4',5-Hexachlorobiphenyl	35694-06-5	7.4	
2,2',3,4,4',5,5',6-Octachlorobiphenyl	52663-76-0	5.1	
2,2',3,4,5,5',6-Heptachlorobiphenyl	52712-05-7	3.5	
2,2',4,4',5,5'-Hexachlorobiphenyl	35065-27-1	7.3	
2,3,3',4,4',5,6-Heptachlorobiphenyl	74472-50-7	5	
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	4.7	
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	6.3	
4,4'-Dichlorobiphenyl	2050-68-2	138.1	
Decachlorobiphenyl	2051-24-3	6.5	

### PCB Congeners Mix #4 (Canadian RM)

Product Number	Description	Qty	Price
ACCAN04	Number Of Components: 15 Solvent: IsoOctane	1 mL	\$74.00
Component	CAS	Units: µg/mL	
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	3.0	
2,2',3,3',4,4',5,5'-Octachlorobiphenyl	35694-08-7	2.4	
2,2',3,3',4,4',5,6'-Octachlorobiphenyl	42740-50-1	3.3	
2,2',3,3',4,4',5,6-Octachlorobiphenyl	52663-78-2	2.6	
2,2',3,3',4,5,5',6'-Octachlorobiphenyl	52663-75-9	3.6	
2,2',3,4',5,5',6-Heptachlorobiphenyl	52663-68-0	3.2	
2,2',3,4,4',5'-Hexachlorobiphenyl	35065-28-2	4.2	
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	2.8	
2,2',3,4,5,5'-Hexachlorobiphenyl	52712-04-6	2.8	
2,2',3,5,5',6-Hexachlorobiphenyl	52663-63-5	5.0	
2,2',4,4',5,5'-Hexachlorobiphenyl	35065-27-1	3.3	
2,2',4,5,5'-Pentachlorobiphenyl	37680-73-2	8.9	
2,3,4,4',5-Pentachlorobiphenyl	31508-00-6	3.9	
4,4'-Dichlorobiphenyl	2050-68-2	76.7	
Decachlorobiphenyl	2051-24-3	2.7	

### PCB Congener Calibration Set

Product Number	Description	Qty	Price
ACCANSET	Mix#1, 2, 3 and 4	4 x 1 mL	\$232.50
Mix	Concentration	Qty	
PCB Congeners Mix #1 AC-CAN-01	Varied conc. in Isooctane	1 mL	
PCB Congeners Mix #2 AC-CAN-02	Varied conc. in Isooctane	1 mL	
PCB Congeners Mix #3 AC-CAN-03	Varied conc. in Isooctane	1 mL	
PCB Congeners Mix #4 AC-CAN-04	Varied conc. in Isooctane	1 mL	





Québec

## PCB CONGENERS & PAHs



### Québec MOE Congener Mix

Product Number	Description	Qty	Price
ACQME01	Number Of Components: 41 Solvent: IsoOctane	1 mL	\$193.70
Component	CAS	Units: ng/mL	
2',3,4-Trichlorobiphenyl	38444-86-9	2000	
2,2',3,3',4',5,6-Heptachlorobiphenyl	52663-70-4	2000	
2,2',3,3',4-Pentachlorobiphenyl	52663-62-4	500	
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	2000	
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	40186-72-9	2000	
2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	2051-24-3	2000	
2,2',3,3',4,4',5,5'-Octachlorobiphenyl	35694-08-7	2000	
2,2',3,3',4,4',5,6-Octachlorobiphenyl	52663-78-2	2000	
2,2',3,3',4,4',6-Heptachlorobiphenyl	52663-71-5	2000	
2,2',3,3',4,4',6-Hexachlorobiphenyl	38380-07-3	2000	
2,2',3,3',4,5,5',6'-Octachlorobiphenyl	52663-75-9	1500	
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	52663-77-1	2000	
2,2',3,3',4,6'-Hexachlorobiphenyl	38380-05-1	1000	
2,2',3,4',5',6-Hexachlorobiphenyl	38380-04-0	2000	
2,2',3,4',5,5',6-Heptachlorobiphenyl	52663-68-0	2000	
2,2',3,4',5',6-Heptachlorobiphenyl	52663-69-1	2000	
2,2',3,4,4',5'-Hexachlorobiphenyl	35065-28-2	2000	
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	2000	
2,2',3,4,5'-Pentachlorobiphenyl	38380-02-8	2000	
2,2',3,5',6-Pentachlorobiphenyl	38379-99-6	1000	
2,2',3,5'-Tetrachlorobiphenyl	41464-39-5	2000	
2,2',3,5,5',6-Hexachlorobiphenyl	52663-63-5	2000	
2,2',4-Trichlorobiphenyl	37680-66-3	500	
2,2',4,4',5-Pentachlorobiphenyl	38380-01-7	2000	
2,2',4,4',5,5'-Hexachlorobiphenyl	35065-27-1	2000	
2,2',4,5'-Tetrachlorobiphenyl	41464-40-8	2000	
2,2',4,5,5'-Pentachlorobiphenyl	37680-73-2	2000	
2,2',5-Trichlorobiphenyl	37680-65-2	2000	
2,2',5,5'-Tetrachlorobiphenyl	35693-99-3	2000	
2,3',4',5-Tetrachlorobiphenyl	32598-11-1	2000	
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	2000	
2,3,3',4',6-Pentachlorobiphenyl	38380-03-9	2000	
2,3,3',4,4',5,6-Heptachlorobiphenyl	74472-50-7	2000	
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	2000	
2,3,3',4,4',5,5',6-Octachlorobiphenyl	74472-53-0	2000	
2,3,3',4,4',6-Hexachlorobiphenyl	74472-42-7	500	
2,3,3',4,4',6-Pentachlorobiphenyl	32598-14-4	500	
2,4',5-Trichlorobiphenyl	16606-02-3	1500	
2,4,4',5-Tetrachlorobiphenyl	32690-93-0	2000	
2,4,4'-Trichlorobiphenyl	7012-37-5	2000	
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	2000	

### Québec MOE PAH Mix

Product Number	Description	Qty	Price
AHQME01	Number Of Components: 24 Solvent: Dichloromethane:Benzene	1 mL	\$170.50
Component	CAS	Units: µg/mL	
3-Methylcholanthrene	56-49-5	500	
7,12-Dimethylbenz(a)anthracene	57-97-6	500	
Acenaphthene	83-32-9	500	
Acenaphthylene	208-96-8	500	
Anthracene	120-12-7	500	
Benz(a)anthracene	56-55-3	500	
Benzo(a)pyrene	50-32-8	500	
Benzo(b)fluoranthene	205-99-2	500	
Benzo(c)phenanthrene	195-19-7	500	
Benzo(e)pyrene	192-97-2	500	
Benzo(g,h,i)perylene	191-24-2	500	
Benzo(j)fluoranthene	205-82-3	500	
Benzo(k)fluoranthene	207-08-9	500	
Chrysene	218-01-9	500	
Dibenz(a,h)anthracene	53-70-3	500	
Dibenzo(a,h)pyrene	189-64-0	500	
Dibenzo(a,i)pyrene	189-55-9	500	
Dibenzo(a,l)pyrene	191-30-0	500	
Fluoranthene	206-44-0	500	
Fluorene	86-73-7	500	
Indeno(1,2,3-cd)pyrene	193-39-5	500	
Naphthalene	91-20-3	500	
Phenanthrene	85-01-8	500	
Pyrene	129-00-0	500	





## CCME DRINKING WATER



The **Canadian Council of Ministers of the Environment (CCME)** members propose nationally-consistent environmental standards and objectives to achieve a high level of environmental quality across the country. The CCME does not impose its suggestions on its members since it does not have the authority to implement or enforce legislation; each jurisdiction decides whether or not to adopt CCME proposals.

### CCME - Drinking Water Phenoxy-acid Herbicides Mix

Product Number	Description	Qty	Price
ACCMECDWPHERB	Number Of Components: 11 Solvent: Acetone	1 mL	\$74.00
Component	CAS	Units: µg/mL	
2,3,4,6-Tetrachlorophenol	58-90-2	1000	
2,4-D	94-75-7	1000	
2,4-Dichlorophenol	120-83-2	1000	
2,4,5-T	93-76-5	1000	
2,4,6-Trichlorophenol	88-06-2	1000	
Bromoxynil	1689-84-5	1000	
Dicamba	1918-00-9	1000	
Diclofop methyl	51338-27-3	1000	
Dinoseb	88-85-7	1000	
Pentachlorophenol	87-86-5	1000	
Picloram	1918-02-1	1000	

### CCME - Drinking Water Chlorinated Pesticide Mix

Product Number	Description	Qty	Price
ACCMECDWCPEST	Number Of Components: 14 Solvent: Hexane:Toluene	1mL	\$65.80
Component	CAS	Units: µg/mL	
2,4'-DDE	3424-82-6	200	
2,4'-DDT	789-02-6	200	
4,4'-DDE	72-55-9	200	
4,4'-DDT	50-29-3	200	
α-Chlordane	5103-71-9	200	
Aldrin	309-00-2	200	
Dieldrin	60-57-1	200	
g-BHC	58-89-9	200	
g-Chlordane	5103-74-2	200	
Heptachlor	76-44-8	200	
Heptachlor epoxide (Isomer B)	1024-57-3	200	
Methoxychlor	72-43-5	200	
Oxychlordane Isomer	27304-13-8	200	
Trifluralin	1582-09-8	200	

### CCME — Drinking Water Carbamates Mix

Product Number	Description	Qty	Price
ACCMECDWCARB	Number Of Components: 5 Solvent: Acetonitrile	1 mL	\$49.40
Component	CAS	Units: µg/mL	
Aldicarb	116-06-3	100	
Bendiocarb	22781-23-3	100	
Carbaryl	63-25-2	100	
Carbofuran	1563-66-2	100	
Triallate	2303-17-5	100	

### CCME — Drinking Water Carbamates Mix

Product Number	Description	Qty	Price
ACCMECDWCARB10X	Number Of Components: 5 Solvent: Acetonitrile	1 mL	Inquire
Component	CAS	Units: µg/mL	
Aldicarb	116-06-3	1000	
Bendiocarb	22781-23-3	1000	
Carbaryl	63-25-2	1000	
Carbofuran	1563-66-2	1000	
Triallate	2303-17-5	1000	

### CCME - Drinking Water OP Pesticides

Product Number	Description	Qty	Price
ACCMECDWOPPEST	Number Of Components: 9 Solvent: Acetonitrile	1 mL	\$65.80
Component	CAS	Units: µg/mL	
Azinphos methyl	86-50-0	1000	
Chlorpyrifos	2921-88-2	1000	
Diazinon	333-41-5	1000	
Dimethoate	60-51-5	1000	
Malathion	121-75-5	1000	
Parathion	56-38-2	1000	
Phorate	298-02-2	1000	
Temephos	3383-96-8	1000	
Terbufos	13071-79-9	1000	



## CCME DRINKING WATER



### Canadian Drinking Water Triazine Herbicides Mix

Product Number	Description	Qty	Price
ACCMECDWTH	Number Of Components: 7 Solvent: Acetone	1 mL	\$74.00
Component	CAS	Units: µg/mL	
Alachlor	15972-60-8	500	
Atrazine	1912-24-9	500	
Cyanazine	21725-46-2	500	
Metolachlor	51218-45-2	500	
Metribuzin	21087-64-9	500	
Prometryne	7287-19-6	500	
Simazine	122-34-9	500	

### CCME PAH Calibration Mix

Product Number	Description	Qty	Price
ACCMEPAH	Number Of Components: 10 Solvent: Methylene chloride	1 mL	\$85.20
Component	CAS	Units: µg/mL	
Benz(a)anthracene	56-55-3	2000	
Benzo(a)pyrene	50-32-8	2000	
Benzo(b)fluoranthene	205-99-2	2000	
Benzo(k)fluoranthene	207-08-9	2000	
Dibenz(a,h)anthracene	53-70-3	2000	
Fluoranthene	206-44-0	2000	
Indeno(1,2,3-cd)pyrene	193-39-5	2000	
Naphthalene	91-20-3	2000	
Phenanthrene	85-01-8	2000	
Pyrene	129-00-0	2000	

### CCME Drinking Water Volatiles Mix

Product Number	Description	Qty	Price
ACCMECDWV	Number Of Components: 19 Solvent: Methanol	1 mL	\$41.10
Component	CAS	Units: µg/mL	
1,1-Dichloroethylene	75-35-4	2000	
1,2-Dichlorobenzene	95-50-1	2000	
1,2-Dichloroethane	107-06-2	2000	
1,4-Dichlorobenzene	106-46-7	2000	
Benzene	71-43-2	2000	
Bromodichloromethane	75-27-4	2000	
Bromoform	75-25-2	2000	
Carbon tetrachloride	56-23-5	2000	
Chlorobenzene	108-90-7	2000	
Chloroform	67-66-3	2000	
Dibromochloromethane	124-48-1	2000	
Ethylbenzene	100-41-4	2000	
m-Xylene	108-38-3	2000	
Methylene chloride	75-09-2	2000	
o-Xylene	95-47-6	2000	
P-Xylene	106-42-3	2000	
Tetrachloroethylene	127-18-4	2000	
Toluene	108-88-3	2000	
Trichloroethylene	79-01-6	2000	







## CCME DIOXINS



### Dioxins - Custom Window Defining Mixture

Product Number	Description	Qty	Price
ADWD	Number Of Components: 7 Solvent: Toluene	1 mL	\$1,395.20
Component	CAS	Units: ng/μL	
1,2,3,4,6,7-Hexachlorodibenzo-p-dioxin	58200-66-1	20	
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	20	
1,2,3,4,6,7,9-Heptachlorodibenzo-p-dioxin	58200-70-7	20	
1,2,3,8,9-Pentachlorodibenzo-p-dioxin	71925-18-3	20	
1,2,4,6,7,9/1,2,4,6,8,9-Hexachlorodibenzo-p-dioxin	39227-62-8/ 58802-09-8	20	
1,2,4,6,8/1,2,4,7,9-Pentachlorodibenzo-p-dioxin	71998-76-0/ 82291-37-0	20	
Octachlorodibenzo-p-dioxin	3268-87-9	20	

### Dioxins - Custom Calibration Mixture

Product Number	Description	Qty	Price
ADCAL	Number Of Components: 6 Solvent: Toluene	1 mL	\$1,141.60
Component	CAS	Units: ng/μL	
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	20	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	20	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	20	
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	20	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	20	
Octachlorodibenzo-p-dioxin	3268-87-9	20	

### Dioxins - Custom Calibration Mixture

Product Number	Description	Qty	Price
ADCAL25X	Number Of Components: 6 Solvent: Toluene	1 mL	\$2,029.40
Component	CAS	Units: ng/μL	
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	50	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	50	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	50	
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	50	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	50	
Octachlorodibenzo-p-dioxin	3268-87-9	50	



*Tens of thousands of Standards  
Ready-to-Ship*





## CCME PETROLEUM HYDROCARBONS IN SOIL



### CCME Light Petroleum Fraction (SET) (F1) (C<sub>6</sub>-C<sub>10</sub> Range)

Product Number	Description					Qty	Price
ACCMELPFSET	Number of Components: 8 Solvent: Methanol  This set contains 5 ampoules, each containing a Brownfield Regulation for Light Petroleum Fraction mixture in varying concentrations, as follows:					5 x 1 mL	\$147.20
Component	CAS	ACCMELPF µg/mL	ACCMELPF0.05X µg/mL	ACCMELPF0.1X µg/mL	ACCMELPF0.2X µg/mL	ACCMELPF0.5X µg/mL	
Benzene	71-43-2	250	12.5	25	50	125	
Ethylbenzene	100-41-4	250	12.5	25	50	125	
m-Xylene	108-38-3	125	6.25	12.5	25	62.5	
n-Decane	124-18-5	250	12.5	25	50	125	
n-Hexane	110-54-3	250	12.5	25	50	125	
o-Xylene	95-47-6	250	12.5	25	50	125	
p-Xylene	106-42-3	125	6.25	12.5	25	62.5	
Toluene	108-88-3	250	12.5	25	50	125	

### CCME Medium & Heavy Petroleum Fraction (F2-F4) (C<sub>10</sub>-C<sub>50</sub> Range)

Product Number	Description	Qty	Price	
ACCMEMHPFSET	Number Of Components: 3 Solvent: n-Hexane  This set contains 3 ampoules, each containing a Brownfield Regulation for Light Petroleum Fraction mixture in varying concentrations, as follows:	1 mL	\$116.20	
Component	CAS	ACCMELPF µg/mL	ACCMELPF-0.1X µg/mL	ACCMELPF-0.5X µg/mL
n-Decane	71-43-2	400	40	200
n-Hexadecane	100-41-4	400	40	200
n-Tetratriacontane	108-38-3	400	40	200

#### Having trouble maintaining your C10/C16/C34 peak area ratios?

Improper storage of the standards may be a factor. The C34 component (and sometimes even the C16 component) can crystallize out of solution if the standards are subjected to sub-ambient temperatures. If you have low peak areas for C16/C34, inspect your standard vials for precipitated solids. If solids are visible, warm the vials in a water bath or sonicate to redissolve. Inspect the standards again when they return to room temperature.



## CCME PETROLEUM HYDROCARBONS IN SOIL



### CCME MHPF Performance Check Standard

Product Number	Description	Qty	Price
ACCMEQC	Number Of Components: 2 Solvent: n-Hexane:Cyclohexane	1 mL	\$74.00
Component	CAS	Units: µg/mL	
n-Pentacontane	6596-40-3	40	
n-Tetracontane	4181-95-7	40	

### CCME F2-F4 Spike

Product Number	Description	Qty	Price
ACCMESPIKE	Number Of Components: 2 Solvent: Hexane	1 mL	\$49.40
Component	CAS	Units: µg/mL	
#2 Diesel Fuel - 50% Weathered	N/A	2500	
SAE 30W Motor Oil Non-Detergent Formula	1-ND-SAE-30	2500	

### CCME Surrogate Standard #1

Product Number	Description	Qty	Price
ACCMESS1	Number Of Components: 1 Solvent: Methylene chloride	1 mL	\$36.70
Component	CAS	Units: µg/mL	
n-Undecane	1120-21-4	1000	

### CCME Surrogate Standard #2

Product Number	Description	Qty	Price
ACCMESS2	Number Of Components: 1 Solvent: Methylene chloride	1 mL	\$57.60
Component	CAS	Units: µg/mL	
2-Methylnonane	871-83-0	1000	

### CCME Retention Time Marker

Product Number	Description	Qty	Price
ACCMERT	Number Of Components: 3 Solvent: Methanol	1 mL	\$41.10
Component	CAS	Units: µg/mL	
n-Decane	124-18-5	2000	
n-Hexane	110-54-3	2000	
Toluene	108-88-3	2000	



Identify hydrocarbon contaminants more easily with AccuStandard's Pattern Recognition Standards guide book in conjunction with the window defining mixture that covers the C<sub>8</sub> to C<sub>40</sub> range (see below).

Product Number	Description	Qty	Price
ABOOKTPH	TPH Pattern Recognition	1	\$62.70
ADRH008SR2	Hydrocarbon Window Defining Standard	1	100.70



## MISA STANDARDS



Like many industrialized areas, Ontario is faced with the challenge of effectively managing the presence of toxic contaminants. Industrial direct discharges represent a significant contributor to water quality impairment and a prominent source of toxics. With the signing of the 1987, 1994 and 2002 Canada/Ontario Agreement Respecting the Great Lakes Basin Ecosystem, Ontario committed to the management of persistent toxic substances. The Municipal Industrial Strategy for Abatement (MISA) program was the provincial response for addressing levels of persistent toxic substances in industrial direct discharges entering Ontario's waterways.

The MISA program, by focusing on nine industrial sectors, covered the major toxic polluters. The nine sectors are petroleum, pulp and paper, metal mining, industrial minerals, metal casting, organic chemical manufacturing, inorganic chemical, iron and steel, and electric power generation. The industrial sectoral regulations were promulgated between 1993 and 1995.

### MISA - Extractables, Acid (Phenolics)

Product Number	Description	Qty	Price
AMISAA	Number Of Components: 20 Solvent: Methylene Chloride	1 mL	\$93.00
Component	CAS	Units: mg/mL	
2-Chlorophenol	95-57-8	2.0	
2,3,4-Trichlorophenol	15950-66-0	2.0	
2,3,4,5-Tetrachlorophenol	4901-51-3	2.0	
2,3,4,6-Tetrachlorophenol	58-90-2	2.0	
2,3,5-Trichlorophenol	933-78-8	2.0	
2,3,5,6-Tetrachlorophenol	935-95-5	2.0	
2,4-Dichlorophenol	120-83-2	2.0	
2,4-Dimethylphenol	105-67-9	2.0	
2,4-Dinitrophenol	51-28-5	2.0	
2,4,5-Trichlorophenol	95-95-4	2.0	
2,4,6-Trichlorophenol	88-06-2	2.0	
2,6-Dichlorophenol	87-65-0	2.0	
4-Chloro-3-methylphenol	59-50-7	2.0	
4-Nitrophenol	100-02-7	2.0	
4,6-Dinitro-o-cresol	534-52-1	2.0	
m-Cresol	108-39-4	2.0	
o-Cresol	95-48-7	2.0	
p-Cresol	106-44-5	2.0	
Pentachlorophenol	87-86-5	2.0	
Phenol	108-95-2	2.0	

### MISA- Extractables, Base Neutral-Mix #1

Product Number	Description	Qty	Price
AMISABN1	Number Of Components: 8 Solvent: Methylene Chloride	1 mL	\$57.60
Component	CAS	Units: mg/mL	
1-Chloronaphthalene	90-13-1	2.0	
1-Methylnaphthalene	90-12-0	2.0	
2-Chloronaphthalene	91-58-7	2.0	
2-Methylnaphthalene	91-57-6	2.0	
5-Nitroacenaphthene	602-87-9	2.0	
Biphenyl	92-52-4	2.0	
Camphene	79-92-5	2.0	
Perylene	198-55-0	2.0	

### MISA- Extractables, Base Neutral-Mix #2

Product Number	Description	Qty	Price
AMISABN2	Number Of Components: 8 Solvent: Methylene Chloride	1 mL	\$57.60
Component	CAS	Units: mg/mL	
4-Bromophenyl phenyl ether	101-55-3	2.0	
4-Chlorophenyl phenyl ether	7005-72-3	2.0	
Benzyl butylphthalate	85-68-7	2.0	
bis(2-Chloroethyl)ether	111-44-4	2.0	
bis(2-Chloroisopropyl)ether	108-60-1	2.0	
bis(2-Ethylhexyl)phthalate	117-81-7	2.0	
Di-n-butyl phthalate	84-74-2	2.0	
Di-n-octyl phthalate	117-84-0	2.0	

#### TECH TIP — Solution Transfer

Each ampoule contains at least 120% of the stated volume of a solution allowing easy transfer. Transfer the required amount using a clean calibrated syringe. Excess solution can be stored in a clean, tightly capped vial, but this is not recommended. AccuStandard cannot guarantee the integrity of the solution once the ampoule has been opened. See EPA method protocol for storage instructions.





## MISA STANDARDS



### MISA Extractables, Base Neutral-Mix #3

Product Number	Description	Qty	Price
AMISABN3	Number of Components: 8 Solvent: Methylene Chloride	1 mL	\$57.60
Component	CAS	Units: mg/mL	
2,4-Dinitrotoluene	121-14-2	2.0	
2,6-Dinitrotoluene	606-20-2	2.0	
bis(2-Chloroethoxy)methane	111-91-1	2.0	
Diphenyl ether	101-84-8	2.0	
Diphenylamine	122-39-4	2.0	
Indole	120-72-9	2.0	
N-Nitrosodi-n-propylamine	621-64-7	2.0	
N-Nitrosodiphenylamine	86-30-6	2.0	

### MISA Group 23 - Extractables, Neutral Chlorinated

Product Number	Description	Qty	Price
AMISANC	Number Of Components: 12 Solvent: Methylene Chloride	1 mL	\$65.80
Component	CAS	Units: mg/mL	
1,2,3-Trichlorobenzene	87-61-6	2.0	
1,2,3,4-Tetrachlorobenzene	634-66-2	2.0	
1,2,3,5-Tetrachlorobenzene	634-90-2	2.0	
1,2,4-Trichlorobenzene	120-82-1	2.0	
1,2,4,5-Tetrachlorobenzene	95-94-3	2.0	
2,4,5-Trichlorotoluene	6639-30-1	2.0	
Hexachlorobenzene	118-74-1	2.0	
Hexachlorobutadiene	87-68-3	2.0	
Hexachlorocyclopentadiene	77-47-4	2.0	
Hexachloroethane	67-72-1	2.0	
Octachlorostyrene	29082-74-4	2.0	
Pentachlorobenzene	608-93-5	2.0	

### MISA Group 22 - Organochlorine Pesticides

Product Number	Description	Qty	Price
AMISAPEST	Number Of Components: 18 Solvent: Acetone	1 mL	\$116.20
AMISAPESTPAK		5 x 1 mL	531.40
Component	CAS	Units: mg/mL	
4,4'-DDD	72-54-8	2.0	
4,4'-DDE	72-55-9	2.0	
4,4'-DDT	50-29-3	2.0	
α-BHC	319-84-6	2.0	
Aldrin	309-00-2	2.0	
β-BHC	319-85-7	2.0	
δ-BHC	319-86-8	2.0	
Dieldrin	60-57-1	2.0	
Endosulfan I	959-98-8	2.0	
Endosulfan II	33213-65-9	2.0	
Endosulfan sulfate	1031-07-8	2.0	
Endrin	72-20-8	2.0	
Endrin aldehyde	7421-93-4	2.0	
Endrin ketone	53494-70-5	2.0	
γ-BHC	58-89-9	2.0	
Heptachlor	76-44-8	2.0	
Heptachlor epoxide (isomer B)	1024-57-3	2.0	
Methoxychlor	72-43-5	2.0	

### AROCLORS - INDIVIDUAL SOLUTIONS

Product Number	Description	Qty	Price
	Concentration: 1000 µg/mL Solvent: Hexane		
AC216SH10X	Aroclor 1016	1	\$27.50
AC221SH10X	Aroclor 1221	1	27.50
AC232SH10X	Aroclor 1232	1	27.50
AC242SH10X	Aroclor 1242	1	27.50
AC248SH10X	Aroclor 1248	1	27.50
AC254SH10X	Aroclor 1254	1	27.50
AC260SH10X	Aroclor 1260	1	27.50
AC262SH10X	Aroclor 1262	1	27.50
AC268SH10X	Aroclor 1268	1	27.50

*Are you using Solid Phase Extraction (SPE)?*

*If you are, we carry a wide variety of SPE products. Call us for samples. If you are not using SPE, we can help you get started.*

Neat Aroclors and Aroclors in Transformer Oil are also available.

Contact our Technical Support Department for details at 1-800-267-8103 or tech@chromspec.com



MISA STANDARDS



## MISA Group 16 - Volatiles, Halogenated

Product Number	Description	Qty	Price
AMISAVH1	Number Of Components: 22 Solvent: MeOH	1 mL	\$65.80
AMISAVH1PAK		5 x 1mL	283.40
Component	CAS	Units: mg/mL	
1,1-Dichloroethane	75-34-3	0.5	
1,1-Dichloroethene	75-35-4	0.5	
1,1,1-Trichloroethane	71-55-6	0.5	
1,1,2-Trichloroethane	79-00-5	0.5	
1,1,2,2-Tetrachloroethane	79-34-5	0.5	
1,2-Dibromoethane	106-93-4	0.5	
1,2-Dichlorobenzene	95-50-1	0.5	
1,2-Dichloroethane	107-06-2	0.5	
1,2-Dichloropropane	78-87-5	0.5	
1,3-Dichlorobenzene	541-73-1	0.5	
1,4-Dichlorobenzene	106-46-7	0.5	
Bromoform	75-25-2	0.5	
Carbon tetrachloride	56-23-5	0.5	
Chlorobenzene	108-90-7	0.5	
Chloroform	67-66-3	0.5	
cis-1,3-Dichloropropene	10061-01-5	0.5	
Dibromochloromethane	124-48-1	0.5	
Methylene chloride	75-09-2	0.5	
Tetrachloroethene	127-18-4	0.5	
trans-1,2-Dichloroethene	156-60-5	0.5	
trans-1,3-Dichloropropene	10061-02-6	0.5	
Trichloroethene	79-01-6	0.5	

## MISA Group 16 - Volatiles, Halogenated

Product Number	Description	Qty	Price
AMISAVH2	Number Of Components: 5 Solvent: MeOH	1 mL	\$41.10
AMISAVH2PAK		5 x 1mL	177.10
Component	CAS	Units: mg/mL	
Bromomethane	74-83-9	0.5	
Chloroethane	75-00-3	0.5	
Chloromethane	74-87-3	0.5	
Trichlorofluoromethane	75-69-4	0.5	
Vinyl chloride	75-01-4	0.5	

## MISA Group 16 - Volatiles, Halogenated

Product Number	Qty	Price
AMISAVH1VH2SET	2 x 1 mL	\$93.00
Component	Conc.	Units: Each
AMISAVH1: Group 16 - Volatiles, Halogenated	0.5 mg/mL in MeOH	1
AMISAVH2: Group 16 - Volatiles, Halogenated	0.5 mg/mL in MeOH	1

## MISA Group 17 - Volatiles, Non-Halogenated

Product Number	Description	Qty	Price
AMISAVNH	Number Of Components: 7 Solvent: MeOH	1 mL	\$49.40
AMISAVNHPAK		5 x 1mL	212.50
Component	CAS	Units: mg/mL	
Benzene	71-43-2	0.5	
Ethylbenzene	100-41-4	0.5	
m-Xylene	108-38-3	0.5	
o-Xylene	95-47-6	0.5	
p-Xylene	106-42-3	0.5	
Styrene	100-42-5	0.5	
Toluene	108-88-3	0.5	

## Acrolein & Acrylonitrile

Product Number	Description	Qty	Price
AMISAVWS	Number Of Components: 2 Solvent: Water	1 mL	\$27.50
Component	CAS	Units: mg/mL	
Acrolein	107-02-8	2.0	
Acrylonitrile	107-13-1	2.0	

# ACCUSTANDARD — CANADIAN METHODS



Atlantic Risk-Based Corrective Action (RBCA or "Rebecca") is a process that helps make the clean up of contaminated properties in Atlantic Canada more consistent and cost-effective.

## RBCA VPH Mix

Product Number	Description	Qty	Price
ACCMEVPH	Number Of Components: 12 Solvent: Methanol	1 mL	\$49.40
Component	CAS	Units: µg/mL	
1-Methyl-3-ethylbenzene	620-14-4	1000	
1,2,4-Trimethylbenzene	95-63-6	1000	
1,3,5-Trimethylbenzene	108-67-8	1000	
Benzene	71-43-2	1000	
Ethylbenzene	100-41-4	1000	
n-Decane	124-18-5	1000	
n-Heptane	142-82-5	1000	
n-Hexane	110-54-3	1000	
n-Octane	111-65-9	1000	
o-Xylene	95-47-6	1000	
p-Xylene	106-42-3	1000	
Toluene	108-88-3	1000	

## RBCA EPH Mix

Product Number	Description	Qty	Price
ACCMEEPH	Number Of Components: 11 Solvent: Hexane:Methylene chloride 85:15	1 mL	\$57.60
Component	CAS	Units: µg/mL	
Acenaphthene	83-32-9	1000	
Anthracene	120-12-7	1000	
Benzo(a)pyrene	50-32-8	1000	
Chrysene	218-01-9	1000	
n-Decane	124-18-5	1000	
n-Dodecane	112-40-3	1000	
n-Dotriacontane	544-85-4	1000	
n-Heneicosane	629-94-7	1000	
n-Hexadecane	544-76-3	1000	
n-Octacosane	630-02-4	1000	
Naphthalene	91-20-3	1000	

## RBCA VPH Surrogate Standard

Product Number	Description	Qty	Price
ACCMEVPHSS	Number Of Components: 1 Solvent: Methanol	1 mL	\$27.50
Component	CAS	Units: µg/mL	
Isobutylbenzene	538-93-2	1000	

## RBCA EPH Surrogate Standard

Product Number	Description	Qty	Price
ACCMEEPHSS	Number Of Components: 2 Solvent: Methylene chloride	1 mL	\$36.70
Component	CAS	Units: µg/mL	
Isobutylbenzene	538-93-2	1000	
n-Dotriacontane	544-85-4	1000	

## COLUMN FOR EPH AROMATIC/ALIPHATIC FRACTIONATION FROM ACE GLASS



Product Number	Description	Price
GA588830	19mm diameter x 30mm effective length	\$91.90

Other column sizes are available, please inquire.

**Buy AccuPaks™  
Save 20-40%, 5 x 1mL**

20% = Buy 4 of the same solution get 5th Free

- Reduce reordering frequency
- Lot No. consistency reduces data entry time for calibration tables

## ALTERNATE SOURCE LINE

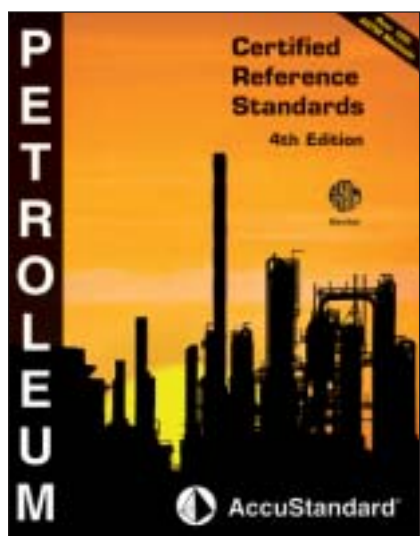
### Improves and Insures Analytical Quality

AccuStandard, in order to enhance your laboratory's analytical results and purchasing efficiencies, has created the following Alternate Source Line of Analytical Standards. Each ASL Analytical Reference Standard is drawn from popularly requested independent lot formulations, which can be used as:

- Second sources to other AccuStandard formulations
- Independent lots to other standard supplier products

Contact our Technical Support Department for details.

## CERTIFIED PETROCHEMICAL REFERENCE MATERIALS



Available in CD format only

### Includes:

- Certified Organic and Inorganic Standards
- Certified Standards for over 100 ASTM Methods
- Certified PIONA, PONA, PNA Solutions
- Certified Detailed Hydrocarbon formulations
- Certified Ready-to-Inject Calibration Curves
- Certified Ready-to-Aspirate Calibration Curves
- Certified Sulfur Standards (Expanded Line)
- Certified Wear Metal Standards
- Real Gasoline Petrocheck Samples
- Disk Deliverable Datasheets

### Custom Formulations

If you don't find your favourite or least favourite ASTM Method listed, AccuStandard can formulate the standard for you.

Call our Technical Support Department at 1-800-267-8103 to request a copy of the CD (use literature code A07), or visit us online at [www.chromspec.com](http://www.chromspec.com) and use our literature request page to order.

The Certified Petrochemical Reference Material products can also be found in the AccuStandard Catalogue in the Petrochemical Standards section.

## ACCUSTANDARD'S EXPIRY DATING POLICY

Expiration dates and storage conditions are given to chemical reference standards because like all chemicals, they can undergo changes or decomposition over time. For the chemist using these products, understanding the way these dates are generated will allow them to choose products with the best accuracy and reliability.

AccuStandard uses over 20 years of data on over 35,000 products from their On-Going Stability Program to determine expiration dates. They compare analytical data from the newest manufactured lot to its historical data and based on this information, an expiration period ranging from 3 months to 3 years is assigned. Other manufacturers may assign longer expiration dates for similar products but AccuStandard's On-Going Stability Program ensures consumer confidence in their product because AccuStandard uses actual time data to determine dates.

If you have any unopened AccuStandard product left at the end of its expiration period, AccuStandard's QC department will re-analyze their in-house product and determine if it is still viable. If so, a new expiry date and documentation will be issued. Contact our Technical Support Team for further details.

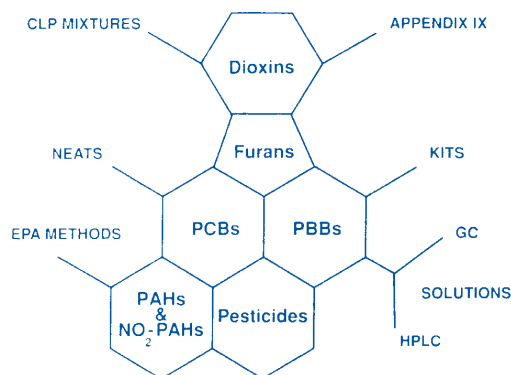
We invite you to compare AccuStandard's Expiration Dating Policy with those of your current supplier.



# ACCUSTANDARD — PESTICIDE STANDARDS

## PESTICIDE REFERENCE STANDARDS

### For Environmental & Pollution Analysis



AccuStandard continues to expand their pesticide analyte list to meet your needs. They offer more than 3,500 pesticide singles and mixes, more than any other chemical standard manufacturer. These new pesticide analytes are manufactured in accordance with our ISO 9001 registered quality system. The individual pesticide solutions are prepared at 100 µg/mL in methanol unless noted. If your analytical requirements call for higher concentrations or a different solvent, AccuStandard can rapidly manufacture the necessary formulation.

If you don't see what you require on the list, please contact our Technical Support Department at 1-800-267-8103 or [tech@chromspec.com](mailto:tech@chromspec.com).

All neats are in 10 mg quantities  
(for larger amounts ask for quotation).

All solutions are 100 µg/mL in methanol  
(other solvents and concentrations are available on request).

Description	Neat	Solution	Price	Description	Neat	Solution	Price
Aatnex	AP005N	AP005S	\$22.00	2,4-D acid	AP020N	AP020S	\$22.00
Alachlor	AP102N	AP102S	22.00	2,4-D methyl ester	AP021N	AP021S	22.00
Aldicarb	AP001N	AP001S	22.00	2,4-DB acid	AP141N	AP141S	22.00
Aldrin	AP002N	AP002S	22.00	2,4-DB methyl ester	AP228N	AP228S	40.40
Alfa	AP033N	AP033S	22.00	Dalapon	AP140N	AP140S	22.00
Alkron	AP070N	AP070S	22.00	Dalapon methyl ester	AP226N	AP226S	52.60
Alltex	AP093N	AP093S	22.00	Dalf	AP065N	*	52.60
Amizine	AP085N	AP085S	22.00	DCPA	AP196N	AP196S	22.00
Aparasin	AP059N	AP059S	22.00	o,p'-DDD	AP024N	AP024S	22.00
Aphamite	AP070N	AP070S	22.00	p,p'-DDD	AP025N	AP025S	22.00
Aphitiria	AP059N	AP059S	22.00	o,p'-DDE	AP026N	*	40.40
Atratul	AP005N	AP005S	22.00	p,p'-DDE	AP027N	AP027S	22.00
Atrazine	AP005N	AP005S	22.00	o,p'-DDT	AP028N	AP028S	40.40
Azinphos methyl	AP007N	AP007S	22.00	p,p'-DDT	AP029N	AP029S	22.00
Banvel	AP008N	AP008S	22.00	Dechlorane	AP066N	AP066S	22.00
Basagran (see Bentazon)	AP177N	AP177SA	22.00	Demeton	AP031N	AP031S	52.60
Ben-Hex	AP059N	AP059S	22.00	Devithion	AP065N	*	52.60
Bentazon	AP177N	AP177SA	22.00	Dextrone-X	AP051N	AP051S	22.00
Bentazon, Methyl	AP241N	AP241S	22.00	Diazinon	AP033N	AP033S	22.00
α-BHC	AP010N	AP010S	40.40	Dibutylchlorendate	AP109N	AP109S	22.00
β-BHC	AP011N	AP011S	40.40	Dicamba	AP008N	AP008S	22.00
γ-BHC	AP059N	AP059S	22.00	Dicamba methyl ester	AP071N	AP071S	40.40
δ-BHC	AP012N	AP012S	Inquire	Dichlobenil	AP275N	AP275S	22.00
Bladan	AP070N	AP070S	22.00	2,4-Dichlorophenylacetic acid	AP244N	AP244S	22.00
Bromacil	AP181N	AP181S	22.00	Dichlorprop acid	AP143N	AP143S	22.00
Camphechlor	AP093N	AP093S	22.00	Dichlorprop methyl ester	AP229N	AP229S	22.00
Captan, 100 mg/mL in MeOH	AP182N	AP182S	22.00	Dichlorvos	AP036N	AP036S	22.00
CDT	AP085N	AP085S	22.00	Dieldrin	AP037N	AP037S	40.40
Cekumethion	AP065N	*	52.60	Dimetate	AP039N	AP039S	40.40
CET	AP085N	AP085S	22.00	Dimethoate	AP039N	AP039S	40.40
Chemathion	AP060N	AP060S	22.00	Dinoseb	AP144N	AP144S	22.00
Chlordane, Tech	AP017N	AP017S	22.00	Dinoseb methyl ether	AP230N	AP230S	22.00
α-Chlordane	AP134N	AP134S	40.40	Disulfoton	—	AP042S	22.00
γ-Chlordane	AP135N	AP135S	40.40	Disyston	AP042N	AP042S	22.00
Chlorthal	AP196N	AP196S	22.00	Dithane D-14, 100 mg/mL in MeOH	AP383N	AP383S	22.00
Chlorpyrifos	AP094N	AP094S	22.00	Diuron	AP227N	AP227S	22.00
Cygon	AP039N	AP039S	40.40	DNTP	AP070N	AP070S	22.00
Cythion	AP060N	AP060S	22.00	Dowpon	AP140N	AP140S	22.00

\* Solution also available. Please inquire.

# ACCUSTANDARD — PESTICIDE STANDARDS

All neat are in 10 mg quantities  
(for larger amounts ask for quotation).

All solutions are 100 µg/mL in methanol  
(other solvents and concentrations are available on request).

Description	Neat	Solution	Price	Description	Neat	Solution	Price
Drinox	AP053N	AP053S	\$22.00	Oxychlordan, 100 µg/mL in MeOH	————	AP331S	\$119.30
Dual	AP158N	AP158S	22.00	Paraquat CL	AP051N	AP051S	22.00
Dursban	AP094N	AP094S	22.00	Parathion	AP070N	AP070S	22.00
Elgetol	AP384N	AP384S	22.00	Paridol	AP065N	*	52.60
Endosulfan I	AP091N	AP091S	40.40	Parton	AP065N	*	52.60
Endosulfan II	AP092N	AP092S	40.40	Penphene	AP093N	AP093S	22.00
Endosulfan sulfate	AP145N	AP145S	40.40	Pentachloroanisole	AP199N	AP199S	22.00
Endothal	AP183N	AP183S	22.00	Perfekthion	AP039N	AP039S	40.40
Endrin	AP045N	AP045S	40.40	Phenacide	AP093N	AP093S	22.00
Endrin ketone	AP146N	AP146S	40.40	Phenetox	AP093N	AP093S	22.00
Etilon	AP070N	AP070S	22.00	Phosphothion	AP060N	AP060S	22.00
Ethyl parathion	AP070N	AP070S	22.00	Picloram	AP047N	AP047S	22.00
Fenoprop	AP084N	AP084S	22.00	Picloram methyl ester	AP198N	AP198S	40.40
Fenvalerate	AP194N	AP194S	22.00	Pramitol	AP077N	AP077S	22.00
Folidol	AP070N	AP070S	22.00	Preeglone	AP051N	AP051S	22.00
Folidolm	AP065N	*	52.60	Premerg	AP044N	AP044S	22.00
Fosferno-50	AP070N	AP070S	22.00	Primatol	AP005N	AP005S	22.00
Fosferno M50	AP065N	*	52.60	Primatol P	AP077N	AP077S	22.00
Fostion MM	AP039N	AP039S	40.40	Primatol S	AP085N	AP085S	22.00
Gammexane	AP059N	AP059S	22.00	Princep	AP085N	AP085S	22.00
Geniphene	AP093N	AP093S	22.00	Prometon	AP077N	AP077S	22.00
Gesaprim	AP005N	AP005S	22.00	Propachlor	AP215N	AP215S	22.00
Gesatop	AP085N	AP085S	22.00	Radapon	AP140N	AP140S	22.00
Gexane	AP059N	AP059S	22.00	Reglone	AP231N	AP231S	22.00
Glyphosate	AP015N	————	36.70	Rogor	AP039N	AP039S	40.40
HCH	AP059N	AP059S	22.00	Rogue	AP049N	AP049S	22.00
HEOD	AP037N	AP037S	40.40	Roundup	AP015N	————	36.70
Heptachlor	AP053N	AP053S	22.00	Roxion	AP039N	AP039S	40.40
Heptachlor epoxide	AP054N	AP054S	40.40	Sarolex	AP033N	AP033S	22.00
Heptamul	AP053N	AP053S	22.00	Sencor	AP089N	AP089S	22.00
Heptox	AP053N	AP053S	22.00	Silvex acid	AP084N	AP084S	22.00
HGI	AP059N	AP059S	22.00	Silvex methyl ester	AP115N	AP115S	22.00
Jucutin	AP059N	AP059S	22.00	Simazine	AP085N	AP085S	22.00
Kelthane	AP057N	AP057S	40.40	Streunex	AP059N	AP059S	22.00
Kewll	AP059N	AP059S	22.00	2,4,5-T acid	AP168N	AP168S	22.00
Kuron	AP084N	AP084S	22.00	2,4,5-T methyl ester	AP067N	AP067S	22.00
Lasso	AP102N	AP102S	22.00	TEPP	AP207N	*	22.00
Lazo	AP102N	AP102S	22.00	Temik	AP001N	AP001S	22.00
Lindane	AP059N	AP059S	22.00	Terbufos	AP208N	AP208S	22.00
Loxexane	AP059N	AP059S	22.00	Thiodan I	AP091N	AP091S	40.40
Malaspray	AP060N	AP060S	22.00	Thiodan II	AP092N	AP092S	40.40
Malathion	AP060N	AP060S	22.00	Thiofanox	AP266N	AP266S	40.40
Malithiozol	AP060N	AP060S	22.00	Thiophanate	AP321N	AP321S	22.00
Marlate	AP064N	AP064S	22.00	Thiophos	AP070N	AP070S	22.00
Metacide	AP065N	*	52.60	Tordon	AP047N	AP047S	22.00
Methoxychlor	AP064N	AP064S	22.00	Toxakil	AP093N	AP093S	22.00
Methoxy DDT	AP064N	AP064S	22.00	Toxaphene	AP093N	AP093S	22.00
Methyl parathion	AP065N	*	52.60	Toxichlor	AP017N	AP017S	22.00
Metolachlor	AP158N	AP158S	22.00	2,4,5 TP acid	AP084N	AP084S	22.00
Metron	AP065N	*	52.60	2,4,5 TP methyl ester	AP115N	AP115S	22.00
Neburon	AP041N	AP041S	22.00	Treflan	AP197N	AP197S	22.00
Neocidol/Nucidol	AP033N	AP033S	22.00	Tri-6	AP059N	AP059S	22.00
Niran	AP070N	AP070S	22.00	Trichloropyriphos	AP094N	AP094S	22.00
Nitran	AP065N	*	52.60	Trifluralin	AP197N	AP197S	22.00
Nitrox	AP065N	*	52.60	Weedol	AP051N	AP051S	22.00
Octalox	AP037N	AP037S	40.40				
Orthophos	AP070N	AP070S	22.00				

\* Solution also available. Please inquire.

# ACCUSTANDARD — EPA 500 STANDARDS

## WE HAVE PLENTY OF SOLUTIONS

In our generation, environmental pollutants have risen to the forefront of concern as a major social and health problem. Contamination of water, food, air and soil by hazardous chemicals has focused our attention on the need for analytical standards and methods. To satisfy this need, AccuStandard has dedicated itself to making available pure analytical reference standards. Many of the chemicals to be monitored are of a "by-product" nature and therefore require special synthesis experience.

AccuStandard has over 15 years of experience in the standards business. The following pages highlight some of the standard mixtures available, listed by EPA method number. Other kits are available as are individual components, internal standard solutions, fortification solutions, performance check standard solutions and surrogate standard solutions. If you are interested in the exact composition of a kit, please call our Technical Service Department at 1-800-267-8103.

We also have standards specific to MISA (Ont.) testing. Please See . . . . . Page 239

**For a comprehensive listing of AccuStandard's product line, request a copy of their catalogue (literature code A01).**

## EPA METHOD 500 SERIES - METHOD STANDARDS FOR DRINKING WATER

The 500 Series product line contains standards used in proposed and promulgated methods for the identification and quantification of organic compounds in drinking water. The organic compounds listed in the various methods include volatile organic compounds (VOCs), pesticides, synthetic organic compounds (SOCs), and trihalomethane disinfection by-products.

EPA Method	Description of Method	Product Number	Composition	per mL Price
501.3	Measurement of Trihalomethanes in drinking water	AM501	Bromoform Chloroform 0.2 mg/mL of each component in MeOH	\$31.20
504	EDB and DBCP	AM504	1,2-Dibromoethane 1,2-Dibromo-3-chloropropane 0.2 mg/mL of each in MeOH	27.50
502.2	Volatile halogenated organic compounds in water by purge and trap gas chromatography.  Volatile organic compounds in water by purge and trap capillary column gas chromatography/mass spectrometry	AM502	60 components, 0.2 mg/mL in MeOH	116.20
		AM502AR	54 components are from the three lists of 60 items below except the 6 gases of AM502B, 0.2 mg/mL in MeOH	93.00
524.2		AM502B	Bromomethane Chloromethane Trichlorofluoromethane each 0.2 mg/mL in MeOH	41.10
		AM502DEFSET (see below)	Mix-D: 26 components in MeOH Mix-E: 21 components in MeOH Mix-F: 13 components in MeOH 0.2 mg/mL of each component in MeOH	186.00 Set of 3 x 1 mL

Mix D only — 26 components	Mix E only — 21 components	Mix F only — 13 components
AM502D . . . . . \$74.00/mL Benzene Bromobenzene Bromochloromethane Bromoform sec-Butyl benzene Carbon tetrachloride Chloroethane 4-Chlorotoluene Dibromomethane 1,2-Dichlorobenzene 1,4-Dichlorobenzene 1,1-Dichloroethene trans 1,2-Dichloroethene Dichlorodifluoromethane 2,2-Dichloropropane Ethyl benzene Ethylene dibromide Isopropylbenzene Tetrachloroethene 1,1,1,2-Tetrachloroethane Toluene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene Trichloroethene Vinyl chloride o-Xylene	AM502E . . . . . \$74.00/mL Bromomethane Chlorobenzene Chloromethane 2-Chlorotoluene Dibromochloromethane 1,3-Dichlorobenzene 1,1-Dichloroethane 1,2-Dichloroethane cis-1,2-Dichloroethene 1,2-Dichloropropane cis-1,3-Dichloropropene* trans-1,3-Dichloropropene** Hexachlorobutadiene Methylene chloride 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichlorofluoromethane Styrene 1,2,3-Trichloropropane 1,2,4-Trimethylbenzene m-Xylene  * 212 µg/mL cis      ** 188 µg/mL trans	AM502F . . . . . \$74.00/mL Bromodichloromethane n-Butyl benzene tert-Butyl benzene Chloroform 1,2-Dibromo-3-chloropropane 1,3-Dichloropropane 1,1-Dichloropropene p-Isopropyl toluene Naphthalene n-Propyl benzene 1,1,2,2-Tetrachloroethane 1,3,5-Trimethyl benzene p-Xylene  <div> <i>New Standards for EPA Methods:</i> <ul style="list-style-type: none"> <li>• 521 Nitrosamines</li> <li>• 527 Pesticides and Flame Retardants</li> <li>• 529 Explosives</li> <li>• 535 Acetanilide / Acetamide Herbicides</li> </ul> </div> <div> <i>Contact our Technical Support Team for product numbers and compositions.</i> </div>

**A complete listing is located in the EPA Methods section of the AccuStandard catalogue (literature code A01).**

# ACCUSTANDARD — EPA 600 STANDARDS

## EPA METHOD 600 SERIES - METHOD STANDARDS FOR WASTE WATER

The 600 Series product line contains standards used in the proposed and promulgated methods for the identification and quantification of organic compounds in municipal and industrial waste water. The organic compounds listed in the various methods include volatile organic compounds (VOCs), pesticides and synthetic organic compounds (SOCs).

EPA Method	Description of Method	Product Number	Composition	per mL Price
601	Purgeable Halocarbons	AM601SET	29 components in MeOH, Set of 4 x 1 mL	\$82.30
602	Purgeable Aromatics	AM602 AM602GAS	7 components in MeOH Gasoline ID, 11 components in MeOH 0.2m g/mL of each component	36.70 49.90
603	Acrolein and Acrylonitrile	AM603	2 components, 1 mg/mL in Water	25.70
604	Phenols	AM604	11 components, 0.5 mg/mL in MeOH	41.10
605	Benzidines	AM60510X	2 components, 1.0 mg/mL in MeOH	41.10
606	Phthalate Ester	AM606	6 components, 0.2 mg/mL in MeOH	36.70
607	Nitrosamines	AM607	3 components in MeOH	33.00
608	Organochlorine Pesticides and PCB's	AM608SET	25 components in MeOH, Set of 4 x 1 mL	93.00
609	Nitroaromatics and Isophorone	AM609RSET	4 components, 1.0mg/mL in Hexane, Set of 2 x 1 mL	36.70
610	Polynuclear Aromatic Hydrocarbons	AM610 AM610A	16 components, 0.1 mg/mL 16 components, various concentrations both in 1:1 CH <sub>3</sub> OH:CH <sub>2</sub> Cl <sub>2</sub>	49.40 57.60
611	Haloethers	AM611	5 components, 0.2 mg/mL in MeOH	49.40
612	Chlorinated Hydrocarbons	AM612	9 components various concentrations in Isooctane	41.10
613	2,3,7,8-Tetrachlorodibenzo-p-Dioxin	AM613	2,3,7,8-TCDD, 10 µg/mL in Toluene	65.80
624	Purgeables	AM624	31 components, 0.2 mg/mL in MeOH	49.40
625	Base/Neutrals and Acids	AM625BN	46 components 0.1 mg/mL in CH <sub>2</sub> Cl <sub>2</sub>	85.20

A complete listing is located in the EPA Methods section of the AccuStandard catalogue.



**Prepare for CAEAL** certification and accreditation. Use AccuStandard's Proficiency Test Standards to evaluate your laboratory's performance. The AccuValue Standards have been confirmed analytically by AccuStandard's QA/QC department against NIST SRMs or commercially available sources by testing the actual concentration in the ampule. The results come in a sealed envelope to be used as true unknowns to test your skills and instrumentation in preparation for CAEAL. Available for Organic and Inorganic Analysis.

For a complete listing, see the AccuStandard catalogue QA/QC section or request a **Proficiency Testing & Other Quality Control Chemical Standards Catalogue** on-line at [www.chromspec.com](http://www.chromspec.com) or call us at 1-800-267-8103.

*Chromatographic Specialties Inc. — The Standards People!*



# ACCUSTANDARD — EPA 8000 STANDARDS

## EPA METHOD 8000 SERIES - METHOD STANDARDS FOR SOLID WASTE

The 8000 Series product line contains standards used in the proposed and promulgated methods for the identification and quantification of organic compounds on the EPA's Appendix VIII and Appendix IX lists in ground water, waste water, and solids at hazardous waste treatment, storage and disposal sites. An additional method Toxicity Characteristic Leaching Procedure (TCLP) method 1311 is used in conjunction with 8000 series methods to estimate the toxicity of solid waste materials under the leaching conditions found in a landfill.

The organic compounds listed in the various methods include organic compounds (VOCs), pesticides, synthetic organic compounds (SOCs), and disinfection by-products.

EPA Method	Description of Method	Product Number	Composition	per mL Price
8010A	Halogenated Volatile Organics	AM8010AM	33 components, 0.2 mg/mL in MeOH	\$85.20
8015A	Non-Halogenated Volatile Organics	AM8015A	4 components, 0.2 mg/mL in MeOH	36.70
8020	Aromatic Volatile Organics	AM802010X	10 components, 2 mg/mL in MeOH	49.40
8030A	Acrolein, Acrylonitrile	AM60310X	2 components, 10 mg/mL in Water	31.20
8040	Phenols by GC/FID	AM8040AR AM8040BR	Mix-A: 10 components, 2 mg/mL in i-PrOH Mix-B: 9 components, 2 mg/mL in i-PrOH	65.80 57.60
8060	Phthalate Esters by GC/ECD	AM8060	6 components, 2 mg/mL in Isooctane	41.10
8070	Nitrosamines	AM8070	3 components, 2 mg/mL in MeOH	41.10
8080	Organochlorine Pesticides and PCBs	AM8080	17 components, 2 mg/mL in Acetone	93.00
8090	Nitroaromatics and Isophorone	AM60910XSET	Mix-A: 2 components, 2 mg/mL in MeOH Mix-B: 2 components, 2 mg/mL in MeOH	36.70 Set of 2 x 1mL
8100	Polynuclear Aromatic Hydrocarbons	AZ014GR	17 components, 2.0 mg/mL in CH <sub>2</sub> Cl <sub>2</sub> :Benzene (1:1)	100.70
8110	Haloethers	AM61110X	5 components, 2 mg/mL in MeOH	49.40
8120	Chlorinated Hydrocarbons	AM8120	10 components, 2 mg/mL in Hexane	41.10
8140	Organophosphorus Pesticides	AM8140M AM8140M5X	20 components, 0.04 mg/mL in Hexane 20 components, 0.2 mg/mL in Hexane:Acetone (19:1)	124.00 193.70
8141A	Additions to Method 8140	AM8141M	7 components, 0.2 mg/mL in Hexane	93.00
8150	Chlorinated Herbicides; methyl derivatives	AM8150SET	10 individual solutions at various concentrations	193.70
8150A	Chlorinated Herbicides	AM8150ASET	10 individual solutions at various concentrations	193.70
8240	GC/MS for volatile organics	AM8240A	41 components, 0.2 mg/mL in MeOH	108.50
8270	GC/MS method for semi-volatile organics: Capillary Column Technique	AM827001 AM827002 AM827003 AM827004A AM827004B AM827005 AM827006 AM8270SET	Mix-1: 17 components, 2 mg/mL in CH <sub>2</sub> Cl <sub>2</sub> Mix-2: 18 components, 2 mg/mL in CH <sub>2</sub> Cl <sub>2</sub> Mix-3: 24 components, 2 mg/mL in CH <sub>2</sub> Cl <sub>2</sub> Mix-4A: 9 components, 2 mg/mL in CH <sub>2</sub> Cl <sub>2</sub> Mix-4B: 6 components, 2 mg/mL in CH <sub>2</sub> Cl <sub>2</sub> Mix-5: 8 components, 2 mg/mL in CH <sub>2</sub> Cl <sub>2</sub> Mix-6: 10 components, 2 mg/mL in CH <sub>2</sub> Cl <sub>2</sub> Set of 7 above	124.00 124.00 186.00 74.00 57.60 124.00 186.00 640.50
8270	Appendix IX, Semi-Volatiles	AM827007 AM827008 AM827009 AM827010	Mix-7: 15 components, 2 mg/mL in CH <sub>2</sub> Cl <sub>2</sub> Mix-8: 9 components, 2 mg/mL in CH <sub>2</sub> Cl <sub>2</sub> Mix-9: 10 components, 2 mg/mL in CH <sub>2</sub> Cl <sub>2</sub> Mix-10: 1 component, 2 mg/mL in MeOH	217.60 100.70 100.70 27.50
8280	The analysis of polychlorinated Dibenzo-p-Dioxins and polychlorinated Dibenzofurans	AM8280A AM8280B	Dioxin Mix, 5 components, 5 µg/mL in Toluene Furan Mix, 5 components, 5 µg/mL in Toluene	232.50 232.50

A complete listing is located in the EPA Methods section of the AccuStandard catalogue (literature code A01).

CLP methods are designed for both volatile and semi-volatile compounds. The most recent EPA Target compounds are listed in the August 1994 Statement of Work which lists 36 Volatiles, 64 Semi-Volatiles, 21 Pesticides and 7 Aroclors®.

## Volatiles

- Selected Target Compound Solutions
- Auxiliary Standards
- Low Concentration SOW (10/92) for Organic Analysis of Waste

## Semi-Volatiles

- Base/Neutral & Acid Composite Mixtures for CLP Semi-Volatile Analysis
- Gel Permeation Compounds for Sample Clean-up
- Low Concentration SOW (10/92) for Organic Analysis of Water
- Pesticides
- Pesticides and Polychlorinated Biphenyls

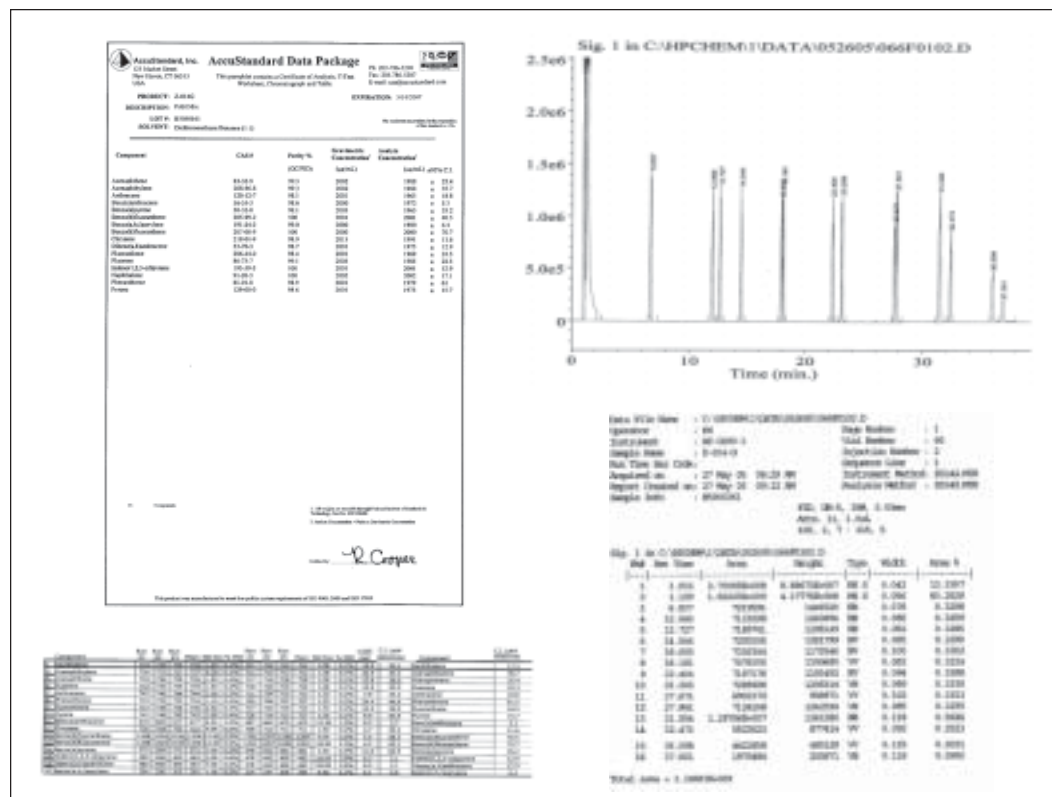
- Pesticide Standards

- Aroclors®
- Gel Permeation Compounds for Sample Clean-up

- Labeled Chromatogram
- CLP Statistical Report of T-test Data
- Certificate of Product Data

## AccuDATA Documentation Includes

- Quantitative analysis of the product by comparison to a separately prepared Standard
- Target concentration analytically determined to be within a 95% confidence interval
- A chromatogram of the product lot with analytes listed by order of elution and instrumental parameters shown
- Certificate showing actual gravimetric/volumetric weights, purities and analyte CAS #'s



For a complete listing:

- See the EPA Methods Section in the AccuStandard catalogue
- Visit Chromatographic Specialties Inc. on-line at [www.chromspec.com](http://www.chromspec.com) to request a catalogue
- Call Chromatographic Specialties Inc. at 1-800-267-8103 to request a catalogue
- Contact our Technical Support Department at 1-800-267-8103 for assistance

# ACCUSTANDARD — QUALITY CONTROL

## PROFICIENCY TESTING AND OTHER QUALITY CONTROL CHEMICAL STANDARDS

Proficiency Testing is simple with the AccuStandard WP and WS program. AccuStandard has been conducting numerous PT studies and has now been named as one of the **first accredited Proficiency Providers!**



- All ACCUracY samples come with easy to use instructions on how to dilute the PE/PT sample and handle the actual test material.
- We provide recommended EPA approved methods to help analytical chemists new to Performance Evaluation testing.
- AccuStandard has the most complete line of all types of WS and WP Proficiency Tests & Quality Control Standards for organic, inorganic and custom requirements.
- Extra Material: AccuStandard includes sufficient material to perform two tests each.

### Canadian Labs Would Benefit By Using The Self Test Proficiency Testing Standards From AccuStandard To Prepare For Certification And Accreditation

- The Self Tests from AccuStandard come in two forms — the AccuTest that AccuStandard grades, and the AccuValue that you grade.
  - Internal Control: Use the Self Tests to periodically verify lab QA/QC performance and management control.
  - Recertification: Use the Self Tests to rapidly demonstrate acceptable performance of your technician or instrumentation.

## CCC LINE™ OF WORKING LEVEL STANDARDS

The new AccuStandard **C**ontinuing **C**alibration **C**heck standards have been designed to enhance the productivity of the analytical chemist by eliminating the tedious, time consuming step of preparing and validating calibration curves.

### When You Use CCC (Continuous Calibration Check) Working Level Standards, You Realize The Following Benefits . . .

Complete . . . . . all necessary standards for Instrument Calibration to perform Sample Analysis  
Fast . . . . . no dilutions required to make multi-point curve  
Easy . . . . . permits direct transfer to autosampler vials  
Accurate . . . . . internal standard or surrogate is already incorporated into the standard solution  
Validated . . . . . the multi-point curve, using independently prepared second source standard, is validated by their QC department  
Economical . . . . . your time is spent quantifying samples, rather than preparing standards  
Responsible . . . . . convenient packaging eliminates waste and reduces disposal cost

CCC Working level standards are available for Pesticides, Organo-Phosphorous Pesticides, Phenoxy-Acid Herbicides, Semi-Volatiles, Aroclor® (PCB) mixtures and ASTM Petrochemical methods.

## NotLot PROGRAM

The simplest way to verify the accuracy of your analysis is to repeat it using the same formulation of materials, but made independently from the first lot.

AccuStandard offers you that ability with the unique "NotLot Program", which gives you material of the same formulation and different lots.

The program is available on almost all catalogue items. Ask your Technical Support Specialist for your catalogue number and your NotLot.



*Chromatographic Specialties Inc. — The Standards People!*

# ACCUSTANDARD — MISCELLANEOUS STANDARDS

## STANDARDS FOR FOOD ANALYSIS

Food Chemists use AccuStandard's comprehensive line of Analytical Reference Materials for their food analyses. These include Lipid Standards, Vitamin Standards, Preservative Standards and Antimicrobial Standards. Each Standard is methodically prepared, quality controlled and packaged under the strict guidelines of their ISO 9001 registered Quality System.

Lipid Standards analysed by both GLC and TLC are supplied with complete analytical documentation.

### Standards Available Include:

- Saturated Methyl Esters
- Unsaturated Methyl Ester Series
- Saturated Glyceride Series
- Unsaturated Glyceride Series
- AOCS Profiling Mixes
- FAME Mixes

Located in the Chemical Kits section of the AccuStandard catalogue (literature code A01).

## POLYSTANDARD KITS

In 1999, the PolyScience Analytical Division was acquired by AccuStandard and renamed PolyStandard kits. AccuStandard now offers the most comprehensive selection of chemical reference kits.

### PolyStandard Kits Available:

- |                    |                             |                       |
|--------------------|-----------------------------|-----------------------|
| • Acids and Esters | • Fatty Acids and Esters    | • Ketones             |
| • Alcohols         | • Fluorocarbon Refrigerants | • MS Instrument       |
| • Aldehydes        | • Food Additives            | Calibration Standards |
| • Amines           | • Glycols                   | • PCBs                |
| • Amino Acids      | • Grob Mixes                | • Pesticides          |
| • Aromatics        | • HPLC Test Mixes           | • Phenols             |
| • Essential Oils   | • Hydrocarbons              | • Vitamins            |



Located in the Chemical Reference Kits catalogue (literature code A13).

## MISCELLANEOUS STANDARDS

### Also Available:

- AccuPetroCheck/AccuPetroValue (ASTM Round Robin Characterized) Consensus Value Samples
- EPA (CRADA) Replacement Standards
- NotLot (Program for providing independently manufactured lot to serve as QC sample)
- Rare Chemicals
- Flame Retardants
- EPA Method 1300 and 1600 Series
- Refinery Products for: Aromatics, Olefins, Saturates, Sulfur and Oxygenates
- Method 1665, 1666, 1667, 1671 and 1673 (Pharmaceutical Waste Discharge Standards)
- CFCs and other Refrigerants solutions
- Lipid Standards
- Vitamin Standards
- Preservative and Antimicrobial Standards

For a complete listing:

- See the AccuStandard catalogue (literature code A01)
- Visit Chromatographic Specialties Inc. on-line at [www.chromspec.com](http://www.chromspec.com) to request a catalogue
- Call Chromatographic Specialties Inc. at 1-800-267-8103 to request a catalogue
- Contact our Technical Support Department at 1-800-267-8103 for assistance



# ACCUSTANDARD — MISCELLANEOUS STANDARDS

## INTERNATIONAL STANDARDS

AccuStandard has researched and developed Standard Solutions that meet the requirements of various governmental bodies around the world. If you do not locate a solution that meets your requirements, please contact our Technical Department and we will quickly develop a formulation that meets your requirements. Methodologies included are from Canada (MISA), Europe, Japan and Korea.

Located in the Miscellaneous Standards section of the AccuStandard catalogue.

## INORGANIC REFERENCE MATERIALS

### AccuTrace™ Standards For ICP/MS, ICP, AA Spectroscopy And Ion Chromatography

- Sulphur Analysis
- EPA Methods
- ASTM Methods
- MISA Methods
- Calibration Standards
- Interface Checks
- QC Standards
- Custom Formulations
- AccuTrace Standards are traceable to National Institute of Standards & Technology Reference Material
- Formulated from Ultra High Purity Starting Material, Water & Acids
- Concentration verified by Wet Chemical & Instrumental Analysis
- Actual Lot Analysis provided on label & Certificate of Analysis
- 18 Month Stability Dating
- Packaged in specially prepared, Acid Leached Bottles



Single Element Solutions now have 3 year expiration periods.

### Acculon™, Ion Chromatography Line Goes Beyond The Ordinary

- High Purity Starting Materials
- 18 Megohm Water
- Pre-cleaned Bottles
- Traceable to NIST Standards
- Certified by two independent methods
- Final Solution is filtered through a 0.2 µm filter to eliminate contaminants (such as suspended solids and microbes) which extends shelf life and protects your column
- Ready-to-use Mixes and Calibration Sets
- Each Standard is supplied with a Certificate of Analysis
- Standards may be used for other "Classical or Wet" methods
- Most complete product line
- "The Right Size" allows you to purchase as much or as little as you need - minimizing waste and assures fresh solution when you need it most



## INORGANIC WET CHEMICALS

Include individual analytes and mixes for:

- Physical and Aggregate Properties
- Inorganic Non-metallic Constituents
- Aggregate Organic Constituents

A sampling of the Inorganic Reference Material and Wet Chemicals can be located in the IC and Inorganic Wet Section of the AccuStandard Catalogue.

To order an Inorganic Reference Materials Catalogue

- See the AccuStandard catalogue
- Call Chromatographic Specialties Inc. at 1-800-267-8103

- Visit Chromatographic Specialties Inc. online at [www.chromspec.com](http://www.chromspec.com) to request a catalogue

## RESTEK'S FULL LINE



Restek understands the needs of analytical chemists. Their line of standards includes the highest attention to quality, unique user-friendly packaging, complete documentation and competitive pricing. Restek's dynamic chemical standards department can also make a custom standard to your specifications.

### Selection

- ASTM Fire Debris Mixture
- ASTM Petrochemical Mixtures
- Column Evaluation Standards
- Diesel Range Organics - CCME Mixtures
  - Gasoline Surrogate & Internal Standards
  - Diesel Surrogate & Internal Standards
  - Composite Fuels
  - Single Source Fuels
  - Fuel Oil Degradation Test Mix
- EPA CLP Standards
  - Volatile Organic Standards
  - Semi-Volatile Organic Standards
  - Pesticide Standards
  - CLP Kits
  - QTM (Quick Turnaround Method)
  - Low Concentration
- EPA 500 Method Standards (Drinking Water Analyses)
- EPA 600 Method Standards (Waste Water Analyses)
- EPA Method 625 and 418.1 Standards
- EPA Method 8021 and 8040 Standards
- EPA Method 8240 and 8260 Standards
- Fatty Acid Methyl Ester Mixtures
- Organometallic Mixes
- Quantitative Drug Standards
- Single Component Solutions and Mixtures
- Standards for SW-846
- TCLP Method Standards
- Test Mixes/USP 467 Calibration Mixtures
- TO-14 Air Monitoring Mixtures
- Underground Storage Tank Monitoring Standards
- VOA-Cyl™

### Convenience

Restek's special packaging stands apart from other manufacturers. Included with every standard:

- An ampoule breaker
- A deactivated amber screw top storage vial
- An extra label with important data
- Certificate of Analysis
- Material Safety Data Sheet

## RESTEK'S DATA PACK



Restek was the first manufacturer to provide complete QA documentation (data packs) on environmental standards. These data packs contain more than just raw material tests. Included is a lot report showing the exact gravimetric weight of each analyte and the volume of solvent used for dilution, a copy of the analytical balance printout with each analyte and lot number clearly identified, the statistical results from QA testing, copies of all the chromatograms, and a copy of the Certificate of Analysis.

### Quality

At Restek, quality doesn't begin with final product testing and end when the product is shipped from the factory. It begins with a total quality program that starts before the raw materials arrive. Only the highest purity raw materials are purchased and they are extensively tested for quality prior to their use in any standards. Every compound is analysed by melting point/refractive index, Differential Scanning Calorimetry (DSC), GC/FID and GC/MS using high resolution capillary columns.

### Restek Is ISO 9001 Certified



Restek's quality system has been officially granted ISO 9001 registration by the AT&T Quality Registrar. ISO 9001 is the most encompassing ISO standard, which includes a quality assurance system for manufacturing and also a quality assurance system for product design, development and service.



**Give us a try and discover  
the magic of Restek!**

For More Information:

- See the Restek Analytical Reference Materials Catalogue
- Visit Chromatographic Specialties on-line at [www.chromspec.com](http://www.chromspec.com) to request a catalogue (request code RK01)
- Call Chromatographic Specialties Inc. at 1-800-267-8103 to request a catalogue

# RESTEK PETROCHEMICAL STANDARDS

## WEATHERED PETROCHEMICAL STANDARDS

- For ASTM Fire Debris Analysis
- For Underground Storage Tank Monitoring

Laboratories analyzing fire debris and environmental samples often find it difficult to determine the type of petrochemical detected during an analysis because the petroleum product has “weathered” from exposure to heat, air, water, sunlight, and microbial action. All of these factors can lead to misidentification of the original product.

When arson is suspected, samples are taken from the site and analysed using ASTM E1387-90 methods. In these methods, quantitation is not performed, but identification of the accelerant (if any) is crucial. Weathering of the petrochemical can drastically change the chromatographic profile when compared to non-weathered material.

Restek now inventories weathered petrochemical products to meet many of these difficult situations. All of these standards are prepared from commercially acquired materials. The material is then weathered in the laboratory based upon a specific weight loss from the original weight of starting material. While they cannot duplicate all environmental or arson factors, these standards may be useful in identification of the type of petrochemical detected.

### Unleaded Gasoline (ASTM Class 2 Accelerant)

Product Number	Description	(concentrations are 5000 µg/mL in P/T methanol)	1 x 1 mL Price
RK30096	Unleaded Gasoline Standard (unweathered)		\$45.90
RK30097	Unleaded Gasoline Standard (25% weathered)		45.90
RK30098	Unleaded Gasoline Standard (50% weathered)		45.90
RK30099	Unleaded Gasoline Standard (75% weathered)		45.90

Product Number	Description	Kit Price
RK30100	Weathered Gasoline Kit Contains: 1 mL of each above: RK30096, RK30097, RK30098, RK30099	\$140.90

These weathered standards are prepared from a single source (one refinery) product. Samples of regular and premium grade unleaded gasoline were collected and then blended in equal volumes. For the diesel fuel, only one grade was used. The weathered materials indicate the percent weight loss from original starting material.

### Diesel Fuel #2 (ASTM Class 5 Accelerant)

Product Number	Description	(concentrations are 5000 µg/mL in methylene chloride)	1 x 1 mL Price
RK31233	Diesel Fuel #2 Standard (unweathered)		\$45.90
RK31234	Diesel Fuel #2 Standard (25% weathered)		45.90
RK31235	Diesel Fuel #2 Standard (50% weathered)		45.90
RK31236	Diesel Fuel #2 Standard (75% weathered)		45.90

Product Number	Description	Kit Price
RK31239	Weathered Diesel Fuel #2 Kit Contains: 1 mL of each above: RK31233, RK31234, RK31235, RK31236	\$140.90

## DATAPACKS

Stock standards include a basic “certificate of analysis”, which is a test chromatogram, analytical parameters, and related gravimetric records.

Data packs are designed to provide legal documentation regarding all aspects of a chemical standards product. The data packs include ALL raw material purity and identification results, gravimetric documentation, ALL quantitative assay raw data, ALL calibration assay raw data and a statistical comparison of sample and calibration data.

Datapacks, in a convenient pdf format, are available free of charge. Visit Restek’s website [www.restek.com](http://www.restek.com) and simply enter the Restek part number and lot number for your standard to access the file.

## RESTEK HYDROCARBON STANDARDS

D3710 Calibration Mix	
Compound	Concentration (% v/v)
2-methylbutane	10
n-pentane	8
2-methylpentane	6
n-hexane	6
2,4-dimethylpentane	6
n-heptane	10
toluene	12
n-octane	5
p-xylene	14
n-propylbenzene	5
n-decane	4
n-butylbenzene	4
n-dodecane	4
n-tridecane	2
n-tetradecane	2
n-pentadecane	2
Packaged 1 mL/ampoule RK31223 . . . . . \$48.90	

D2887 Calibration Mix	
Compound	Concentration (% v/v)
n-decane	12
n-dodecane	12
n-dotriacontane	1
n-eicosane	2
n-heptane	6
n-hexadecane	10
n-hexane	6
n-hexatriacontane	1
n-nonane	8
n-octacosane	1
n-octadecane	5
n-octane	8
n-tetracontane	1
n-tetracosane	2
n-tetradecane	12
n-tetratetracontane	1
n-undecane	12
Packaged 1 mL/ampoule RK31222 . . . . . \$48.90	

Diesel Range Organics Mix (EPA)	
decane (C10)	eicosane (C20)
dodecane (C12)	docosane (C22)
tetradecane (C14)	tetracosane (C24)
hexadecane (C16)	hexacosane (C26)
octadecane (C18)	octacosane (C28)
2000µg/mL each in $\text{CH}_2\text{Cl}_2$ , 1 mL/ampoule RK31064 . . . . . \$41.40	



## USP 467 STANDARD MIXTURES

### For Residual Solvents In Pharmaceuticals

USP revision USP25/NF20, effective January 2002, does not require further changes to calibration mixes. Revisions published in Supplement Two of USP24/NF19 became effective August 1, 2000. USP officially removed the limit test requirements for the benzene from any article specified to be tested for organic volatile impurities, except where a specific limit for benzene is in the individual monograph. USP 467 calibration mixes #4-#7 can be used when no benzene limit is specified in the monograph.

Restek still offers several USP calibration mixtures with benzene for monographs requiring those limit tests.



Product Number	Description	Price
RK36009	USP 467 Mix #7 Solvent - DMSO Chloroform . . . . . 60 µg/mL 1,4-dioxane . . . . . 380 methylene chloride . . . . . 600 trichloroethylene . . . . . 80	\$41.40
RK36008	USP 467 Mix #6 Solvent - Methanol Chloroform . . . . . 60 µg/mL 1,4-dioxane . . . . . 380 methylene chloride . . . . . 600 trichloroethylene . . . . . 80	41.40
RK36007	USP 467 Mix #5 Solvent - DMSO benzene . . . . . 2 µg/mL chloroform . . . . . 60 1,4-dioxane . . . . . 380 methylene chloride . . . . . 600 trichloroethylene . . . . . 80	41.40
RK36006	USP 467 Mix #4 Solvent - DMSO benzene . . . . . 2 µg/mL chloroform . . . . . 60 1,4-dioxane . . . . . 380 methylene chloride . . . . . 600 trichloroethylene . . . . . 80	41.40

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# REGIS DERIVATIZATION REAGENTS

Chromatographic Specialties Inc. now offers GC derivatization reagents from **Regis Technologies Inc.** Regis is a manufacturer of technically advanced chromatography products serving the analytical needs of scientists and researchers worldwide. Several of Regis' reagents are listed below. For derivatization procedures, applications, references or further product information, please contact our Technical Support Group at 1-800-267-8103 or tech@chromspec.com.

## BSA

### [N,O-Bis(trimethylsilyl)acetamide]

- Forms highly stable TMS derivatives, with most organic functional groups, under mild reaction conditions

Product Number	Description	Price
RT270501	10 x 1 g ampule	\$83.20
RT270502	4 x 5 g	78.70
RT270503	25 g	98.30
RT270504	100 g	219.40

## MSTFA - [N-Methyltrimethylsilyltrifluoroacetamide]

- Most volatile of the TMS-acetamides
- Useful in the analysis of volatile trace materials where derivatives elute near reagent or byproduct peak

RT270590	10 x1g	\$113.50
RT270589	10g	98.30
RT270593	25g	124.00
RT270594	100g	453.90

## BSTFA-REGISIL®/BSTFA +TMCS (1%, 10%)

### [N,O-Bis(trimethylsilyl)trifluoroacetamide]

- BSTFA reacts faster and more completely than BSA, due to trifluoroacetamide leaving group
- The high volatility of BSTFA and its byproducts results in non-co-elution of early eluting peaks
- Highly volatile and stable products result in low detector noise and fouling
- Excellent solubility and solvency
- Addition of TMCS catalyzes reactions of hindered functional groups and other difficult functionalities such as secondary hydroxyls and amines

### Regisil RC-1 (BSTFA)

RT270111	10 x 1 g ampule	\$105.90
RT270117	50 x 1 g ampule	546.50
RT270112	4 x 5 g	95.40
RT270113	25 g	105.90
RT270114	100 g	287.40

### Regisil RC-2 (BSTFA + 1% TMCS)

RT270121	10 x 1 g ampule	105.90
RT270127	50 x 1 g ampule	546.50
RT270122	4 x 5 g	95.40
RT270123	25 g	105.90
RT270124	100 g	287.40

### Regisil RC-3 (BSTFA + 10% TMCS)

RT270131	10 x 1 g ampule	\$105.90
RT270132	4 x 5 g	95.40
RT270133	25 g	105.90
RT270134	100 g	287.40

## HMDS

### [Hexamethyldisilazane]

- Weak TMS donor, used in silylating mixtures

RT270651	25 g	\$45.40
RT270652	100 g	90.80

## TMCS

### [Trimethylchlorosilane]

- Catalyst used to increase reactivity of other silylation reagents

Product Number	Description	Price
RT270601	25 g	\$45.40
RT270602	100 g	90.80

## TMSI - [Trimethylsilylimidazole]

- Potent, selective TMS donor that reacts with hydroxyls but not amines or amides
- Derivatives wet sugar samples, hindered hydroxyl groups in steroids and amino acids in fluorinated acylation reagents

RT270401	10 x 1g	\$83.20
RT270402	5g	42.40
RT270403	25g	101.30

## DERIVA-SIL

- TFA:TMCS:TMSI:Pyridine (3:2:3:10) formulation
- Derivatizes sterically-hindered compounds
- Reacts with carbohydrates, hydroxy- and keto-steroids, fatty acids, and some amines and amides
- Fast derivatizations, complete in minutes

RT270151	10 x 1 mL	\$128.60
RT270152	25 mL	128.60

## DERIVA-SIL CONCENTRATE

- BSTFA:TMCS:TMSI (3:2:3) concentrate formulation
- Used for applications where pyridine is undesirable (i.e., 3-ketosteroids)

RT270150	25 mL	\$143.70
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## HYDROX-SIL

- HMDS:TMCS:Pyridine (2:1:10) formulation for one-step derivatizations
- Fast formation of the TMS derivatives of organic acids, unhindered alcohols and phenols, and some amines

RT270455	10 x 1 mL ampule	\$98.30
RT270457	25 mL	83.20

## HYDROX-SIL AQ

- TMSI:Pyridine (21% w/v) formulation
- Forms TMS derivatives of hydroxyl and polyhydroxyl compounds in the presence of water

RT270451	10 x 1 mL ampule	\$98.30
RT270453	25 mL	83.20

## HYDROX-SIL CONCENTRATE

- HMDS:TMCS (2:1) concentrate formulation
- Suited for applications where pyridine in Hydrox-Sil is undesirable

RT270458	25 mL	\$121.00
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Derivatization can often be the key to unlocking and simplifying complex separation problems. Since derivatization is accomplished through the alteration of functional groups, it can facilitate meaningful analyses of compounds by:

- Increasing sample volatility
- Improving both selectivity and chromatographic efficiency
- Enhancing detectability

A variety of reactants can be used in preparing derivatives, but the resulting products are usually classified into several main categories. In GC Derivatization, replacement of active hydrogen in functional groups, such as -COOH, -OH, -NH and -SH is the primary area of concern.



# REGIS DERIVATIZATION REAGENTS

## 3N Butanolic HCl

- Used for derivatizing amino acids and acylcarnites
- Screening newborn infants for metabolic disorders

Product Number	Description	Price
RT201009	1 x 100 mL	\$72.60
RT201007	4 x 25 mL	72.60
RT201010	1 x 500 mL	340.40

## FLUORINATED ANHYDRIDES

[Heptafluorobutyric Anhydride/Pentafluoropropionic Anhydride/Trifluoroacetic Anhydride]

- Most commonly used for ECD
- React with alcohols, amines, and phenols
- Bases such as triethylamine and trimethylamine can be added to promote reactivity
- Frequently used for drugs of abuse confirmation
- HFBA derivatives are the most sensitive to ECD
- PFPA derivatives require the lowest analysis temperatures
- TFAA is the most reactive and volatile of the anhydrides

HFBA		
RT270851	10 x 1 g ampule	\$113.50
RT270853	25 g	151.30
PFPA		
RT640110	10 x 1 g ampule	143.70
RT640113	25 g	143.70
RT640114	100 g	416.10
TFAA		
RT270841	10 x 1 g ampule	98.30
RT270843	25 g	45.40

## PFPOH

2,2,3,3,3-Pentafluoropropanol

- Reacts more slowly with alcohols, phenols and thiols
- Works well in the analysis of sugars

RT270815	5 g	\$53.00
RT270816	25 g	143.70

## MBTFA - [N-Methyl-N-bis(trifluoroacetamide)]

- Reacts rapidly under mild conditions with primary and secondary amines
- Reacts more slowly with alcohols, phenols and thiols
- Works well in the analysis of sugars

RT270092	10 x 1 g	136.20
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## HFBI

[Heptafluorobutyrylimidazole]

- Fluorinated imidazole forms ECD derivatives well
- Reactions are fast and mild
- No decomposition or corrosion occurs on columns as imidazole is not acidic
- Works best with phenols, alcohols, and amines

RT270611	5 x 1 g ampule	\$158.90
RT270612	5 g	130.10

## Glas-Treet

- Used to deactivate active sites found in glassware, chromatography columns, and glass wool
- Does not coat glass; renders it inactive chemically

RT970069	4 x 25 mL	\$30.30
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## Col-Treet

- Silylating mixture designed for conditioning gas chromatography columns
- Eliminates peak tailing, peak broadening and residues which may reduce column efficiency
- Not to be used with any hydrogen bonding stationary phases such as CARBOWAX® or phases with active hydrogen sites

RT970130	10 x 1 mL	\$60.50
RT970131	4 x 5 mL	75.60

Contact our knowledgeable Technical Support Team at 1-800-267-8103 or by email at [tech@chromspec.com](mailto:tech@chromspec.com) for application assistance.

## GC Chiral Derivatization

- GC determination of enantiomeric purity is facilitated by using enantiopure derivatization reagents
- These derivatization reagents produce covalent diastereomers of the enantioenriched analytes
- TPC (N-TFA-L-Propyl Chloride) and MCF (1R, 2S, 5R-L-7-Menthylchloroformate trifluoroacetyl) are the most commonly used derivatization reagents

## TPC

N-Trifluoroacetyl-L-Propyl Chloride

RT440001	25 mL	\$151.30
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## MCF

(1R, 2S, 5R)-(-)-Menthylchloroformate

RT440003	25 mL	\$151.30
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## Free Literature



For your copy of the GC Derivatization Reagents Guide, please request literature code **RG01**. PDF format is also available.

Please contact our Technical Support Department at 1-800-267-8103 or [tech@chromspec.com](mailto:tech@chromspec.com) for more information.

# MACHEREY-NAGEL & UCT DERIVATIZATION REAGENTS



Silylation is the most widely used derivatization procedure for sample analysis by GC. The popularity of silylation reagents is enhanced by their ease of use and formation of derivatives. In silylation, an active hydrogen is replaced by an alkylsilyl group such as trimethylsilyl (TMS).

Compared to their parent compounds, silyl derivatives are more volatile, less polar, and more thermally stable. As a result, GC separation is improved and detection is enhanced.

TMS reagents are suitable for a wide variety of compounds, offer excellent thermal stability and can be used under a variety of GC conditions and applications.

Acylation reduces the polarity of amino, hydroxyl, and thiol groups and adds halogenated functionalities for ECD. In comparison to silylating reagents, the acylating reagents target highly polar, multifunctional compounds, such as carbohydrates and amino acids.

Alkylation reduces molecular polarity by replacing active hydrogens with an alkyl group. These reagents are used to modify compounds with acidic hydrogens, such as carboxylic acids and phenols. These reagents make esters, ethers, alkyl amines and alkyl amides. Reagents containing fluorinated benzoyl groups can be used for ECD.

## MACHEREY-NAGEL SILYLATION REAGENTS

### DMDCS [Dimethyldichlorosilane]

- Used to form dimethylsilyl (DMS) derivatives. DMS derivatives are much more susceptible to hydrolysis than TMS derivatives, therefore maintaining anhydrous conditions during the reaction are very important.

Product Number	Description	Qty	Price
MCN701230650	DMDCS	6 x 50 mL	\$220.50

### MSHFBA [N-methyl-N-trimethylsilyl-heptafluorobutyramide]

- Used for the general purpose trimethylsilylation of carboxylic acids, alcohols, phenols, primary and secondary amines and amino acids.

MCN701260201	MSHFBA	20 x 1 mL	\$290.20
MCN701260110	MSHFBA	1 x 10 mL	151.40
MCN701260510	MSHFBA	5 x 10 mL	557.50
MCN7012601100	MSHFBA	1 x 100 mL	848.30

## MACHEREY-NAGEL ALKYLATION REAGENTS

### DMF-DMA [N,N-dimethylformamidedimethylacetal]

- Used to methylate fatty acids, primary amines and some amino acids.

MCN701430201	DMF-DMA	20 x 1 mL	\$161.10
MCN701430110	DMF-DMA	1 x 10 mL	74.00

### TMSH [0.2M Trimethylsulfonium hydroxide in methanol]

- Recommended for free acids (fatty acids), their salts and derivatives as well as for phenols and chlorophenols, which can be detected in very small amounts.

MCN701520101	TMSH	10 x 1 mL	\$150.80
MCN701520201	TMSH	20 x 1 mL	271.70
MCN701520110	TMSH	1 x 10 mL	157.90
MCN701520510	TMSH	5 x 10 mL	640.10

## UCT ACYLATION REAGENTS

### TFAI [Trifluoroacetylimidazole]

- Reacts readily with alcohols, phenols and amines to produce stable, volatile derivatives for TCD, FID, ECD and other detectors.

UCTSTFAI01	TFAI	10 x 1 gram vials	\$212.70
UCTSTFAI05	TFAI	5 gram vial	80.70

## UCT ALKYLATION REAGENTS

### TMPAH [0.2M Trimethylanilinium Hydroxide in Methanol]

- Used for the methylation of barbiturates, sedatives, xanthines and alkaloids.

UCTSTMPAH010	TMPAH	10 gram vial	\$84.40
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*A full selection of Macherey-Nagel and UCT reagents is available.  
Please inquire.*

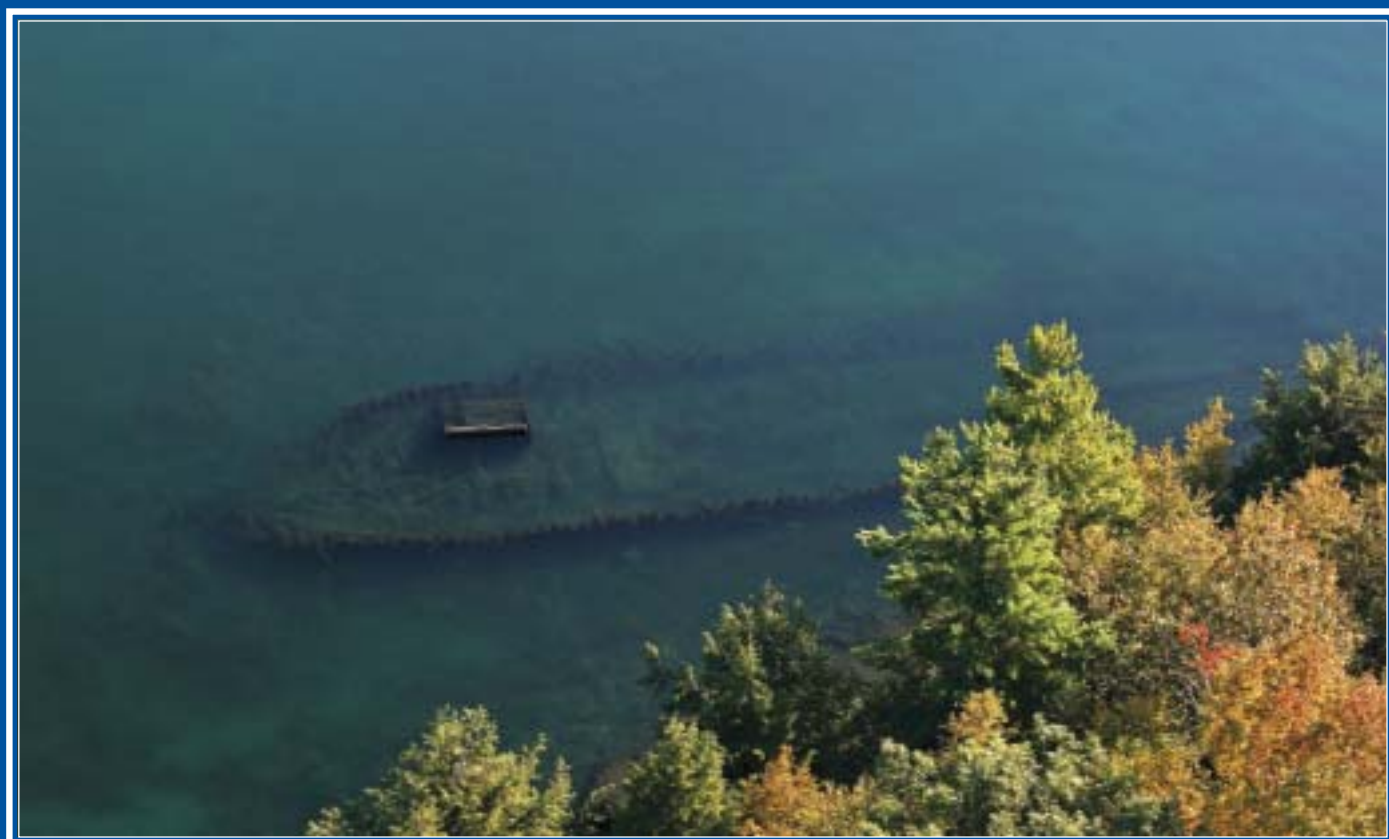
# SAMPLE PREPARATION

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For SPE Applications, please visit our website at [www.chromspec.com](http://www.chromspec.com) or contact our Technical Support Group.

## 1-800-267-8103





# SYRINGE FILTER SELECTION

## A GUIDE TO SYRINGE FILTER SELECTION

### STEP 1 Determine Your Filtering Needs

*To choose the appropriate syringe filter for your application, you need to determine the amount of filtration required or the pore size needed.*

- 0.2 µm pore size is used for removing fine particles from solutions and sterile venting
- 0.45 µm pore size is used primarily for sample clarification of chromatography samples
- 1.0 µm/2.5 µm/5.0 µm pore sizes are used for coarse particle removal or viscous samples
- Difficult to filter solutions may require glass pre-filters to prevent the filter membrane from clogging

### STEP 2 Determine Your Filtering Needs

*To choose the appropriate syringe filter for your application, you need to determine the amount of filtration required or the pore size needed.*

Properties	PE	Nylon	PES	PP	PTFE	PVDF	CA	MCE	GF	RC
Hydrophilic	Y	Y	Y	N	N	Y	Y	Y	Y	Y
Autoclavable	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Low Protein Binding	N	N	Y	N	N	Y	Y	Y	N	Y
Sterile Filters Available	N	Y	Y	N	N	Y	Y	N	N	Y
Chemical Compatability										
Aromatic Hydrocarbons	Y	L	L	L	Y	Y	Y	Y	Y	Y
Chlorinated Hydrocarbons	Y	N	N	N	Y	Y	N	N	Y	Y
Oxygenated Organics (alcohols, ketones)	Y	L	N	L	Y	N	N	N	Y	Y
Nitrogen Containing Solvents (DMF, Amides)	Y	Y	N	L	Y	N	N	N	Y	N
Acids	L	N	N	N	L	N	N	N	Y	N
Bases	L	N	N	N	Y	N	N	N	N	N

*For more specific compatability information, please contact our Technical Support Department at 1-800-267-8103 or [tech@chromspec.com](mailto:tech@chromspec.com).*

**PE** - polyester  
**PES** - polyethersulfone  
**PP** - polypropylene  
**PTFE** - Teflon  
**PVDF** - polyvinylidene difluoride

**CA** - cellulose acetate  
**MCE** - mixed cellulose ester  
**GF** - glass fibre  
**RC** - regenerated cellulose

**Y** = yes      **N** = no      **L** = limited

### STEP 3 Determine The Syringe Filter Size

*The size of the syringe filter that you choose is dependent on the sample volume to be filtered.*

- 4 mm syringe filters for sample volumes up to 1 mL
- 13 mm syringe filters for sample volumes from 1-10 mL
- 25 mm syringe filters for sample volumes from 10-100 mL
- For very viscous or highly contaminated solutions, switching to a larger syringe filter size is advisable

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## CHROMSPEC™ . . . The Name for Affordable Quality

- Ultra clean
- Autoclavable
- Fusion sealing ensures purity of filtrate and eliminates bursting
- Best combination of large surface area with minimal hold-up volume
- Durable polypropylene housing for increased solvent resistance
- Female Luer Lock inlet connection to ensure a secure fitting and a Male Slip Luer Fitting
- Individually labeled to prevent confusion or unnecessary waste
- Available in 4 mm, 13 mm and 25 mm sizes for an increased selection for your filtering needs
- Samples available



### CHROMSPEC™ NON-STERILE SYRINGE FILTERS

Size (mm)	Membrane Type	Pore (µm)	Product Number	Pkg. 100 Price	Product Number	Pkg. 500 Price	Product Number	Pkg. 1000 Price
25	Nylon	0.20	CS25N201	\$135.00	CS25N202	\$590.00	CS25N203	\$985.00
25	Nylon	0.45	CS25N451	135.00	CS25N452	590.00	CS25N453	985.00
25	PTFE	0.20	CS25T201	135.00	CS25T202	590.00	CS25T203	985.00
25	PTFE	0.45	CS25T451	135.00	CS25T452	590.00	CS25T453	985.00
25	PVDF	0.45	CS25P451	135.00	CS25P452	590.00	CS25P453	985.00
13	Nylon	0.20	CS13N201	\$115.00	CS13N202	\$495.00	CS13N203	\$825.00
13	Nylon	0.45	CS13N451	115.00	CS13N452	495.00	CS13N453	825.00
13	PTFE	0.20	CS13T201	115.00	CS13T202	495.00	CS13T203	825.00
13	PTFE	0.45	CS13T451	115.00	CS13T452	495.00	CS13T453	825.00
13	PVDF	0.20	CS13P201	115.00	CS13P202	495.00	CS13P203	825.00
13	PVDF	0.45	CS13P451	115.00	CS13P452	495.00	CS13P453	825.00
4	Nylon	0.20	CS04N201	\$98.50	CS04N202	\$450.00	CS04N203	\$750.00
4	Nylon	0.45	CS04N451	98.50	CS04N452	450.00	CS04N453	750.00
4	PTFE	0.20	CS04T201	98.50	CS04T202	450.00	CS04T203	750.00
4	PTFE	0.45	CS04T451	98.50	CS04T452	450.00	CS04T453	750.00

# ALL PURPOSE SYRINGE FILTERS FROM MACHEREY-NAGEL

CHROMAFIL®

NEW

## CHEMICAL RESISTANCE COMPARISON

SOLVENT	MCE	CA	NYLON	PTFE	PVDF	PE	GF	PP
Acetaldehyde	-	-	O	+	-	+	+	O
Acetic acid, 100%	-	-	-	+	O	+	+	+
Acetone	-	-	+	+	-	+	+	+
Acetonitrile	-	-	+	+	O	+	+	+
Ammonia, 25%	-	-	-	+	+	O	+	+
Benzene	+	+	+	+	+	+	+	O
n-Butanol	+	+	O	+	O	+	+	+
Carbon tetrachloride	+	-	+	+	+	+	+	O
Chloroform	+	-	-	+	+	+	+	-
Cyclohexane	+	+	O	+	+	+	+	+
Diethyl ether	O	O	+	+	O	+	+	O
Dimethylformamide	-	-	+	+	-	+	+	+
1,4-Dioxane	-	-	+	+	O	+	+	O
Ethanol	-	+	+	+	+	+	+	+
Ethyl acetate	-	-	+	+	O	+	+	O
Ethylene glycol	O	O	+	+	+	+	+	+
Formic acid, 100%	+	-	-	+	O	O	+	+
Hydrochloric acid, 30%	-	-	-	+	O	-	+	+
Methanol	-	-	+	+	+	+	+	+
Methylene chloride	+	-	-	+	O	+	+	-
Nitric acid, 65%	-	-	-	O	O	O	+	-
Oxalic acid, 10% aq.	+	-	-	+	+	+	+	+
Petroleum ether	+	+	+	+	+	+	+	+
Phosphoric acid, 80%	-	-	-	+	O	+	+	+
Potassium hydroxide, 1mol/l	-	-	+	+	O	O	+	+
2-Propanol	+	+	+	+	+	+	+	+
Sodium hydroxide, 1mol/l	-	-	+	+	O	O	O	+
Tetrahydrofuran	-	-	O	+	+	+	+	O
Toluene	+	-	+	+	+	+	+	O
Trichloroethylene	+	+	O	+	+	+	+	O
Urea	+	+	+	+	+	+	+	+
Water	+	+	+	+	+	+	+	+
Xylene	+	+	+	+	+	+	+	O

+ resistant, - not resistant, O limited resistance

PP = polypropylene, MCE = cellulose mixed esters,  
CA = cellulose acetate, RC = regenerated cellulose,  
Nylon, PTFE = polytetrafluoroethylene (Teflon),  
PVDF = polyvinylidene difluoride, PET = polyester,  
GF = glass fibre

## Polyester syringe filters from Macherey-Nagel

This membrane features outstanding chemical resistance and is suitable for both polar and non-polar solvents. This **all purpose membrane** is recommended for sterile filtration, filtration of aggressive media, for dust and aerosol analyses, ultrapurification of solvents, etc. It is very well suited for TOC/DOC determination. The membrane is not cytotoxic and does not inhibit the growth of microorganisms and higher cells.



## Technical Data

The membrane housing consists of polypropylene. This material is very resistant to most solvents and is very low in extractables. The filters can be used with almost all solvents, acids and bases (see table). Both filter inlet and outlet can be fitted to CHROMOBOND® SPE columns for sample preparation with the aid of special adaptors. All filters can be autoclaved at 121°C for 30 minutes.

Product Number	Filter Diameter (mm)	Pore (µm)	Qty	Price
MCN729021	25	0.20	100	\$138.90
MCN729020	25	0.45	100	138.90
MCN729029	25	1.20	100	138.90
MCN729022	15	0.20	100	138.90
MCN729023	15	0.45	100	138.90
MCN729021500	25	0.20	500	621.60
MCN729020500	25	0.45	500	621.60
MCN729029500	25	1.20	500	621.60
MCN729022500	15	0.20	500	621.60
MCN729023500	15	0.45	500	621.60
MCN729021M	25	0.20	1000	1,096.80
MCN729020M	25	0.45	1000	1,096.80
MCN729029M	25	1.20	1000	1,096.80
MCN729022M	15	0.20	1000	1,096.90
MCN729023M	15	0.45	1000	1,096.80

*Not sure which filter is best for your application?  
Contact our Technical Support Team for answers!*

**1-800-267-8103 • tech@chromspec.com**

*For disposable plastic syringes, see page 297*

## WHATMAN GD/X SYRINGE FILTERS

Whatman GD/X syringe filters are manufactured with a unique pre-filtration stack of Whatman GMF-150 and GF/F glass microfiber media which allows you to filter even the most difficult samples with less hand pressure.

### Features and Benefits

- Increased volume throughput - Volume of sample filtered can be three to seven times greater than conventional filters
- Rigorous testing of each lot ensures product reliability
- The unique pre-filter layer allows high particulate samples to be filtered with less hand force, minimizing operator fatigue
- Manufactured with pigment free polypropylene housing to eliminate presence of extractables

## 25mm WHATMAN GD/X SYRINGE FILTERS

Membrane	Pore (µm)	Product Number	Pkg. 50 Price	Product Number	Pkg. 150 Price	Product Number	Pkg. 1500 Price
Nylon	0.20			WH68702502	\$399.60	WH68712502	\$1,725.00
Nylon	0.45			WH68702504	399.60	WH68712504	1,725.00
PTFE	0.20			WH68742502	399.60	WH68752502	1,840.00
PTFE	0.45			WH68742504	399.60	WH68752504	1,725.00
PVDF	0.20	WH69002502*	\$140.40	WH68722502	399.60	WH68732502	1,840.00
PVDF	0.45	WH69002504*	140.40	WH68722504	399.60	WH68732504	1,725.00
PES	0.20	WH68962502*	140.40	WH69042502	387.90	WH69052502	1,725.00
PES	0.45	WH68962504*	140.40	WH69042504	399.60	WH69052504	1,725.00
PP	0.20			WH68782502	399.60		
PP	0.45			WH68782504	399.60	WH68792504	1,840.00
CA	0.20	WH69012502*	140.40	WH68802502	399.60		
CA	0.45	WH69012504*	140.40	WH68802504	399.60	WH68812504	1,725.00
GF/D	2.7			WH68882527	399.60		
GF/F	0.7			WH68902507	399.60	WH68912507	1,725.00
GMF	0.45	WH69022504*	140.40	WH68942504	399.60	WH68952504	1,725.00

\* Sterile syringe filters  
Available in 13mm. Please inquire.

## 30 mm TITAN2 SYRINGE FILTERS

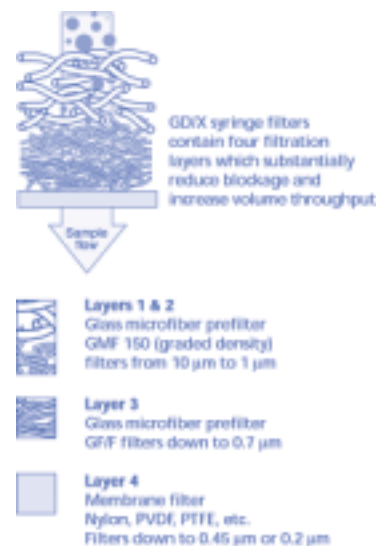
### Specifications

- Retention Volume < 137 µL
- Female Luer Lock Inlet
- HPLC Certified Membranes
- Maximum Operating Pressure 90 psi
- Male Slip Outlet
- Medical Grade Polypropylene Housing

Product Number	Membrane	Porosity µm	Pre-Filter Recommended	Sample Vol. (mL)	Qty	Price
SB42225NN	Nylon	0.20	Yes	<150	100	\$152.40
SB44525NN	Nylon	0.45	Yes	<150	100	152.40
SB44525NC	Nylon	0.45	Yes	<150	500	726.90
SB45025NN	Nylon	5.0	No	<100	100	152.40
SB42225NP	PTFE	0.20	Yes	<150	100	157.00
SB44525NP	PTFE	0.45	Yes	<150	100	157.00
SB44525PC	PTFE	0.45	Yes	<150	500	703.40
SB42225PV	PVDF	0.20	Yes	<150	100	163.50
SB44525PV	PVDF	0.45	No	<150	100	163.50
SB42225PS	PES	0.20	Yes	<30	100	165.50
SB44525PS	PES	0.45	No	<30	100	165.50
SB42225PP	Polypropylene	0.20	No	<150	100	152.50
SB44525PP	Polypropylene	0.45	No	<150	100	152.40
SB42225CA	Cellulose Acetate	0.20	No	<150	100	152.50
SB44525CA	Cellulose Acetate	0.45	No	<150	100	152.50

Available in 4 and 17mm. Please inquire.

GD/X syringe filters contain four filtration layers which help reduce blockage and increase volume throughput.



Request literature code **WH02** for more information on Whatman GD/X syringe filters.



### Titan2 Syringe Filters

- 30 mm and 17 mm syringe filters have larger filtration areas for enhanced throughput
- Standard 1 µm pre-filter ensures increased sample handling capacity
- Sample distribution rings maximize filtration area, uniformity and speed
- Low extractables
- Color coded sealing ring permits instant identification of filter membrane and porosity
- Sealing ring minimizes bursting and leakage
- Vigorous QC testing ensures quality and reproducibility, filter to filter
- Validated for HPLC performance with a standard test mixture



# CHROMSPEC™ MEMBRANE FILTERS

**Introducing CHROMSPEC™ Membrane Filters**  
**... the newest addition to the CHROMSPEC™ line.**



- Optimized for HPLC media prep, pharmaceuticals and cold sterilization
- Low extractables for cleaner filtrates
- Conveniently packaged for easy removal of membrane disc
- Affordable
- Available in 13, 25, 47 and 90mm diameters
- Nylon membranes for filtration of aqueous solutions
- Teflon membranes for filtration of organic solutions
- Samples available

Product Number	Description	Qty	Price
CSMF47N45	47 mm Nylon 0.45 µm	100	\$96.90
CSMF47N20	47 mm Nylon 0.20 µm	100	96.90
CSMF25N45	25 mm Nylon 0.45 µm	100	75.30
CSMF13N45	13 mm Nylon 0.45 µm	100	63.90
CSMF47T10	47 mm PTFE 1.0 µm	100	163.30
CSMF47T45	47 mm PTFE 0.45 µm	100	110.20
CSMF47T20	47 mm PTFE 0.20 µm	100	110.30

*Other diameters, pores sizes and membranes are available including an assortment of products from Whatman.  
For more information, contact our knowledgeable Technical Support Team toll free  
1-800-267-8103 or by email [tech@chromspec.com](mailto:tech@chromspec.com).*

*See page 265 for 25 and 47mm filtration glassware.*

*We are continuously adding innovative products to our CHROMSPEC™ product line,  
we encourage you to visit our website at [www.chromspec.com](http://www.chromspec.com) for product updates.*

**CHROMSPEC™ ...The Name for Affordable Quality**

## GLASS FILTRATION APPARATUS

### 25 mm Filter Assembly (N419325)

Assembly includes a fritted glass filter support base, an aluminum clamp, and a 15 mL glass funnel. Support base is constructed of a coarse porosity fritted glass disc. Clamp fastens support base and funnel to prevent leakage.

### 47 mm Filter Assembly (N419370)

This assembly has the same advantages as the N419325 with the exception of a Teflon-faced base and funnel which allows the assembly to be autoclaved with the filter membrane in place. Funnel 300 mL.

### 47 mm Vacuum Filter Assembly with $\nabla$ 40/35 Joints (N419380)

The 47 mm Vacuum Filter Assembly with  $\nabla$  40/35 Joints is ideal for HPLC solvent/sample filtrate recovery, as well as filtration of corrosive liquids for particulate contamination analysis. The flask and fritted glass base are joined with a  $\nabla$  40/35 ground joint, so liquids will only come in contact with borosilicate glass. The vacuum hose connection is located above the filtration drip tip to prevent contamination in the vacuum line.



25 mm Filter Assembly  
(Product Number: N419325)

## GLASS FUNNEL / SUPPORT ASSEMBLIES

Product Number	Funnel Capacity	Filter Dia.	Flask	Price
N419325	15 mL	25 mm	125 mL (not included)	\$169.20
N419370	300 mL	47 mm	1000 mL (not included)	232.90
N419380	300 mL	47 mm	1000 mL (included)	328.90

## FILTER FLASKS

Product Number	Flask Capacity	Description	Price
N635245	1000 mL	For use with 300 mL filtr. app.	\$134.30

## ACCESSORIES

Product Number	Description	Fig.	Price
N419350	300 mL Glass Funnel	3	\$68.80
N419415	500 mL Glass Funnel	2	75.80
N419420	1000 mL Glass Funnel	2	84.20
N419382	Glass Filter Vacuum Connection	3	194.90
N635525	1000 mL Ground Glass Flask	3	145.80
N419336	Silicone Stopper #5, Pkg. 6	1	63.00
N419356	Silicone Stopper #8, Pkg. 6	2	70.20
N419354	Aluminum Clamp, 47 mm	all	52.80
N419334	Aluminum Clamp, 25 mm	all	49.40



47 mm Glass Funnel/Support Assembly  
(Product Number: N419370)



All-Glass 47 mm Funnel/Support Assembly  
(Product Number: N419380)

*Chromatographic Specialties Inc. carries an extensive range of filtration devices and media from ACE Glass, Whatman, Wheaton and others.*

*Please contact our Technical Support Group to help you find exactly what you need!*

# WHATMAN FILTER PRODUCTS



POLYCAP™ Capsule Filters

- Ideal for filtration of aqueous and solvent samples
- Available in pore sizes ranging from 1 to 20µm
- Available in two sizes, Polycap™ 35 and Polycap™ 75
- Large filtration area
- Standard hose barb connections  
Polycap™ 35 3/8" tubing  
Polycap™ 75 1/2" tubing

## Membrane Filters

Chromatographic Specialties offers the entire line of Whatman Schleicher & Schuell membrane filters.

- Anopore
- Cyclopore® Track-Etched
- Nucleopore® Track-Etched
- Hemafil™ Polycarbonate Track Etched
- Membra-Fil® Mixed Cellulose Esters
- Flow Through Nitrocellulose Membranes
- PRIMA lateral flow membranes

## WHATMAN POLYCAP™ CAPSULE FILTERS

Whatman Polycap™ capsule filters are high surface area in-line devices for applications involving larger volumes of solution. The devices feature a high purity polypropylene housing which is free of adhesives or chemicals to ensure sample purity. They are available with a choice of pore sizes and are autoclavable (excluding products with a filling bell). Whatman offers a wide variety of Polycap filters to meet your specific needs.

**HD:** Ideal for filtration of aqueous solvent samples. **Non-sterile.**

**TC:** Safe and efficient filtration of biological and tissue culture solutions. **Sterile.**

**TF:** Designed for use with organic solvents and chemically aggressive solutions. **Non-sterile.**

**AS:** Suitable for large volume aqueous samples. Glass microfiber pre-filter. **Sterile.**

Phase	Membrane	Pore Size (µm)	Vent	Polycap 36	Price each	Polycap 75	Price each
HD	Polypropylene	1.0	No	WH67033610	\$54.90	WH67037510	\$78.20
HD	Polypropylene	5.0	No	WH67033650	54.90	WH67037550	78.20
HD	Polypropylene	10.0	No	WH67033611	54.90	WH67037511	78.20
HD	Polypropylene	20.0	No	WH67033621	54.90	WH67037521	78.20
TC	Polyethersulfone	0.2/0.2	Yes	WH67143602	80.50	WH67147502	126.40
TC	Polyethersulfone	0.65/0.45	Yes	WH67143604	80.50	WH67147504	126.40
TF	PTFE	0.2	Yes	WH67003602	89.90	WH67007502	117.70
TF	PTFE	0.45	Yes	—	—	WH67007504	117.70
AS	Nylon	0.2	Yes	WH67053602	56.70	WH67057502	80.00
AS	Nylon	0.45	Yes	WH67053604	56.70	WH67057504	80.00

\* All product numbers in the above table feature standard hose barb connections.

The Polycap™ 75 has a larger filtration area than the Polycap™ 35; contact Technical Support for individual capsule filter specifications.

Polycap™ capsule filters are available with other connection fittings, pore sizes and volumes; contact our Technical Support Team at 1-800-267-8103 or by email at [tech@chromspec.com](mailto:tech@chromspec.com) for more information.

## WHATMAN SCHLEICHER & SCHUELL MEMBRANE FILTERS

Whatman membranes are renowned for their consistent high quality and superior performance.

- Nylon for the filtration of aqueous and organic mobile phases
- Polyethersulfone (PES) for the filtration of biological samples
- Anopore inorganic membrane with honeycomb structure for micrometer and nanometer filtration

Product Number	Diameter (mm)	Membrane	Pore Size (µm)	Qty	Price
WH7404002	25	Nylon	0.45	100	\$87.70
WH68096002	25	Anopore	0.02	50	141.90
WH68096012	25	Anopore	0.1	50	141.90
WH7402004	47	Nylon	0.2	100	120.80
WH68095022	47	Anopore	0.2	50	176.10
WH7404004	47	Nylon	0.45	100	126.80
WH7408004	47	Nylon	0.8	100	134.50
WH7404009	90	Nylon	0.45	100	157.90

If you don't see the membrane you need,  
contact our Technical Support Team at 1-800-267-8103 for available products.

## WHATMAN MINI-UNIPREP™ SYRINGELESS FILTERS

Whatman's Mini-UniPrep™ Syringeless filter is a unique assembly that provides a fast and easy way to remove particulates from HPLC samples.

The Mini-UniPrep™ features a sample reservoir and a membrane fitted plunger that incorporates a cap and septa on one end. To use, simply place unfiltered sample in the reservoir, install and depress plunger. The pre-capped and filtered sample is ready for the autosampler.

Product Number	Membrane	Pore Size (µm)	Qty	Price
WHUN203NPUNYL	Nylon	0.45	100	\$256.80
WHUN203NPENYL	Nylon	0.20	100	256.80
WHUN203NPUORG	PTFE	0.45	100	256.80
WHUN203NPEORG	PTFE	0.20	100	256.80
WHUN203NPUAQU	PVDF	0.45	100	256.80
WHUN203NPEAQU	PVDF	0.20	100	256.80
WHUN203NPUPES	PES	0.45	100	256.80
WHUN203NPEPES	PES	0.20	100	215.80
WHUN203NPUPP	Polypropylene	0.45	100	256.80
WHUN203NPEPP	Polypropylene	0.20	100	256.80
WHUN203NPUGMF	Glass Microfiber	0.45	100	256.80

The Mini-UniPrep™ is also available in amber for light sensitive samples or with pre-slit PTFE coated silicone rubber for automated injectors. Contact our Technical Support Team for part numbers and pricing.

## WHATMAN EXTRACTION THIMBLES

Whatman cellulose and glass microfiber extraction thimbles are known for their purity and consistent high quality. The thimbles are widely used in Soxhlet extraction units providing a safe, convenient and efficient method of solvent extraction of solids and semi-solids.

Cellulose extraction thimbles are produced from high quality alpha cellulose cotton linter and have excellent mechanical strength and retention.

High purity glass microfibre thimbles manufactured from 100% pure borosilicate glass are available for specialized applications. The thimbles are completely free of binders or additives and can be used at temperatures up to 500°C or when using solvents incompatible with cellulose thimbles.

### Cellulose Extraction Thimbles, Pkg. 25

Dimensions (mm)	Single Thickness	Price	Double Thickness	Price
10 x 50	WH2800105	\$84.50	-	-
16 x 60	WH2800166	84.50	WH2810166	\$117.40
19 x 90	WH2800199	84.50	-	-
22 x 65	WH2800226	84.50	-	-
22 x 80	WH2800228	89.60	WH2810228	117.40
25 x 80	WH2800258	89.60	WH2810258	117.40
25 x 90	WH2800259	89.60	-	-
25 x 100	WH2800250	89.60	-	-
26 x 60	WH2800266**	95.60	WH2810266**	126.70
30 x 77	WH2800307	95.60	-	-
30 x 80	WH2800308	95.60	-	-
30 x 100	WH2800300	95.60	-	-
33 x 80	WH2800338	109.70	WH2810338	155.50
33 x 94	WH2800339	109.70	WH2810339	155.50
33 x 118	WH2800331	109.70	-	-
43 x 123	WH2800432	148.00	WH2810432	203.50
60 x 180	WH2800608	190.50	-	-

\*\* Fits Soxtec™ extractor

### Glass Microfiber Thimbles-Grade HP-GF, Pkg. 25

19 x 90	-	-	WH2814199	\$146.50
30 x 100	-	-	WH2814300	146.50
43 x 123	-	-	WH2814432	280.20



Whatman Mini-UniPrep™

- All-in-one filtration process allows you to process sample loads in one third the time with fewer consumables required
- Available in a wide range of membranes
- Compatible with most autosamplers



Extraction Thimbles

- Available in a range of sizes and wall thicknesses to suit your application
- Standard single thickness thimbles have a wall thickness of approximately 1 mm (10 µm nominal particle retention)
- Double thickness thimbles have a wall thickness of approximately 2 mm (6 µm nominal particle retention for cellulose) for applications where higher retention and increased wet or dry strength or rigidity is required
- Designed to fit most commercially available Soxhlet extractors
- No binders are added

See Page 292 for glass thimbles.

Chromatographic Specialties Inc. carries a line of Soxhlet extractors, see page 292.



# WHATMAN FILTER PAPER

## WHATMAN GLASS MICROFIBRE FILTERS

Whatman glass microfibre filters have wide application in many areas of laboratory use. In particular, they can be used to advantage when filtration of fine precipitate through cellulose media is slow and increased loading capacity is required. Applications include research and process biochemistry, liquid scintillation counting, radioimmunoassay, water and wastewater analysis, air pollution monitoring and prefiltration.

### Glass Microfibre Filters Circles (100 per box) \*(25 per box)

Dia. (cm)	934AH	GF/A	GF/B	GF/C	GF/D	GF/F
4.25	WH1827042 \$36.70	WH1820042 \$35.00	WH1821042 \$71.40	WH1822042 \$66.10	WH1823042 \$42.20	WH1825042 \$122.70
4.7	WH1827047 44.80	WH1820047 39.00	WH1821047 84.70	WH1822047 88.30	WH1823047 49.20	WH1825047 131.70
5.5	WH1827055 47.10	WH1820055 41.50	WH1821055 91.70	WH1822055 104.90	WH1823055 56.60	WH1825055 155.60
7.0	WH1827070 59.00	WH1820070 48.70	WH1821070 122.70	WH1822070 113.70	WH1823070 79.00	WH1825070 181.00
9.0	WH1827090 98.80	WH1820090 73.40	*WH1821090 39.50	WH1822090 159.30	*WH1823090 32.90	*WH1825090 63.20
11.0	WH1827110 110.50	WH1820110 102.20	*WH1821110 45.70	WH1822110 253.10	*WH1823110 43.20	*WH1825110 93.80
12.5	WH1827125 135.70	WH1820125 130.30	*WH1821125 61.70	WH1822125 272.70	*WH1823125 56.80	*WH1825125 111.30
15.0	WH1827150 176.50	WH1820150 176.30	*WH1821150 92.60	WH1822150 487.70	*WH1823150 98.80	*WH1825150 172.20

Glass and Quartz rectangular filters for PM10 analyses are also available,  
contact our Technical Support Team for further information and assistance.

## WHATMAN MEMBRANE FILTERS

Cellulose Nitrate (Type WCN) Membranes are recommended for the majority of routine applications. This grade is manufactured under strictly controlled cleanroom conditions. Usually, it can directly replace the general purpose membrane filters of other manufacturers without requiring any significant change of technique.

### Cellulose Nitrate (Type WCN) White Plain Circles (100 per box)

Dia. (mm)	0.1 µm	0.2	0.3	0.45	0.65	0.8	1.0	3.0	5.0
13	_____	_____	_____	WH7184001 \$86.70	_____	_____	_____	_____	_____
25	WH7181002 \$277.40	WH7182002 \$112.30	_____	WH7184002 80.60	_____	_____	WH7190002 \$112.20	WH7193002 \$113.50	WH7195002 \$109.90
37	_____	_____	_____	WH7184003 134.80	_____	_____	_____	_____	_____
47	WH7181004 347.20	WH7182004 156.00	_____	WH7184004 132.40	WH7186004 167.30	WH7188004 150.40	WH7190004 167.50	WH7193004 164.70	WH7195004 167.50

### PTFE (Type WTP) White Plain Circles (100 per box)

Dia. (mm)	0.2 µm	0.5	1.0
25	WH7582002 \$322.10	_____	WH7590002 \$313.20
47	WH7582004 417.20	WH7585004 438.70	WH7590004 425.40

### Cellulose Nitrate (Type WCN) Sterile 0.45 µm (sealed in polyester envelopes) (boxes of 100 envelopes)

Black Plain	White Grid	Black Grid	Green Grid	White Grid *
_____	_____	_____	_____	_____
Other Diameters Available	WH7141104 \$77.00	WH7153104 \$177.30	_____	WH7141114 \$77.50

Packed individually with an absorbent pad

\* Packed individually without pads

PM 2.5 PTFE filters are also available,  
contact our Technical Support Team for further information and assistance.

# UNITED CHEMICAL TECHNOLOGIES SPE COLUMNS

United Chemical Technologies, Inc. is a market leader in the field of silica based solid phase extraction technology. UCT manufactures a wide range of highly reproducible columns which allow the chromatographer to achieve a consistent extraction technique.



A significant effort has been put into learning and developing the polymeric silicon chemistries related to silica gel and its surface modified polymers. UCT's product line has grown to include over 35 bonded phases which are used in the drug testing industry as well as the pharmaceutical, environmental, agricultural and biotechnology markets.

UCT bonded phases are vigorously tested to ensure lot to lot reproducibility and performance. Careful attention to particle size distribution, pore diameters and assembly assures consistent column flow. Sorbents are thoroughly tested to meet or exceed quality expectations.

Here is an overview of UCT's product line-up:

**Clean-Screen® DAU, TCH:** Allows for maximum selectivity for extraction of acids, bases, and neutrals  
**Request Literature Code UCT12**

**Clean-Screen® GHB:** Allows for extraction of gamma hydroxybutyric acid

**XtrackT®:** Gravity-flow columns; Allows for extraction of acids, neutrals, bases in viscous samples such as equine urine, post-mortem blood and tissues, amniotic fluid, and meconium  
**Request Literature Code UCT15**

**Reduced Solvent Volume:** Uses 75% less solvent than the traditional packed column  
**Request Literature Code UCT14**

**Style Screen®:** Polymeric resins which allow for extraction of acidic, basic and neutral compounds

**Clean-Up® Copolymeric:** Allows for both extraction of neutral and charged compounds  
**Request Literature Code UCT16**

**Clean-Up® Hydrophobic:** Used to extract compounds which exhibit non-polar or neutral characteristics out of complex matrices

**Clean-Up® Hydrophilic:** Used for extraction of amines, hydroxyls, and carbonyls

**Clean-Up® Ion Exchange:** Used for analysis of anions and cations

**Clean-Up® Carbon:** Used for isolation of extremely polar organic compounds

**Enviroclean®:** Designed for the isolation and separation of environmental analytes such as pesticides, herbicides, polyaromatic hydrocarbons, polychlorinated biphenyls, and other environmental related compounds with the absence of a plasticizer background. Included in this line are Dispersive SPE products for **QuEChERS** clean-up of pesticides and herbicides in fruits and vegetables.  
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# SOLID PHASE SORBENT SELECTION

## ORGANIC LOADING AND EXCHANGE CAPACITY



### REVERSE PHASE (Hydrophobic)

Sorbent	Structure	% Organic Loading	Applications
C2 ethyl	-SiCH <sub>2</sub> CH <sub>3</sub>	6.60	Removes larger or more hydrophobic compounds
C3 propyl	-Si(CH <sub>2</sub> ) <sub>2</sub> CH <sub>3</sub>	7.60	
C4 n-butyl	-Si(CH <sub>2</sub> ) <sub>3</sub> CH <sub>3</sub>	8.50	
Ci4 isobutyl	-SiCH <sub>2</sub> CH(CH <sub>3</sub> ) <sub>2</sub>	8.80	
Ct4 tertiary	-SiC(CH <sub>3</sub> ) <sub>3</sub>	8.50	
C5 pentyl	-Si(CH <sub>2</sub> ) <sub>4</sub> CH <sub>3</sub>	9.50	
C6 hexyl	-Si(CH <sub>2</sub> ) <sub>5</sub> CH <sub>3</sub>	11.00	
C7 heptyl	-Si(CH <sub>2</sub> ) <sub>6</sub> CH <sub>3</sub>	Not Tested	
C8 octyl	-Si(CH <sub>2</sub> ) <sub>7</sub> CH <sub>3</sub>	11.1	
C10 decyl	-Si(CH <sub>2</sub> ) <sub>9</sub> CH <sub>3</sub>	15.70	
C12 dodecyl	-Si(CH <sub>2</sub> ) <sub>11</sub> CH <sub>3</sub>	Not Tested	Removal of hydrophobic impurities, de-salting and purification of hydrophobic compounds
C18 octadecyl	-Si(CH <sub>2</sub> ) <sub>17</sub> CH <sub>3</sub>	21.70	
C20 eicosyl	-Si(CH <sub>2</sub> ) <sub>19</sub> CH <sub>3</sub>	24.30	
C30 tricontyl	-Si(CH <sub>2</sub> ) <sub>29</sub> CH <sub>3</sub>	26.00	Removes smallest or least hydrophobic compounds
Cyclohexyl	-Si- 	11.60	Scavenger for phenolic compounds
Phenyl	-Si- 	11.00	Scavenger for polar compounds


### NORMAL PHASE (Hydrophilic)

Sorbent	Structure	% Organic Loading	Exchange Capacity (meq/g)	Applications
Silica	-SiOH	N/A	N/A	Removal of hydrophilic (polar) impurities, purification of hydrophilic (polar) compounds
Diol	-Si(CH <sub>2</sub> ) <sub>3</sub> OCH <sub>2</sub> CHOHCH <sub>2</sub> OH	8.00	N/A	
Cyanopropyl	-Si(CH <sub>2</sub> ) <sub>3</sub> CN	6.90	N/A	Removes steroid type compounds
Florisil®		N/A	N/A	Removes polar type compounds
Alumina-Acid		N/A	N/A	
Alumina-Neutral		N/A	N/A	
Alumina-Base		N/A	N/A	
Carbon		N/A	N/A	

### COPOLYMERIC PHASES (Multifunctional)

Sorbent	Structure	% Organic Loading	Exchange Capacity (meq/g)	Applications
Aminopropyl +C8	-Si(CH <sub>2</sub> ) <sub>3</sub> NH <sub>2</sub> & -Si(CH <sub>2</sub> ) <sub>7</sub> CH <sub>3</sub>	12.30	0.163	Dual functionality for strong acids and hydrophobic compounds
Quaternary Amine +C8	-Si(CH <sub>2</sub> ) <sub>3</sub> N <sup>+</sup> (CH <sub>3</sub> ) <sub>3</sub> & -Si(CH <sub>2</sub> ) <sub>7</sub> CH <sub>3</sub>	13.60	0.160	Dual functionality for weak acids and hydrophobic compounds
Carboxylic Acid +C8	-SiCH <sub>2</sub> COOH & -Si(CH <sub>2</sub> ) <sub>7</sub> CH <sub>3</sub>	12.50	0.105	Dual functionality for strong base and hydrophobic compounds
Propylsulfonic Acid +C8	-Si(CH <sub>2</sub> ) <sub>3</sub> SO <sub>3</sub> H & -Si(CH <sub>2</sub> ) <sub>7</sub> CH <sub>3</sub>	14.62	0.114	Dual functionality for weak bases and hydrophobic compounds
Benzenesulfonic Acid +C8	-Si(CH <sub>2</sub> ) <sub>2</sub> -  -SO <sub>3</sub> H & -Si(CH <sub>2</sub> ) <sub>7</sub> CH <sub>3</sub>	12.30	0.072	
Cyanopropyl + C8	-Si(CH <sub>2</sub> ) <sub>3</sub> CN & -Si(CH <sub>2</sub> ) <sub>7</sub> CH <sub>3</sub>	14.60	0.163	Dual functionality for polar and hydrophobic compounds
Cyclohexyl +C8	-Si-  & -Si(CH <sub>2</sub> ) <sub>7</sub> CH <sub>3</sub>	N/A	N/A	Dual functionality for phenols and hydrophobic compounds



### COVALENT PHASES

Sorbent	Structure	% Organic Loading	Exchange Capacity (meq/g)	Applications
Epoxy	-Si(CH <sub>2</sub> ) <sub>3</sub> -O-CH <sub>2</sub> -CH-CH <sub>2</sub> 	N/A	N/A	Covalent bond formation with proteins, amines and other nucleophiles
Aldehyde	-Si(CH <sub>2</sub> ) <sub>4</sub> CHO	N/A	N/A	Scavenger for primary amines, hydrazines, reducing agents and other nucleophiles. Covalent bonding for proteins, enzymes and other bioactive molecules.
Isocyanate	-Si(CH <sub>2</sub> ) <sub>3</sub> NCO	7.1	N/A	Scavenger for amines, alkoxides and other nucleophiles
Thiopropyl	-Si(CH <sub>2</sub> ) <sub>3</sub> SH	6.50	N/A	Scavenger for alkylating agents, alcohols and amines

## ION EXCHANGE — ANION

Sorbent	Structure	pK <sub>a</sub>	% Organic Loading	Exchange Capacity (meq/g)	Applications
Aminopropyl (1° Amine)	-Si(CH <sub>2</sub> ) <sub>3</sub> NH <sub>2</sub>	9.8	6.65	0.310	Scavenger for acids, cyclic compounds, cholesterol, and other lipid type compounds
N-2 Aminoethyl (1° & 2° Amine)	-Si(CH <sub>2</sub> ) <sub>3</sub> NH(CH <sub>2</sub> ) <sub>2</sub> NH <sub>2</sub>	10.1, 10.9	9.70	0.320	
Diethylamino (3° Amine)	-Si(CH <sub>2</sub> ) <sub>3</sub> N(CH <sub>2</sub> CH <sub>3</sub> ) <sub>2</sub>	10.6	8.40	0.280	
Quaternary Amine with Chloride counter ion	-Si(CH <sub>2</sub> ) <sub>3</sub> N <sup>+</sup> (CH <sub>3</sub> ) <sub>3</sub> Cl <sup>-</sup>	Always charged	8.40	0.250	Scavenger for acids and sulfonyl chlorides, isocyanates and weak electrophiles  Useful when charge on ion being removed is stronger than the counter ion
Quaternary Amine with Acetate counter ion	-Si(CH <sub>2</sub> ) <sub>3</sub> N <sup>+</sup> (CH <sub>3</sub> ) <sub>3</sub> CH <sub>3</sub> CO <sub>2</sub> <sup>-</sup>	Always charged	8.40	0.250	
Quaternary Amine with Hydroxide counter ion	-Si(CH <sub>2</sub> ) <sub>3</sub> N <sup>+</sup> (CH <sub>3</sub> ) <sub>3</sub> OH <sup>-</sup>	Always charged	8.40	0.250	
Quaternary Amine with Formate counter ion	-Si(CH <sub>2</sub> ) <sub>3</sub> N <sup>+</sup> (CH <sub>3</sub> ) <sub>3</sub> CHO <sub>2</sub> <sup>-</sup>	Always charged	8.40	0.250	
Polyimine	-Si(CH <sub>2</sub> ) <sub>3</sub> -R-[NHCH <sub>2</sub> CH <sub>2</sub> ] <sub>x</sub>		13.5	0.88	Scavenger for acids and sulfonyl chlorides, isocyanates and weak electrophiles.

## ION EXCHANGE — CATION

Sorbent	Structure	pK <sub>a</sub>	% Organic Loading	Exchange Capacity (meq/g)	Applications
Carboxylic Acid	-SiCH <sub>2</sub> COOH	4.8	9.10	0.170	Scavenger for strong amines with quats
Propylsulfonic Acid	-Si(CH <sub>2</sub> ) <sub>3</sub> SO <sub>3</sub> H	<1	7.10	0.180	Scavenger for amines, alcohols and other nucleophiles
Benzenesulfonic Acid	-Si(CH <sub>2</sub> ) <sub>2</sub> -  -SO <sub>3</sub> H	Always charged	11.00	0.320	
Benzenesulfonic Acid High Load	-Si(CH <sub>2</sub> ) <sub>2</sub> -  -SO <sub>3</sub> H	Always charged	15.00	0.650	
Triacetic Acid	-Si(CH <sub>2</sub> ) <sub>3</sub> NH-(CH <sub>2</sub> ) <sub>2</sub> -N(CH <sub>2</sub> COOH) <sub>2</sub>   CH <sub>2</sub> COOH		7.61	Anion 0.17 Cation 0.06	Chelator for metal ions





# UNITED CHEMICAL TECHNOLOGIES SPE PRODUCTS



## ENVIRO-CLEAN® UNIVERSAL CARTRIDGES



The Enviro-Clean® Universal Cartridge is the choice of modern contract labs because it is inexpensive and easy to use. Enviro-Clean® sorbents, UCT polypropylene, and PTFE frits offer clean blanks, reproducible extractions, and consistent flow rates. Designed for the environmental lab, the cartridge is made to handle large volumes of waste water. An optional bottle holder is available for continuous feed from Boston Round and wide mouth bottles.



Compatible with the  
Horizon SPE-DEX® 4790 Extraction System



Whether you are using the automated SPE-DEX® system or the UCT manifold, you will see a dramatic **increase in sample throughput**. Your lab will also benefit from a significant **reduction in solvent use**.



Product Number	Description	Amount Sorbent/ Tube Volume	Qty	Price
UCTECUNIOAG	Universal Oil and Grease Cartridge For EPA Method 1664	4000mg/83 mL	15	\$85.60
UCTECUNI525	Universal 525 For EPA Method 525.2	1500mg/83mL	8	75.40
UCTECUNIPAH	Universal PAH/DRO For PAH and Diesel Range Organic Extractions	2000mg/83mL	8	75.40
UCTECUNIC18	Universal C18 For extractions of Pesticides, Herbicides, PCBs, etc.	1100mg/83mL	8	75.40

## DISK MANIFOLD AND ACCESSORIES

Product Number	Description	Qty	Price
UCTEUCTVAC147	1 Station Manifold Assembly (47mm) Includes: 1 Station Manifold, KEL-F Screen, Funnel, Base, Clamp	1	\$879.80
UCTEUCTVAC190	1 Station Manifold Assembly (90mm) Includes: 1 Station Manifold, KEL-F Screen, Funnel, Base, Clamp	1	1,127.30
UCTEUCTVAC347	3 Station Manifold Assembly (47mm) Includes: 3 Station Manifold, KEL-F Screen, Funnel, Base, Clamp	1	2,332.50
UCTEUCTVAC390	3 Station Manifold Assembly (90mm) Includes: 3 Station Manifold, KEL-F Screen, Funnel, Base, Clamp	1	3,612.00
UCTEUCTVAC647	6 Station Manifold Assembly (47mm) Includes: 6 Station Manifold, KEL-F Screen, Funnel, Base, Clamp	1	4,086.00
UCTEUCTVAC690	6 Station Manifold Assembly (90mm) Includes: 6 Station Manifold, KEL-F Screen, Funnel, Base, Clamp	1	5,770.00

# UCT SOLID PHASE EXTRACTION PRODUCTS

## THE DISPERSIVE SOLID PHASE EXTRACTION TUBE

*Designed for use with the **QuEChERS** Method*

- **Q**uick (one technician can prepare 10 GC ready extracts in under an hour)
- **E**asy (multiple transfers and manipulations of the sample are eliminated)
- **C**heap (materials cost is low)
- **E**ffective (gives good recoveries of a wide range of pesticides)
- **R**ugged (method can be repeatedly performed after simple training)
- **S**afe (solvent use reduced as much as 90%)

Product Number	Description	Qty	Price
UCTCUMPSCB2CT	2mL micro-centrifuge tube, 150mg Anhydrous Magnesium Sulphate, 50mg PSA, 50mg Carbon	100	\$164.30
UCTCUMPS2CT	2mL micro-centrifuge tube, 150mg Anhydrous Magnesium Sulphate, 50mg PSA	100	133.40
UCTCUMPS18CT	2mL micro-centrifuge tube, 150mg Anhydrous Magnesium Sulphate, 50mg PSA, 50mg endcapped C18	100	148.80
UCTECMPSCB15CT	15mL centrifuge tube, 900mg Anhydrous Magnesium Sulphate, 300mg PSA, 50mg endcapped C18	50	179.60
UCTECMPSC1815CT	15mL centrifuge tube, 900mg Anhydrous Magnesium Sulphate, 300mg PSA, 150mg endcapped C18	50	179.60
UCTECPSCB6	6mL columns with 400mg PSA on bottom, 200mg graphitized carbon on top, separated by Teflon frit	30	154.00
UCTECPSCB256	6mL columns with 250mg graphitized carbon on top, 500mg PSA on bottom, separated by Teflon frit	30	164.30
UCTECPSCB506	6mL columns with 500mg graphitized carbon on top, 500mg PSA on bottom, separated by Teflon frit	30	225.90
UCTECMSSA50CT	50mL PP centrifuge tube, with 6g Anhydrous Magnesium Sulphate, 1.5g Anhydrous Sodium Acetate	250	461.90
UCTECMSSC50CT	50mL PP centrifuge tube, with 4g Anhydrous Magnesium Sulphate, 1g NaCl	250	451.60

For detailed information on this technique log on to [www.quechers.com](http://www.quechers.com)

## UCT BULK PRODUCTS

Product Number	Description	Qty	Price
UCTECCU01K	Copper Granules, 99.5%, 30 mesh	1 Kg	\$44.70
UCTECALN00D	Alumina, neutral	500g	116.90
UCTECFLS00D	Florisil® PR (Pesticide Residual Grade)	500g	93.00
UCTECFLOR00D	Florisil® A, 100/200 mesh	500g	62.50
UCTECSTOH00D	Silica Gel, 100/200 mesh	500g	57.20
UCTEC56601K	Celite 566 for ASE or PSE extractions	1 Kg	95.60

Many other bulk products are available.  
Contact our Technical Support Department for further details.



Fast, economical sample preparation for pesticide residues in food products.



### Applications for QuEChERS

- Pesticides in fruit & vegetables
- Pesticides and herbicides in processed foods
- Antioxidants in pet food
- Antibiotics in tissue



Dispersive SPE Extraction Tubes, specially designed for use with the QuEChERS Method.

Request literature code **UCT19** for further information.



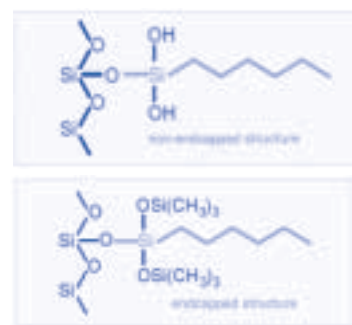
# UNITED CHEMICAL TECHNOLOGIES SPE COLUMNS

## REVERSE PHASE (HYDROPHOBIC) SORBENTS

### Unendcapped vs. Endcapped

Bonded phases are manufactured by the reaction of organosilanes with activated silica. During the polymerization reaction of carbon chains to the silica backbone, a very stable silyl ether linkage forms. UCT's uncapped columns allow hydroxyl sites to remain, thus making these columns slightly hydrophilic.

In order to decrease this slight polarity, these hydroxyl sites are deactivated. Proprietary bonding techniques ensure that these sites are 100% reacted, leading to a complete endcapping. Because there are no hydroxyl sites left, endcapped columns are more hydrophobic than uncapped columns.



### CLEAN-UP® Non-Endcapped Reverse Phase Sorbents

Bed Mass/ Tube Volume/Qty	C18	C8
50 mg/1 mL Pkg. 100	UCTCUC181L1 \$145.80	UCTCUC081L1 \$145.80
100 mg/3 mL Pkg. 50	UCTCUC18113 \$92.60	UCTCUC08113 \$92.60
200 mg/3 mL Pkg. 50	UCTCUC18123 \$96.80	UCTCUC08123 \$96.80
200 mg/10 mL Pkg. 50	UCTCUC1812Z* \$105.30	UCTCUC0812Z \$105.30
500 mg/6 mL Pkg. 50	UCTCUC18156* \$110.60	UCTCUC08156 \$110.60
500 mg/10 mL Pkg. 50	UCTCUC1815Z* \$117.10	UCTCUC0815Z \$117.10
1 g/6 mL Pkg. 30	UCTCUC181M6* \$96.80	UCTCUC081M6 \$96.80
2 g/15 mL Pkg. 20	UCTCUC1812M15 \$111.70	UCTCUC0812M15 \$111.70

\* Also available in Xtract® high flow format.

### CLEAN-UP® Endcapped Reverse Phase Sorbents

Bed Mass/ Tube Volume/Qty	C18	C8
50 mg/1 mL Pkg. 100	UCTCEC181L1 \$145.80	UCTCEC081L1 \$145.80
100 mg/1 mL Pkg. 100	UCTCEC18111 \$151.20	UCTCEC08111 \$151.20
200 mg/3 mL Pkg. 50	UCTCEC18123* \$96.80	UCTCEC08123 \$96.80
500 mg/6 mL Pkg. 50	UCTCEC18156* \$110.60	UCTCEC08156 \$110.60
500 mg/10 mL Pkg. 50	UCTCEC1815Z* \$117.10	UCTCEC0815Z \$117.10
1 g/6 mL Pkg. 30	UCTCEC181M6* \$96.80	UCTCEC081M6 \$96.80
2 g/15 mL Pkg. 20	UCTCEC1812M15 \$111.70	UCTCEC0812M15 \$111.70
5 g/25 mL Pkg. 20	UCTCEC1815M25* \$129.80	UCTCEC0815M25 \$129.80
10 g/75 mL Pkg. 10	UCTCEC18110M75 \$124.50	UCTCEC08110M75 \$124.50

## NORMAL PHASE (HYDROPHILIC) SORBENTS

Compounds typically extracted on a hydrophilic column include analytes which have polar groups, including amines, hydroxyls and carbonyls. Elution is performed using strong polar solvents.

Bed Mass/ Tube Volume/Qty	Silica	Florisil	CN	AL-A	AL-B	AL-N
100 mg/1 mL Pkg. 100	UCTCUSIL111 \$151.20	UCTCUFLS111 \$178.80	UCTCUCNP111 \$165.00	UCTCUALA111 \$158.60	UCTCUALB111 \$158.60	UCTCUALN111 \$158.60
100 mg/3 mL Pkg. 50	UCTCUSIL113 \$78.70	UCTCUFLS113 \$108.60	UCTCUCNP113 \$120.20	UCTCUALA113 \$97.90	UCTCUALB113 \$97.90	UCTCUALN113 \$97.90
200 mg/3 mL Pkg. 50	UCTCUSIL123 \$83.00	UCTCUFLS123 \$111.70	UCTCUCNP123 \$123.50	UCTCUALA123 \$101.10	UCTCUALB123 \$101.10	UCTCUALN123 \$101.10
200 mg/10 mL Pkg. 50	UCTCUSIL12Z \$94.70	UCTCUFLS12Z \$123.50	UCTCUCNP12Z \$116.00	UCTCUALA12Z \$111.70	UCTCUALB12Z \$117.10	UCTCUALN12Z \$111.70
500 mg/6 mL Pkg. 50	UCTCUSIL156 \$96.80	UCTCUFLS156 \$134.10	UCTCUCNP156 \$144.70	UCTCUALA156 \$122.40	UCTCUALB156 \$122.40	UCTCUALN156 \$122.40
500 mg/10 mL Pkg. 50	UCTCUSIL15Z \$105.30	UCTCUFLS15Z \$134.10	UCTCUCNP15Z \$123.50	UCTCUALA15Z \$117.10	UCTCUALB15Z \$117.10	UCTCUALN15Z \$117.10
1 g/6 mL Pkg. 30	UCTCUSIL1M6 \$80.90	UCTCUFLS1M6 \$106.40	UCTCUCNP1M6 \$130.90	UCTCUALA1M6 \$127.70	UCTCUALB1M6 \$127.70	UCTCUALN1M6 \$127.70

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## CATION EXCHANGE SORBENTS

<b>BCX</b>	Benzenesulfonic acid	Application — Scavenger for amines, alcohols and other nucleophiles
<b>BCXHL</b>	High Load Benzenesulfonic acid	Application — Scavenger for amines, alcohols and other nucleophiles
<b>CCX</b>	Carboxylic acid	Application — Scavenger for strong amines with quats
<b>PCX</b>	Propylsulfonic acid	Application — Scavenger for amines, alcohols and other nucleophiles
<b>TAX</b>	Triacetic acid	Application — Chelator for metal ions. i.e. tin, palladium, copper, ruthenium chromium, nickel, etc.

Bed Mass/ Tube Volume/Qty	BCX	BCXHL	CCX	PCX	TAX
100 mg /1 mL Pkg. 100	UCTCUBCX111 \$176.60	UCTCUBCX1HL11 \$178.80	UCTCUCCX111 \$176.60	UCTCUPCX111 \$176.60	UCTCUTAX111 \$176.60
200 mg/3 mL Pkg. 50	UCTCUBCX123 \$134.10	UCTCUBCX1HL23 \$156.40	UCTCUCCX123 \$134.10	UCTCUPCX123 \$134.10	UCTCUTAX123 \$134.10
200 mg/10 mL Pkg. 50	UCTCUBCX12Z* \$118.20	UCTCUBCX1HL2Z \$162.80	UCTCUCCX12Z* \$118.20	UCTCUPCX12Z \$118.20	UCTCUTAX12Z \$118.20
500 mg/6 mL Pkg. 50	UCTCUBCX156* \$155.40	UCTCUBCX1HL56 \$168.10	UCTCUCCX156* \$155.40	UCTCUPCX156 \$155.40	UCTCUTAX156 \$155.40
1 g/6 mL Pkg. 30	UCTCUBCX1M6* \$130.90	UCTCUBCX1HLM6 \$151.20	UCTCUCCX1M6* \$130.90	UCTCUPCX1M6 \$130.90	UCTCUTAX1M6 \$130.90

## ANION EXCHANGE SORBENTS

<b>Amino</b>	Aminopropyl Application — Scavenger for acids, cyclic compounds, cholesterol and other lipid type compounds
<b>QAX</b>	Quaternary amine with chloride counter ion Application — Scavenger for acids, sulfonyl chlorides, isocyanates and weak electrophiles
<b>CAQAX</b>	Quaternary amine with acetate counter ion Application — Scavenger for acids and sulfonyl chlorides, isocyanates and weak electrophiles Useful when charge on ion being removed is weaker than the acetate counter ion.
<b>CHQAX</b>	Quaternary amine with hydroxide counter ion Application — Scavenger for acids and sulfonyl chlorides, isocyanates and weak electrophiles Useful when charge on ion being removed is weaker than the hydroxide counter ion.
<b>CFQAX</b>	Quaternary amine with formate counter ion Application — Scavenger for acids and sulfonyl chlorides, isocyanates and weak electrophiles Useful when charge on ion being removed is weaker than the formate counter ion.
<b>Polyimine</b>	Application — Scavenger for acids and sulfonyl chlorides, isocyanates and other electrophiles.

Bed Mass/ Tube Volume/Qty	Amino	QAX	CAQAX	CHQAX	CFQAX	Polyimine
100 mg /1 mL Pkg. 100	UCTCUNAX111 \$176.60	UCTCUQAX111 \$176.60	UCTCAQAX111 \$176.60	UCTCHQAX111 \$176.60	UCTCFQAX111 \$176.60	UCTCUPAX111 \$176.60
200 mg/3 mL Pkg. 50	UCTCUNAX123 \$134.10	UCTCUQAX123 \$134.10	UCTCAQAX123 \$134.10	UCTCHQAX123 \$134.10	UCTCFQAX123 \$134.10	UCTCUPAX123 \$134.10
200 mg/10 mL Pkg. 50	UCTCUNAX12Z \$118.20	UCTCUQAX12Z* \$118.20	UCTCAQAX12Z \$118.20	UCTCHQAX12Z \$118.20	UCTCFQAX12Z \$118.20	UCTCUPAX12Z \$118.20
500 mg/6 mL Pkg. 50	UCTCUNAX156 \$155.40	UCTCUQAX156* \$155.40	UCTCAQAX156 \$155.40	UCTCHQAX156 \$155.40	UCTCFQAX156 \$155.40	UCTCUPAX156 \$155.40
1 g/6 mL Pkg. 30	UCTCUNAX1M6 \$130.90	UCTCUQAX1M6* \$130.90	UCTCAQAX1M6 \$130.90	UCTCHQAX1M6 \$130.90	UCTCFQAX1M6 \$130.90	UCTCUPAX1M6 \$130.90

\* Also available in XtrackT<sup>®</sup> high flow format.

For other chemistries, particle sizes and column configurations,  
contact our Technical Support Group at 1-800-267-8103 or email [tech@chromspec.com](mailto:tech@chromspec.com).

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The UCT Applications Manual is available in PDF format at [www.chromspec.com](http://www.chromspec.com) in the literature section.

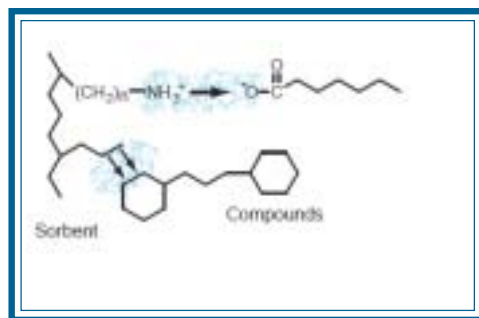
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or contact our Technical Support Group at 1-800-267-8103 or [tech@chromspec.com](mailto:tech@chromspec.com)



# UNITED CHEMICAL TECHNOLOGIES SPE COLUMNS

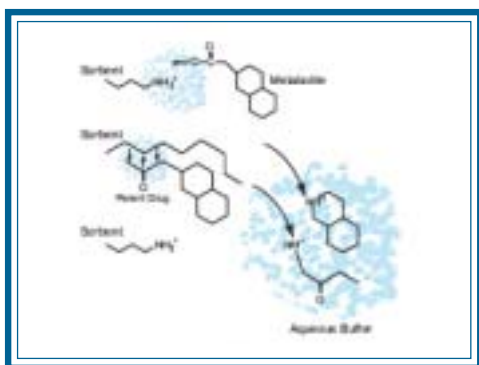
## CLEAN-UP® COPOLYMERIC SPE COLUMNS

### Example of Copolymeric Bonding



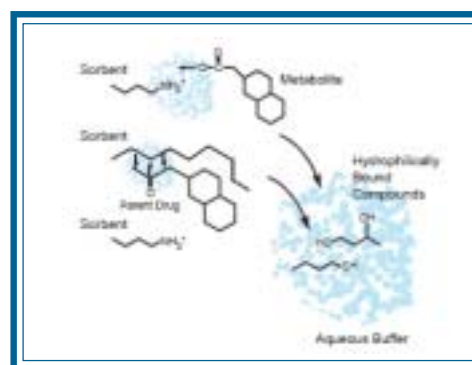
UCT copolymeric sorbents are composed of a silica backbone with equal amounts of two types of functional groups attached - an ion exchanger or polar chain and a hydrophobic carbon chain. This copolymerization technique yields reproducible bonded phases and unique copolymeric chemistries which allow the controlled use of mixed mode separation mechanisms. This type of dual chemistry is especially beneficial when looking for both a neutral and a charged compound such as when a neutral parent drug metabolizes into a charged compound.

### Sample Application



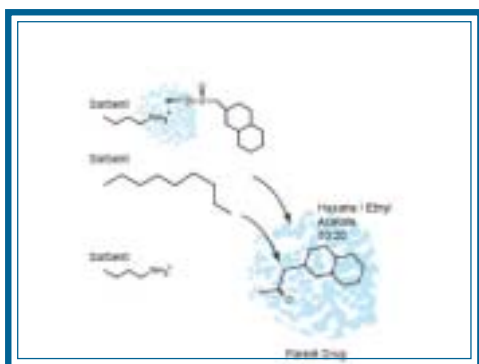
A sample composed of a theoretical neutral parent drug and its charged acidic metabolite is applied at a pH of 6. At this pH many amine groups are positively charged, since the column is also positively charged, compounds with this chemistry (cations) are repelled. Depending on the pKa of the metabolite, carboxylic acid groups may be negatively charged, allowing the metabolite to bond to the positively charged sorbent. Since the column also possesses a hydrophobic chain, the neutral parent drug also bonds to the column.

### Column Wash



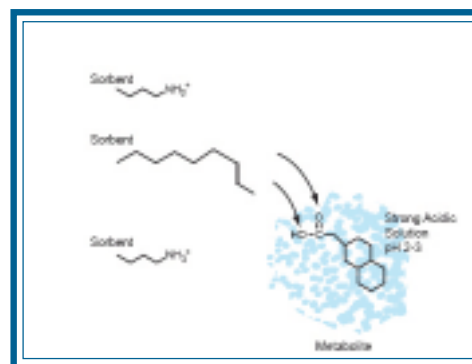
Water or weak aqueous buffer (pH6) washes away hydrophilically bound interferences. The column is then dried to free the column of any residual aqueous phase that would interfere with elution.

### Elution 1



The hydrophobically bound neutral parent drug is eluted with a solvent of minimal polarity, such as 80:20 hexane/ethyl acetate.

### Elution 2



The final elution employs an acid to neutralize the charge of acidic analytes. Ionic interaction is released, and analytes are eluted in an appropriate solvent mixture.

## CLEAN-UP® COPOLYMERIC SPE COLUMNS

### Copolymeric Sorbents

<b>BCX2</b>	Strong cation exchange column containing benzenesulfonic acid and C8 functional groups Application — weak bases and hydrophobic compounds
<b>PCX2</b>	Strong cation exchange column containing propylsulfonic acid and C8 functional groups, pKa <1 Application — extraction of weak bases and hydrophobic compounds
<b>CCX2</b>	Weak cation exchange column containing carboxylic acid and C8 functional groups, pKa 4.8 Application — strong base and hydrophobic compounds
<b>QAX2</b>	Strong anion exchange column containing quarternary amine and C8 functional groups Application — weak acids and hydrophobic compounds
<b>NAX2</b>	Weak anion exchange column containing aminopropyl and C8 functional groups, pKa 9.8 Application — strong acids and hydrophobic compounds
<b>CNP2</b>	Hydrophobic anion exchange column with cyanopropyl functional group Application — polar and hydrophobic compounds

### Silica Based Copolymer Columns

Bed Mass/ Tube Volume/Qty	BCX2	PCX2	CCX2	QAX2	NAX2	CNP2
50 mg/1 mL Pkg. 100	UCTCUBCX2L1 \$169.20	UCTCUPCX2L1 \$169.20	UCTCUCCX2L1 \$169.20	UCTCUQAX2L1 \$169.20	UCTCUNAX2L1 \$169.20	UCTCUCNP2L1 \$169.20
100 mg/1 mL Pkg. 100	UCTCUBCX211 \$176.60	UCTCUPCX211 \$176.60	UCTCUCCX211 \$176.60	UCTCUQAX211 \$176.60	UCTCUNAX211 \$176.60	UCTCUCNP211 \$176.60
100 mg/10 mL Pkg. 50	UCTCUBCX21Z \$110.60	UCTCUPCX21Z \$110.60	UCTCUCCX21Z \$110.60	UCTCUQAX21Z \$110.60	UCTCUNAX21Z \$110.60	UCTCUCNP21Z \$110.60
200 mg/3 mL Pkg. 50	UCTCUBCX223 \$134.10	UCTCUPCX223 \$134.10	UCTCUCCX223 \$134.10	UCTCUQAX223 \$134.10	UCTCUNAX223 \$134.10	UCTCUCNP223 \$134.10
200 mg/10 mL Pkg. 50	UCTCUBCX22Z \$118.20	UCTCUPCX22Z \$118.20	UCTCUCCX22Z \$118.20	UCTCUQAX22Z \$118.20	UCTCUNAX22Z \$118.20	UCTCUCNP22Z \$118.20
500 mg/3 mL Pkg. 50	UCTCUBCX253 \$152.10	UCTCUPCX253 \$152.10	UCTCUCCX253 \$152.10	UCTCUQAX253 \$152.10	UCTCUNAX253 \$152.10	UCTCUCNP253 \$152.10
500 mg/6 mL Pkg. 50	UCTCUBCX256 \$155.40	UCTCUPCX256 \$155.40	UCTCUCCX256 \$155.40	UCTCUQAX256 \$155.40	UCTCUNAX256 \$155.40	UCTCUCNP256 \$155.40
500 mg/10 mL Pkg. 50	UCTCUBCX25Z \$123.50	UCTCUPCX25Z \$123.50	UCTCUCCX25Z \$123.50	UCTCUQAX25Z \$123.50	UCTCUNAX25Z \$123.50	UCTCUCNP25Z \$123.50
1 g/6 mL Pkg. 30	UCTCUBCX2M6 \$130.90	UCTCUPCX2M6 \$130.90	UCTCUCCX2M6 \$130.90	UCTCUQAX2M6 \$130.90	UCTCUNAX2M6 \$130.90	UCTCUCNP2M6 \$130.90
2 g/15 mL Pkg. 20	UCTCUBCX22M15 \$142.60	UCTCUPCX22M15 \$142.60	UCTCUCCX22M15 \$142.60	UCTCUQAX22M15 \$142.60	UCTCUNAX22M15 \$142.60	UCTCUCNP22M15 \$142.60

For other chemistries, particle sizes and column configurations, contact our Technical Support Group toll free at 1-800-267-8103 or email [tech@chromspec.com](mailto:tech@chromspec.com).

# UNITED CHEMICAL TECHNOLOGIES SPE COLUMNS



## CLEAN SCREEN® DAU SPE Columns

- No shrinking / swelling
- Cleaner chromatograms
- Silica backbone prevents leeching
- High exchange capacity
- Responds quickly to changes in pH

For more information request literature code **UCT12**.

## CLEAN SCREEN® DAU SPE COLUMNS - For Drugs of Abuse

Analytical demand for more efficient and robust methods for the extraction of drugs from biological matrices led to the development of WORLDWIDE MONITORING® CLEAN SCREEN® sorbents. Since 1986, CLEAN SCREEN® has led the industry with dependable and reproducible solid phase extraction products and applications. CLEAN SCREEN® phases are true copolymeric sorbents that contain hydrophobic and ion exchange functional groups uniquely polymerized to a silica substrate. The design and quality of CLEAN SCREEN® provides superior sample clean up, recovery and reproducibility.

Mixed mode separations allow maximum selectivity for the extraction of acids, neutrals and bases. This selectivity makes CLEAN SCREEN® ideal for both screening and confirmation analysis of virtually all drug categories. CLEAN SCREEN® DAU columns are used extensively by forensic and clinical laboratories.

Sorbent Bed Mass Column Volume	Qty	Product Number Without Tips	Price	Product Number Clean-Thru® Tips	Price
130 mg / 1 mL	100	UCTCSDAU131	\$194.70	UCTCCDAU131	\$235.20
130 mg / 3 mL	50	UCTCSDAU133	108.60	UCTCCDAU133	125.60
200 mg / 3 mL	50	UCTCSDAU203	111.70	UCTCCDAU203	129.80
200 mg / 6 mL	50	UCTCSDAU206	116.00	UCTCCDAU206	136.20
200 mg / 10 mL	50	UCTZSDAU020	117.10	UCTCCDAU020	133.00
300 mg / 3 mL	50	UCTCSDAU303	117.10	UCTCCDAU303	136.20
500 mg / 3 mL	50	UCTCSDAU503	122.40	UCTCCDAU503	143.60
500 mg / 6 mL	50	UCTCSDAU506	128.70	UCTCCDAU506	149.00
1000 mg / 6 mL	30	UCTCSDAU1M6*	118.20	UCTCCDAU1M6	137.30
1000 mg / 15 mL	30	UCTCSDAUM15*	118.20	UCTCCDAUM15	139.40
5000 mg / 25 mL	20	UCTCSDAU5M25	106.40	UCTCCDAU5M25	122.40

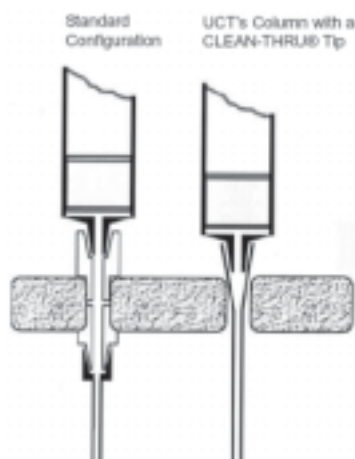
\* Available in XtrackT® High Flow Phase.

## CLEAN SCREEN® GHB

### Now an Innovative New Extraction for Gamma-Hydroxybutyrate without the need for Lactone Conversion

The small polar nature of the GHB molecule and the lack of a UV chromophore complicate its chromatographic and spectrophotometric analysis. GHB is unstable and readily forms Gamma-butyrolactone (GBL) when heated in acidic conditions. Most analytical methods are based upon the interconversion to GBL, followed by a chemical derivatization step to form the TMS derivative. UCT's methodology allows for the direct extraction of GHB.

## CLEAN THRU® TIPS



Product Number	Description	Qty	Price
UCTCSGHB203	GHB, 200 mg / 3 mL	50	\$129.80
UCTZSGHB020	GHB without tips, 200 mg / 10 mL	50	129.80
UCTZCGHB020	GHB with Clean Thru tips, 200 mg / 10 mL	50	152.10

## CLEAN-THRU® TIPS

CLEAN-THRU® tips provide the first solid phase extraction cartridge system that eliminates sample carry over from the vacuum manifold lid. The technology was pioneered by UCT's Research Scientists and consists of disposable tips that attach to the end of each column. The system was designed to meet the strict requirements that the Substance Abuse and Mental Health Services Administration certification has placed on laboratories to address the problem of cross-contamination between samples.

CLEAN-THRU® tips provide a completely disposable system that eliminates any contact between the sample, or wash solvents and the extraction apparatus. The continuous passage of the sample through the system provides a direct, accurate route to waste or collection vessels. As each extraction is completed, the column and tip are discarded as a unit. CLEAN-THRU® tips eliminate your concerns about sample residue remaining in the extraction system.

Product Number	Description	Qty	Price
UCTCLTTP050	CLEAN THRU® Tips	50	\$27.90

## XtrackT® HIGH-FLOW BONDED PHASES

XtrackT® columns are designed to give uniform flow for viscous samples, including equine urine, post mortem blood and tissues, meconium, amniotic fluid, milk, etc. Their large particle size enhances flow characteristics, sample application and analysis. XtrackT® also functions as a gravity flow column for most blood and urine samples. A single column provides extraction for a broad spectrum of compounds with selective elution of acid/neutrals, steroids and bases.

These columns are available in a variety of phases. Please call our Technical Support Group for assistance.

## STYRE SCREEN® POLYMERIC RESIN SPE COLUMNS

- Highly cross-linked styrene/divinylbenzene polymer, pH stable from pH 1-14
- No conditioning steps required for most drugs of abuse applications
- Copolymer allows for extraction of acids, neutrals and bases
- High and reproducible recoveries; cleaner extracts
- Increased analyte capacity means less sorbent bed mass and solvent volumes required, which results in significant savings in both time and money
- Methods for NIDA/SAMHSA 5 Drugs

### DBX

DBX extraction columns contain an ultra clean, highly cross-linked styrene and divinylbenzene copolymer sorbent that is functionalized with both a reverse phase hydrophobic component and a strong cation exchanger. With an average particle size of 30 µm and a very high capacity, DBX columns are ideal for the extraction of acidic, neutral and basic compounds.

Product Number	Bed Mass/Tube Volume	Qty	Price
UCTSSDBX031	30 mg/1 mL	50	\$235.50
UCTSSDBX033	30 mg/3 mL	50	120.80
UCTSSDBX056	50 mg/6 mL	50	152.20

### DVB — Polystyrene divinylbenzene

UCTSSDVB031	30 mg/1 mL	50	\$210.20
UCTSSDVB033	30 mg/3 mL	50	140.20
UCTSSDVB056	50 mg/6 mL	50	152.20

### BCX

Benzenesulfonic acid is suitable for use as a scavenger for amines, alcohols and nucleophiles.

UCTSSBCX031	30 mg/1 mL	50	\$213.30
UCTSSBCX033	30 mg/3 mL	50	159.50
UCTSSBCX056	50 mg/6 mL	50	171.50

### C18

C18 chains are bonded to the polymeric resin. This phase is suitable for removing hydrophobic impurities, de-salting and purification of hydrophobic compounds.

UCTSSC18031	30 mg/1 mL	50	\$210.20
UCTSSC18033	30 mg/3 mL	50	152.60
UCTSSC18056	50 mg/6 mL	50	165.50

### QAX

QAX sorbents contains a polymeric backbone bonded with a quaternary amine which is capable of removing large or more hydrophobic compounds from sample matrices.

UCTSSQAX031	30 mg/1 mL	50	\$210.20
UCTSSQAX033	30 mg/3 mL	50	152.20
UCTSSQAX056	50 mg/6 mL	50	165.50



STYRE SCREEN® Polymeric Resin SPE Columns

United Chemical Technologies also offers micro bed packed SPE columns using CLEAN-SCREEN® sorbents.

**CLEAN-SCREEN®-RSV-Reduced Solvent Volume Extraction Columns use 75% less solvent than traditional packed SPE columns.** Less solvent means faster extractions, faster drying times and decreased solvent disposal costs.

RSV columns are available in 3 or 10mL configurations and are compatible with standard vacuum manifolds and most automated systems.

Request literature code **UCT14** or contact Technical Support at 1-800-267-8103 or by email at [tech@chromspec.com](mailto:tech@chromspec.com) for more information.

Need SPE Assistance? Fill out our SPE E-help form at [www.chromspec.com](http://www.chromspec.com) or contact our Technical Support Group at 1-800-267-8103 or [tech@chromspec.com](mailto:tech@chromspec.com)



# UNITED CHEMICAL TECHNOLOGIES SPE COLUMNS

## UCT'S SUGGESTED APPROACH TO METHOD DEVELOPMENT:

- Define the problem or objective
- Characterize the analyte(s) and matrix
- Select a Method Development Kit
- Evaluate extraction performance of columns in kit
- Select best column — optimize method

### Application Notes and Methods

Application notes and methods are available for many analytes.

Call Chromatographic Specialties' Technical Support Group for assistance.

**Forensic & Clinical Applications of Solid Phase Extraction** edited by Michael J. Telepchak, Glynn Chaney and Thomas F. August



Forensic and Clinical Applications of Solid Phase Extraction presents a compendium of methods and supporting data that allows the scientist to perform procedures using solid phase extraction to isolate compounds of interest in the field of clinical and forensic toxicology.

UCTZZ3801 . . . . . \$124.90

## SPE METHOD DEVELOPMENT KITS

United Chemical Technologies offers a variety of SPE Method Development Kits for parallel screening of multiple sorbents. Each kit contains a selection of phases with similar retention characteristics allowing you to evaluate several chemistries and optimize your separation without having to purchase boxes of different SPE columns.

### ION EXCHANGE PHASES

This kit contains ten 100 mg/1 ml tubes of each of the seven ion exchange phases including primary amine (aminopropyl; NAX), secondary amine (aminoethyl; PSA), tertiary amine (diethylamino; DAX), quaternary amine (QAX), carboxylic acid (CCX), propylsulfonic acid (PCX), and benzenesulfonic acid (BCX) phases.

Product Number	Description	Qty	Price
UCTMDKIEXI	Ion Exchange Phases Kit	70 tubes, 7 pkgs/10 each	\$129.10

### NON-POLAR PHASES, ENDCAPPED

This kit contains ten 100 mg/1 ml tubes of each of fourteen non-polar phases which include the endcapped hydrophobic phases, for C2, C3, C4, iC4 (isobutyl), tC4 (tertbutyl), C6, C7, C8, C10, C12, C18, C20, along with cyclohexyl (CYH), and phenyl (PHY) phases.

UCTMDKNPEI	Non-Polar Phases, Endcapped, Kit	140 tubes, 14 pkgs/10 each	\$149.60
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### POLAR PHASES

This kit contains ten 100 mg/1 ml tubes of each of eight phases with polar characteristics, including C2, cyanopropyl (CNP), diol (DOL), silica (SIL), primary amine (aminopropyl; NAX), secondary amine (aminoethyl; PSA), and tertiary amine (diethylamino; DAX).

UCTMDKPUI	Polar Phases Kit	80 tubes, 8 pkgs/10 each	\$129.10
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### (COPOLYMERIC) POLAR AND ION EXCHANGE PHASES

This kit contains ten 100 mg/1 ml tubes of each of the six mixed mode phases containing a nonpolar, polar and/or ion exchange functionality. The non-polar functionality in each case has an effective chain length of a C8. The polar or ion exchange functionality of each phase consists of one of the following: cyanopropyl (CNP2), primary amine (aminopropyl; NAX2), quaternary amine (QAX2), carboxylic acid (CCX2), propylsulfonic acid (PCX2), and benzenesulfonic acid (BCX2).

UCTMDKPUIEXII	Copolymeric Polar and Ion Exchange Phases Kit	60 tubes, 6 pkgs/10 each	\$129.10
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### TOXICOLOGY — For Automated Methods Development

This kit contains five 200 mg/3 ml tubes of each of the eight phases. The two standard phases used for drugs of abuse testing are CSDAU and CSTHC. Other phases commonly used in toxicology are the polar phases (unbonded silica and cyanopropyl) and non-polar phases C2 EC, C8 EC and both endcapped and non-endcapped C18.

UCTMDKTOXIII	Toxicology Kit	40 tubes, 8 pkgs/5 each	\$129.10
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### PHARMACEUTICAL — For Automated Methods Development

This kit contains five 200 mg/3 ml tubes of each of eight phases that are most often selected for pharmaceutical applications. Two copolymeric phases having the dual functionalities of non-polar C8 and either benzenesulfonic acid (BCX) or aminopropyl (NAX). The remaining columns are polymeric phases which include three endcapped, hydrophobic phases (C2, C8, C18), two ion exchange phases (CCX, QAX), and one polar phase (CNP).

UCTMDKPHMIII	Pharmaceutical Kit	40 tubes, 8 pkgs/5 each	\$129.10
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### ENVIRONMENTAL METHOD DEVELOPMENT KIT

Each kit contains five 200 mg/3 mL tubes of each of ten phases: C18, Silica, Florisil, QAX, Alumina-N, CLEANSOFT®-DAU, Alumina A, Alumina B, BCX, and graphitized Carbon.

UCTMDKENVIII	Environmental Method Development Kit	50 tubes, 10 pkgs/5 each	\$129.10
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## POSITIVE PRESSURE MANIFOLD

- 48 position individually regulated
- 4 banks of 12 positions
- Capacity 1 to 48 columns of either 1mL, 6mL, 10mL or 15mL
- Pressure supply: N<sub>2</sub> or air @ 75psi (filtered to 10µm)

Product Number	Description	Price
UCTVMFPPM	Positive Pressure Manifold	\$3,902.00



Positive Pressure Manifold

## 96 DEEP WELL PLATE MANIFOLD SYSTEM

- Accommodates standard 96 deep well plate - 2 mL wells
- Collect directly into microplate

UCTVMF96WP	96-Well Plate Manifold System	\$1,026.50
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96 Deep Well Plate

## VACUUM MANIFOLDS

- Vacuum manifold system consists of a rigid Corian® lid which resists warping with extended use
- The glass block is equipped with a vacuum control valve for optimizing sample flow rate during the extraction process
- A vacuum gauge and bleed valve allow for easy monitoring of the vacuum process
- Polypropylene racks are provided according to the number of positions on the manifold lid and are highly resistant to chemical degradation and abuse

UCTVMF016GL	16 port Vacuum Manifold, Complete	\$874.20
UCTVMF024GL	24 port Vacuum Manifold, Complete	920.20



Glass Block Manifold

## MISCELLANEOUS SPE ACCESSORIES

Product Number	Description	Qty	Price
UCTAD0000AS	Adaptors for 1, 3 and 6 mL reservoirs	15	\$59.80
UCTVMF02024	Stopcocks	24	63.70
UCTVMF02116	Stopcocks	16	43.90
UCTLUER50	Luer caps	50	30.50

### Empty Reservoirs

UCTRFV0001P	Reservoir, 1 mL capacity	50	\$22.60
UCTRFV0004P	Reservoir, 4 mL capacity	50	23.90
UCTRFV0008P	Reservoir, 8 mL capacity	50	26.50
UCTRFV0010P	Reservoir, 10 mL capacity	50	45.10
UCTRFV0015P	Reservoir, 15 mL capacity	50	33.20
UCTRFV0025P	Reservoir, 25 mL capacity	50	34.60
UCTRFV0075P	Reservoir, 75 mL capacity	20	37.20

### 20 µm Polyethylene Frits

UCTFR20011P	Frits for 1 mL reservoirs	100	\$34.60
UCTFR20041P	Frits for 4 mL reservoirs	100	38.50
UCTFR20081P	Frits for 8 mL reservoirs	100	41.20
UCTFR20101P	Frits for 10 mL reservoirs	100	42.50
UCTFR20151P	Frits for 15 mL reservoirs	100	43.90
UCTFR20251P	Frits for 25 mL reservoirs	100	47.80
UCTFR20751P	Frits for 75 mL reservoirs	100	50.50

Single fritted and double fritted reservoirs are also available. For more information, contact our Technical Support Group 800-267-8103 or by email [tech@chromspec.com](mailto:tech@chromspec.com).



Adapters



Stopcocks

# UCT CARBON SPE AND FLASH CHROMATOGRAPHY COLUMNS



CLEAN-UP® Carbon SPE Columns

## CLEAN-UP® CARBON SPE Columns

CLEAN-UP non-porous graphitized carbon SPE columns have a high surface area and can isolate a broad range of compounds from polar and non-polar solvents. Visit our website for available product numbers.

Product Number	Description	Qty	Price
UCTCUCARBL1	50mg / 1 mL	100	\$318.20
UCTCUCARB11	100mg / 1 mL	100	415.70
UCTCUCARB1L3	150mg / 3 mL	50	230.90
UCTCUCARB23	200mg / 3 mL	50	215.60
UCTCUCARB2L3	250mg / 3 mL	50	251.50
UCTCUCARB53	500mg / 3 mL	50	297.70
UCTCUCARB2L6	250mg / 6 mL	30	169.40
UCTCUCARB56	500mg / 6 mL	30	198.10
UCTCUCARB1Z	100mg / 10 mL	50	225.90
UCTCUCARB2Z	200mg / 10 mL	50	244.30
UCTCUCARB5Z	500mg / 10 mL	50	197.10
UCTCUCARBM6	1g / 6 mL	30	184.70
UCTCUCARBM15	1g / 15 mL	20	184.70
UCTCUCARB2M15	2g / 15 mL	20	261.80
UCTCUCARB5M25	5g / 25 mL	20	487.50
UCTCUCARB10M75	10g / 75 mL	10	800.60



## Ultra Flash™ I and Ultra Flash™ II Chromatography Columns

- Economical
- High Yield Separations
- Flash Chromatography  
Columns can be packed with a variety of UCT phases

For more information on available Flash phases and column configurations, contact our Technical Support Group 1-800-267-8103 or by email [tech@chromspec.com](mailto:tech@chromspec.com)

## ULTRA FLASH™ I Chromatography Columns for Biotage® Systems

UCTFEC1812S20	C18, 4 / 12 S	20	\$258.00
UCTFUSIL12S20	Silica, 4 / 12 S	20	229.60
UCTFEC1812M20	C18, 8 / 12 M	20	402.30
UCTFUSIL12M20	Silica, 8 / 12 M	20	344.30
UCTFEC1840S12	C18, 40 / 40 S	12	372.80
UCTFUSIL40S12	Silica, 40 / 40 S	12	270.00
UCTFEC1840M12	C18, 90 / 40 M	12	602.30
UCTFUSIL40M12	Silica, 90 / 40 M	12	402.30
UCTFEC1865M6	C18, 300 / 65 M	6	602.30
UCTFUSIL65M6	Silica, 300 / 65 M	6	390.20

## ULTRA FLASH™ Chromatography Columns for Flashmaster® Systems

UCTMEC18110M75	C18, 10 g / 75 mL	16	\$160.70
UCTMUSIL110M75	Silica, 10 g / 75 mL	16	114.70
UCTMEC18120M75	C18, 20 g / 75 mL	16	155.30
UCTMUSIL120M75	Silica, 20 g / 75 mL	16	120.20
UCTMEC18125M150	C18, 25 g / 150 mL	8	166.10
UCTMUSIL125M150	Silica, 25 g / 150 mL	8	132.30
UCTMEC18150M150	C18, 50 g / 150 mL	8	201.20
UCTMUSIL150M150	Silica, 50 g / 150 mL	8	137.70
UCTMEC18170M150	C18, 70 g / 150 mL	8	241.60
UCTMUSIL170M150	Silica, 70 g / 150 mL	8	143.20

Interested in trying a sample?

Contact our helpful Customer Service Department  
at 1-800-267-8103 or by email at  
[sales@chromspec.com](mailto:sales@chromspec.com).





# UNITED CHEMICAL TECHNOLOGIES SPE WELL PLATES

## 48 AND 96 DEEP WELL SORBENT PACKED PLATES

96 deep well plates are available with 50, 100, 200 and 300 mg bed masses in a variety of sorbents. These plates can accommodate up to 2 mL of sample.

48 deep well plates are available with 100, 300, 500 and 1000 mg bed masses. These plates can accommodate up to 5 mL of sample.

Description	96-Well Product Number	Price	48-Well Product Number	Price
C18 EC, 50 mg	UCTWORCEC18105	\$190.90		
C18 EC, 100 mg	UCTWORCEC1811	200.50	UCTWIMCEC1811	\$144.60
C18 EC, 300 mg	UCTWORCEC1813	213.20	UCTWIMCEC1813	157.20
C18 EC, 500 mg			UCTWIMCEC1815	168.70
C8 EC, 50 mg	UCTWORCEC08105	190.70		
C8 EC, 100 mg	UCTWORCEC0811	200.50	UCTWIMCEC0811	144.60
C8 EC, 300 mg	UCTWORCEC0813	213.20	UCTWIMCEC0813	157.20
C8 EC, 500 mg			UCTWIMCEC0815	168.70
Phenyl, 50 mg	UCTWOPHY105	190.70		
Phenyl, 100 mg	UCTWOPHY11	200.50	UCTWIMPHY11	144.60
Phenyl, 300 mg	UCTWOPHY13	213.20	UCTWIMPHY13	157.20
Phenyl, 500 mg			UCTWIMPHY15	168.70
Cyano, 50 mg	UCTWORCNP105	190.70		
Cyano, 100 mg	UCTWORCNP11	200.50	UCTWIMCNP11	144.60
Cyano, 300 mg	UCTWORCNP13	213.20	UCTWIMCNP13	157.20
Cyano, 500 mg			UCTWIMCNP15	168.70
Amino, 50 mg	UCTWORNAX105	190.70		
Amino, 100 mg	UCTWORNAX11	200.50	UCTWIMNAX11	144.60
Amino, 300 mg	UCTWORNAX13	213.20	UCTWIMNAX13	157.20
Amino, 500 mg			UCTWIMNAX15	168.70
QAX, 50 mg	UCTWORQAX105	190.70		
QAX, 100 mg	UCTWORQAX11	200.50	UCTWIMQAX11	144.60
QAX, 300 mg	UCTWORQAX13	213.20	UCTWIMQAX13	157.20
QAX, 500 mg			UCTWIMQAX15	168.70
Carboxylic acid, 50 mg	UCTWORCCX105	190.70		
Carboxylic acid, 100 mg	UCTWORCCX11	200.50	UCTWIMCCX11	144.60
Carboxylic acid, 300 mg	UCTWORCCX13	213.20	UCTWIMCCX13	157.20
Carboxylic acid, 500 mg			UCTWIMCCX15	174.10
BCX, 50 mg	UCTWORBCX105	200.50		
BCX, 100 mg	UCTWORBCX11	211.30	UCTWIMBCX11	144.60
BCX, 300 mg	UCTWORBCX13	223.00	UCTWIMBCX13	157.20
BCX, 500 mg			UCTWIMBCX15	168.70
BCX + C8, 50 mg	UCTWORBCX205	200.50		
BCX + C8, 100 mg	UCTWORBCX21	211.30	UCTWIMBCX21	157.20
BCX + C8, 300 mg	UCTWORBCX23	223.00	UCTWIMBCX23	168.70
BCX + C8, 500 mg			UCTWIMBCX25	181.30
Silica, 50 mg	UCTWORSIL105	190.70		
Silica, 100 mg	UCTWORSIL11	200.50	UCTWIMSIL11	144.60
Silica, 300 mg	UCTWORSIL13	213.20	UCTWIMSIL13	157.20
Silica, 500 mg			UCTWIMSIL15	168.70



### 48 and 96 Deep Well Plates

- Manufactured from solvent resistant, low extractable polypropylene
- Standard 20 µm polyethylene frits. Different pore size and frit materials are available
- Over 35 sorbent chemistries to choose from
- Method Development plates available
- Custom packing and manufacturing available
- Compatible with Advanced Chemtech, Beckman, Bodan, Gilson, Hamilton, Packard, Sagian, Tecan, Tomtec, Zinser and Zymark robotic and liquid handling systems



### Universal Vacuum Manifold

- Processes 24, 48 and 96-well plates

For more information,  
please request literature  
code **UCT02**.

Other chemistries and bed masses are available; contact our Technical Support Team at 1-800-267-8103 or email [tech@chromspec.com](mailto:tech@chromspec.com) for further details.



# MACHEREY-NAGEL SPE SORBENTS

Macherey-Nagel has been a leader in Europe's scientific supply market for decades. Chromatographic Specialties Inc. is pleased to bring their products to Canada.

The tables below are a brief overview of their SPE product line. For further information or application support, contact our Technical Support Group at 1-800-267-8103 or tech@chromspec.com.



## OVERVIEW OF MACHEREY-NAGEL STANDARD SPE PHASES

Easy	polar, bifunctionally modified adsorbent resin based on polystyrene-divinylbenzene (PS/DVB)	- Drug analysis in urine, blood, serum; pharmaceuticals; herbicides, phenols
HR-P	adsorbent resin based on polystyrene-divinylbenzene (PS/DVB)	- Aromatic Amines in water
C18 ec/ec f	octadecyl-modified silica, endcapped, normal or fast flow	- Nonpolar compounds. Aflatoxins, pesticides, drugs, PAH, PCBs
C18/f	octadecyl-modified silica, not endcapped, normal or fast flow	- As above. Fast flow column. Can be used for viscous liquids
C18 Hydra	octadecyl-modified silica, not endcapped, for polar analytes	- Phenols, acids
C8	octyl-modified silica	- Pesticides, PCBs
C4	butyl-modified silica	- Analgesics from blood. Other compounds too strongly retained by C18 or C8
C2	dimethyl-modified silica	- Antiepileptics in plasma
C <sub>6</sub> H <sub>11</sub> ec	cyclohexyl-modified silica, endcapped	- Analgesics
C <sub>6</sub> H <sub>5</sub>	phenyl-modified silica	- Phenols from water. Chloroanilines from waste water
NO <sub>2</sub>	nitrophenyl-modified silica	- Aflatoxins, caffeine, phenols
NH <sub>2</sub>	aminopropyl-modified silica	- Trace elements, Lipids
DMA	dimethylamino-modified silica	- Trace elements, Lipids
CN	cyano-modified silica	- Cyclosporins, carbohydrates
OH	diol-modified silica	- Antibiotic, prostaglandins
SiOH	unmodified silica	- Aflatoxins, chloramphenicol, pesticides, steroids, vitamins
PCA	propylcarboxylic acid cation exchanger based on silica	- Viscotoxines, strong cations
SA	benzenesulphonic acid cation exchanger based on silica	- Amino acids, chlorophyll, PCBs
PSA	propylsulphonic acid cation exchanger based on silica	- Weak cations
SB	quaternary ammonium anion exchanger based on silica	- Organic acids, caffeine, saccharin
PS-RP	PS/DVB phase for removal in interfering organic components for ion chromatography	- Removal of organic interferences for ion chromatography
PS-OH <sup>-</sup>	strong PS/DVB anion exchanger in OH <sup>-</sup> form for ion chromatography	- Removal or concentration of anions from water
PS-H <sup>+</sup>	strong PS/DVB cation exchanger in H <sup>+</sup> form for ion chromatography	- Removal or concentration of cations from water
PS-Ag <sup>+</sup>	strong PS/DVB cation exchanger in Ag <sup>+</sup> form for removal of halide ions	- Removal of halide ions from water
PS-Ba <sup>2+</sup>	strong PS/DVB cation exchanger in Ba <sup>2+</sup> form for removal of sulphate ions	- Removal of sulphate from water
Alox A, N, B	aluminum oxide, acidic, neutral, basic	- Used together with SA for PCBs and pesticides
Florisil®	magnesium silicate	- Organic tin compounds, aliphatic acids, PCBs, PAHs
PA	polyamide 6	- Flavonoids, PAHs

## SPE PHASES FOR SPECIAL APPLICATIONS

ABC18	special phase for extraction of acrylamide from food
Diamino	special phase for determination of pesticides on food samples
Drug	special bifunctionally modified silica for enrichment of drugs from urine
Tetracycline	special phase for enrichment of tetracyclines
Crosslinks	special phase for enrichment of collagen crosslinks
AOX	special PS/DVB phase for extraction of AOX from water (DIN 38409 - H22)
CN/SiOH	combination phase for enrichment of PAHs from soil
C18 PAH	special octadecyl phase for enrichment of PAHs from water
NH <sub>2</sub> /C18	combination phase for enrichment of PAHs from water
Na <sub>2</sub> SO <sub>4</sub> /Florisil®	combination phase for extraction of hydrocarbons from water (DIN H-53 / ISO DIS 9377-4)
SiOH-H+/SA	combination phase, used together with SiOH for enrichment of PCBs from oil
SA/SiOH	combination phase for enrichment of PCBs from waste oil
NAN	special phase for enrichment of PCBs from sludge
DNPH	2,4-dinitrophenylhydrazine impregnated silica for enrichment of carbonyl compounds from air
Dry	special phase for drying organic samples
XTR	kieselguhr for liquid-liquid extraction
PTS	special columns for phase separation of solvents which are heavier than water
PTL	special columns for phase separation of solvents which are lighter than water



Columns are available in polypropylene or glass. In volumes from 1 to 70 mL.



# MACHEREY-NAGEL SPE PRODUCTS

## STANDARD SORBENTS

Sorbent Mass	100 mg / 1 mL		200mg / 3 mL		500 mg / 3 mL		500 mg / 6 mL		1000 mg / 6 mL	
Quantity	100		50		50		30		30	
Sorbent	Product Number	Price	Product Number	Price	Product Number	Price	Product Number	Price	Product Number	Price
Easy	MCN730752	\$75.10	MCN730754	\$94.10	MCN730759	\$135.50	MCN730756	\$197.20	—	—
HR-P	MCN730280	75.10	MCN730108	90.80	MCN730117	101.90	MCN730111	124.30	MCN730118	\$181.50
C <sub>18</sub> -ec	MCN730011	171.40	MCN730012	118.80	MCN730013	137.70	MCN730014	91.80	MCN730015	127.70
C <sub>18</sub>	MCN730001	171.40	MCN730002	118.80	MCN730003	137.70	MCN730004	91.80	MCN730005	127.70
C <sub>18</sub> Hydra	MCN730295	171.40	MCN730296	118.80	MCN730297	137.70	MCN730299	91.80	MCN730300	127.70
C <sub>8</sub>	MCN730021	171.40	MCN730022	118.80	MCN730023	137.70	MCN730024	91.80	MCN730134	127.70
C <sub>4</sub>	MCN730225	171.40	—	—	MCN730227	137.70	—	—	—	—
C <sub>2</sub>	MCN730169	171.40	—	—	MCN730221	137.70	MCN730409	91.80	MCN730410	127.70
C <sub>6</sub> H <sub>11</sub> ec	—	—	—	—	MCN730442	137.70	MCN730443	91.80	MCN730444	127.70
C <sub>6</sub> H <sub>5</sub>	MCN730083	171.40	MCN730411	118.80	MCN730084	137.70	—	—	—	—
NO <sub>2</sub>	—	—	—	—	MCN730143	191.60	—	—	—	—
NH <sub>2</sub>	MCN730031	221.80	MCN730413	169.20	MCN730033	191.60	MCN730180	126.60	MCN730626	185.90
DMA	MCN730041	221.80	—	—	MCN730043	191.60	—	—	—	—
CN	MCN730061	221.80	MCN730420	169.20	MCN730063	191.60	MCN730421	126.60	—	—
OH	MCN730051	221.80	MCN730417	169.20	MCN730053	191.60	MCN730418	126.60	—	—
SiOH	MCN730071	151.30	MCN730214	127.70	MCN730073	128.80	MCN730070	94.10	MCN730075	105.30
PCA	—	—	—	—	MCN730482	191.60	MCN730483	126.60	MCN730484	185.90
SA	MCN730076	221.80	MCN730275	169.20	MCN730077	191.60	—	—	MCN730212	185.90
PSA	MCN7304060	221.80	—	—	MCN730462	191.60	—	—	MCN730464	185.90
SB	MCN730078	221.80	MCN730322	169.20	MCN730079	191.60	MCN730426	126.60	MCN730323	185.90
PS-RP	—	—	MCN730765	91.80	MCN730692	132.20	MCN730693	192.70	—	—
PS-OH <sup>-</sup>	—	—	MCN730396	101.90	MCN73034430	149.00	MCN730378	216.20	—	—
PS-H <sup>+</sup>	—	—	MCN730690	101.90	MCN73037630	149.00	MCN730377	216.20	—	—
PS-Ag <sup>+</sup>	Inquire		Inquire		Inquire		Inquire		Inquire	
Ps-Ba2 <sup>+</sup>	Inquire		Inquire		Inquire		Inquire		Inquire	
Alox A	—	—	—	—	MCN730452	153.50	MCN730453	101.90	MCN730017	152.30
Alox B	MCN730427	191.60	—	—	MCN730429	153.50	MCN730466	101.90	MCN730020	152.30
Alox N	—	—	—	—	MCN730446	153.50	MCN730447	101.90	MCN730139	152.30
Florisil®	MCN730089	151.30	MCN730457	127.70	MCN730081	128.80	MCN730238	94.10	MCN730082	105.30
PA	MCN730383	221.80	MCN730384	169.20	MCN730126	191.60	MCN730007	126.60	MCN730127	185.90

Many of the sorbents listed above are also available in Chromafix® cartridges and Multi 96 well plates. Contact our Technical Support Group for further information.



More than 250 applications and basics of Solid Phase Extraction



A valuable tool for SPE Method Development; please request literature code **MN07**



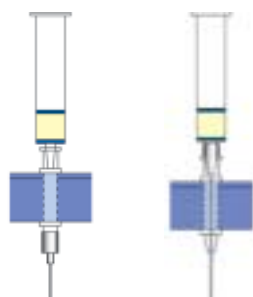
# MACHEREY-NAGEL SPECIALTY SPE PHASES



**CHROMOBOND® Vacuum Manifold**

CHROMOBOND® vacuum manifolds are available in 12, 16 and 24 sample models. The manifold is made up of a clear glass cabinet with attached vacuum control and gauge and a polypropylene lid with fittings for SPE columns and cartridges.

Valves allow individual vacuum control of each SPE column. The cabinet is fitted with a variable rack to accommodate a wide variety of tubes and vials. The sample drying accessory allows eluates to be reduced in volume or to dryness by purging with inert gas.



Cross-contamination free elution with stainless steel or PTFE connectors (right) compared to the standard configuration (left).



**CHROMOBOND® MULTI 96**

CHROMABOND® MULTI 96 well plate manifolds are designed to work with all standard 96 well plate SPE systems. The manifold consists of a reservoir tank, vacuum gauge and control valve. 96 well collection plates and 8 well tube strips are also available for this system.

## MACHEREY-NAGEL SPECIALTY SORBENTS

Sorbent	Application	Product Number	Description	Quantity	Price
ABC18	Acrylamide in Food	MCN730533	500mg/6mL	30	\$119.80
Diamino	Pesticides in Food	MCN73065320 (See Application 303770)	<i>Sold in bulk for QuEChERS Method</i>	20gm	133.30
Drug	Drugs in Urine & Plasma	MCN730168 LV and 96 Well format also available	200mg/3mL	50	149.00
Tetracycline	Enrichment of Tetracyclines from Tissue	MCN730315	500mg/6mL	30	104.20
Crosslinks	Collagen crosslinks enrichment in Urine	MCN730458	300mg/3mL	50	149.00
AOX	Absorbable Organic Halides in Water with high salt loads	MCN730119AOX MCN730111AOX	200mg/6mL 500mg/6mL	30 30	154.60 172.50
CNSiOH	PAHs from Soil	MCN730112 MCN730135 MCN730135G Glass Columns	500/1000mg/3mL 500/1000mg/6mL 500/1000mg/6mL	50 30 30	386.40 234.10 326.00
C <sub>18</sub> PAH	PAHs from Water	MCN730166 MCN730166G Glass Columns	2000mg/6mL 2000mg/6mL	30 30	240.80 331.60
NH <sub>2</sub> /C <sub>18</sub>	PAHs from Water containing Humic Acids	MCN730618 MCN730620 MCN730618G Glass Columns MCN730620G Glass Columns	500/500mg/6mL 500/1000mg/6mL 500/500mg/6mL 500/1000mg/6mL	30 30 30 30	191.60 234.10 304.70 326.00
Na <sub>2</sub> SO <sub>4</sub> /Florasil	Hydrocarbons from Water (DIN H-53 / ISO DIS 9377-4)	MCN730249G Glass Columns	2000/2000mg/6mL	30	191.60
SiOH-H <sup>+</sup> /SA	PCBs from Oil	MCN730085 MCN730085G Glass Columns	500/500mg/3mL 500/500mg/3mL	50 50	284.50 398.70
SA/SiOH	PCBs from Waste Oil	MCN730132 MCN730132G Glass Columns	500/500mg/3mL 500/500mg/3mL	50 50	234.10 348.30
NAN	PCBs from Sludge	MCN730109 MCN730149 MCN730109G Glass Columns MCN730149G Glass Columns	400/1400/400mg/3mL 700/2000/700mg/6mL 400/1400/400mg/3mL 700/2000/700mg/6mL	50 30 50 30	152.30 303.60 240.80 394.30
DNPH	Concentration and derivatization of aldehydes and ketones from air	MCN731855	Cartridge 400mg	20	194.90
Dry	Drying Organic Samples	MCN731852 MCN731853 MCN731854	Na <sub>2</sub> SO <sub>4</sub> Cartridges 780mg Na <sub>2</sub> SO <sub>4</sub> Cartridges 1500mg Na <sub>2</sub> SO <sub>4</sub> Cartridges 2800mg	50 50 50	107.50 137.70 171.40
XTR	Liquid - Liquid Extraction	Efficient liquid-liquid extraction without using a separatory funnel.			Call
PTS	Phase Separation - Solvents Heavier than Water	Automatic separation of a two phase mixture without the use of a separatory funnel.			Call
PTL	Phase Separation - Solvents Lighter than Water	Automatic separation of a two phase mixture without the use of a separatory funnel.			Call



**Macherey-Nagel can also prepare custom SPE products to suit your applications.**

**Contact our Technical Support Group for further details.**

# MACHEREY-NAGEL SPE METHOD DEVELOPMENT KITS

## CHROMABOND® AND CHROMAFIX® METHOD DEVELOPMENT KITS

If you do not know the behaviour of your samples in solid phase extraction, or if you want to optimise the extraction procedure, Macherey-Nagel recommends their method development kits.

For the development kits as well as for all individual CHROMABOND®, CHROMABOND® LV AND CHROMAFIX® products, columns are packaged in units of five to prevent adsorption of contaminants from the environment. CHROMAFIX® DNPH cartridges are individually sealed in laminated aluminum bags.

Designation	Contents	Product Number	Price
<b>Investigating the best separation mechanism for a clean-up procedure</b>			
CHROMABOND® Standard Development Kit	10 columns each with 1 mL/100mg C <sub>18</sub> , C <sub>18</sub> ec, C <sub>8</sub> , Phenyl, NH <sub>2</sub> , DMA, OH, CN, SiOH, SA, SB	MCN730110	\$164.70
<b>Selecting the optimum RP phase for a clean-up procedure</b>			
CHROMABOND® RP Development Kit I	10 columns each with 3 mL/500mg C <sub>18</sub> , C <sub>18</sub> ec, C <sub>8</sub> , C <sub>4</sub> , and 10 columns with 3 mL/200mg HR-P	MCN730197	84.00
CHROMABOND® RP Development Kit II	10 columns each with 1 mL/100mg C <sub>18</sub> , C <sub>18</sub> ec, C <sub>8</sub> , C <sub>4</sub> , and HR-P	MCN730207	66.10
CHROMABOND® RP Development Kit III	10 columns each with 3 mL/500mg C <sub>18</sub> , C <sub>18</sub> ec, C <sub>18</sub> Hydra, C <sub>8</sub> and 10 columns with 3 mL/200 mg HR-P	MCN730490	84.00
CHROMABOND® RP Development Kit IV	10 columns each with 1 mL/100mg C <sub>18</sub> , C <sub>18</sub> ec, C <sub>18</sub> Hydra, C <sub>8</sub> and HR-P	MCN730491	66.10
CHROMABOND® RP Development Kit V	10 columns each with 3 mL/500mg C <sub>6</sub> H <sub>5</sub> , NO <sub>2</sub> , C <sub>6</sub> H <sub>11</sub> ec, C <sub>4</sub> , C <sub>2</sub>	MCN730492	84.00
CHROMABOND® RP Development Kit VI	10 columns each with 1 mL/100mg C <sub>6</sub> H <sub>5</sub> , NO <sub>2</sub> , C <sub>6</sub> H <sub>11</sub> ec, C <sub>4</sub> , C <sub>2</sub>	MCN730493	66.10
CHROMAFIX® RP Development Kit I	10 cartridges each CHROMAFIX® S C <sub>18</sub> , C <sub>18</sub> ec, C <sub>8</sub> , C <sub>4</sub> , and 10 cartridges with 125 mg HR-P	MCN731883	68.30
CHROMAFIX® RP Development Kit II	10 cartridges each CHROMAFIX® S C <sub>18</sub> , C <sub>18</sub> ec, C <sub>18</sub> Hydra, C <sub>8</sub> and 10 cartridges with 125 mg HR-P	MCN731886	68.30
CHROMAFIX® RP Development Kit III	10 cartridges each CHROMAFIX® S C <sub>6</sub> H <sub>5</sub> , NO <sub>2</sub> , C <sub>6</sub> H <sub>11</sub> ec, C <sub>4</sub> , C <sub>2</sub>	MCN731887	68.30
<b>Selecting the optimum polar phase for a clean-up procedure</b>			
CHROMABOND® Polar Development Kit I	10 columns each with 3 mL/500mg SiOH, Florisil®, NH <sub>2</sub> , CN, OH	MCN730199	84.00
CHROMABOND® Polar Development Kit II	10 columns each with 1 mL/100mg SiOH, Florisil®, NH <sub>2</sub> , CN, OH	MCN730208	66.10
CHROMAFIX® Polar Development Kit	10 cartridges each CHROMAFIX® S SiOH, Florisil®, NH <sub>2</sub> , CN, OH	MCN731884	68.30
<b>Selecting the optimum ion exchanger for a clean-up procedure</b>			
CHROMABOND® Ion Exchange Development Kit I	10 columns each with 3 mL/500mg SA, SB, PS-OH, PS-H <sup>+</sup> , DMA	MCN730206	165.70
CHROMABOND® Ion Exchange Development Kit II	10 columns each with 1 mL/100mg SA, SB, PS-OH, PS-H <sup>+</sup> , DMA	MCN730209	127.70
CHROMABOND® Ion Exchange Development Kit III	10 columns each with 3 mL/500mg SA, PSA, PCA, PS-H <sup>+</sup>	MCN730494	154.60
CHROMABOND® Ion Exchange Development Kit IV	10 columns each with 1 mL/100mg SA, PSA, PCA, PS-H <sup>+</sup>	MCN730495	113.20
CHROMAFIX® Ion Exchange Development Kit I	10 cartridges each CHROMAFIX® S SA, SB, PS-OH, PS-H <sup>+</sup> , DMA	MCN731885	127.70
CHROMAFIX® Ion Exchange Development Kit II	10 cartridges each CHROMAFIX® S SA, PSA, PCA, PS-H <sup>+</sup>	MCN731888	113.20
<b>Phase selection for clean-up procedures for environmental samples</b>			
CHROMABOND® Kit for Environmental Sample Preparation	10 columns each with 3 mL/200mg HR-P, 6 mL/1000mg C <sub>18</sub> ec, 6 mL/2000mg C <sub>18</sub> PAH, 6 mL/500/1000mg CN/SiOH, 3 mL/500/500mg SA/SiOH	MCN730205	295.80



# J.T. BAKER SPE COLUMNS

## J. T. BAKER SPE COLUMNS

Chromatographic Specialties Inc. is pleased to offer J.T. Baker high quality products for increased productivity.

BAKERBOND Phases	Sorbent Mass	Column Size	Qty	Product Number	Price
<b>Reversed Phase</b>					
Octadecyl (C <sub>18</sub> ) <small>Meets specifications of EPA Method 525</small>	100 mg	1 mL	100	JT702001	\$188.20
	200 mg	3 mL	50	JT702002	125.30
	500 mg	3 mL	50	JT702003	140.80
	500 mg	6 mL	30	JT702006	95.60
	1000 mg	6 mL	30	JT702007	133.20
Octadecyl (C <sub>18</sub> )	500 mg	Wide Mouth	50	JT702013	168.20
Octyl (C <sub>8</sub> )	100 mg	1 mL	100	JT708701	197.50
	200 mg	3 mL	50	JT708702	131.50
	500 mg	3 mL	50	JT708703	159.70
	500 mg	6 mL	30	JT708706	153.50
Ethyl (C <sub>2</sub> )	100 mg	1 mL	100	JT727301	232.00
	200 mg	3 mL	50	JT727302	150.10
Cyano (CN)	100 mg	1 mL	100	JT702101	232.00
	500 mg	3 mL	50	JT702103	195.20
	1000 mg	6 mL	30	JT702107	192.80
Phenyl (C <sub>6</sub> H <sub>5</sub> )	100 mg	1 mL	100	JT709501	194.00
	500 mg	3 mL	50	JT709503	159.70
Cyclohexyl (C <sub>6</sub> H <sub>11</sub> )	500 mg	3 mL	50	JT721203	203.70

<b>Cation Exchange</b>					
Aromatic Sulfonic Acid (C <sub>6</sub> H <sub>5</sub> SO <sub>3</sub> H)	100 mg	1 mL	100	JT709001	\$237.30
	500 mg	3 mL	50	JT709003	200.10
	1000 mg	6 mL	30	JT709007	181.30
Carboxylic Acid (COOH)	500 mg	3 mL	50	JT721103	194.00

<b>Biochromatography</b>					
WP Butyl (C <sub>4</sub> )	500 mg	6 mL	30	JT721606	\$156.70
WP CBX (COOH)	500 mg	6 mL	30	JT721706	156.70
WP PEI (NH)	500 mg	6 mL	30	JT721806	156.70
WP HI-Propyl (C <sub>3</sub> )	500 mg	6 mL	30	JT723806	156.70
Sephadex G-25	500 mg	6 mL	30	JT721907	148.90

<b>Special Applications</b>					
narc-1 (Δ <sup>9</sup> -carboxy THC)	500 mg	3 mL	50	JT722103	\$159.70
SPE-500 (EPA Approved for organochloropesticides)	500 mg	6 mL	30	JT722206	133.40
EPA Method 525 (1000mg C <sub>18</sub> )	1000 mg	6 mL	30	JT702007	133.20

BAKERBOND Phases	Sorbent Mass	Column Size	Qty	Product Number	Price
<b>Adsorption</b>					
Silica Gel (SiOH)	100mg	1 mL	100	JT708601	\$161.40
	500 mg	3 mL	50	JT708603	126.10
	500 mg	6 mL	30	JT708606S	114.00
	1000 mg	6 mL	30	JT708607	130.10
Florisil (Mg <sub>2</sub> SiO <sub>3</sub> )	1000 mg	6 mL	30	JT721307	114.30
Alumina, Neutral (Al <sub>2</sub> O <sub>3</sub> )	1000 mg	6 mL	30	JT721407	122.50

<b>Normal Phase</b>					
Cyano (CN)	100 mg	1 mL	100	JT702101	\$232.00
	500 mg	3 mL	50	JT702103	195.20
	1000 mg	6 mL	30	JT702107	192.80
Amino (NH <sub>2</sub> )	500 mg	3 mL	50	JT708803	192.00
	1000 mg	6 mL	30	JT708807	172.70
Diol (COHCOH)	500 mg	3 mL	50	JT709403	193.70

<b>Anion Exchange</b>					
Quaternary Amine (N <sup>+</sup> )	500 mg	3 mL	50	JT709103	\$197.50
Amino (NH <sub>2</sub> )	500 mg	3 mL	50	JT708803	192.00
	1000 mg	6 mL	30	JT708807	172.70
Diamino (NH <sub>2</sub> /NH)	500 mg	3 mL	50	JT708903	201.60

<b>SPE Glass/Teflon Columns</b>					
Empty, with Teflon Frits		8 mL	30	JT732806	\$156.70
Octadecyl (C <sub>18</sub> ) <small>Meets specifications of EPA Method 525</small>	500 mg	8 mL	30	JT733406	285.00
Florisil® (Mg <sub>2</sub> SiO <sub>3</sub> )	500 mg	8 mL	30	JT742006	309.30
	1000 mg	8 mL	30	JT742007	362.00

<b>Method Development</b>					
Method Development Kit (5 columns of each) (Octadecyl, octyl, phenyl, silica, cyano, amino, diol, quaternary amine, diamino, aromatic sulfonic acid, carboxylic acid)					
	500 mg	3 mL	55	JT709600	\$197.40
Protein Sorbent Selection Kit (3 columns of each) (CBX, PEI, HI-Propyl, Butyl, Sephadex G-25)					
	500 mg	6 mL	15	JT723909	156.70

Other products available from J.T. Baker include: Speedisk™ Columns  
Speedisk™ 96 Columns  
Bakerbond Speedisk™ Extraction Disks  
Speedisk™ Extraction Stations



## Empore™ EXTRACTION DISKS

Empore™ extraction disks provide a sample prep solution for large volume samples. The disk format provides a large surface area for sorbent/sample contact. Faster flow rates and higher throughput are realized compared to liquid-liquid extraction or traditional packed column technology.

Sorbent	47mm Disks		90mm Disks	
	Product Number	Pkg. 60 Price	Product Number	Pkg. 30 Price
C8	3M2214	\$580.40	3M2314	\$843.70
C18	3M2215	580.40	3M2315	843.70
C18FF	3M2215FF	757.70	3M2315FF	1,020.00
SDB-XC	3M2240	714.00	3M2340	1,428.80
SDB-RPS	3M2241	714.00	3M2341	1,428.80
Cation Exchange-SR	3M2251	714.00	—	—
Anion Exchange-SR	3M2252	714.00	3M2352	1,428.80
Oil & Grease	3M2270	327.60	3M2370	331.80
Chelating	3M2271	714.00	3M2371	1,428.80
Carbon	3M2272	714.00	3M2372	1,428.80

## Empore™ CARTRIDGES

Empore™ High Performance Extraction Disk Cartridges provide an innovative alternative to packed column technology. Standard density (SD) membranes for all silica based sorbent chemistries allow reliable sample preparation for difficult sample matrices. The high density (HD) membrane formulation is intended for minimal elution volumes. Empore membranes efficiently extract samples with no channeling. The small bed volume allows compound elution from Empore™ cartridges in as little as 100-300µL of mobile phase or mobile phase compatible solutions. Efficient extraction followed by direct injection of these solutions eliminates the need for time-consuming sample dry-down and reconstitution.

40 mL cartridges are also available for most sorbents.

Sorbent	1mL (4mm)		3mL (7mm)		6mL (10mm)	
	Product Number	Pkg. 300 Price	Product Number	Pkg. 150 Price	Product Number	Pkg. 90 Price
C2-SD	3M4111SD	\$681.60	3M4211SD	\$379.90	3M4311SD	\$308.20
C8-SD	3M4114SD	632.70	3M4214SD	359.80	3M4314SD	313.80
C18-SD	3M4115SD	632.70	3M4215SD	359.90	3M4315SD	313.80
MPC-SD	3M4130SD	729.30	3M4230SD	399.40	3M4330SD	320.70
UR(Universal Resin)	—	—	3M4245SD	353.40	—	—
C2-HD	3M4111HD	715.50	3M4211HD	397.10	3M4311HD	324.10
C8-HD	3M4114HD	663.60	3M4214HD	380.00	3M4314HD	330.00
C18-HD	3M4115HD	663.60	3M4215HD	353.40	3M4315HD	329.90
MPC-HD	3M4130HD	763.70	3M4230HD	417.10	3M4330HD	336.70
SDB-XC	3M4140HD	681.60	3M4240HD	380.00	3M4340HD	308.20
SDB-RPS	3M4141HD	681.60	3M4241HD	380.00	3M4341HD	308.20
CHELATING	—	—	—	—	3M4371HD	308.20

## Empore™ 96-WELL PLATES

Empore™ 96-Well Plates provide a means of high throughput sample preparation by processing 96 samples in a standard 8x12 microcolumn plate format compatible with standard 96-well plate liquid handling technologies and injection systems. Empore™ 96-Well Plates are available for solid phase extraction (SPE) and for filtration after protein precipitation.

Sorbent	Standard Well (1.2mL)		Deep Well (2.5mL)	
	Product Number	Pkg. 12 Price	Product Number	Pkg. 12 Price
C2-SD	3M6011SD	\$3,126.00	3M6311SD	\$3,438.00
C8-SD	3M6014SD	3,126.00	3M6314SD	3,438.00
C18-SD	3M6015SD	3,126.00	3M6315SD	3,438.00
MPC-SD	3M6030SD	3,126.00	3M6330SD	3,438.00
UR(Universal Resin)	3M6045SD	3,410.00	3M6345SD	3,751.00
Filter Plates	3M6065SD	838.20	3M6360SD	922.00

# 3M Empore™



*Need assistance with  
SPE Applications?*

*See the SPE applications  
available from our website  
literature list. Use our  
on-line SPE help form at  
[www.chromspec.com/tech/smpl-prep](http://www.chromspec.com/tech/smpl-prep)  
or contact our Technical  
Support Group at  
1-800-267-8103 or  
[tech@chromspec.com](mailto:tech@chromspec.com)*

# CHROMOSEP SPE COLUMNS AND ACCESSORIES

ChromoSep SPE products are economical alternatives to higher priced materials



ChromoSep SPE Manifold

*Need assistance with  
SPE Applications?  
Use our online SPE  
help form at*

*www.chromspec.com/tech/smpl-prep  
or contact our Technical  
Support Group at  
1-800-267-8103 or  
tech@chromspec.com*

## CHROMOSEP SPE COLUMNS

Product Number	Sorbent	Sorbent Mass/ Column Volume	Qty	Price
C612050	C18	100 mg / 1 mL	100	\$146.90
C612051	C18	200 mg / 3 mL	50	95.30
C612052	C18	500 mg / 3 mL	50	102.20
C612053	C18	500 mg / 6 mL	30	130.20
C612054	C18	1000 mg / 6 mL	30	104.10
C612060	C8	100 mg / 1 mL	100	146.90
C612061	C8	200 mg / 3 mL	50	95.30
C612062	C8	500 mg / 3 mL	50	102.20
C612063	C8	500 mg / 6 mL	30	130.20
C61206430	C8	1000 mg / 6 mL	30	104.10
C612090	Silica	100 mg / 1 mL	100	130.20
C612091	Silica	200 mg / 3 mL	50	83.90
C612092	Silica	500 mg / 3 mL	50	95.20
C61209225	Silica	500 mg / 6 mL	30	73.90
C6120923	Silica	1000 mg / 6 mL	30	83.00
C612096	SAX	100 mg / 1 mL	100	165.20
C612097	SAX	500 mg / 3 mL	50	137.20
C61209730	SAX	1000 mg / 6 mL	30	158.60
C612098	SCX	100 mg / 1 mL	100	165.20
C612099	SCX	500 mg / 3 mL	50	130.70
C61211430	SCX	1000 mg / 6 mL	30	158.60
C612078	Florisil	500 mg / 3 mL	50	100.80
C612079	Florisil	1000 mg / 6 mL	30	90.70

## CHROMOSEP SNAP-CAP SPE CARTRIDGES

Product Number	Sorbent	Sorbent Mass	Qty	Price
C6120926S	C18	300 mg	50	\$132.90
C6120934S	C18	600 mg	50	164.00
C6120942S	C18	900 mg	50	171.70
C6120950S	C8	300 mg	50	132.90
C6120974S	Silica	300 mg	50	132.90
C6120982S	Silica	600 mg	50	146.90
C6120990S	Silica	900 mg	50	153.80
C61210054S	Florisil	300 mg	50	132.90
C6121907S	SAX	600 mg	50	166.60
C6121902S	SCX	600 mg	50	181.80

## SPE VACUUM MANIFOLDS AND ACCESSORIES

Product Number	Description	Qty	Price
C612100	Vacuum Manifold 12 position complete*	1	\$733.80
C6121002	Vacuum Manifold 24 position complete*	1	1,044.10
C612130	5 mL collection tubes	12	Inquire
UCTRFV0001P	Reservoirs, empty, 1 mL	50	22.60
UCTRFV0004P	Reservoirs, empty, 4.0 mL	50	23.90
UCTRFV0008P	Reservoirs, empty, 8.0 mL	50	26.50
C612103	Reservoirs, empty, 15 mL	100	54.50
C612104	Reservoirs, empty, 25 mL	100	92.50
UCTRFV0075P	Reservoirs, empty, 75 mL	20	37.20
UCTRFV02F1P	Filter column with 2 frits, 1 mL	50	49.10
UCTRFV02F4P	Filter column with 2 frits, 4.0 mL	50	53.20
C612112	Filter column with 2 frits, 8.0 mL	50	71.60

\* Vacuum Manifold comes complete with cover, gasket, vacuum valve and gauge, glass chamber, needles and stopcocks (12 or 24) and collection racks. For replacement parts for the vacuum manifold or accessories not listed, please inquire.

# HORIZON's DryDisk™ SEPARATION SYSTEM

## DryDisk™ SEPARATION SYSTEM



### Solvent Drying System Glassware Apparatus

The Solvent Drying System provides vacuum assisted operation to facilitate and speed up the solvent drying step.

The system consists of a PTFE Membrane holder assembly with a docking bracket, clamp and vacuum line.

Quick disconnect fittings and a detachable disk holder permit the collected residual water to be poured back into the separatory funnel for re-extraction and optimal recovery of analytes.



Do you need to also concentrate the sample...

See our DryVap™ system on page 210



Do you want to stop performing liquid /liquid extractions...

See our SPE-DEX® 4790 automated SPE system on page 208



Product Number	Description	Price
HZSDS1011922	Solvent Drying System	\$549.20

## DryDisk™ SEPARATION MEMBRANE

The DryDisk™ separation membrane is a hydrophobic membrane utilizing GORETEX® filtration membrane that has been specifically designed to remove residual water from organic solvent. By eliminating the need for chemical drying with sodium sulfate, DryDisk™ reduces laboratory waste and eliminates the tedious multi step process associated with chemical drying.

- Faster processing time
- Unlimited capacity for water (physical barrier)
- No oven drying or special preparation
- Higher sample throughput
- Reduce laboratory waste
- Works on emulsions



HZ40705HT	DryDisk™ Membrane, Pkg. 50	\$271.00
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Dedicated Oil and Grease Automated Extractor for EPA Method 1664...

See page 209

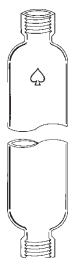




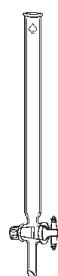
# ACE GLASS PRODUCTS



Request Literature Code **ACE01**



Chromatography Column (5820)



Chromatographic Column,  
1:5 PTFE Plug (5888)



Extraction Apparatus, Soxhlet (6783)



Extraction Thimbles, Glass (6813)

Porosity A = 145-174  $\mu\text{m}$   
Porosity B = 70-100  $\mu\text{m}$   
Porosity C = 25-50  $\mu\text{m}$

Cellulose and glass fibre extraction thimbles are listed on page 267.

Ace Glass Inc. has been a worldwide leader in scientific glassware since 1936. Ace Glass designed and patented internally threaded scientific glassware; Ace Threds® and precision bore, Trubore® Glassware, chromatography columns, beakers, extraction apparatus, filters, fritted ware, funnels, tubing connectors and much more!

Product Number	Description	Price
GA582016	Column, 300 x 15mm, #15 Ace	\$41.60
GA582020	Column, 450 x 15mm, #15 Ace	44.40
GA582024	Column, 600 x 15mm, #15 Ace	45.60
GA582030	Column, 300 x 25mm, #25 Ace	54.30
GA582034	Column, 450 x 25mm, #25 Ace	55.40
GA582037	Column, 600 x 25mm, #25 Ace	58.20
GA5820104	Column, 450 x 37mm, #25 Ace	114.60
GA582050	Column, 300 x 50mm, #50 Ace	101.40
GA582053	Column, 450 x 50mm, #50 Ace	114.60
GA582055	Column, 600 x 50mm, #50 Ace	123.50
GA582059	Column, 900 x 50mm, #50 Ace	154.70
GA582058	Column, 1200 x 50mm, #50 Ace	119.70
GA5820105	Column, 300 x 75mm, #50 Ace	519.80
GA5820107	Column, 600 x 75mm, #50 Ace	562.00
GA588810	Column, 10.5mm x 25cm	\$74.70
GA588815	Column, 14.5mm x 25cm	84.40
GA588820	Column, 14.5mm x 51cm	96.30
GA588825	Column, 19mm x 25cm	89.80
GA588830	Column, 19mm x 30cm	91.90
GA588835	Column, 19mm x 51cm	108.70
GA588837	Column, 22mm x 30cm	99.40
GA588839	Column, 22mm x 41cm	101.90
GA588841	Column, 22mm x 51cm	103.00
GA588845	Column, 25mm x 51cm	112.10
GA588850	Column, 41mm x 51cm	135.20
GA588855	Column, 41mm x 61cm	158.60
GA678303	27mm Extraction Apparatus	\$359.80
GA678305	37mm Extraction Apparatus	401.20
GA678307	46mm Extraction Apparatus	451.20
GA678311	55mm Extraction Apparatus	791.90
GA411124	50mL Extractor Body	359.20
GA411127	85mL Extractor Body	436.60
GA411131	200mL Extraction Body	491.90
GA411134	500mL Extraction Body	781.70
GA674002	Extraction Condenser, Size A	110.90
GA674006	Extraction Condenser, Size C	128.10
GA674008	Extraction Condenser, Size D	167.20
GA674010	Extraction Condenser, Size E	153.60
GA673506	Extractor, Size C	242.80
GA673510	Extractor, Size E	272.00
GA681302	40mL Porosity A Extraction Thimble, 28x85mm	\$51.80
GA681304	40mL Porosity B Extraction Thimble, 28x85mm	51.80
GA681306	40mL Porosity C Extraction Thimble, 28x85mm	51.80
GA681308	40mL Porosity D Extraction Thimble, 28x85mm	51.80
GA681310	40mL Porosity E Extraction Thimble, 28x85mm	51.80
GA681312	70mL Porosity A Extraction Thimble, 35x85mm	52.60
GA681314	70mL Porosity B Extraction Thimble, 35x85mm	52.60
GA681316	70mL Porosity C Extraction Thimble, 35x85mm	52.60
GA681318	70mL Porosity D Extraction Thimble, 35x85mm	52.60
GA681320	70mL Porosity E Extraction Thimble, 35x85mm	52.60
GA681322	160mL Porosity A Extraction Thimble, 45x125mm	52.60
GA681324	160mL Porosity B Extraction Thimble, 45x125mm	52.60
GA681326	160mL Porosity C Extraction Thimble, 45x125mm	52.60
GA681328	160mL Porosity D Extraction Thimble, 45x125mm	52.60
GA681330	160mL Porosity E Extraction Thimble, 45x125mm	52.60

All Ace precision-grade glassware is warranted to be within the tolerance specified in ASTM Specifications. All laboratory-grade ware is twice precision-grade tolerances. All Ace-manufactured glassware items listed are, unless otherwise noted, fabricated from Pyrex® Brand Glass, a product of Corning Incorporated.

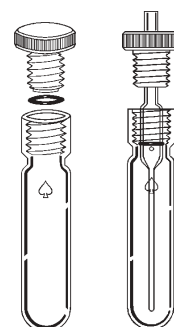
The items listed on the following two pages are but a small sampling of the Ace Glass product lines. Many more products, including custom glassware, are available. Please request a copy of the Ace Glass catalogue (literature code ACE01) or contact our Technical Support Group at 1-800-267-8103 or tech@chromspec.com.



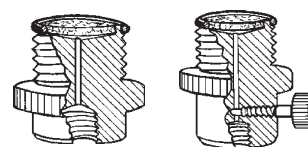
Product Number	Description	Price
GA722860	30mL Funnel, #2 stopcock	\$75.80
GA722862	60mL Funnel, #2 stopcock	114.50
GA722864	125mL Funnel, #2 stopcock	126.00
GA722866	250mL Funnel, #2 stopcock	148.90
GA722868	500mL Funnel, #4 stopcock	174.50
GA722870	1000mL Funnel, #4 stopcock	223.50
GA722872	2000mL Funnel, #6 stopcock	299.80
GA722876	4000mL Funnel, #6 stopcock	284.60
GA722877	4000mL Funnel, #8 stopcock	336.30
GA722879	6000mL Funnel, #8 stopcock	385.90
GA864803	15mL #15 150psi Pressure Tube	\$62.30
GA864806	35mL #15 150psi Pressure Tube	62.90
GA864808	38mL #15 150psi Pressure Tube	63.90
GA864889	100mL #15 150psi Pressure Tube	82.90
GA864897	120mL #15 150psi Pressure Tube	88.00
GA864898	48mL #15 150psi Pressure Tube	82.50
GA8648103	60 mL #15 150psi Pressure Tube	67.20
GA8648106	185 mL #15 150psi Pressure Tube	90.30
GA8648137	60mL #25 150psi Pressure Tube	96.20
GA8648250	77mL #25 150psi Pressure Tube	123.40
GA8648110	120mL #25 150psi Pressure Tube	96.90
GA8648114	140mL #25 150psi Pressure Tube	97.90
GA8648116	210mL #25 150psi Pressure Tube	102.00
GA583843	11mm Teflon Adapter, internally threaded	\$45.60
GA583845	11mm Teflon Adapter, internally threaded w/valve	95.60
GA583847	15mm Teflon Adapter, internally threaded	51.10
GA583849	15mm Teflon Adapter, internally threaded w/valve	100.20
GA583851	25mm Teflon Adapter, internally threaded	65.50
GA583853	25mm Teflon Adapter, internally threaded w/valve	101.90
GA583854	50mm Teflon Adapter, internally threaded	172.50
GA583855	50mm Teflon Adapter, internally threaded w/valve	202.20
GA583746	11mm Teflon Adapter, luer	45.50
GA583748	11mm Teflon Adapter, luer, w/valve	100.90
GA583751	15mm Teflon Adapter, luer	52.80
GA583753	15mm Teflon Adapter, luer w/valve	101.90
GA584843	11mm Porosity A Filter Disc	\$60.10
GA584844	15mm Porosity A Filter Disc	60.10
GA584847	25mm Porosity A Filter Disc	67.00
GA584849	50mm Porosity A Filter Disc	132.50
GA584852	11mm Porosity B Filter Disc	60.10
GA584854	15mm Porosity B Filter Disc	60.10
GA584856	25mm Porosity B Filter Disc	67.00
GA584858	50mm Porosity B Filter Disc	132.50
GA584821	11mm Porosity C Filter Disc	60.10
GA584823	15mm Porosity C Filter Disc	60.10
GA584825	25mm Porosity C Filter Disc	67.00
GA584828	50mm Porosity C Filter Disc	132.50
GA584831	11mm Porosity D Filter Disc	60.10
GA584833	15mm Porosity D Filter Disc	60.10
GA584835	25mm Porosity D Filter Disc	67.00
GA584838	50mm Porosity D Filter Disc	132.50



FUNNEL, Separatory, Squibb, Pear-Shaped, 1:5 PTFE Plug (7228)



Reaction Vessels, Pressure Tubes, Solvent Reservoirs (8648)



ADAPTERS, Bottom Drip, Internal Thread (5838)



Filter discs (5848)

# J-KEM REACTION BLOCK MODULES



Reaction blocks are a fast way to derivatize, extract or concentrate batches of samples. There are three basic components to any reaction block system. A heater, a temperature controller, and the reaction block itself. The controller and heater maintain the reaction block at the desired temperature, while the block has machined cavities that transfer heat evenly and efficiently to the samples.

More complex reaction blocks can offer programmed temperature profiles, heating and cooling steps, and even reflux reactions. No matter how sophisticated the system, the key to good performance is matching the vials and reaction block for efficient heat transfer.

## MODULAR REACTION BLOCKS FROM J-KEM

Select the block type and size, appropriate temperature controller and rotary shaker. Unlike one piece reaction blocks, you can choose the features you need for your lab. Modules are interchangeable for greater flexibility.

Vial Size	Heated	Heated & Cooled	Reflux	Reflux & Cooled
2mL	JKRB2 96 vials	JKRBC2 70 vials	JKRBR2 70 vials	JKRBR2BCP 70 vials
4mL	JKRB4 96 vials	JKRBC4 70 vials	JKRBR4 70 vials	JKRBR4BCP 70 vials
8mL	JKRB8 96 vials	JKRBC8 70 vials	JKRBR8 70 vials	JKRBR8BCP 70 vials
20mL	JKRB20 81 vials	JKRBC20 63 vials	JKRBR20 63vials	JKRBR20BCP 63 vials
Price	\$970.10	\$1,381.80	\$2,356.00	\$3,025.00

## TEMPERATURE CONTROLLER AND THERMOCOUPLE

Temperature Range	Model 150	Price	Model 150 + Timer	Price
Type T -200 to 250°C	JK150T JKRBTCT	\$603.20 \$92.70	JK150TimerT JKRBTCT	\$777.50 \$92.70
Type J 0 to 800°C	JK150J JKRBTCTJ	\$603.20 \$92.70	JK150TimerJ JKRBTCTJ	\$777.50 \$92.70
Type K -50 to 1200°C	JK150K JKRBTCK	\$603.20 \$92.70	JK150TimerK JKRBTCK	\$777.50 \$92.70

**Note:** The table above contains two product numbers per box. The top product number is the controller unit, the bottom product number is the thermocouple.

If you are setting up a new system, purchase BOTH product numbers; for replacement thermocouples simply order the bottom product number.

## Rotary Shakers

### Digital Shaker

Fits J-Kem reaction blocks. 15-500rpm rotational speed set via digital front panel. 100 hour timer turns shaker off at pre-set time. Unbalanced load sensor stops shaker in case of excess vibration. RS-232 port to monitor speed.



JKBTS3500 Digital Shaker \$2,520.10

### Analog Shaker

Fits J-Kem reaction blocks. 40-400rpm rotational speed set via front panel dial. Continuous run or 1 hour timer.



JKBTS1500 Analog Shaker \$1,839.10

## Reaction Blocks

### Heated

Ambient to 130°C. Built-in heater for rapid and homogenous heating.



### Heated and Cooled

-100°C to 130°C. Built-in heater and internally milled coolant flow path surrounding every vial position. Cooling is provided by external circulating chiller.



### Reflux

Ambient to 130°C. Heated bottom layer, cooled top layer, and insulating middle layer. Cooled top (condenser) sustains continuous reflux in a capped vial.



### Reflux and Cooled

-100°C to 130°C. Has the same features as the Reflux block, but cooling channels are added to the bottom (heated) layer. Allows heating, cooling, and reflux in the same block.

**Reaction Block Evaporators are also available.** Call our Technical Support Group for more details.

## Temperature Controllers

### Model 150

Built-in ramp-to-setpoint. 1200 watts of power. +/- 0.1°C temperature regulation.



### Model 150 with Timer

Built-in ramp-to-setpoint. 1200 watts of power. +/- 0.1°C temperature regulation. 100 hour digital timer to heating OFF or ON at a user set time.



If you require even greater control over reaction temperatures, contact our Technical Support Group and inquire about the J-Kem 200 Series Controllers.

Replacement thermocouples are available.

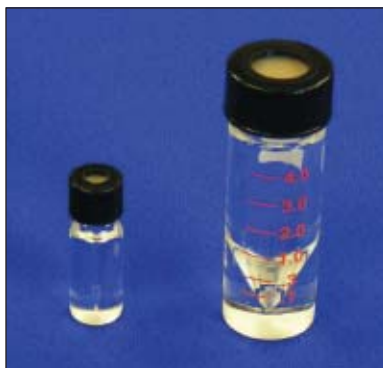


# VIALS AND ACCESSORIES FOR REACTION BLOCKS

## REACTION VIALS

- Small Scale Reaction
- Virtually Leakproof

These unique multi-purpose containers are ideal for micro and semi-micro applications. The internal tapered cone is designed for maximum sample recovery with a syringe or micropipette. The Teflon™ faced silicone disc may be readily pierced with a syringe needle, yet provides excellent re-sealing characteristics. Manufactured from borosilicate glass with heavy walls and base which provides sample magnification, mechanical strength and stability for bench work without a rack. The 3 mL and 5 mL sizes have approximate volume graduations. Also available with amber coating for protection of light sensitive materials. Packaged in a plastic storage box with protective foam inserts. Priced per dozen with cap and teflon faced silicone liner.



Product Number	Dimensions Diam. x Ht.	Disc Size	Volume	Cap Size	Glass	Qty	Price
C57003	12 x 32 mm	8 mm	0.1 mL	8-425	Clear	12	\$139.60
C57003A	12 x 32 mm	8 mm	0.1 mL	8-425	Amber	12	188.10
C57010	13 x 32 mm	12 mm	0.3 mL	13-425	Clear	12	136.90
C57014	13 x 32 mm	12 mm	0.3 mL	13-425	Amber	12	212.60
C57020	13 x 47 mm	12 mm	1.0 mL	13-425	Clear	12	143.10
C57024	13 x 47 mm	12 mm	1.0 mL	13-425	Amber	12	223.50
C57025	20 x 38 mm	18 mm	2.0 mL	20-400	Clear	12	149.70
C57029	20 x 38 mm	18 mm	2.0 mL	20-400	Amber	12	237.80
C57030	20 x 49 mm	18 mm	3.0 mL	20-400	Clear	12	156.30
C57034	20 x 49 mm	18 mm	3.0 mL	20-400	Amber	12	241.80
C57040	20 x 60 mm	18 mm	5.0 mL	20-400	Clear	12	166.70
C57044	20 x 60 mm	18 mm	5.0 mL	20-400	Amber	12	267.80
C57085	25 x 69 mm	22 mm	10.0 mL	24-400	Clear	12	222.30

## NEEDLES FOR PIERCE REACTI-VAP®

Product Number	Description	OEM Equivalent	Qty	Price
H90019S34	4" (102mm), 19 gauge, SS needle	18784	6	\$54.50
H90019S36	6" (152mm), 19 gauge, SS needle	18786	6	54.50
H90622	12" (304mm), 22 gauge Teflon® needle*	18784/18786	6	19.80

\* 22 gauge Teflon® needle has the same ID as a 19 gauge SS needle. 12" Teflon® can be cut to 4" or 6" as needed.

## SPINVANE FOR VIALS

Magnet is encased in PTFE and is designed to fit conical shaped Mini-Vials. Provides efficient mixing and stirring for microscale titrations and reactions.



Product Number	Description	Pierce Equivalent	Qty	Price
C57100	Spin Vane for 0.3 and 1.0 mL reaction vials	16000	1	\$9.70
C57102	Spin Vane for 3.0 and 5.0 mL reaction vials	16010	1	10.70

## Dynabloc™ REACTION BLOCKS FOR CIRCULAR-TOP HOT PLATES

- Convenient - one block base, multiple blocks for different size vials, tubes and flasks
- Base fits standard circular 135mm diameter stirrer/hotplate tops
- Base accommodates a standard thermocouple
- Easy to use - switch from vials to flasks in seconds
- Economical and efficient
- Excellent heat transfer
- Insulated T-handle to lift hot blocks from base



Product Number	Description / # of Wells (size)	Price
GA1369805	Base Plate, 135mm Diameter	\$134.20
GA1369809	T-Handle	86.10
GA1369821	Block, 1 mL Vial 28 (13 x 27.6mm)	172.00
GA1369849	Block, 1 mL Vial 54 (13 x 27.6mm)	163.50
GA1369838	Block, 4 or 8 mL Vial 36 (17 x 27.6mm)	170.30
GA1369841	Block, 4 or 8mL Vial 52 (17 x 27.6mm)	170.30
GA1369814	Block, 10 mL Reaction Vial 18 (26 x 50mm)	172.00
GA1369812	Block, 20 mL Vial 18 (28 x 27.6mm)	154.90
GA1369813	Block, 40 mL Vial 18 (28 x 50mm)	154.90
GA1369830	Block, 16mm OD Tube 40 (17 x 50mm)	189.20

### Need Other Sizes?

Dynabloc™ reaction blocks for common vial sizes are listed here. Other block sizes are available, as are blocks for round bottomed and Erlenmeyer flasks. Please call our Technical Support Team for more information.



# SUN SRi DISSOLUTION ACCESSORIES



Sun dissolution test vessels and accessories are an economical alternative to costly OEM products. The dissolution vessels are manufactured to meet all USP XXIV, monograph <711> requirements.



Dissolution Test Vessels — Glass

## DISSOLUTION TEST VESSELS — GLASS

- Precision formed with straight sides, a flat flange and hemispherical bottom, free from imperfections
- Designed to meet all USP XXIV requirements, monograph <711>

Product Number	Description	Qty	Price
SB100002	Clear, 1000 mL Serialized Vessel	each	\$94.20
SB100008	Clear, 1000 mL Graduated Serialized Vessel	each	108.40
SB100006	Amber, 1000 mL Serialized Vessel	each	176.60

## ACRYLIC STACKABLE VESSEL HOLDER

SB204416	Single Place Vessel Holder	each	\$104.60
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Dissolution Cannula

## DISSOLUTION TESTING CANNULA

- Hub and needle are made of Type 316 stainless steel
- Convenient luer-lock connection for attaching syringes or filters
- Angled to allow easy access to the dissolution vessel
- Plastic tubing covering the tip ensures that the micro filters will remain attached to the needle cannula

SB401350	Dissolution Testing Cannula, 4 3/8" for 900 mL	each	\$66.60
SB401352	Dissolution Testing Cannula, 7 1/2" for 500 mL	each	72.70

## SUNFLO™ DISSOLUTION FILTERS

- Designed to remove all small particulate from samples drawn from dissolution vessels
- Manufactured of foamed porous polyethylene
- Fits conveniently on the end of a cannula or sample probe



Dissolution Filters

SB400104	Dissolution Filters, 10 µm	100	\$75.40
SB400105	Dissolution Filters, 10 µm	1000	588.90
SB400111	Dissolution Filters, 20 µm	1000	588.90
SB400101	Dissolution Filters, 35 µm	100	75.40
SB400102	Dissolution Filters, 35 µm	1000	588.90
SB400110	Dissolution Filters, 45 µm	100	75.40
SB400109	Dissolution Filters, 45 µm	1000	588.90
SB400107	Dissolution Filters, 70 µm	100	75.40
SB400108	Dissolution Filters, 70 µm	1000	588.90

## FILTER TIPS

- Economical dissolution filters
- Manufactured of polyethylene with a limited porous area
- Fits securely on the end of a 1/8" cannula or sample probe

Product Number	Description	Qty	Price
SB203972	Filter Tip, 2 µm	1000	\$295.30
SB203980	Filter Tip, 5 µm	1000	295.30
SB204004	Filter Tip, 10 µm	1000	295.30
SB204002	Filter Tip, 45 µm	1000	295.30



## PLASTIC DISPOSABLE SYRINGES

- No rubber plunger seals or silicone lubricants that may cause sample contamination
- Manufactured from chemically resistant polypropylene and polyethylene
- Available in either Luer Lok or Luer Slip connections
- Easy to read permanent graduations



Product Number	Volume	Tip Orientation	Sterility	Graduation Intervals	Qty	Price
SB400027	1 mL	Luer Slip, centered tip	Non-sterile	0.01 mL	1000	\$270.10
SB201631	2 mL	Luer Slip, centered tip	Sterile	0.1 mL	100	13.90
SB400030	3 mL	Luer Slip, centered tip	Non-sterile	0.1 mL	1000	208.70
SB501370	3 mL	Luer Lok, centered tip	Non-sterile	0.1 mL	1000	347.90
SB201636	5 mL	Luer Slip, centered tip	Sterile	0.2 mL	100	25.60
SB400010	5 mL	Luer Lok, centered tip	Non-sterile	0.2 mL	1000	392.20
SB400008	5 mL	Luer Slip, centered tip	Non-sterile	0.2 mL	1000	217.80
SB201635	10 mL	Luer Lok, centered tip	Sterile	0.5 mL	100	53.40
SB400014	10 mL	Luer Lok, centered tip	Non-sterile	0.5 mL	1000	479.30
SB400012	10 mL	Luer Slip, eccentric tip	Non-sterile	0.5 mL	1000	305.00
SB201637	20 mL	Luer Lok, centered tip	Sterile	1.0 mL	100	71.90
SB400018	20 mL	Luer Lok, centered tip	Non-Sterile	1.0 mL	1000	610.00
SB201644	20 mL	Luer Slip, eccentric tip	Sterile	1.0 mL	100	60.30
SB400016	20 mL	Luer Slip, eccentric tip	Non-sterile	1.0 mL	1000	442.20
SB400035	30 mL	Luer Slip, centered tip	Non-sterile	2.0 mL	500	649.60
SB201652	50 mL	Luer Slip, eccentric tip	Sterile	2.0 mL	30	58.10
SB400020	50 mL	Luer Slip, eccentric tip	Non-sterile	2.0 mL	300	522.90

## TITAN II® SYRINGE FILTERS

- Low UV Extractables
- Colour-coded housing for easy identification
- Sealing ring prevents premature bursting
- Available in 4, 13 and 30 mm formats

Product Number	Description	Qty	Price
SB40725GM	Syringe Filter, Glass Microfiber, 0.7 µm, 30 mm	100	\$146.10
SB41225GM	Syringe Filter, Glass Microfiber, 1.2 µm, 30 mm	100	146.00
SB42725GM	Syringe Filter, Glass Microfiber, 3.1 µm, 30 mm	100	146.00



# OPTIMIZE CAPILLARY TRAP CARTRIDGES



Trap, clean and elute your sample with OPTI-PAK™ Trap Cartridges

#### Applications:

- Desalting and buffer removal
- Sample clean-up
- Sample pre-concentration
- Selective analyte elution
- Rapid chromatographic separation



OPTI-PAK™ can be installed directly into the fitting port of an injection valve.

## OPTI-PAK™ CAPILLARY TRAP CARTRIDGES

OPTI-PAK™ capillary trap cartridges can be used for a variety of applications, from desalting and detergent removal to in-line sample concentration and purification. Trap cartridges are an effective means of handling sample clean-up and pre-concentration tasks in an on-line environment.

OPTI-PAK™ can be installed directly into column ports, injection valve manifolds and detector inlets and its patented auto-adjusting design allows installation with absolutely no dead volume. Install an OPTI-PAK™ into the outlet of a switching valve to facilitate the trapping, desalting and pre-concentration of an analyte mixture. Or add a second trap downstream in the loop of an injection valve, and selectively elute analytes from the first trap onto the second, where they can be easily eluted onto your LC/MS.

OPTI-PAK™ is available in several low-volume configurations, packed with 40 µm C18, strong cation exchanger or a mixed mode sorbent with both non-polar and ion exchange characteristics.

### Bed Selection Guide

Use these guidelines to select an optimal bed volume for your application. Please note, however, that they are just guidelines, and not strict limits.

Sample Capacity	Sample Volume	Load Rate (Optimal)	Suggested Bed Volume
0.5 µg	0.025 - 25 µL	1.25 - 5 µL/min	0.12 µL
1 µg	0.05 - 50 µL	2.5 - 10 µL/min	0.25 µL
2 µg	0.1 - 100 µL	5 - 20 µL/min	0.5 µL
4 µg	0.2 - 200 µL	10 - 40 µL/min	1.0 µL
8 µg	0.4 - 400 µL	20 - 80 µL/min	2.0 µL
20 µg	1.0 - 1000 µL	50 - 200 µL/min	5.0 µL

### OPTI-PAK™ Trap Cartridge Kit

Includes: 1 OPTI-PAK™ holder, 5 trap cartridges and 5 replacement PEEK ferrules

Product Number	Description	Price
M1003324TA	OPTI-PAK™ Trap Cartridge Kit with C18, 0.25 µL bed	\$513.70
M1003317TA	OPTI-PAK™ Trap Cartridge Kit with C18, 0.5 µL bed	402.00
M1003225TA	OPTI-PAK™ Trap Cartridge Kit with C18, 1.0 µL bed	402.00
M1003324TE	OPTI-PAK™ Trap Cartridge Kit with SCX, 0.25 µL bed	513.70
M1003317TE	OPTI-PAK™ Trap Cartridge Kit with SCX, 0.5 µL bed	402.00
M1003225TE	OPTI-PAK™ Trap Cartridge Kit with SCX, 1.0 µL bed	402.00
M1003324TB	OPTI-PAK™ Trap Cartridge Kit with C18 AQ, 0.25 µL bed	513.70
M1003317TB	OPTI-PAK™ Trap Cartridge Kit with C18 AQ, 0.5 µL bed	402.00
M1003225TB	OPTI-PAK™ Trap Cartridge Kit with C18 AQ, 1.0 µL bed	402.00
M102002875	Tube Set for OPTIPAK™ Trap Cartridges (Rheodyne Injection Valve)*	47.00
M102002876	Tube Set for OPTIPAK™ Trap Cartridges (Valco Injection Valve)*	35.00

\* These tube sets come with one 30 cm length of 0.003" ID PEEK tubing and a valve port fitting designed for use with the specified injection valve. The Tube Set can also be used for making in-line connections.

# VIALS AND SAMPLE HANDLING

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**1-800-267-8103**





# GUIDELINES FOR AUTOSAMPLER VIAL SELECTION

We have updated this section to make it easier to select the appropriate vials and/or accessories quickly and accurately.  
All the seals, caps, septa and inserts will be located on the corresponding vial pages.



## Vial Description

Vial Dimensions Neck Finish Closure size	12x32 Crimp 11mm	12x32 Screw 8-425	12x32 Screw 9-425	12x32 Screw 10-425	12x32 Snap Snap	15x45 Screw 13-425	15x45 Shell	8x40 Shell	8x40 Crimp 9mm	Headspace Crimp 20mm	Headspace Screw
<b>Autosampler</b>	<b>See Page</b>										
<b>Agilent</b> 1050, 1090, 1100 5890, 6890, 7890 7673 A/B, 7683 B Headspace	305-310	316-317	305, 314-315	318	305, 311-313					322	322
<b>Beckman</b> 501, 502, 507		316-317	305, 314-315	318					321		
<b>Hitachi</b> AS-2000, AS-6000 S6551, L-7200 L-7250	305-310	316-317	305, 314-315		305, 311-313						
<b>Konik</b> HRGC4000 B	305-310	316-317									
<b>Leap</b> CTC A200S Headspace	305-310	316-317	305, 314-315	318	305, 311-313					322	
<b>Perkin Elmer</b> Autosystem LC600 42 vial tray 420/B, 4900 Headspace	305-310 305-310 305-310	316-317	305, 314-315		305, 311-313					322	
<b>Shimadzu</b> SIL-6B, -7A, -8A SIL10A, 10Ai, 10AxL SIL-2AS	305-311	316-317	318								
<b>Spark Holland</b> Marathon Promis Triathlon Midas	305-310 305-310 305-310 305-310	316-317 316-317 316-317 316-317	305, 314-315 305, 314-315	318	305, 311-313 305, 311-313						
<b>Spectra Physics/Thermo</b> 8875, 8880	305-310	316-317	305, 314-315		305, 311-313						
<b>Varian</b> 8000 series 8100/8200 Marathon 9100/9090/9095 Headspace	305-310 305-310 305-310	316-317 316-317 316-317 316-317	305-314-315 305-314-315	318	305, 311-313				321		
<b>Waters</b> Alliance 2690 Wisp 717 48 position Wisp 717 96 position			305, 314-315	318		319	320	320			

If you don't see your instrument listed in the table above, contact our Technical Support Team at 1-800-267-8103 for assistance or to try a sample.

# GUIDELINES FOR AUTOSAMPLER VIAL SELECTION

## A VIAL IS A VIAL, OR IS IT?

Autosampler vials may seem insignificant when compared to the sophisticated analytical instrumentation most laboratories use, but the incorrect vial, cap or septa can contribute to problems that can decrease productivity and reproducibility.

### Potential Problems Caused by Using Incorrect Vial/Cap/Septum:

- Loss of analyte due to evaporation
- Presence of extra peaks in the chromatogram due to solvent/septum interaction
- Mechanical damage to autosampler
- Sample degradation
- Irreproducible injection volumes



## WHAT TO CONSIDER WHEN SELECTING AN AUTOSAMPLER VIAL

### Autosampler Compatibility

Not all autosamplers are alike. Some utilize robotic arms to pick up a sample vial; some use tray rotation while others move the sampling needle to the respective vial coordinates. The dimensions of autosampler vials vary. Most autosamplers are equipped with trays that use 12x32mm vial configurations but some like the Waters Wisp require a 15x45mm configuration. Consult your autosampler's operating manual or manufacturer to determine the vial dimensions required.

### Sample Volume

The amount of sample available for analysis is important in choosing the appropriate vial. If only a limited volume of sample is available, you will have to choose between using an insert for your regular autosampler vial, a microvial or a high recovery vial.

Note: Most 12x32 mm autosampler vials hold between 1.5mL to 2.0mL of liquid, depending on where the manufacture measures the vial full. The dimensions for 12x32mm vials are standard between manufacturers but the length of the neck and width/shape of the vial shoulder may vary. 12x32mm microvials have the same outer dimensions but the inside of the vial may be tapered to reduce volume or contain a fused insert. 12x32mm high recovery vials will have an internal conical bottom that allows for maximum sample recovery.

### Sample Compatibility

The analyte and solvent compatibility should be considered in choosing vials and accessories. For example, amber glass is most often used for light sensitive samples while deactivated glass or plastic vials are used for compounds that are sensitive to glass or stick to the glass itself. Volatile samples require closures that reduce the risk of analyte loss due to evaporation.

### Vial Composition

Several factors need to be considered when choosing laboratory glass - chemical inertness, durability, light sensitivity, storage conditions, analyte composition and especially exposure to heat/freezing temperatures.

**Linear Coefficient of Expansion** refers to the fractional change in the length of glass per degree of change in temperature, in short, the ability of the glass to tolerate rapid thermal changes. The lower the coefficient of expansion the better the glass can handle temperature change without fracturing.

Classifications for laboratory glass based on its resistance to attack from water were established by the United States Pharmacopoeia, USP.

**USP Type 1, Class A, 33 Borosilicate Glass** is the most inert and chemically resistant glass widely used in laboratories especially for chromatography applications. Type I glass is composed primarily of silicone and oxygen, with trace amounts of boron and sodium. It has the lowest leaching characteristics and a linear coefficient of expansion of 33.

**USP Type 1, Class B, 51 Borosilicate Glass** which is composed of silicone and oxygen, trace amounts of boron, sodium and other element is more alkaline than Class A glass but still adequate for laboratory use. All amber borosilicate glass is made of Class B unless otherwise specified and has an expansion coefficient of 51.

**Silanized or deactivated glass** is borosilicate glass that has undergone further deactivation by treating the surface of the glass with an organosilane. The surface becomes more hydrophobic and inert making the vial suitable for use with pH sensitive compounds, trace analyses and applications requiring long term sample storage.

# GUIDELINES FOR AUTOSAMPLER VIAL SELECTION



**USP Types II, III and NP glass** are manufactured from soda lime which has less chemical resistance than borosilicate.

**Polypropylene** is a rigid and translucent material, which also comes in a variety of colours and has good chemical resistance for short term storage of most common laboratory chemicals. Resistance decreases over time when using aromatic and halogenated hydrocarbons. Polypropylene vials are often used for ion chromatography because of the extremely low metal content and excellent cleanability with dilute acid followed by deionized water rinse. Polypropylene vials limit the exposure to hazardous materials since they can be incinerated while sealed.



**Polymethylpentene (TPX)** is a rigid transparent material, which has a relatively high melting point with a temperature range of 0°-170°C. TPX vials can be used as alternative to opaque polypropylene vials because they provide maximum clarity. Their chemical resistance is similar to that of polypropylene vials. TPX vials should be used for applications where visual clarity is required or repetitive exposure to higher temperatures such as autoclaving. TPX vials tend to be more brittle at room temperature.



## Type of Vial Finish and Closures

Autosampler vials are available in a variety of neck finishes and opening diameters. Large mouth or wide ID vials have approximately a 40% wider mouth opening than standard opening vials. The large opening reduces the risk of bent autosampler needles during sampling.



**Screw thread vials and caps** provide low evaporation, reusability, less hand injury during manipulation than crimp seals and require no special tools. All screw threads vials and caps are differentiated by their thread finish as defined by the Glass Packaging Institute, GPI. For screw thread vials, a two part number is assigned. For example, 8-425 neck finish represents a vial with a diameter of 8 mm across the outside of the threads and a thread style of 425. Screw thread vials and caps are more expensive than crimp seals.



**Caps** for screw thread vials are available with either an open hole for autosampler use and standard addition or with a solid top for sample storage. One piece polypropylene cap and membrane are also available. These pierceable screw thread caps are designed for one time use and reduce sample preparation time as there is no cap and seal to assemble.



**Crimp top vials** require lacquered aluminum crimp seals which are relatively inexpensive and, when properly assembled, provide the best seal for long term storage. Crimp seals are not reusable.

A **crimping tool** is required to seal caps and a decrimper or decapper is required to remove the seals. Several types of hand crimpers are available including the adjustable precision crimpers that Chromatographic Specialties offers. Adjustable hand crimpers feature an adjustable stop on the handle to provide consistent seal tightness every time. Adjusting the hex screw inside the steel crimper jaws will also alter the amount of crimp. Achieving a good crimp is crucial because overcrimping can cause septum coring, bent needles and create a larger hole in the Teflon septum layer than a properly crimped seal. Undercrimping can result in loose seals and sample evaporation.



**Hand decrimpers** quickly and safely remove seals with just a single squeeze of the handle. Decappers are similar in design to pliers and provide an inexpensive alternative to decrimpers. Decrimpers should be used for applications involving hazardous samples because there is less chance of spillage.

**Electronic crimpers and decappers** are also available. Electronic units reduce hand fatigue, provide consistent crimps and are ideal for laboratories analyzing a lot of samples.

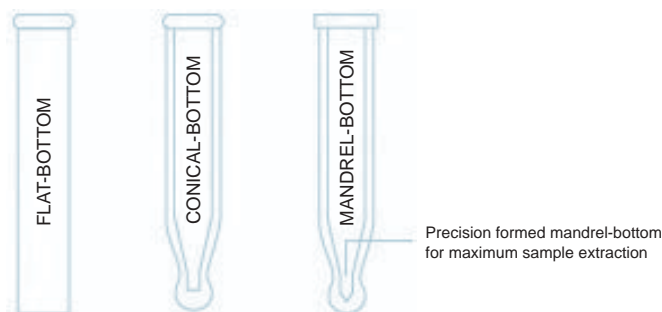


**Snap seal vials** are less prone to breakage during decapping because more glass is used in the neck of the vial. The snap seal neck finish is compatible with either crimp and/or snap seals and no special tools are required to remove the cap. These vials are recommended for short term sample storage and non-volatile samples because the seal is not as secure as a crimp or screw thread seal.

**Shell Vials** are an economical alternative to screw thread vials for Waters' HPLC autosamplers or any other autosampler that doesn't use a robotic arm to move the vials. Most shell vials are sold with a polyethylene cap that has a starburst design for easy needle penetration.

# GUIDELINES FOR AUTOSAMPLER VIAL SELECTION

## WHAT TO CONSIDER WHEN SELECTING THE PROPER INSERT...



Limited volume inserts are an economical solution when there is a limited amount of sample and injection is done using an autosampler. Most autosamplers have a set depth that the injection needle can go into the vial without bottoming out. Inserts increase the sample depth within the vial even if there is a very minute volume of sample available.

### Solvent Compatibility

Type I borosilicate glass inserts are most commonly used for trace analysis in chromatography.

Polypropylene inserts are less expensive than glass and are suitable for applications involving pH sensitive samples.

### Insert Shape and Point Style

The style of insert chosen is dependent on the amount of sample available and the residual volume after sampling.

- **Conical** inserts have a tapered bottom with pulled tips and are available with or without plastics springs. The spring acts as a shock absorber during needle penetration and raises the insert above the bottom of the vial, allowing greater sample recovery.
- **Mandrel** inserts also have a tapered bottom but the tips have been precision formed over a mandrel to give the internal tip a "V" shape that reduces the residual volume of the insert. Mandrel precision formed inserts are recommended when maximum recovery of the sample is required.
- **Flat bottom** inserts have the largest capacity and are the most economical inserts. These inserts are cylindrical in shape with a flat bottom
- **Hanging** inserts have either a flange top or top spring that suspends the insert correctly centered in the vial.
- **Step** inserts with a built-in glass flange are designed specifically for step vials with a special tapered neck. The flange suspends the insert correctly centered in the vial without causing a bulge in the septum when the cap is screwed on.

### Dimensions of the Autosampler Vial

Choosing the incorrect size of insert for an autosampler vial can result in poor reproducibility between sample injections, damage to the autosampler needle and an inadequate seal between the septum and the vial. The dimensions listed for insert size in the catalogue refer to the outside diameter and length. Inserts with an outside diameter of 5mm are used with vials with standard mouth openings and the 6mm are used with wide mouth vials. The length of the insert should be flush with the neck of the vial to prevent the insert from causing the septum to bulge.

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# GUIDELINES FOR AUTOSAMPLER VIAL SELECTION

## WHAT TO CONSIDER WHEN SELECTING SEPTA



Septum compatibility or chemical resistance with the sample and solvent is the main consideration when choosing vial septa. Any interaction can lead to sample degradation or the appearance of ghost peaks in the chromatogram. Teflon or PTFE is the most inert but has poor resealability making it unsuitable for multiple injections or storage. For layered septa such as PTFE/silicone the chemical resistance of the septa is that of Teflon until the septum is punctured. Once punctured, the silicone layer is exposed and able to react with sample/solvent so the chemical resistance of silicone should be considered when using these septa.

Note: The thicker the facings on the seal the better the resealability but it compromises the ability of the autosampler needle to pierce the septum.

Septa Material	Advantages	Chemical Resistance	Applications	Max Temp
PTFE	Economical	Excellent	For single injection only	550°C
PTFE/silicone	Excellent resealing capabilities	Excellent until punctured Not suitable for chlorosilanes	Multiple injections than moderate resistance	200°C
Pre-slit PTFE/silicone	Reduces coring Prevents vacuum from inside the vial	Excellent until punctured than moderate resistance	Multiple injections	200°C
PTFE/silicone/PTFE	Resistant to coring Autoclavable	Excellent	Above average resealing Multiple injections or applications with long periods between injections	200°C
PTFE/red rubber	Economical	Excellent until punctured	Moderate resealability not recommended for holding samples for further analysis	110°C
Molded polypropylene	Economical	Good Not resealable	For single injection use only	130°C
Gray butyl	Very economical	Not suitable for chlorinated solvents, alkanes, benzenes or cyclohexanes	Suitable for low pressure applications	125°C
Viton		Excellent chemical resistance Good for chlorinated solvents Not recommended for use with amines, pyridine, acetonitrile, DMF, DMSO, THF, dioxane, methanol, Freon 22, ethylacetate, acetone or acid anhydrides.	Average resealability	160°C

Our new line of CHROMSPEC™ vials and caps offer the same high quality and affordability that you have come to expect. The new line also introduces products with important new features:

Bonded Cap/Septa (Available in 9-425 screw cap format only)

Septa are bonded to the cap to prevent "push through" of the septa. This type of cap works very well with Waters Alliance autosamplers and other systems that have blunt point sampling needles.

Ultra-Low Bleed (ULB) Septa ( Available in Snap Cap and Screw Cap)

The septa have been conditioned at high temperatures to remove extractables. Use these for highly sensitive analyses where low background levels are a necessity.

- **40% larger opening reduces autosampler needle damage**
- **Manufactured from Type 1 borosilicate glass**
- **Compatible with robotic autosamplers**

## 12 x 32mm WIDE OPENING CRIMP TOP GLASS VIALS

Product Number	Description	Qty	Price
C223682CLM	Clear Wide Opening Crimp Top Glass Vial	100	\$13.20
C223683MLM	Clear Wide Opening Crimp Top Glass Vial	1000	116.00
C7711800W	Clear Wide Opening Crimp Top Glass Vial with White Marking Spot	100	15.00
C7711800WM	Clear Wide Opening Crimp Top Glass Vial with White Marking Spot	1000	128.30
C7711800A	Amber Wide Opening Crimp Top Glass Vial	100	15.80
C7711800AM	Amber Wide Opening Crimp Top Glass Vial	1000	138.80
C7711800AW	Amber Wide Opening Crimp Top Glass Vial with White Marking Spot	100	15.80
C7711800AWM	Amber Wide Opening Crimp Top Glass Vial with White Marking Spot	1000	138.80



## 11mm CRIMP TOP SEAL WITH SEPTA

C221150C	Silver Aluminum Seal with Teflon/Orange Rubber Septa	100	\$12.00
C221150	Silver Aluminum Seal with Teflon/Orange Rubber Septa	1000	85.00



## 2 mL 9-425 WIDE OPENING SCREW THREAD VIALS

C779100	Clear 2 mL 9-425 Wide Opening Screw Thread Vial	100	\$13.90
C779100M	Clear 2 mL 9-425 Wide Opening Screw Thread Vial	1000	122.30
C779100W	Clear 2 mL 9-425 Wide Opening Screw Thread Vial with White Marking Spot	100	17.70
C779100WM	Clear 2 mL 9-425 Wide Opening Screw Thread Vial with White Marking Spot	1000	155.70
C779100A	Amber 2 mL 9-425 Wide Opening Screw Thread Vial	100	16.60
C779100AM	Amber 2 mL 9-425 Wide Opening Screw Thread Vial	1000	146.50
C779100AW	Amber 2 mL 9-425 Wide Opening Screw Thread Vial with White Marking Spot	100	18.70
C779100AWM	Amber 2 mL 9-425 Wide Opening Screw Thread Vial with White Marking Spot	1000	164.20

## PREASSEMBLED CAPS AND SEPTA FOR 2 mL 9-425 WIDE OPENING SCREW THREAD VIALS

C779200B	9-425 Screw Cap, Blue*; Red PTFE/White Silicone Septa <b>Non-bonded</b>	100	\$10.40
C779200BM	9-425 Screw Cap, Blue*; Red PTFE/White Silicone Septa <b>Non-bonded</b>	1000	92.80
C779200BB	9-425 Screw Cap, Blue*; Red PTFE/White Silicone Septa <b>Bonded</b>	100	12.50
C779200BBM	9-425 Screw Cap, Blue*; Red PTFE/White Silicone Septa <b>Bonded</b>	1000	111.80
C779200XBB	9-425 Screw Cap, Blue*; Red PTFE/White Silicone Septa <b>Bonded Pre-Slit</b>	100	14.60
C779200XBBM	9-425 Screw Cap, Blue*; Red PTFE/White Silicone Septa <b>Bonded Pre-Slit</b>	1000	130.00
C779400B	9-425 Screw Cap, Blue*; Clear PTFE/White Silicone Septa <b>Ultra Low Bleed</b>	100	15.50
C779400BM	9-425 Screw Cap, Blue*; Clear PTFE/White Silicone Septa <b>Ultra Low Bleed</b>	1000	138.20

\* Caps are available in a variety of colours. Please inquire.



# CHROMSPEC™ AUTOSAMPLER VIALS



## SNAP SEAL™ VIALS, 12 x 32mm

Product Number	Description	Qty	Price
C7711100	Snap Seal™ Vial	100	\$11.60
C7711100M	Snap Seal™ Vial	1000	102.30
C7711100W	Snap Seal™ Vial with White Marking Spot	100	14.60
C7711100WM	Snap Seal™ Vial with White Marking Spot	1000	128.20
C7711100A	Amber Snap Seal™ Vial	100	12.40
C7711100AM	Amber Snap Seal™ Vial	1000	109.50
C7711100AW	Amber Snap Seal™ Vial with White Marking Spot	100	16.20
C7711100AWM	Amber Snap Seal™ Vial with White Marking Spot	1000	142.50



## PREASSEMBLED CAPS AND SEPTA FOR SNAP SEAL™ VIALS, 12 x 32mm

C7711200B	Standard Snap Seal™ Cap, Blue; Red PTFE/White Silicone Septa <b>Non-bonded</b>	100	\$11.00
C7711200BM	Standard Snap Seal™ Cap, Blue; Red PTFE/White Silicone Septa <b>Non-bonded</b>	1000	98.50
C7711200XB	Standard Snap Seal™ Cap, Blue; Red PTFE/White Silicone Septa <b>Non-bonded Pre-Slit</b>	100	14.20
C7711200XBM	Standard Snap Seal™ Cap, Blue; Red PTFE/White Silicone Septa <b>Non-bonded Pre-Slit</b>	1000	126.30
C7711400B	Snap Seal™ Cap, Blue*; Clear PTFE/White Silicone Septa <b>Ultra Low Bleed</b>	100	16.10
C7711400BM	Snap Seal™ Cap, Blue*; Clear PTFE/White Silicone Septa <b>Ultra Low Bleed</b>	1000	143.90

\* Caps are available in a variety of colours.



## MICROINSERTS FOR WIDE MOUTH CRIMP AND 9-425 SCREW THREAD VIALS

- For limited sample volumes
- Manufactured from Type 1 borosilicate glass
- Microinserts are an economical alternative to expensive limited volume vials

Product Number	Volume (µL)	Material	Point Style	Spring	Size (mm)	Qty	Price
C221191LM	250	51 Glass	Conical	No	6x31	100	\$38.20
C221191LMM	250	51 Glass	Conical	No	6x31	1000	325.10
C221016	250	51 Glass	Conical	No	6x31	100	39.20
C221016M	250	51 Glass	Conical	No	6x31	1000	333.00
C731109S	250	51 Glass	Conical	Yes	6x29	100	76.30
C731109SM	250	51 Glass	Conical	Yes	6x29	1000	660.00
C221094	250	51 Glass	Conical	Yes	6x31	100	59.00
C221094M	250	51 Glass	Conical	Yes	6x31	1000	502.00
C221020	250	33 Glass	Mandrel	Yes	6x29	100	65.00
C221020M	250	33 Glass	Mandrel	Yes	6x29	1000	584.70

## CERTIFIED VIALS

Due to the growing demand for certified chromatography vials, Chromatographic Specialties is now offering products from National Scientific and Agilent. More products will be added as they become available.

The listing below is only a small sampling of the certified products available. Please contact Technical Support if the product you require is not listed.



### National Scientific Certified Vial Kits (all are screwtop vials)

Product Number	Description	Qty	Price
C58CERT400078W	Target DP 2mL Certified Clear ID™ Vial Kit w/ Bonded PTFE/Silicone	100	\$65.80
C58CERT400093W	Target DP 2mL Certified Clear ID™ Vial Kit w/ Bonded Slit PTFE/Silicone	100	75.00
C58CERT400069LV	Target DP 350µL Certified Clear ID™ Insert Vial Kit w/ Bonded PTFE/Silicone	100	146.30
C58CERT400071LV	Target DP 350µL Certified Clear ID™ Insert Vial Kit w/ Bonded Slit PTFE/Silicone	100	162.60
C58CERT400075W	Target DP 2mL Certified Amber ID™ Vial Kit w/ Bonded PTFE/Silicone	100	64.40
C58CERT400076W	Target DP 2mL Certified Amber ID™ Vial Kit w/ Bonded Slit PTFE/Silicone	100	65.70
C58CERT400072LV	Target DP 350µL Certified Amber ID™ Insert Vial Kit w/ Bonded PTFE/Silicone	100	157.90
C58CERT400073LV	Target DP 350µL Certified Insert Vial w/ Bonded Slit PTFE/Silicone	100	176.90
C58CERT400080	Target DP 2mL Certified Clear Vial Kit w/ PTFE/Rubber	100	54.30
C58CERT400080W	Target DP 2mL Certified Clear ID™ Vial Kit w/ PTFE/Rubber	100	58.30
C58CERT400092W	Target DP 2mL Certified Clear ID™ Vial Kit w/ PTFE/Silicone	100	66.00
C58CERT400082W	Target DP 2mL Certified Amber ID™ Vial Kit w/ PTFE/Rubber	100	62.90
C58CERT400086W	Target DP 2mL Certified Clear ID™ Vial Kit w/ PTFE/Silicone/PTFE	100	71.10
C58CERT401583	4mL Screwtop Certified Clear Vial Kit w/ Bonded PTFE/Silicone	100	102.70
C58CERT401584	4mL Screwtop Certified Clear Vial Kit w/ Bonded Slit PTFE/Silicone	100	104.70
C58CERT401586	4mL Screwtop Certified Amber Vial Kit w/ Bonded PTFE/Silicone	100	104.70
C58CERT401587	4mL Screwtop Certified Amber Vial Kit w/ Bonded Slit PTFE/Silicone	100	106.20
C58CERT401091	2mL Certified Clear 10-425 Vial Kit w/ Bonded PTFE/Silicone	100	79.80



### Agilent Certified Vials

Product Number	Description	Qty	Price
CS51820714	Clear 2mL screw top vials	100	\$16.10
CS51813375	Clear 2mL crimp top vials	100	13.40
CS51820715	Clear 2mL screw top vials, write on spot	100	17.20
CS51820716	Amber 2mL screw top vials, write on spot	100	18.30
CS51820717	Blue screw cap, PTFE/red silicone rubber septa	100	17.20
CS51811210	Silver crimp cap, clear PTFE/red natural rubber septa	100	12.30
CS51820720	Blue screw cap, PTFE/silicone septa	100	24.70
CS51813400	Vial kit, Clear crimp top vial, Write on Spot, caps PTFE/red rubber septa	500	112.00
CS51818801	Vial kit, Amber crimp top vial, Write on Spot, caps PTFE/red rubber septa	500	131.00
CS51820868	Vial kit, Clear screw top vial, Write on Spot, caps PTFE/silicone septa	500	207.00
CS51820735	Vial kit, Amber screw top vial, Write on Spot, caps PTFE/silicone septa	500	215.00



# AUTOSAMPLER VIALS AND ACCESSORIES



## *Our Most Economical Autosamplers Vials and Accessories for Agilent Autosamplers!*

### Clear 12 x 32 mm WIDE OPENING CRIMP TOP Glass Vials

- 40% larger opening reduces autosampler needle damage
- Manufactured from Type 1 borosilicate glass
- 12 x 32 mm vials are compatible with robotic autosamplers

Product Number	Description	Qty	Price
C223682CLM	Clear Wide Opening Crimp Top Glass Vial, CHROMSPEC™	100	\$13.20
C223683MLM	Clear Wide Opening Crimp Top Glass Vial, CHROMSPEC™	1000	116.00

### 11 mm Crimp Top Seal with Septa

C221150C	Silver Aluminum Seal with Teflon/Orange Rubber Septa, CHROMSPEC™	100	\$12.00
C221150	Silver Aluminum Seal with Teflon/Orange Rubber Septa, CHROMSPEC™	1000	85.00

### Clear 2 mL 9-425 WIDE OPENING SCREW THREAD Vials

- 40% larger opening than standard vials
- Specifically designed to work with robotic arm autosamplers
- StepVial design precisely centers a limited volume insert in the vial neck
- Borosilicate Type 1 33 glass ensures superior results

Product Number	Description	Qty	Price
C779100	Clear 2 mL 9-425 Wide Opening Screw Thread Vials, CHROMSPEC™	100	\$13.90
C779100M	Clear 2 mL 9-425 Wide Opening Screw Thread Vials, CHROMSPEC™	1000	122.30

### Preassembled Caps and Septa

C779200B	Blue Cap with PTFE/Red Rubber Septa*, CHROMSPEC™	100	\$10.40
C779200BM	Blue Cap with PTFE/Red Rubber Septa*, CHROMSPEC™	1000	92.80

\* Caps are available in a variety of colours. Please inquire.

### CHROMSPEC™ MICROINSERTS for Wide Mouth Crimp and 9-425 Screw Thread

- For limited sample volumes
- Manufactured from Type 1 borosilicate glass
- Microinserts are an economical alternative to expensive limited volume vials

Product Number	Volume (µL)	Material	Point Style	Spring	Size (mm)	Qty	Price
C221191LM	250	51 Glass	Conical	No	6 x 31	100	\$38.20
C221016	250	51 Glass	Conical	No	6 x 31	100	39.20
C731109S	250	51 Glass	Conical	Yes	6 x 29	100	76.30
C221094	250	51 Glass	Conical	Yes	6 x 31	100	59.00
C221020	200	33 Glass	Mandrel	Yes	6 x 29	100	65.00

See Page 306 for packages of 1000.

This page details only a small sampling of the vials, caps, seals and inserts that we have to offer.

For further assistance, or to try a sample of any of these products, please contact our Technical Support Team at 1-800-267-8103 or by email at [sales@chromspec.com](mailto:sales@chromspec.com).

# 12x32mm WIDE OPENING CRIMP TOP VIALS AND ACCESSORIES

## 2mL WIDE OPENING Crimp Top Glass Vials, 12x32mm

Product Number	Vial Description	Marking Spot	Qty	Price
C223682CLM	Clear 33 glass	No	100	\$13.20
C223683MLM	Clear 33 glass	No	1000	116.00
C781100LM	Clear, 33 glass	Yes	100	15.70
C221100LMA	Amber, 51 glass	No	100	16.00
C781110LM	Amber, 51 glass	Yes	100	18.10
CS51813375	Agilent clear, 33 glass, certified	No	100	13.40
CS51820543	Agilent clear, 33 glass, certified	Yes	100	15.60

## Crimp Top Microvials, 12x32mm

Product Number	Volume	Material	Qty	Price
CQ2030	300µL	Clear 33 glass QSetVial	100	\$96.90
CQ2032	300µL	Amber 51 glass QSetVial	100	99.60
CQ2002	1.5mL	Clear QVial, 33 glass, conical bottom	100	113.50
C731203	100µL	Polypropylene	100	16.70
C731203M	100µL	Polypropylene	1000	145.20
SB200050	250µL	Polypropylene	100	25.00
SB200046	250µL	Polypropylene	1000	200.80
C226023	300µL	Polypropylene, snap cap/crimp top	100	18.10
C226070	700µL	Polypropylene, snap cap/crimp top	100	20.40
C731211	750µL	Polypropylene	100	12.40

## 11mm Aluminum Seals with Septa for WIDE OPENING 12x32mm Vials

Product Number	Septum Description	Seal Colour	Qty	Price
C221150C*	PTFE/orange rubber	Silver	100	\$12.00
C221150*	PTFE/orange rubber	Silver	1000	85.00
C51110050C	PTFE/orange silicone	Silver	100	16.40
C51110050M	PTFE/orange silicone	Silver	1000	126.40
C511100535M	Red PTFE/white silicone, 0.045"	Silver	1000	191.50
C511100459M	Red PTFE/white silicone, 0.060"	Silver	1000	191.50
C307C	Red PTFE/silicone/PTFE	Silver	100	24.80
C307M	Red PTFE/silicone/PTFE	Silver	1000	223.40

\* Other Seal Colours Available

## Microinserts — Conical Point Style for WIDE OPENING Crimp Top Vials

Product Number	Volume (µL)	Material	Spring	Size (mm)	Qty	Price
CS51832085	100	Agilent	No	6 x 31	100	\$41.00
C5810630	200	Target, 33 glass	Yes	6 x 30	100	126.70
C5810630P	200	Polypropylene	Yes	6 x 31	100	38.40
C221191LM	250	51 glass	No	6 x 31	100	38.20
C221016	250	51 glass	No	6 x 31	100	39.20
C731109S	250	51 glass	Yes	6 x 29	100	76.30
C221094	250	51 glass	Yes	6 x 31	100	59.00
C734025P631	250	Polypropylene	No	6 x 31	1000	74.70
C734025PBS631	250	Polypropylene	Yes	6 x 31	1000	149.50
C221070	300	51 glass, hanging insert	No	6 x 30	100	61.80

## Microinserts — MANDREL POINT Style for WIDE OPENING Crimp Top Vials

C221020	200	33 glass	Yes	6 x 29	100	\$65.00
C5810629	200	Target, 33 glass	No	6 x 29	100	65.90

## Microinserts — FLAT BOTTOM for WIDE OPENING Crimp Top Vials

C221190LM	350	51 glass		6 x 31	1000	\$101.30
C221190CLM	350	51 glass		6 x 31	100	16.00



### Autosampler Compatibility

**Agilent** — 8042, 1050, 1100, 1084, 7670A, 7671A, 7672, 1042, 1090, 1082, 7673A/B, 1080, 5890, 6890

**Leap** — CTC A200S, CTC A105S

**Hitachi** — AS-2000, AS-6000

**Perkin Elmer** — AI-1, ISS 100, ISS 200, LC600 42 vial tray, Autosystem GC, Integral 4000, 4900, 420/B

**Spark Holland** — SPH 125, Marathon, Promis, Triathlon, Midas

**Spectra Physics** — 8875, 8880

**Shimadzu** — SIL-10A, -10Ai, -10Axi

**Varian** — 8100/8200, 9100/9090/9095, Marathon

**Waters** — Alliance 2690

*Most products are available in packages of 100 and 1000.*



Microinserts for WIDE OPENING Crimp Top Vials

# 12x32mm STANDARD OPENING CRIMP TOP VIALS AND ACCESSORIES



2ml Crimp Top Vials and Seals

## Autosampler Compatibility

**Agilent** — 1090, 1100

**Beckman** — 501, 502, 507, 508

**Leap** — CTC A200S, A105S

**Perkin Elmer** — Autosystem

**Shimadzu** — SIL-6B, -7A, -8A, -9A, -10A, -10Ai, -10AxL

**Spark Holland** — Marathon, Midas, Triathlon, Promis

**Varian** — 8000 series, Marathon, Vista, 9100/9090/9095

*Most products are available in packages of 100 and 1000.*



Crimpers and Decrimpers

See Page 335 for more crimpers.

## 2mL STANDARD OPENING Crimp Top Glass Vials, 12 x 32mm

Product Number	Vial Description	Marking Spot	Qty	Price
C223682C	Clear 33 glass	No	100	\$13.20
C223683M	Clear 33 glass	No	1000	116.00
C221100A	Amber	No	100	17.50
C221100AM	Amber	No	1000	136.80
C221100AWP	Amber	Yes	100	18.80

## 11mm Wide ID Aluminum Seals with Septa for STANDARD OPENING Crimp Top Vials

Product Number	Septum Description	Seal Colour	Qty	Price
C221150C	PTFE/orange rubber	Silver	100	\$12.00
C221150	PTFE/orange rubber	Silver	1000	85.00
C221150B	PTFE/orange rubber	Blue	100	17.50
C221150R	PTFE/orange rubber	Red	100	17.50
C221150G	PTFE/orange rubber	Green	100	17.50
C221150Y	PTFE/orange rubber	Yellow	100	17.50
C51110050C	PTFE/orange silicone	Silver	100	16.40
C51110050M	PTFE/orange silicone	Silver	1000	126.40
C511100535M	Red PTFE/white silicone, 0.045"	Silver	1000	191.50
C511100459M	Red PTFE/white silicone, 0.060"	Silver	1000	191.50
C307C	Red PTFE/silicone/PTFE	Silver	100	24.80
C307M	Red PTFE/silicone/PTFE	Silver	1000	223.40

## Microinserts for STANDARD OPENING 12x32mm Crimp Top Vials

Product Number	Volume (µL)	Material	Point Style	Spring	Size (mm)	Qty	Price
C734005BS425	50	51 glass	Conical	Yes	4 x 25	100	\$53.10
C221015	100	51 glass	Conical	No	5 x 31	100	37.60
C221030	100	51 glass	Precision	No	5 x 31	100	38.40
C221021	100	51 glass	Precision	Yes	5 x 30	100	48.20
C731100S	100	51 glass	Conical	Yes	5 x 30	100	35.20
C73401PBS530	100	Polypropylene	Conical	Yes	5 x 30	1000	202.80
C221190	250	51 glass	Flat bottom	No	5 x 31	1000	115.00
C221190C	250	51 glass	Flat bottom	No	5 x 31	100	16.50

## Miscellaneous Accessories for 12x32mm Crimp Top Vials

Product Number	Description	Qty	Price
C6980611	Hand crimper for 11mm aluminum seals	each	\$201.90
C6981611	Decrimper for 11mm aluminum seals	each	224.00
C220248	Decapping Pliers for 11mm aluminum seals	each	77.10
N228778	Wheaton Vial File, stores up to 60 x 13mm diameter x 50mm height vials	6	101.50

\* Free samples are available.

Contact Technical Support at  
1-800-267-8103 for more details.



# SNAP TOP VIALS AND ACCESSORIES

## 2.0 mL SNAP TOP GLASS VIALS WITH WIDE OPENING, 12 x 32 mm

Product Number	Vial	Marking Spot	Qty	Price
C7331811232	Clear Snap Seal	No	100	\$13.50
C731003	Clear Snap Ring	No	100	12.50
C731003A	Amber Snap Ring	No	100	13.40
CS51820544	Clear Agilent	No	100	14.80
CS51820546	Clear Agilent	Yes	100	15.70
C58115	Clear Target Snap-It	No	100	17.80
C58115W	Clear Target Snap-It	Yes	100	19.70
C7331811232A	Amber Snap Seal	No	100	14.20
CS51820545	Amber Agilent	Yes	100	16.50
C58116W	Amber Target Snap-It	Yes	100	20.90
SB501300	Clear StepVial	Yes	100	19.40
SB501302	Amber StepVial	Yes	100	22.10

## POLYPROPYLENE SNAP TOP MICROVIALS WITH WIDE OPENING, 12 x 32 mm

Product Number	Volume	Qty	Price
C731203	100µL	100	\$16.70
C731203M	100µL	1000	145.20
C731205	100µL Glass Insert	100	130.40
CS51882788	300µL	100	31.10
C731211	750µL	100	12.40
CS51820567	1.0mL	100	16.30

## PRE-ASSEMBLED CLEAR SNAP CAPS WITH SEPTA

Product Number	Septum Description	Qty	Price
C731304	PTFE/silicone/PTFE	100	\$28.40
C731305	PTFE/silicone	100	23.90
C731306	PTFE disc, 0.10"	100	14.30
C73524011	PTFE/butyl rubber	100	17.30
C581150	Target Snap-It polyethylene SepCap	100	8.10
C581151	Target Snap-It, PTFE/red rubber	100	13.80
C581152	Target Snap-It, PTFE disc	100	20.60
C581153	Target Snap-It, PTFE/silicone/PTFE	100	40.60
C581154	Target Snap-It, PTFE/silicone	100	32.90
C581155	Target Snap-It, pre-slit PTFE/silicone	100	45.40
SB501313	StepVial Cap, PTFE/silicone	100	24.60
SB501317	StepVial Cap, pre-slit PTFE/silicone	100	44.30

## MICROINSERTS — CONICAL POINT STYLE

Product Number	Volume (µL)	Material	Spring	Size (mm)	Qty	Price
C221191LM	250	51 glass	No	6 x 31	100	\$38.20
C221016	250	51 glass	No	6 x 31	100	39.20
C731109S	250	51 glass	Yes	6 x 29	100	76.30
C221094	250	51 glass	Yes	6 x 31	100	59.00
CS51832085	100	Agilent	No	6 x 31	100	41.00
C5810630	200	33 glass	Yes	6 x 31	100	126.70
C5810630P	200	Polypropylene	Yes	6 x 31	100	38.40
C734025P631	250	Polypropylene	No	6 x 31	1000	74.70
C734025PBS631	250	Polypropylene	Yes	6 x 31	1000	149.50
C221070	300	51 glass Hanging Insert	No	6 x 30	100	61.80



### Autosampler Compatibility

**Agilent** — 8042, 1050, 1100, 1084, 7670A, 7671A, 7672, 1042, 1090, 1082, 7673A/B, 1080, 5890, 6890

**Leap** — CTC A200S

**Hitachi** — AS-2000, AS-6000

**Perkin Elmer** — AI-1, ISS 100, ISS 200, LC600 42 vial tray

**Spark Holland** — SPH 125, Marathon, Promis

**Spectra Physics** — 8875, 8880

**Shimadzu** — -SIL-10A, -10Ai, -10AxL

**Varian** — 8100/8200, Marathon

**Waters** — Alliance 2690

*Most products are available in packages of 100 and 1000.*

Assembled caps and septa are also available in other colours, contact our Technical Support Team at 1-800-267-8103 or by email [tech@chromspec.com](mailto:tech@chromspec.com) for product numbers.

Assembled vial, cap and septa kits are also available. Contact our Technical Support Team at 1-800-267-8103 or by email [tech@chromspec.com](mailto:tech@chromspec.com) for product numbers.



# J.G. FINNERAN SNAP TOP VIALS FOR AGILENT



## SNAP SEAL™ VIALS (Patented)

Simplify your choices when putting a cap together with a vial. The Snap Seal™ Vial (patented) can be securely sealed with the new patented Poly Crimp™ Seal, an aluminum crimp seal or a variety of Snap Top Cap™ designs. The Snap Seal™ Vial is designed, engineered and manufactured in compliance with ISO9002 guidelines by J.G. Finneran Associates. Although the Snap Seal™ Vial can work with many standard caps and seals, the tighter manufacturing tolerances and quality assurance programs at J.G. Finneran assure better performance when Finneran caps are used with Finneran vials.

Product Number	Description	Qty	Price
C73318111232	Clear Vial, 2.0mL, 12x32	100	\$13.50
C73318111232A	Amber Vial, 2.0mL, 12x32	100	14.20
C7331811E1232	Clear Vial, white graduation spot, 2.0mL, 12x32	100	15.70
C7331811E1232A	Amber Vial, white graduation spot, 2.0mL, 12x32	100	17.40
C7331511SS1232	Clear Snap Seal, High Recovery Glass Vial, 1.5mL	100	168.60



## POLY CRIMP™ SEALS (Patented)

A crimp cap constructed of plastic that fits virtually any crimp top vial.

C73551011	Clear Seal, 10mil PTFE Septa	100	\$11.70
C73554011	Clear Seal, PTFE/Red Rubber Septa	100	11.70
C73555011	Clear Seal, PTFE/Silicone Septa	100	21.40
C73556011	Clear Seal, PTFE/Silicone/PTFE Septa	100	24.90
C73557011	Clear Seal, PTFE/Silicone pre-slit Septa	100	34.10
C73558111	Clear Seal, PTFE/Silicone Septa with Starburst	100	33.90
C735500SB11	Clear Seal with molded Starburst Septa	100	6.00



## SNAP TOP™ CAPS

Caps may be snapped on and off by hand which eliminates the need for metal crimping and decapping tools, thus reducing the potential hazards due to sharp edges.

C731305	Clear Cap, PTFE/Silicone Septa	100	\$23.90
C73521011	Clear Cap, 10mil PTFE Septa	100	14.30
C73524011	Clear Cap, PTFE/Red Rubber Septa	100	17.30
C735200SB11	Clear Cap, molded Starburst Septa	100	6.20
C73527011	Clear Cap, PTFE/Silicone Septa with Starburst	100	34.60
C73528111	Clear Cap, PTFE/Silicone Septa with Slit	100	34.80



## CONVENIENCE PACKS

C7391855412	Clear Vial, PTFE/Red Rubber Septa with Poly Crimp™ Seals	100	\$24.10
C7391852412	Clear Vial, PTFE/Red Rubber Septa with Snap Top™ Caps	100	29.50
C7391855512	Clear Vial, PTFE/Silicone with Poly Crimp™ Seals	100	33.60
C7391852512	Clear Vial, PTFE/Silicone Septa with Snap Top™ Caps	100	35.30

# 12x32mm LIMITED VOLUME QSERTVIALS™

## QSertVial™

### The Ultimate in Microsampling Devices

The QSertVial™ consists of a precision 300µL conical glass insert permanently fused into a 12x32mm autosampler vial.

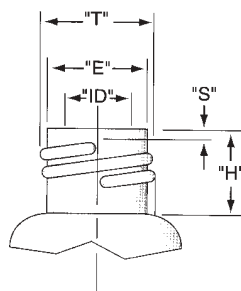
#### Benefits:

- This integral unit saves time and reduces the risk of contamination that is associated with the manual assembly of vial and insert
- Enables consistent sample recovery from vial to vial because the insert is always at the same precise depth within the vial
- Evaporation and cross contamination between the insert and vial is eliminated with the tighter seal of the insert to the septa
- The wide mouth opening of the QSertVial™ reduces the possibility of bent needles
- Available in screw top, crimp top and snap cap styles
- Compatible with all autosamplers that use 12x32mm vials



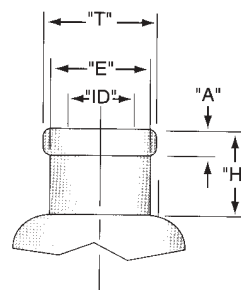
Product Number	Description	Qty	Price
CQ2030	Clear, QSertVial™, 12x32mm Crimp Top Vial Only with Fused 300µL Insert	100	\$96.90
CQ2032	Amber, QSertVial™, 12x32mm Crimp Top Vial Only with Fused 300µL Insert	100	99.60
CQ2028	Clear, QSertVial™, 12x32mm Snap Top Vial Only with Fused 300µL Insert	100	97.60
CQ2024	Clear, QSertVial™, 12x32mm Screw Top Vial with Fused 300µL Insert, Cap and PTFE/Silicone Septa	100	135.40
CQ2036	Amber, QSertVial™, 12x32mm Screw Top Vial with Fused 300µL Insert, Cap and PTFE/Silicone Septa	100	140.70
CQ2042	Clear, QSertVial™, 12x32mm Screw Top Vial with Fused 300µL Insert, Cap and PTFE/Silicone Pre-Slit Septa	100	146.00
CQ2044	Amber, QSertVial™, 12x32mm Screw Top Vial with Fused 300µL Insert, Cap and PTFE/Silicone Pre-Slit Septa	100	151.40
CQ2026	Clear, QSertVial™, 12x32mm Screw Top Vial with Fused 300µL Insert, Cap and PTFE/Silicone/PTFE Septa	100	146.00
CQ2038	Amber, QSertVial™, 12x32mm Screw Top Vial with Fused 300µL Insert, Cap and PTFE/Silicone/PTFE Septa	100	148.70

#### TECH TIP — Vial Finish Specifications



Standard Screw Thread Finish

"T" = Outer diameter of the thread  
 "E" = Inside diameter of the thread  
 "ID" = Inside diameter  
 "S" = Start of thread  
 "H" = Distance from top of finish to shoulder for closure clearance



Standard Crimp Seal Finish

"T" = Outer diameter of the seal  
 "E" = Crimp tool and robotic arm clearance  
 "ID" = Inside diameter  
 "A" = Crimp seal thickness  
 "H" = Distance from top to shoulder for crimp and robotic arm clearance

# 12x32mm 9-425 SCREW THREAD VIALS AND ACCESSORIES



## Autosampler Compatibility

**Agilent** — 8042, 1050, 1100, 1084, 7670A, 7671A, 7672, 1042, 1090, 1082, 7673A/B, 1080, 5890, 6890, 7890

**Leap** — CTC A200S

**Hitachi** — AS-2000, AS-6000

**Perkin Elmer** — AI-1, ISS 100, ISS 200, LC600 42 vial tray

**Spark Holland** — SPH 125, Marathon, Promis

**Spectra Physics** — 8875, 8880

**Shimadzu** — -SIL-10A, -10Ai, -10AxiL

**Varian** — 8100/8200, Marathon

**Waters** — Alliance 2690

## Vial Manufacturers

Agilent Brand - Agilent Technologies  
Target DP - National Scientific  
RAM - J.G. Finneran

*Most products are available in packages of 100 and 1000.*

Assembled caps and septa are also available in other colours, contact our Technical Support Team at 1-800-267-8103 or by email at tech@chromspec.com for product numbers.

## 2mL CLEAR 9-425 SCREW THREAD TYPE 33 GLASS VIALS, 12x32 mm

Product Number	Vial Description	Marking Spot	Qty	Price
C779100M	CHROMSPEC™ Vial	No	1000	\$122.30
C779100WM	CHROMSPEC™ Vial	Yes	1000	155.70
C73320091232	RAM vial	No	1000	130.80
C7332009M1232M	RAM vial	Yes	1000	185.30
C58001M	Target DP	No	1000	186.40
C58001W	Target DP	Yes	100	22.00
CS51820714	Agilent	No	100	16.10
CS51820715	Agilent	Yes	100	17.20

## 2mL AMBER 9-425 SCREW THREAD TYPE 51 GLASS VIALS, 12x32 mm

C779100A	CHROMSPEC™ Vial	No	100	\$16.60
C779100AM	CHROMSPEC™ Vial	Yes	1000	146.50
C73320091232AC	RAM	No	100	17.90
C7332009M1232A	RAM	Yes	1000	195.30
C58002W	Target DP	Yes	100	28.40

## 12x32 mm MICROVIALS 9-425 SCREW THREAD

Product Number	Volume (µL)	Vial	Septa	Qty	Price
C226025	300	Polypropylene	None	100	\$18.10
C226064	700	Polypropylene	None	100	20.40
C226060	700	Polypropylene	PTFE/silicone	100	42.40
C226062	700	Polypropylene	Pre-slit PTFE/silicone	100	59.00

## SCREW THREAD CAPS FOR 9-425 SCREW THREAD VIALS

Product Number	Description	Qty	Price
C580098B*	Target DP, blue	100	\$9.20
C73531009BC	RAM, blue	100	7.10

\* Other cap colours are available, please inquire.

## 9mm SEPTA

C731405	Red PTFE/silicone, 75mil, 9 mm	100	\$13.50
C731404	Red PTFE/silicone, 60mil, 9 mm	100	11.80
C229900C	Red PTFE/silicone, 40mil, 9 mm	100	14.20
C66522C0609C	Pre-slit red PTFE/silicone, 60mil, 9 mm	100	16.00
C580030	Target DP PTFE/red rubber	100	17.60
C580040	Target DP, PTFE/silicone/PTFE	100	40.30
C580060	Target DP, PTFE/silicone	100	25.70
CS51820731	Agilent ivory PTFE/red rubber	100	11.60

## PREASSEMBLED BLUE CAPS AND SEPTA

C779200B	CHROMSPEC™, PTFE/silicone, non-bonded	100	\$10.40
C779200BM	CHROMSPEC™, PTFE/silicone, non-bonded	1000	92.80
C779200XB	CHROMSPEC™, PTFE/silicone, non-bonded Pre-Slit	100	13.60
C779200XBM	CHROMSPEC™, PTFE/silicone, non-bonded Pre-Slit	1000	121.20
C779200BB	CHROMSPEC™, PTFE/silicone, Bonded	100	12.50
C779200BBM	CHROMSPEC™, PTFE/silicone, Bonded	1000	111.80
C779200XBB	CHROMSPEC™, PTFE/silicone, Bonded Pre-Slit	100	14.60
C779200XBBM	CHROMSPEC™, PTFE/silicone, Bonded Pre-Slit	1000	130.70
C779400B	CHROMSPEC™, PTFE/silicone, Ultra Low Bleed	100	15.50
C779400BM	CHROMSPEC™, PTFE/silicone, Ultra Low Bleed	1000	138.20
C73539509B	RAM PTFE/silicone	100	21.30
C73539509BM	RAM PTFE/silicone	1000	192.40
C73539609B	RAM PTFE/silicone/PTFE	100	25.90
C73539709B	RAM Pre-slit PTFE/silicone	100	32.90
C73539709BM	RAM Pre-slit PTFE/silicone	1000	304.60

# 12x32mm 9-425 SCREW THREAD VIALS AND ACCESSORIES

## PREASSEMBLED BLUE CAPS AND SEPTA (cont'd)

Product Number	Description	Qty	Price
C580054B	Target DP PTFE/silicone	100	\$32.90
C580053B	Target DP PTFE/silicone/PTFE	100	46.90
C580051B	Target DP PTFE/red rubber	100	19.50
CS51820717	Agilent PTFE/red rubber	100	17.20
CS51820720	Agilent PTFE/silicone	100	24.70

## Microinserts — CONICAL POINT Style

Product Number	Volume (µL)	Material	Spring	Size (mm)	Qty	Price
CS51832085	100	Agilent	No	6 x 31	100	\$41.00
C221191LM	250	51 glass	No	6 x 31	100	38.20
C221016	250	51 glass	No	6 x 31	100	39.20
C731109S	250	51 glass	Yes	6 x 29	100	76.30
C221094	250	51 glass	Yes	6 x 31	100	59.00
C5810630	200	33 glass	Yes	6 x 31	100	126.70
C5810630P	200	Polypropylene	Yes	6 x 31	100	38.40
C734025P631	250	Polypropylene	No	6 x 31	1000	74.70
C734025PBS631	250	Polypropylene	Yes	6 x 31	1000	149.50
C221070	300	51 glass Hanging	No	6 x 30	100	61.80

## Microinserts — MANDREL POINT Style

CS51811270	100	33 glass	Yes	6 x 31	100	\$81.20
C221020	200	33 glass	Yes	6 x 29	100	65.00
C5810629	200	33 glass	No	6 x 29	100	65.90

## Microinserts — FLAT BOTTOM

CS51813377	250	33 glass		6 x 31	500	\$52.70
CS51832087	250	Polypropylene		6 x 31	500	66.10
C221190LM	350	51 glass		6 x 31	1000	101.30
C221190CLM	350	51 glass		6 x 31	100	16.00

## CONVENIENCE KITS — CLEAR VIAL WITH PREASSEMBLED BLUE CAP AND SEPTA

Product Number	Vial	Marking Spot	Septum Description	Qty	Price
C7390953412B	RAM	No	PTFE/red rubber	100	\$33.70
C7390953412BM	RAM	No	PTFE/red rubber	1000	312.40
C7390953512B	RAM	No	PTFE/silicone	100	37.60
C7390953512BM	RAM	No	PTFE/silicone	1000	348.30
C7390953612B	RAM	No	PTFE/silicone/PTFE	100	42.70
C7390953612BM	RAM	No	PTFE/silicone/PTFE	1000	396.00
C580080	Target DP	No	Ivory PTFE/red rubber	100	50.40
C580092	Target DP	No	Red PTFE/white silicone	100	59.50
C580092W	Target DP	Yes	PTFE/silicone	100	61.20
C580095W	Target DP	Yes	Pre-slit PTFE/silicone	100	71.20
CS51820732	Agilent	No	PTFE/red silicone rubber	500	175.00
CS51820867	Agilent	Yes	PTFE/red silicone rubber	500	181.00

## KITS — PREASSEMBLED CLEAR VIAL WITH BLUE CAP AND SEPTA

C5800180	Target DP	No	PTFE/red rubber	100	\$55.20
C5800180W	Target DP	Yes	PTFE/red rubber	100	57.90

Note: Other preassembled vial, cap and septa configurations are available. Please inquire.



Microinserts



Convenience Kits

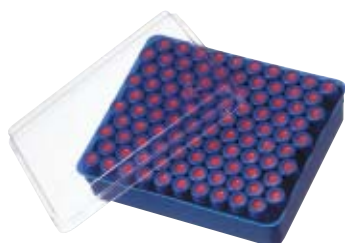
**Interested in trying a sample?**

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Technical Support Department at  
1-800-267-8103 or by email at  
tech@chromspec.com.



# AUTOSAMPLER SUPPLIES FOR VARIAN

## Our Most Economical Autosampler Vials and Accessories for Varian Autosamplers!



### CLEAR 2mL 9-425 WIDE OPENING SCREW THREAD VIALS

Product Number	Description	Qty	Price
C779100	Clear 2mL 9-425 Wide Opening Screw Thread Vials, CHROMSPEC™	100	\$13.90
C779100M	Clear 2mL 9-425 Wide Opening Screw Thread Vials, CHROMSPEC™	1000	122.30

### PREASSEMBLED CAPS AND SEPTA

C779200B	Blue Cap with PTFE/red rubber septa, CHROMSPEC™	100	\$10.40
C779200BM	Blue Cap with PTFE/red rubber septa, CHROMSPEC™	1000	92.80

### MICROINSERTS FOR 9-425 WIDE MOUTH SCREW THREAD VIALS

Product Number	Volume (μL)	Material	Point Style	Spring	Size (mm)	Qty	Price
C221191LM	250	51 glass	Conical	No	6 x 31	100	\$38.20
C221016	250	51 glass	Conical	No	6 x 31	100	39.20
C731109S	250	51 glass	Conical	Yes	6 x 29	100	76.30
C221094	250	51 glass	Conical	Yes	6 x 31	100	59.00
C221020	200	33 glass	Mandrel	Yes	6 x 29	100	65.00



### CLEAR 2mL 8-425 STANDARD OPENING SCREW THREAD VIALS, 12x32mm

Product Number	Description	Qty	Price
C223700C	Clear screw thread glass vial, 8-425	100	\$15.40
C223701M	Clear screw thread glass vial, 8-425	1000	135.00

### 8-425 SCREW THREAD OPEN TOP BLACK CAPS

C223710C	Black open top polypropylene screw thread cap	100	\$8.20
C223711M	Black open top polypropylene screw thread cap	1000	55.90

### 8 mm SEPTA

C221250G	Red PTFE/silicone, 60mL	100	\$14.30
C221250	Red PTFE/silicone, 60mL	1000	99.80

### 8-425 PRE-ASSEMBLED CLEAR GLASS VIAL, CAP AND SEPTA

C223704MR	Vial C223701M, Cap C223711M, Septa C22150G	1000	\$275.00
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### MICROINSERTS FOR 8-425 SCREW THREAD VIALS

Product Number	Volume (μL)	Material	Point Style	Spring	Size (mm)	Qty	Price
C221015	100	51 Glass	Conical	No	5 x 31	100	\$37.60
C221030	100	51 Glass	Precision	No	5 x 31	100	38.40
C221021	100	51 Glass	Precision	Yes	5 x 30	100	48.20
C221190	250	51 Glass	Flat bottom	No	5 x 31	1000	115.00
C221190C	250	51 Glass	Flat bottom	No	5 x 31	100	16.50



Vial Storeroom - Please inquire

This page details only a small sampling of the vials, caps, seals and inserts that we have to offer.

For further assistance, or to try a sample of any of these products, please contact our Technical Support Team at 1-800-267-8103 or by email at [sales@chromspec.com](mailto:sales@chromspec.com).

# 12x32mm 8-425 SCREW THREAD VIALS AND ACCESSORIES

## 12x32mm 8-425 SCREW THREAD VIALS

Product Number	Volume	Material	Marking Spot	Qty	Price
C223700C	1.5 mL	Clear 33 glass	No	100	\$15.40
C223701M	1.5 mL	Clear 33 glass	No	1000	135.00
C221200A	1.5 mL	Amber 51 glass	No	100	17.80
C7332008M1232	2.0 mL	Clear 33 glass	Yes	100	15.80
SB200264	250 µL	Polypropylene	No	1000	207.80
SB500114	300 µL	Polypropylene	No	1000	214.10
SB500124	500 µL	Polypropylene	No	100	26.40

## 8-425 SCREW THREAD CAPS

Product Number	Description	Qty	Price
C223710C	Open top, black polypropylene	100	\$8.20
C223711M	Open top, black polypropylene	1000	55.90
SB200330	Solid top, black phenolic with Teflon/rubber liner	100	33.20
SB500194	Open top, yellow polypropylene for Shimadzu	100	9.00

## SEPTA

C242C	White Teflon/silicone (60 mil)	100	\$14.30
C243M	White Teflon/silicone (60 mil)	1000	99.80
C221250G	Red Teflon/white silicone (60 mil)	100	14.30
C221250	Red Teflon/white silicone (60 mil)	1000	99.80
C66522B0608M	Blue Teflon/white silicone (60 mil) with slit	1000	100.70
C221249	Teflon/silicone/Teflon (40 mil)	1000	137.70
C221255	Virgin Teflon only, non-resealable	1000	31.90
C221251C	Teflon/orange silicone (40 mil)	100	9.80

## CAPS WITH SEPTA ASSEMBLED

C22371250CAS	Cap C223710C with PTFE/silicone septa (C221250G)	100	\$24.50
C22371250MAS	Cap C223711M with PTFE/silicone septa (C221250)	1000	183.40
C223733CAS	Cap C223710C with PTFE/silicone septa (C242C)	100	24.50
C223733MAS	Cap C223711M with PTFE/silicone septa (C243M)	1000	183.40
SB500210	Open top cap with 10 mil membrane for Shimadzu	100	9.20

## MICROINSERTS

Product Number	Volume (µL)	Material	Point Style	Spring	Size (mm)	Qty	Price
C734005BS425	50 µL	51 Glass	Conical	Yes	4 x 25	100	\$53.10
C221015	100 µL	51 Glass	Conical	No	5 x 31	100	37.60
C221030	100 µL	51 Glass	Precision	No	5 x 31	100	38.40
C221021	100 µL	51 Glass	Precision	Yes	5 x 30	100	48.20
C73401PBS530	100 µL	Polypropylene	Conical	Yes	5 x 30	1000	202.80
C731100S	100 µL	51 Glass	Conical	Yes	5 x 30	100	35.20
C221190	250 µL	51 Glass	Flat bottom	No	5 x 31	1000	115.00
C221190C	250 µL	51 Glass	Flat bottom	No	5 x 31	100	16.50

## VIAL KITS

Product Number	Description	Qty	Price
C223702C	Vial C223700C plus septum C242C	100	\$29.10
C223703M	Vial C223701M plus septum C243M	1000	225.00
C223750M	Vial C223701M plus septum C221250	1000	225.00
C223704C	Vial C223700C, cap C223710C, septum C242C	100	36.40
C223704M	Vial C223700C, cap C223710C, septum C243M	1000	275.00
C223704MR	Vial C223701M, cap C223711M, septum C221250	1000	275.00
C223704CRAS	Vial C223700C, cap C223710C, septum C221250G (complete assembly)	100	36.40
C223704MAS	Vial C223701M, cap C223711M, septum C243M (complete assembly)	1000	275.00



2 mL Screw Thread Vials and Caps

## Autosampler Compatibility

Beckman — 501, 502, 507

Hitachi — S6551, L-7200, L-7250

Leap — CTC A200S

Perkin Elmer — Autosystem GC, 420/B, 4900

Spark Holland — Marathon, Promis, Triathalon, Midas

Shimadzu — SIL-6B, -8A, -9A, -10A, -10Ai, -10AxL

Spectra Physics — 8875, 8880

Unicam — 4700LC, LC-XP, 4247

Varian — 8100/8200, 8035, 8000 series, Marathon, 8055, 8085, 9100/9090/9095, 3800 GC

Waters — Alliance



Microinserts

Interested in trying a sample?

Contact our helpful  
Technical Support Department at  
1-800-267-8103 or by email at  
tech@chromspec.com.

# 12x32mm 10-425 SCREW THREAD VIALS AND ACCESSORIES



12x32mm 10-425 Vials

## Autosampler Compatibility

**Beckman** — 501, 502, 507

**Leap** — CTC A200S

**Shimadzu** — SIL-10A, -10Ai, -10AxL

**Varian** — 8100, 8200

**Waters** — Alliance 2690



10-425 Caps



Preassembled Kits

## Interested in trying a sample?

Contact our helpful  
Technical Support Department at  
1-800-267-8103 or by email at  
tech@chromspec.com.

## 2mL 10-425 SCREW THREAD GLASS VIALS, 12x32 mm

Product Number	Description	Qty.	Price
C731002	Clear, 33 glass	100	\$14.50
C731002A	Amber, 51 glass	100	16.30
SB500306	Clear, 33 glass	100	19.20
SB500322	Amber, 51 glass	100	23.60

## CAPS

C731501	Open top, black polypropylene	100	\$8.00
SB500309	Open top, black polypropylene	100	10.80
SB500067	Open top, black polypropylene with PTFE/silicone septa	100	28.60
C73535010	Solid top, black polypropylene with pulp/Teflon liner	100	11.30

Caps available in other colours. Please inquire.

## SEPTA

C731405	Red PTFE/silicone, 75mil, 9 mm	100	\$16.90
C731404	Red PTFE/silicone, 60mil, 9 mm	100	14.70
C229900C	Red PTFE/silicone, 40mil, 9 mm	100	17.70
C229200C	Red PTFE/silicone, 60mil, 9.5 mm	100	19.40
C66522C0609C	Pre-slit red PTFE/silicone, 60mil, 9.5 mm	100	20.00

## MICROINSERTS

Product Number	Volume (µL)	Material	Point Style	Spring	Size (mm)	Qty	Price
C221191LM	250	51 Glass	Conical	No	6 x 31	100	\$38.20
C221016	250	51 Glass	Conical	No	6 x 31	100	39.20
C731109S	250	51 Glass	Conical	Yes	6 x 29	100	76.30
C221094	250	51 Glass	Conical	Yes	6 x 31	100	59.00
C221020	200	33 Glass	Mandrel	Yes	6 x 29	100	65.00
C5810630	200	33 Glass	Conical	Yes	6 x 30	100	126.70
C5810629	200	33 Glass	Conical	No	6 x 29	100	65.90
C221190LM	350	51 Glass	Flat bottom	No	6 x 31	1000	101.30
C221190CLM	350	51 Glass	Flat bottom	No	6 x 31	100	16.00
C734025P631	250	Polypropylene	Conical	No	6 x 31	1000	74.70
C734025PBS631	250	Polypropylene	Conical	Yes	6 x 31	1000	149.50
C221070	300	51 Glass Hanging Insert	Conical	No	6 x 30	100	61.80

## PREASSEMBLED VIAL/CAP/SEPTUM KITS

Product Number	Description	Qty.	Price
C73101514CAS	Clear vial, black cap, red PTFE/silicone 60mil septa	100	\$37.20
C731002RCAS	Clear vial, black cap, pre-slit red PTFE/silicone 60mil septa	100	42.50
C731002ACAS	Amber vial, black cap, red PTFE/silicone 60mil septa	100	39.00
SB200405	Clear vial, black cap, PTFE/silicone, 60mil septa	100	49.00
SB501362	Amber vial, black cap, PTFE/silicone, 60mil septa	100	49.70

## Our Custom Capabilities

We routinely provide custom preassembled or kit packaging for many vial/cap/seal/insert combinations. Should this be of interest to you, please contact our Technical Support Team to discuss your requirements.

## Inventory Levels

Chromatographic Specialties inventories a large selection of autosampler vials and accessories for next day delivery.

# 4mL 15x45mm 13-425 SCREW THREAD VIALS AND ACCESSORIES

## 4mL, 15x45mm, 13-425 SCREW THREAD GLASS VIALS

Product Number	Description	Qty	Price
C221500	Clear 33 glass	100	\$19.40
C221500M	Clear 33 glass	1000	148.20
C221500A	Amber glass	100	22.30

## CAPS FOR 4mL, 13-425 SCREW THREAD VIALS

Product Number	Description	Material	Septum	Qty	Price
C221520PG	Black open top	Polypropylene	No	100	\$9.50
C221520P	Black open top	Polypropylene	No	1000	55.90
C2215205CAS	Black open top	Polypropylene	Red PTFE/silicone	100	36.60
C2215205MAS	Black open top	Polypropylene	Red PTFE/silicone	1000	261.50
C731510	Clear solid top	Polypropylene	Polypropylene	500	37.60
SB200568	Black solid top	Phenolic	PTFE/rubber lined	100	24.30

## 12mm SEPTUM FOR 13-425 CAPS

Product Number	Septum Description	Septum Thickness	Qty	Price
C2215465C	Red PTFE/silicone	0.075"	100	\$18.50
C2215465M	Red PTFE/silicone	0.075"	1000	160.10
C221551G	Red PTFE/silicone	0.065"	100	17.80
C221551	Red PTFE/silicone	0.065"	1000	154.70
C221553G	White PTFE/silicone	0.040"	100	16.30
C221553	White PTFE/silicone	0.040"	1000	142.60
SB200622	White PTFE/silicone	0.040"	100	21.00
C221552	White PTFE	0.010"	1000	42.00

## MICROINSERTS FOR 15x45mm SCREW THREAD VIALS

Product Number	Volume (µL)	Material	Point Style	Spring	Size (mm)	Qty	Price
C221010	250	33 glass	Mandrel	No	6 x 38	100	\$82.70
C221011	250	51 glass	Conical	No	6 x 38	100	40.50
C73403BS638X	300	51 glass	Conical	Yes	6 x 38	100	39.00
C73403PBS638	300	Polypropylene	Conical	Yes	6 x 38	100	23.30
SB200778		Stainless steel spring for above inserts without springs				100	13.90

## PREASSEMBLED 4mL SCREW THREAD CLEAR GLASS VIAL/CAP/SEPTUM KITS

Product Number	Septum Description	Septum Thickness	Qty	Price
C221560	Red PTFE/silicone septum	0.075"	100	\$42.80
C221562	PTFE	0.010"	100	32.70
SB200636	PTFE	0.010"	100	38.40

## MISCELLANEOUS ACCESSORIES FOR 4mL, 15x45mm VIALS

Product Number	Description	Qty	Price
N868804	Vial rack, 48 position, polypropylene, stackable	5	\$123.20



4mL Screw Thread Vials and Caps

### Autosampler Compatibility

**Waters** — Wisp- 48 position

**Hitachi** — L-7200, L-7250

**Shimadzu** — AOC-14/1400, AOC-17, SII-2AS

**TosoHaas** — TSK-6080, AS-8010, AS-8020

**Unicam** — LC-XP



### Interested in trying a sample?

Contact our helpful Technical Support Department at 1-800-267-8103 or by email at [tech@chromspec.com](mailto:tech@chromspec.com).

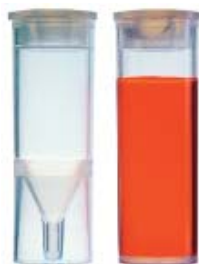
### Our Custom Capabilities

We routinely provide custom preassembled or kit packaging for many vial/cap/seal/insert combinations. Should this be of interest to you, please contact our Technical Support Team to discuss your requirements.

See page 320 for 4mL Shell Vials and Accessories



# SHELL VIALS



Shell Vials and Caps

## Autosampler Compatibility

Unicam — LC-XP

Shimadzu — AOC-14/1400,  
AOC-17, SII-2AS

Waters Wisp — 48 position



2mL Shell Vials and Caps

## Autosampler Compatibility

Agilent



1mL Shell Vials and Caps

## Autosampler Compatibility

Hitachi — L-7200

Waters — Wisp 96 position

## Interested in trying a sample?

Contact our helpful  
Technical Support Department at  
1-800-267-8103 or by email at  
tech@chromspec.com.

### 4mL, 15x45mm SHELL VIALS WITH CAPS

Product Number	Vial	Cap	Qty	Price
SB200498	Clear, 51 glass	PE push cap, 20 mil septum	100	\$25.90
C739800P1545		Polypropylene plug	100	19.50

See page 319 for 4mL Screw Thread Vials

### 3mL, 15x45mm SHELL VIALS WITH CAPS

SB500766	Polypropylene (consert)	Star push cap	100	\$24.90
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### 2mL, 12x32mm SHELL VIALS WITH CAPS

C220301	Clear glass	11mm, PE plug closure, 20mil molded septum	100	\$20.20
SB500070	Clear SunVial, 51 glass	PE push cap, 20 mil septum	100	23.50
SB500072	Clear SunVial, 51 glass	PE push cap, 10 mil septum	100	23.50
SB200020	Amber SunVial, 51 glass	PE push cap, 20 mil septum	100	24.80
SB200024	Amber SunVial, 51 glass	PE push cap, 10 mil septum	100	25.80

### REPLACEMENT CAPS FOR 2mL SHELL VIALS

Product Number	Cap	Qty	Price
SB500058	White 20 mil polyethylene	100	\$13.90
SB500060	Clear 10 mil polyethylene	100	13.90

### 1mL, 8x43mm SHELL VIALS WITH CLOSURES

Product Number	Vial	Cap	Qty	Price
C221503	Clear 51 glass	Polyethylene with star opening	500	\$57.50
C221503A	Amber 51 glass	Polyethylene with star opening	500	63.20
C221502	Clear 51 glass	No	500	58.20
C221502A	Amber 51 glass	No	500	46.40

### POLYPROPYLENE MICROVIAL

Product Number	Vial	Cap	Qty	Price
SB500765	700µL Consert, polypropylene	Polyethylene with star opening	250	\$33.30

### REPLACEMENT CAPS FOR 8 x 43mm SHELL VIALS

Product Number	Description	Qty	Price
C221503C	Polyethylene with star opening	500	\$30.30
C735400SB08	Clear polyethylene*	200	9.50
C7354003008	Silicone lined	100	21.80

\* Coloured replacement caps are also available. Simply add the corresponding letter suffix — B (blue), G (green), R (red) and Y (yellow) to C735400SB08. For example blue cap — C735400SB08B

### MICROINSERTS FOR 8 x 43mm SHELL VIALS

Product Number	Volume (µL)	Material	Point Style	Spring	Size (mm)	Qty	Price
C221021	100	51 glass	Conical	Yes	5 x 30	100	\$48.20
C221023	200	33 glass	Mandrel	No	6 x 29	100	63.90
C221022	200	33 glass	Mandrel	Yes	5 x 29	100	64.50
C221033	200	51 glass	Precision	Yes	5 x 36	100	48.50
C73402BS536	200	51 glass	Conical	Yes	4 x 36	100	34.10
C221190LM	250	51 glass	Flat	No	6 x 31	1000	101.30
C734025PBS631	250	Polypropylene	Conical	Yes	6 x 31	1000	149.50
SB200658		Stainless steel spring for use with above inserts that require a spring				100	9.30

## 8mm CRIMP TOP GLASS MICROVIALS

Product Number	Volume (µL)	Vial	Bottom	Size (mm)	Qty	Price
C2211051	300	Clear	Round	6 x 32	100	\$16.40
C2211053	100	Clear	Conical	6 x 32	100	53.80
C37088	700	Amber	Conical	7 x 40	100	45.00
C37355	700	Amber	Conical	7 x 40	500	192.60
C223706	500	Clear	Flat	8 x 30	200	46.70
C223705	500	Clear	Flat	8 x 30	2000	361.60

## 8mm ALUMINUM SEALS WITH SEPTA

Product Number	Septum Description	Seal Colour	Qty	Price
C220850C	PTFE/red rubber	Silver	100	\$16.10
C220850	PTFE/red rubber	Silver	1000	98.50
C220856	Red PTFE/white silicone	Silver	1000	85.00
C220851C	PTFE/orange silicone, 0.040"	Silver	100	15.10
C220851	PTFE/orange silicone, 0.040"	Silver	1000	136.10
C220852C	PTFE/orange silicone/PTFE, 0.040"	Silver	100	15.70
C220852	PTFE/orange silicone/PTFE, 0.040"	Silver	1000	141.60
SB201880	PTFE/silicone/PTFE, 0.040"	Silver	200	50.70
C225522	PTFE	Silver	1000	70.00

## MISCELLANEOUS ACCESSORIES FOR 8mm CRIMP TOP VIALS

Product Number	Description	Qty	Price
N985750	Vial rack, polypropylene	5	\$183.80
C6980608	Hand crimper for 8mm seals	each	230.80
C6981608	Decrimper for 8mm seals	each	224.00
C6981708	Decapping pliers for 8mm seals	each	90.00

### TECH TIP

A **crimping tool** is required to seal caps and a decrimper or decapper is required to remove the seals. Adjustable hand crimpers feature an adjustable stop on the handle to provide consistent seal tightness every time. Adjusting the hex screw inside the steel crimper jaws will also alter the amount of crimp. Achieving a good crimp is crucial because overcrimping can cause septum coring, bent needles and create a larger hole in the Teflon septum layer than a properly crimped seal. Undercrimping can result in loose seals and sample evaporation.

Correctly crimped caps and seals have a flat top and septum with no presence of cap deformation. A bulging cap and convex septa is an indication of overcrimping. An undercrimped cap and seal is distinguished by the improper crimping of the skirt of the cap onto the neck of the vial allowing the seal to easily turn. Adjusting the crimping pressure in both cases will resolve the issue. If the cap is slightly dented on top during crimping, it can indicate that the thickness of the septum is too thin. Using a thicker septum or adjusting the crimper will correct the problem.

**Hand decrimpers** quickly and safely remove seals with a single squeeze of the handle. Decappers are similar in design to pliers and provide an inexpensive alternative to decrimpers. Decrimpers should be used for applications involving hazardous samples because there is less chance of spillage.

**Electronic crimpers and decappers** are also available. Electronic units reduce hand fatigue, provide consistent crimps and are ideal for laboratories processing a lot of samples.



8mm Crimp Top Microvials



8mm Aluminum Seals

### Autosampler Compatibility

#### 6x32mm

**Agilent** — 1050, 1090A  
**Beckman** — 501, 502, 507, 508  
**Hitachi** — AS-4000

#### 7x40mm

**Beckman** — 504

#### 8x30mm

**Perkin Elmer** — AS-100, AS-100B, AS-300, AS-2000, AS-8300, AI-1, LC-30, LC-60



Crimpers and Decrimpers

# HEADSPACE VIALS

## Autosampler Compatibility

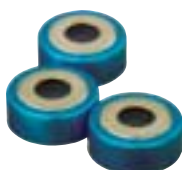
Agilent  
Leap  
Perkin Elmer  
Varian



Crimp Top Headspace Vials



20 mm Aluminum Seals



20 mm Magnetic Seals (Bimetal)



20 mm Tin Plated Magnetic Seals

Interested in trying a sample?  
Contact our helpful Technical  
Support Department at  
1-800-267-8103 or by email at  
sales@chromspec.com.

## Autosampler Compatibility

Agilent — G1888A  
Combi PAL



Screw Thread Headspace Vials

## CRIMP TOP HEADSPACE VIALS

Product Number	Description	Volume (mL)	Size (mm)	Qty	Price
C223720C	Clear 33 glass	20	23 x 75	100	\$31.10
C223721PQC	Clear 33 glass, beveled top	20	23 x 75	100	31.10
C223770C2	Clear 33 glass	10	23 x 46	200	67.40
C223731	Clear 33 glass	6	22 x 38	100	22.60

## 20mm METAL SEALS FOR CRIMP TOP HEADSPACE VIALS

Product Number	Description	Qty	Price
C51200210	Open top, aluminum	1000	\$43.80
C222119	Open top, wide ID, aluminum	1000	52.70
C222123	Open top, aluminum	1000	30.50
N22418301	Center tear out, aluminum	1000	73.20
C222120*	Open top with septum retaining ring, aluminum	1000	48.70
SB502370	Bimetallic Magnetic Seals, 20 mm	500	48.80

\*Red, Green, Blue and Yellow coloured seals are also available. Contact Technical Support at 1-800-267-8103.

## SEPTA FOR 20mm METAL SEALS

Product Number	Septum Description	Thickness	Qty	Price
C665120C	Tegrabond, PTFE/silicone	10/50 mil	100	\$42.20
C665120M	Tegrabond, PTFE/silicone	10/50 mil	1000	308.20
C669120C	Tegrabond, PTFE/silicone	10/90 mil	100	46.60
C669120M	Tegrabond, PTFE/silicone	10/90 mil	1000	348.80
C8812120C	Tegrabond, PTFE/silicone	10/125 mil	100	57.80
C8812120M	Tegrabond, PTFE/silicone	10/125 mil	1000	422.10
N224168	PTFE faced grey butyl rubber, molded	8/120 mil	100	66.00
C710382S	PTFE/grey butyl rubber	2/130 mil	100	128.60
C222067	Tan PTFE/silicone rubber	130 mil	100	41.90
C222068	Red PTFE/silicone	55 mil	100	41.90
C222069	PTFE/silicone	110 mil	100	51.30

## PREASSEMBLED 20mm METAL SEALS WITH SEPTA

C222070	PTFE/red rubber, aluminum	100 mil	100	\$131.30
C51202067AS	Tan PTFE/silicone, aluminum	130 mil	1000	427.50
C735145TP820	Tin plated, magnetic seal, 8mm hole PTFE/silicone septa	100 mil	100	66.80
C735145TP20	Tin plated, magnetic seal, 5mm hole PTFE/silicone septa	100 mil	100	66.80
C735144TP820	Tin plated, magnetic seal, 8mm hole PTFE/butyl rubber septa	100 mil	100	81.00
C735144TP20	Tin plated, magnetic seal, 5mm hole PTFE/butyl rubber septa	100 mil	100	81.00

## STOPPERS FOR 20mm METAL SEALS

Product Number	Description	Qty	Price
C714396S	Grey butyl rubber with flange	100	\$28.00
C714396M	Grey butyl rubber with flange	1000	151.70

## MISCELLANEOUS ACCESSORIES FOR CRIMP TOP HEADSPACE VIALS

C6980620	Handcrimper for 20mm seals	each	\$228.10
C6981620	Decrimper for 20mm seals	each	224.00
C220974	Decapping pliers for 20mm seals	each	64.00

## SCREW THREAD HEADSPACE VIALS AND SEALS FOR AGILENT G1888A

CS51882753	Clear 20mL glass vial, 23x75mm	100	\$66.20
CS51882759	UltraClean 18mm screw thread cap with 1.5mm white PTFE/blue silicone septa	100	118.00
SB502458	Clear 20mL vial, 22x75mm	125	38.20
SB502460	Clear 10mL vial, 22x45mm	125	35.40
SB405031	Screw Cap 18mm PTFE/silicone	100	63.80

## SERUM VIALS

Description						
Product Number	Diam. x Ht. (mm)	Qty.	Price	Volume	Seal Size	Colour
N223712	17.5 x 35	288	\$149.10	2 mL	7 x 13 mm	Clear
N223693	15 x 32	144	73.30	2 mL	7 x 13 mm	Amber
N223738	23 x 47	288	158.60	5 mL	13 x 20 mm	Clear
N223760	23 x 47	288	261.50	5 mL	13 x 20 mm	Amber
N223739	25 x 54	288	221.90	10 mL	13 x 20 mm	Clear
N223761	25 x 54	288	289.80	10 mL	13 x 20 mm	Amber
N223742	32 x 58	288	248.50	20 mL	13 x 20 mm	Clear
N223762	32 x 58	288	328.40	20 mL	13 x 20 mm	Amber
N223743	37 x 63	288	306.00	30 mL	13 x 20 mm	Clear
N223763	37 x 63	288	401.70	30 mL	13 x 20 mm	Amber
N223745	43 x 73	288	384.10	50 mL	13 x 20 mm	Clear
N223764	43 x 73	288	512.20	50 mL	13 x 20 mm	Amber
N223747	52 x 95	144	296.70	100 mL	13 x 20 mm	Clear
N223766	52 x 95	144	381.90	100 mL	13 x 20 mm	Amber

## SERUM VIAL SEPTA

Product Number	Type	Qty.	Price	Fits Vial I.D. Of	Profile
N224100060	Natural Rubber (Red)	1000	\$319.10	7 x 13 mm	 Vial I.D.
C710792S	Natural Rubber (Red)	100	80.90	7 x 13 mm	
N224100161	Natural Rubber (Red)	1000	290.90	13 x 20 mm	
N224100030	Natural Rubber (Red)	1000	107.30	5 x 11 mm	 Vial I.D.
C711513S	Butyl Rubber (Grey)	100	33.00	7 x 13 mm	
C714396S	Butyl Rubber (Grey)	100	28.00	13 x 20 mm	
C714396M	Butyl Rubber (Grey)	1000	151.70	13 x 20 mm	

## ALUMINUM SEALS FOR HYPO, SERUM &amp; CRIMP-TOP VIALS

- Colour-code your samples
- Use for identifying chemical hazards, stability status, and storage conditions of reagents, standards or samples



Product Number	Seal Colour	Seal Diam.	Qty	Price
C7100090	Silver	13 mm	1000	\$88.70
C222120	Silver	20 mm	1000	48.70
N22417806	Red	20 mm	1000	95.60
N22417807	Green	20 mm	1000	95.60
N22417805	Blue	20 mm	1000	95.60



# EPA VOC VIALS

## EPA WATER SAMPLING VIALS

Scientific Specialties offers a complete line of vials useful in volatile organic analysis. All of their 40 & 20 mL vials are made of high quality borosilicate glass. Scientific Specialties vials are available in a number of size and capliner variations. Their vials are also available Precleaned and QA Analyzed. All of their QA Analysis is performed by an independent laboratory to assure absolute sample integrity.



40 mL EPA VIALS			Not Precleaned - Assembled		*Precleaned - Assembled	
Description	Cap Size	Glass	Product Number	Pkg. 72 Price	Product Number	Pkg. 72 Price
with polypropylene open top aqua caps & teflon/silicone septa (5/120)	24-400	Clear	C85176740	\$71.00	C85276740	\$82.50
	24-400	Amber	C85176840	71.00	C85276840	82.50
with teflon lined aqua closed top caps (0.025") teflon	24-400	Clear	C85175540	87.50	C85275540	98.70
	24-400	Amber	C85175541	90.40	C85275541	98.70
with teflon lined aqua closed top caps (0.005") teflon / (0.035") polypropylene foam	24-400	Clear	C85B75540	68.20	_____	_____
	24-400	Amber	C85B75541	74.70	_____	_____

20 mL EPA VIALS			Not Precleaned - Assembled		*Precleaned - Assembled	
Description	Cap Size	Glass	Product Number	Pkg. 72 Price	Product Number	Pkg. 72 Price
with polypropylene open top aqua caps & teflon/silicone septa (5/120)	24-400	Clear	C85176720	\$76.00	C85276720	\$98.40
	24-400	Amber	C85176820	77.80	C85276820	104.40
with teflon lined aqua closed top caps (0.025") teflon	24-400	Clear	C85175520	74.00	C85275520	89.30
	24-400	Amber	C85175521	81.10	C85275521	93.70
with teflon/silicone lined aqua closed top caps (0.005") teflon / (0.035") polypropylene foam	24-400	Clear	C85B75520	61.40	_____	_____
	24-400	Amber	C85B75521	61.60	_____	_____

\* Also available QA Analyzed with a Certificate of Analysis and Sample Labels referencing the corresponding lot numbers.

For purge and trap supplies, see page 106

For VOC standards, see pages 235-248

## DISPOSABLE SCREW-THREAD BOROSILICATE GLASS CULTURE TUBES

- Low cost, multiple-use tube for solvent extraction
- Mixing, shaking, freezing, storage

Product Number	Dimension Diam. x Ht.	Description	Thread	Volume	Qty	Price
C786000	13 x 100 mm	Type 1, Clear, 51 Expansion	13-415	8 mL	1000	\$273.00
C786200	13 x 100 mm	Type 1, Clear, 51 Expansion - w/markings spot	13-415	8 mL	1000	344.40
C786010	16 x 100 mm	Type 1, Clear, 51 Expansion	15-415	10 mL	1000	296.30
C786205	16 x 100 mm	Type 1, Clear, 51 Expansion - w/markings spot	15-415	10 mL	1000	372.60
C786015	16 x 125 mm	Type 1, Clear, 51 Expansion	15-415	15 mL	1000	150.00
C786210	16 x 125 mm	Type 1, Clear, 51 Expansion - w/markings spot	15-415	15 mL	1000	389.40
C786020	16 x 150 mm	Type 1, Clear, 51 Expansion	15-415	20 mL	1000	360.50
C786215	16 x 150 mm	Type 1, Clear, 51 Expansion - w/markings spot	15-415	20 mL	1000	450.50
C786030	20 x 125 mm	Type 1, Clear, 51 Expansion	18-415	25 mL	500	202.30
C786040	20 x 150 mm	Type 1, Clear, 51 Expansion	18-415	30 mL	500	215.80
C786225	20 x 150 mm	Type 1, Clear, 51 Expansion - w/markings spot	18-415	30 mL	500	312.80



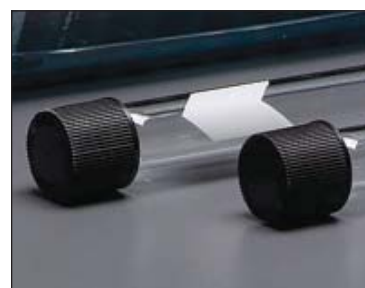
## DISPOSABLE PLAIN TOP BOROSILICATE GLASS CULTURE TUBES

Product Number	Dimension Diam. x Ht.	Description	Volume	Qty	Price
C786600	6 x 50 mm	Clear, Borosilicate Glass	2 mL	1000	\$82.10
C786610	10 x 75 mm	Clear, Borosilicate Glass	4 mL	1000	52.80
C786620	12 x 75 mm	Clear, Borosilicate Glass	5 mL	1000	32.50
C786630	13 x 100 mm	Clear, Borosilicate Glass	8 mL	1000	71.90
C786640	16 x 100 mm	Clear, Borosilicate Glass	12 mL	1000	108.70
C786650	16 x 125 mm	Clear, Borosilicate Glass	15 mL	1000	122.70
C786660	16 x 150 mm	Clear, Borosilicate Glass	20 mL	1000	124.90
C786670S	18 x 150 mm	Clear, Borosilicate Glass	25 mL	500	96.80
C786680S	20 x 150 mm	Clear, Borosilicate Glass	30 mL	500	162.60



## CAPS FOR SCREW THREAD CULTURE TUBES

Product Number	Description	Thread	Qty	Price
C783000M	Natural linerless polypropylene cap	13-415	1000	\$58.70
C783200	Black linerless polypropylene cap	13-415	1000	57.90
C220828	Teflon faced rubber lined phenolic cap	13-415	125	36.00
C783005	Natural linerless polypropylene cap	15-415	1000	56.90
C783205	Black linerless polypropylene cap	15-415	1000	53.90
C220832	Teflon faced rubber lined phenolic cap	15-415	125	43.80
C220886	White rubber lined phenolic cap	15-415	500	77.20
C783010	Natural linerless polypropylene cap	18-415	1000	Inquire
C783210	Black linerless polypropylene cap	18-415	1000	103.70



Chromatographic Specialties Inc. offers the more commonly used sizes of culture tubes for use in sample preparation and storage. For other sizes, materials and styles of culture tubes and centrifuge tubes, please contact our sister company <sup>MJS</sup> BioLynx Inc. by phone at 1-888-593-5969 or email [tech@biolynx.ca](mailto:tech@biolynx.ca). You can also request literature code BL01 to receive their catalogue of life sciences apparatus and supplies.

# STORAGE VIALS

## SCREW TOP GLASS VIALS

Product Number	Description	Dimensions Diam. x Ht.	Volume	Disc Size	Cap Size	Qty	Price
C223700C	Clear, vial only	12 x 32 mm	2 mL	8 mm	8-425	100	\$15.40
C85B69301	Clear, vial with Teflon lined aqua cap	12 x 32 mm	2 mL	8 mm	8-425	144	43.50
C221200A	Amber, vial only	12 x 32 mm	2 mL	8 mm	8-425	100	17.80
C85B75652	Amber, vial with polyvinyl lined cap	12 x 32 mm	2 mL	8 mm	8-425	100	32.30
C85B69400	Clear, vial only	15 x 26 mm	2 mL	12 mm	13-425	144	33.60
C85B69300	Clear, vial with Teflon lined aqua cap	15 x 26 mm	2 mL	12 mm	13-425	144	59.30
C85B75962	Amber, vial only	15 x 26 mm	2 mL	12 mm	13-425	144	35.70
C85B75562	Amber, vial with Teflon lined aqua cap	15 x 26 mm	2 mL	12 mm	13-425	144	67.10
C221500	Clear, vial only	15 x 45 mm	4 mL	12 mm	13-425	100	19.40
C85B69302	Clear, vial with Teflon lined aqua cap	15 x 45 mm	4 mL	12 mm	13-425	144	62.40
C221500A	Amber, vial only	15 x 45 mm	4 mL	12 mm	13-425	100	22.30
C85B75572	Amber, vial with Teflon lined aqua cap	15 x 45 mm	4 mL	12 mm	13-425	144	73.10
C85B69403	Clear, vial only	17 x 35 mm	4 mL	12 mm	13-425	144	39.40
C85B69303	Clear, vial with Teflon lined aqua cap	17 x 35 mm	4 mL	12 mm	13-425	144	64.20
C85B69404	Clear, vial only	16 x 50 mm	6.5 mL	12 mm	13-425	144	37.80
C85B69304	Clear, vial with Teflon lined aqua cap	16 x 50 mm	6.5 mL	12 mm	13-425	144	65.50
C787215	Clear, vial only	17 x 60 mm	7 mL	13mm	15-425	200	57.10
C85B69306	Clear, vial with Teflon lined aqua cap	17 x 60mm	8 mL	13 mm	15-425	144	59.00
C85B75982	Amber, vial only	17 x 60 mm	8 mL	13 mm	15-425	144	52.20
C85B75582	Amber , vial with Teflon lined aqua cap	17 x 60 mm	8 mL	13 mm	15-425	144	85.80
C85B75682	Amber, vial with polyvinyl lined cap	17 x 60 mm	8 mL	13 mm	15-425	144	69.10
C787220	Clear, vial only	19 x 65 mm	11 mL	13 mm	15-425	200	64.10
C85B69308	Clear, vial with Teflon lined aqua cap	19 x 65 mm	11 mL	13 mm	15-425	144	69.10
C85B75992	Amber, vial only	19 x 65 mm	11 mL	13 mm	15-425	144	57.10
C85B75592	Amber, vial with Teflon lined aqua cap	19 x 65 mm	11 mL	13 mm	15-425	144	88.70
C85B75692	Amber, vial with polyvinyl lined cap	19 x 65 mm	11 mL	13 mm	15-425	144	71.40
C787225	Clear, vial only	21 x 70 mm	15 mL	16 mm	18-400	200	70.80
C85B69310	Clear, vial with Teflon lined aqua cap	21 x 70 mm	15 mL	16 mm	18-400	144	78.00
C85B69210	Clear, vial with polyvinyl lined cap	21 x 70 mm	15 mL	16 mm	18-400	144	68.60
C85B75994	Amber, vial only	21 x 70 mm	15 mL	16 mm	18-400	144	59.10
C85B75594	Amber, vial with Teflon lined aqua cap	21 x 70 mm	15 mL	16 mm	18-400	144	97.60
C787000	Clear, vial only	27 x 57 mm	20 mL	22 mm	24-400	100	Inquire
C85B75520	Clear, vial with Teflon lined aqua cap	27 x 57 mm	20 mL	22 mm	24-400	72	61.40
C85B75620	Clear, vial with polyvinyl lined aqua cap	27 x 57 mm	20 mL	22 mm	24-400	144	86.40
C85B75521G	Amber, vial with Teflon lined aqua cap	27 x 57 mm	20 mL	22 mm	24-400	144	118.20
C85B75621	Amber, vial with polyvinyl lined cap	27 x 57 mm	20 mL	22 mm	24-400	144	88.10
C787230	Clear, vial only	23 x 85 mm	22 mL	18 mm	20-400	200	85.00
C85B69314	Clear, vial with Teflon lined aqua cap	23 x 85 mm	22 mL	18 mm	20-400	144	100.50
C85B75925	Clear, vial only	27 x 70 mm	25mL	22 mm	24-400	144	73.50
C85B75525	Clear, vial with Teflon lined aqua cap	27 x 70 mm	25 mL	22 mm	24-400	144	115.00
C85B75626	Amber, vial with polyvinyl lined cap	27 x 70 mm	25 mL	22 mm	24-400	144	89.10
C702795	Clear, vial only	27 x 95 mm	40 mL	22 mm	24-400	100	Inquire
C85B75540G	Clear, vial with Teflon lined aqua cap	27 x 95 mm	40 mL	22 mm	24-400	144	125.50
C85176740	Clear, assembled with cap and septum	27 x 95 mm	40 mL	22 mm	24-400	72	71.00
C85276740	Clear, precleaned with cap and septum	27 x 95 mm	40 mL	22 mm	24-400	72	82.50
C85B75941	Amber, vial only	27 x 95 mm	40 mL	22 mm	24-400	144	77.10
C85B75541G	Amber, vial with Teflon lined aqua cap	27 x 95 mm	40 mL	22 mm	24-400	144	125.90
C222030A	Amber, vial with cap & Tef/silicone septa	27 x 95 mm	40 mL	22 mm	24-400	100	172.20
C85176840	Amber, assembled with cap and septum	27 x 95 mm	40 mL	22 mm	24-400	72	71.00
C85276840	Amber, precleaned with cap and septum	27 x 95 mm	40 mL	22 mm	24-400	72	82.50
C85B75950	Clear, vial only	27 x 108 mm	50 mL	22 mm	24-400	100	83.20
C85B75960	Clear, vial only	27 x 135 mm	60 mL	22 mm	24-400	144	87.50
C85B75560	Clear, vial with Teflon lined aqua cap	27 x 135 mm	60 mL	22 mm	24-400	144	158.10

Can't find what you're looking for? Call our Technical Support Group at 1-800-267-8103 or email [tech@chromspec.com](mailto:tech@chromspec.com).

**POLYPROPYLENE OPEN TOP SCREW CAPS**

Product Number	Description (Cap Size)	Disc Size	Qty	Price
C223710C	8-425	8mm	100	\$8.20
C221520PG	13-425	12mm	100	9.50
C85169615G	15-425	13mm	100	11.90
C85169618G	18-400	16mm	100	29.70
C85169620G	20-400	18mm	144	16.50
C85169624G	24-400	22mm	144	27.60

**POLYPROPYLENE CLOSED TOP SCREW CAPS WITH TEFLON LINER**

C85B69908G	8-425	8mm	144	\$36.30
C85B69913G	13-425	12mm	144	35.70
C85B69915G	15-415	13mm	144	36.10
C85B69918G	18-400	16mm	144	55.10
C85B69920G	20-400	18mm	144	40.20
C85B69924G	24-400	22mm	144	47.60

**PHENOLIC CLOSED TOP SCREW CAPS WITH RUBBER LINERS**

N240206	8-425	8mm	1000	\$146.10
N240208	13-425	12mm	200	45.90
N240209	15-425	13mm	200	52.50
N240215	18-400	16mm	500	148.60
N240216	20-400	18mm	500	221.10
N240218	24-400	22mm	500	260.70

**ALUMINUM SEALS FOR HYPO, SERUM & CRIMP-TOP VIALS**

- Colour-code your samples
- Use for identifying chemical hazards, stability status, and storage conditions of reagents, standards or samples

Product Number	Seal Colour	Seal Diam.	Qty	Price
C220850	Silver	8mm	1000	\$98.50
C221150	Silver	11mm	1000	85.00
C221150R	Red	11mm	100	17.50
C221150G	Green	11mm	100	17.50
C221150B	Blue	11mm	100	17.50
C221150Y	Yellow	11mm	100	17.50
C7100090	Silver	13mm	1000	88.70
C222120	Silver	20mm	1000	48.70

All above with Teflon/rubber septa

For Teflon/silicone Septa  
See . . . . . Pages 328-329

For Vials  
See . . . . . Pages 322-324





## CAPLINER SEPTA



Capliner septa are used primarily with hole-caps in either screw or crimp top designs.

Containers vary from micro reaction vessels to autosampler and screw cap vials, and from serum vials to storage bottles. Capliner septa construction is tailored to meet the purpose of the container.

**Please inquire about other thicknesses of teflon or silicone if you cannot find what you are looking for below.**

Tegrabond Discs			Description				Fits Alum. Seal mm	Fits Screw Cap Size
Product Number	Qty.	Price	Diameter		Thickness (inches)			
			mm	Inches	Silicone	Teflon		
C665108C	100	\$17.90	8	0.305	0.050	0.010	8	8-425
C665108M	1000	137.50	8	0.305	0.050	0.010	8	8-425
C887108C	100	21.60	8	0.305	0.075	0.010	8	8-425
C887108M	1000	166.10	8	0.305	0.075	0.010	8	8-425
C669108C	100	19.80	8	0.305	0.090	0.010	8	8-425
C669108M	1000	151.80	8	0.305	0.090	0.010	8	8-425
C665112C	100	20.50	12	0.445	0.050	0.010	12	13-425
C665112M	1000	157.60	12	0.445	0.050	0.010	12	13-425
C669112C	100	23.50	12	0.445	0.090	0.010	12	13-425
C669112M	1000	180.80	12	0.445	0.090	0.010	12	13-425
C665113C	100	21.60	13	0.510	0.050	0.010	13	15-425
C665113M	1000	166.10	13	0.510	0.050	0.010	13	15-425
C887113C	100	24.30	13	0.510	0.075	0.010	13	15-425
C887113M	1000	186.50	13	0.510	0.075	0.010	13	15-425
C669113C	100	25.70	13	0.510	0.090	0.010	13	15-425
C669113M	1000	198.00	13	0.510	0.090	0.010	13	15-425
C665116C	100	25.40	16	0.610	0.050	0.010	16	18-400
C665116M	1000	195.00	16	0.610	0.050	0.010	16	18-400
C669116C	100	33.20	16	0.610	0.090	0.010	16	18-400
C669116M	1000	255.10	16	0.610	0.090	0.010	16	18-400
C665118C	100	35.40	18	0.707	0.050	0.010	18	20-400
C665118M	1000	272.30	18	0.707	0.050	0.010	18	20-400
C669118C	100	36.50	18	0.707	0.090	0.010	18	20-400
C669118M	1000	280.90	18	0.707	0.090	0.010	18	20-400
C665119C	100	40.20	19	0.748	0.050	0.010	20	20-400
C665119M	1000	309.80	19	0.748	0.050	0.010	20	20-400
C669119C	100	41.00	19	0.748	0.090	0.010	20	20-400
C669119M	1000	315.40	19	0.748	0.090	0.010	20	20-400
C665120C	100	42.20	20	0.787	0.050	0.010	20	22-400
C665120M	1000	308.20	20	0.787	0.050	0.010	20	22-400
C669120C	100	46.60	20	0.787	0.090	0.010	20	22-400
C669120M	1000	348.80	20	0.787	0.090	0.010	20	22-400
C8812120C	100	57.80	20	0.787	0.125	0.010	20	22-400
C8812120M	1000	422.10	20	0.787	0.125	0.010	20	22-400
C665122C	100	48.50	22	0.866	0.050	0.010	22	24-400
C665122M	1000	359.10	22	0.866	0.050	0.010	22	24-400
C669122C	100	48.50	22	0.866	0.090	0.010	22	24-400
C669122M	1000	359.10	22	0.866	0.090	0.010	22	24-400
C8812122C	100	59.10	22	0.866	0.125	0.010	22	24-400
C8812122M	1000	430.90	22	0.866	0.125	0.010	22	24-400
C889123C	100	54.00	23	0.906	0.090	0.010	—	24-400
C889123M	1000	415.80	23	0.906	0.090	0.010	—	24-400
C889125C	100	57.80	25	0.982	0.090	0.010	—	28-400
C889125M	1000	444.50	25	0.982	0.090	0.010	—	28-400
C889131C	100	83.90	31	1.220	0.090	0.010	—	33-400
C889131M	1000	645.20	31	1.220	0.090	0.010	—	33-400

## TEFLON/RUBBER LAMINATED DISCS

Flexseal Discs			Description				Fits Alum. Seal mm	Fits Screw Cap Size
Product Number	Qty.	Price	Diameter		Thickness (inches)			
			mm	Inches	Rubber	Teflon		
C8850508C	100	\$21.80	8	0.305	0.050	0.005	8	8-425
C8850512C	100	22.80	12	0.445	0.050	0.005	12	13-425
C8850513C	100	22.80	13	0.510	0.050	0.005	13	15-425
C8850516C	100	30.40	16	0.610	0.050	0.005	16	18-400
C8850518C	100	33.80	18	0.707	0.050	0.005	18	20-400
C8850520C	100	34.30	20	0.787	0.050	0.005	20	22-400
C8850522C	100	35.20	22	0.866	0.050	0.005	22	24-400

## SEPTA FOR: Varian (8mm) and Waters (12mm) Autosamplers

Autosampler Septa			Description				Fits Alum. Seal mm	Fits Screw Cap Size
Product Number	Qty.	Price	Diameter		Colour	Thickness		
			mm	Inches				
C242C	100	\$14.30	8	0.305	White	Teflon/silicone 60mil	8	8-425
C243M	1000	99.80	8	0.305	White	Teflon/silicone 60mil	8	8-425
C221250G	100	14.30	8	0.305	Red	Teflon/silicone 60mil	8	8-425
C221250	1000	99.80	8	0.305	Red	Teflon/silicone 60mil	8	8-425
C221256G	100	21.00	8	0.305	Red	Teflon/silicone/teflon 60mil	8	8-425
C221256	1000	183.50	8	0.305	Red	Teflon/silicone/teflon 60mil	8	8-425
C66522B0608M	1000	100.70	8	0.305	Blue	Teflon/silicone 60mil - Split	8	8-425
C2215465C	100	18.50	12	0.445	Red	Teflon/silicone 75mil	12	13-425
C2215465M	1000	160.10	12	0.445	Red	Teflon/silicone 75mil	12	13-425

## VIRGIN TEFLON DISCS

Autosampler Septa			Description				Fits Alum. Seal mm	Fits Screw Cap Size
Product Number	Qty.	Price	Diameter		Colour	Thickness (Inches)		
			mm	Inches				
C221255	1000	\$31.90	8	0.305	White	Teflon 0.010	8	8-425
C221552	1000	42.00	12	0.445	White	Teflon 0.010	12	13-425
C661013	1000	54.00	13	0.510	White	Teflon 0.010	13	15-425
C661015	1000	60.30	15	0.590	White	Teflon 0.010	16	15-425
C661016	1000	66.40	16	0.610	White	Teflon 0.010	16	18-400
C661018	1000	78.30	18	0.707	White	Teflon 0.010	18	20-400
C661020	1000	93.40	20	0.787	White	Teflon 0.010	20	22-400
C661022	1000	104.40	22	0.866	White	Teflon 0.010	22	24-400

## COMPUTERIZED DELIVERY SYSTEM (for high or low volume usage)

By issuing a Blanket Purchase Order, covering your future supply of vials or any chromatography products, our computerized delivery system offers many advantages.

- (1) At the beginning of the agreement you can specify prearranged delivery dates and quantities for the following year.
- (2) For each shipment, quantities do not have to be uniform.
- (3) To facilitate prompt delivery at least two shipments will be stocked in advance.
- (4) It provides a cost efficient method of ordering with a reduction in order processing.
- (5) Invoicing will occur after each shipment.
- (6) If you have overestimated your requirements, shipment dates can be postponed or cancelled upon your request.
- (7) If you have underestimated your requirements, shipment dates can be altered and/or quantities increased.
- (8) There is no penalty for cancelling or postponing shipments.
- (9) Our ordering system has a flexible structure, consequently we can accommodate most purchasing requirements. Please feel free to ask for modifications. We can design a schedule to suit your needs.
- (10) Please specify shipping dates, product numbers, descriptions and quantities.

# SAMPLE CONTAINERS

## CLEAR GLASS BOSTON ROUND BOTTLES



## AMBER GLASS BOSTON ROUND BOTTLES



### CLEAR GLASS BOSTON ROUND BOTTLES (With Caps Assembled)

Not Precleaned  
with foam lined  
Polypropylene Caps

Not Precleaned  
with 0.010" teflon lined  
Polypropylene Caps  
10 Class

Not Precleaned  
with 0.030" teflon lined  
Polypropylene Caps  
1000 Class

Precleaned  
with 0.030" teflon lined  
Polypropylene Caps  
2000 Class

Volume	Pkg.	Cap Size	Product Number	Price	Product Number	Price	Product Number	Price	Product Number	Price
4000 mL	4	38-400	C85F73528	\$34.20	C85B73528	\$36.80	C85173528	\$41.30	C85273528	Inquire
2360 mL	6	38-430	C85F73580	33.70	C85B73580	36.40	C85173580	40.80	C85273580	Inquire
1000 mL	12	33-400	C85F73532	32.50	C85B73532	35.50	C85173532	45.80	C85273532	\$47.00
500 mL	12	28-400	C85F73516	23.60	C85B73516	26.00	C85173516	39.60	C85273516	42.00
250 mL	12	24-400	C85F73508	16.60	C85B73508	18.80	C85173508	31.70	C85273508	34.00
125 mL	24	22-400	C85F73504	28.60	C85B73504	31.00	C85173504	Inquire	C85273504	Inquire
60 mL	24	20-400	C85F73502	23.20	C85B73502	25.10	C85173502	Inquire	C85273502	Inquire
30 mL	24	20-400	C85F73501	21.80	C85B73501	24.60	C85173501	Inquire	C85273501	Inquire

### AMBER GLASS BOSTON ROUND BOTTLES (With Caps Assembled)

Not Precleaned  
with foam lined  
Polypropylene Caps

Not Precleaned  
with 0.010" teflon lined  
Polypropylene Caps  
10 Class

Not Precleaned  
with 0.030" teflon lined  
Polypropylene Caps  
1000 Class

Precleaned  
with 0.030" teflon lined  
Polypropylene Caps  
2000 Class

Volume	Pkg.	Cap Size	Product Number	Price	Product Number	Price	Product Number	Price	Product Number	Price
4000 mL	4	38-430	C85F73628	\$34.20	C85B73628	\$36.80	C85173628	\$41.30	C85273628	\$47.40
2360 mL	6	38-430	C85F73680	33.70	C85B73680	36.40	C85173680	40.80	C85273680	45.80
1000 mL	12	33-400	C85F73632	32.50	C85B73632	35.50	C85173632	45.80	C85273632	52.70
500 mL	12	28-400	C85F73616	23.60	C85B73616	26.00	C85173616	39.60	C85273616	43.90
250 mL	12	24-400	C85F73608	16.60	C85B73608	18.80	C85173608	31.70	C85273608	34.00
125 mL	24	22-400	C85F73604	28.60	C85B73604	31.00	C85173604	53.80	C85273604	65.60
60 mL	24	20-400	C85F73602	23.20	C85B73602	25.10	C85173602	43.70	C85273602	75.80
30 mL	24	20-400	C85F73601	21.80	C85B73601	24.60	C85173601	41.50	C85273601	46.80

**2000 Class** - Container, cap and capliner. Precleaned and assembled to EPA protocol "A".

**1000 Class** - Container, cap and .030" virgin teflon capliner assembled.

**10 Class** - Container, cap and .010" virgin teflon capliner assembled.

**NOTE:** • Safety coated bottles and QA analyzed bottles are also available.

## SEPTUM BOTTLES



## WIDE MOUTH SEPTUM JARS



### CLEAR GLASS SEPTUM BOTTLES

(With Open Top Caps & Teflon/Silicone Septa - Assembled)

				Not Precleaned		Precleaned EPA Protocol "B"		Precleaned / QA EPA Protocol "B" (with a certificate of analysis)	
Volume	Pkg.	Bottle Style	Cap Size	Product Number	Price	Product Number	Price	Product Number	Price
250 mL	12	Standard	24-400	C85173708	\$27.20	C85273708	\$32.10	C85373708	\$49.50
125 mL	24	Standard	22-400	C85173704	43.10	C85273704	70.60	C85373704	Inquire
60 mL	24	Standard	20-400	C85173702	37.80	C85273702	52.30	C85373702	Inquire
30 mL	24	Standard	20-400	C85173701	39.60	C85273701	Inquire	C85373701	Inquire

### AMBER GLASS SEPTUM BOTTLES

(With Open Top Caps & Teflon/Silicone Septa - Assembled)

				Not Precleaned		Precleaned EPA Protocol "B"		Precleaned / QA EPA Protocol "B" (with a certificate of analysis)	
Volume	Pkg.	Bottle Style	Cap Size	Product Number	Price	Product Number	Price	Product Number	Price
250 mL	12	Standard	24-400	C85173808	\$27.20	C85273808	\$32.10	C85373808	\$49.50
125 mL	24	Standard	22-400	C85173804	43.10	C85273804	60.40	C85373804	102.70
60 mL	24	Standard	20-400	C85173802	39.30	C85273802	48.60	C85373802	Inquire
30 mL	24	Standard	20-400	C85173801	38.70	C85273801	47.10	C85373801	Inquire

### CLEAR WIDE MOUTH GLASS SEPTUM JARS

(With Open Top Caps & Teflon/Silicone Septa - Assembled)

				Not Precleaned		Precleaned EPA Protocol "B"		Precleaned / QA EPA Protocol "B" (with a certificate of analysis)	
Volume	Pkg.	Bottle Style	Cap Size	Product Number	Price	Product Number	Price	Product Number	Price
250 mL	12	Tall	58-400	C85174708	\$44.40	C85274708	\$49.90	C85374708	\$62.50
125 mL	24	Tall	48-400	C85174704	67.20	C85274704	83.10	C85374704	134.40
60 mL	24	Short	53-400	C85174702	66.10	C85274702	95.70	C85374702	120.70

### AMBER WIDE MOUTH GLASS SEPTUM JARS

(With Open Top Caps & Teflon/Silicone Septa - Assembled)

				Not Precleaned		Precleaned EPA Protocol "B"		Precleaned / QA EPA Protocol "B" (with a certificate of analysis)	
Volume	Pkg.	Bottle Style	Cap Size	Product Number	Price	Product Number	Price	Product Number	Price
1000 mL	12	Standard	53-400	C85174832	\$62.20	C85274832	\$66.80	C85374832	\$92.80
500 mL	12	Standard	53-400	C85174816	43.70	C85274816	48.30	C85374816	82.00



# SAMPLE CONTAINERS

## AMBER WIDE MOUTH JARS




## CLEAR WIDE MOUTH JARS



AMBER GLASS WIDE MOUTH JARS (With Caps Assembled)			Not Precleaned with PV Lined Phenolic Caps		Not Precleaned with foam lined Polypropylene Caps		Not Precleaned with 0.010" teflon lined Polypropylene Caps 10 Class		Not Precleaned with 0.030" teflon lined Polypropylene Caps 1000 Class		Precleaned with 0.030" teflon lined Polypropylene Caps 2000 Class	
Volume	Pkg.	Cap Size	Product Number	Price	Product Number	Price	Product Number	Price	Product Number	Price	Product Number	Price
2500 mL	6	70-400	C85X71180	\$55.40	C85F71180	\$54.20	C85B71180	\$66.70	C85171180	\$72.80	C85271180	\$110.00
1000 mL	12	53-400	C85X71132	35.40	C85F71132	39.40	C85B71132	47.30	C85171132	61.80	C85271132	70.90
500 mL	12	53-400	C85X71116	32.90	C85F71116	28.40	C85B71116	38.50	C85171116	46.90	C85271116	49.20
250 mL	24	45-400	C85X71108	36.70	C85F71108	41.00	C85B71108	43.10	C85171108	53.90	C85271108	62.20
125 mL	24	38-400	C85X71104	29.60	C85F71104	32.90	C85B71104	39.10	C85171104	49.10	C85271104	55.90
60 mL	24	33-400	C85X71102	26.80	C85F71102	26.20	C85B71102	28.70	C85171102	47.00	C85271102	49.70
30 mL	24	28-400	C85X71101	20.10	C85F71101	21.50	C85B71101	23.30	C85171101	34.40	C85271101	38.40
15 mL	24	28-400	C85X71100	19.70	C85F71100	21.10	C85B71100	23.10	C85171100	34.10	C85271100	41.40

CLEAR GLASS WIDE MOUTH JARS (With Caps Assembled)			Not Precleaned with PV Lined Phenolic Caps		Not Precleaned with foam lined Polypropylene Caps		Not Precleaned with 0.010" teflon lined Polypropylene Caps 10 Class		Not Precleaned with 0.030" teflon lined Polypropylene Caps 1000 Class		Precleaned with 0.030" teflon lined Polypropylene Caps 2000 Class	
Volume	Pkg.	Cap Size	Product Number	Price	Product Number	Price	Product Number	Price	Product Number	Price	Product Number	Price
1000 mL	12	89-400	C85X70832	\$50.30	C85F70832	\$43.30	C85B70832	\$55.40	C85170832	\$28.00	C85270832	\$63.00
500 mL	12	89-400	C85X70816	43.40	C85F70816	37.60	C85B70816	47.90	C85170816	52.20	C85270816	54.50
250 mL	12	70-400	C85X70808	27.40	C85F70808	23.50	C85B70808	31.40	C85170808	36.30	C85270808	41.30
125 mL	24	58-400	C85X70804	42.10	C85F70804	41.30	C85B70804	46.40	C85170804	56.30	C85270804	74.10
60 mL	24	53-400	C85X70802	35.90	C85F70802	38.40	C85B70802	44.90	C85170802	51.40	C85270802	58.70
30 mL	24	38-400	C85X70801	27.20	C85F70801	26.60	C85B70801	34.10	C85170801	45.50	C85270801	76.30

AMBER GLASS STRAIGHT SIDE JARS					Not Precleaned - Assembled		*Precleaned - Assembled	
Description	Volume (mL)	Cap Size	Qty.		Product Number	Price	Product Number	Price
	with .030" teflon lined aqua closed top caps	500	100-400	12				
		180	63-400	24				
		125	58-400	24	C85172204	\$58.20	C85272204	\$69.80
		60	51-400	24	C85172202	53.20	C85272202	60.30
	with .010" teflon lined aqua closed top caps	500	100-400	12				
		180	63-400	24				
		125	58-400	24	C85B72204	48.00		
		60	51-400	24	C85B72202	46.50		

\* Also available QA Analyzed with a Certificate of Analysis and Sample Labels referencing the corresponding lot numbers.

## SCINTILLATION VIALS



### From Scientific Specialties

- Made from low Potassium Borosilicate glass.
- Made to fit all liquid scintillation counting equipment.
- Clean packed in compartmentalized trays of 100 for 20 mL vials and 200 for 7 mL vials.
- 5 tray pricing is also available for Scientific Specialties vials, please feel free to enquire.

Product Number	Description	Qty.	Price
<b>20 mL Borosilicate Glass</b>			
<b>22-400 finish 27 x 57 mm (caps not attached)</b>			
C85B33020	without caps	100	\$34.30
C85B33020C5	without caps	500	168.60
C85B33120	with polypropylene pulp and foil lined caps	100	40.80
C788005	with polypropylene pulp and foil lined caps	500	256.30
C85B33220	with white urea pulp and foil lined caps	100	54.00
C85B33220C5	with urea pulp and foil lined caps	500	244.10
C85B33320	with white urea polyethylene cone lined caps	100	54.40
C85B33420	with polypropylene linerless seal caps	100	40.80
C85B33520	with .010" teflon lined caps	100	67.10
C85B33620	with open top caps and teflon/silicone septa	100	143.20
<b>20 mL High Density Polyethylene</b>			
<b>22-400 finish 27 x 57 mm (caps not attached)</b>			
C85P22020	without caps	100	\$23.80
C85P22120	with polypropylene pulp and foil lined caps	100	28.60
C85P22220	with white urea pulp and foil lined caps	100	31.70
C85P22320	with white urea polyethylene cone lined caps	100	41.90
C85P22420	with polypropylene linerless seal caps	100	33.40
<b>7 mL Borosilicate Glass</b>			
<b>15-425 finish (caps not attached)</b>			
C85B33007	without caps	200	\$63.00
C788020	without caps	200	55.00
C85B33207	with white polypropylene and foil lined caps	200	66.80
C85B33507	with .010" teflon lined caps	200	121.70
C85B33607	with open top caps and teflon/silicone septa	200	182.00

Please contact our Technical Support Group if you are having difficulty finding a product.

**DIRECT**  
613-342-4678

**TOLL FREE**  
800-267-8103

**FAX**  
613-342-1144

**TECHNICAL SUPPORT**  
tech@chromspec.com

www.chromspec.com  
**GENERAL INQUIRIES**  
sales@chromspec.com

**INSTRUMENTATION**  
instrum@chromspec.com

# VIAL RACKS



## Vial Racks for all 2 mL, 12 x 32 mm Vials

Product Number	Description	Qty	Price
C581125	Polystyrene 2mL Storage Rack with Lid, 100 holes, with alpha-numeric indexing	1	\$9.30
C5811255	Polystyrene 2mL Storage Rack with Lid, 100 holes, with alpha-numeric indexing	5	44.10
C581225	Polypropylene 2mL Vial Rack, 50 holes, with alpha-numeric indexing	1	17.90
C5812255	Polypropylene 2mL Vial Rack, 50 holes, with alpha-numeric indexing	5	84.50



## Vial Racks for all 4 mL, 15 x 45 mm Vials

Product Number	Description	Qty	Price
C581527	Polystyrene 4 mL Storage Rack with Lid, 100 holes, with alpha-numeric indexing	1	\$9.40
C5815275	Polystyrene 4 mL Storage Rack with Lid, 100 holes, with alpha-numeric indexing	5	86.20
C581525	Polypropylene 4 mL Vial Rack, 50 holes, with alpha-numeric indexing	1	18.30
C5815255	Polypropylene 4 mL Vial Rack, 50 holes, with alpha-numeric indexing	5	86.20



Product Number	Description	Vials/Rack	Qty	Price
N985750	For 8 mm Chromatography Vials	96	5	\$183.80
N985800	For 12 x 32 mm Chromatography Vials	50	5	109.70
N868810	For 4-6 mL Vials (13-17 mm dia.)	90	5	144.00
N868805	For Headspace and VOC Vials up to 23 mm dia.	36	5	107.90



Product Number	Description	Vials/Rack	Qty	Price
C73970008	SnapRack™ for 8 mm Vials, White	96	5	\$13.70
C73970008B	SnapRack™ for 8 mm Vials, Blue	96	5	13.70
C73970012	SnapRack™ for 12 mm Vials, White	96	5	13.70
C73970012B	SnapRack™ for 12 mm Vials, Blue	96	5	13.70



Product Number	Description	Vials/Rack	Qty	Price
SB500141	For 8 mm vials, White	96	1	\$7.00
SB500142	For 12 mm vials, White	50	1	7.00
SB500144	For 15 mm vials, White	48	1	7.00
SB501368	For 12 mm vials, Hinged top	50	1	9.70

## GAS SAMPLING TUBES

Product Number	Description	Qty	Price
C72800	125 mL Gas Sampling Tube	1	\$242.10
C72805	250 mL Gas Sampling Tube	1	266.90

## MININERT™ VALVES

For Screw Cap Vials and Crimp Top Vials

Product Number	Description	Qty	Price
D614250	Mininert, fits crimp top (20mm)	12	\$108.90
D614158	Screw cap Mininert - (13-425)	12	80.30
D614160	Screw cap Mininert - (15-425)	12	82.50
D614161	Screw cap Mininert - (18-400)	12	86.90
D614170	Screw cap Mininert - (20-400)	12	92.40
D614163	Screw cap Mininert - (24-400)	12	96.80
D654051	Valve, Luer Tip Fitting	1	20.90
D631201	Valve 1/4 - 28" Male	1	26.40
D631203	Valve 1/4 - 28" Female	1	26.40
D621102	Valve 14/20 Standard Taper	1	26.40
D621103	Valve 19/22 Standard Taper	1	26.40
D644350	Septa, silicone, for all above	50	28.60

## WHEATON VIAL FILE®

N228778	Wheaton Vial File®, stores 60 1.5-2 mL vials	6	\$101.50
N228780	Wheaton Vial File®, stores 40 3.5-4 mL vials	6	101.50

## CRIMPERS, DECRIMPERS, AND DECAPPING PLIERS

Product Number	Description	Price
<b>Crimpers</b> (For crimping aluminum seals to vials)		
C6980608	Hand crimper, 8 mm	\$230.80
C6980611	Hand crimper, 11 mm	201.90
C6980613	Hand crimper, 13 mm	270.30
C6980620	Hand crimper, 20 mm	228.10
<b>Precision Decrimpers</b> (For removing aluminum seals from vials)		
C6981608	Decrimper, 8 mm	\$224.00
C6981611	Decrimper, 11 mm	224.00
C6981613	Decrimper, 13 mm	224.00
C6981620	Decrimper, 20 mm	224.00
<b>Decapping Pliers</b> (For removing aluminum seals from vials)		
C6981708	Decapping pliers, 8 mm	\$90.00
C220248	Decapping pliers, 11 mm	77.10
C73931013	Decapping pliers, 13 mm	57.00
C220974	Decapping pliers, 20 mm	64.00
<b>Electronic Crimpers and Decappers</b>		
C6982608E	Electronic crimper, 8 mm, with charger	\$776.80
C6982611E	Electronic crimper, 11 mm, with charger	776.80
C6982613E	Electronic crimper, 13 mm, with charger	776.80
C6982620E	Electronic crimper, 20 mm, with charger	776.80
C6983611E	Electronic decapper, 11 mm, with charger	776.80
C6983613E	Electronic decapper, 13 mm, with charger	776.80
C6983620E	Electronic decapper, 20 mm, with charger	776.80

Agilent Technologies has recently upgraded and improved their offering of electronic crimpers, contact our Technical Support Group for details.



### VICI Mininert® Valves for Vials

- Leak-tight closure with syringe access
- Ideal for containing volatile liquids, reference materials, and standards
- Fits threaded and crimp-top vials
- Replaceable septum
- Liquid only comes in touch with inert parts
- Operation is extremely simple - push the green button, insert the needle through the septum to take a sample, withdraw the needle, and push the red button



**Vial File®** provides a compact, easily accessible means of sample storage.



The vials are stored in individual partitions within a plastic clear case. The case is made from polystyrene with hinged lids and alphanumeric indexing. Foam inserts provide extra protection for the vials.

### Manual Crimpers/Decappers

Precision-crafted hand operated crimpers are used to secure aluminum caps to autosampler vials. They are easy to use and durable for years of dependable service. Crimper jaws are made of steel. An adjustable stop in the handle can be set to give the same sealing tightness every time. Decappers are available in both a precision model, and a less expensive "plier" type decapper, suitable for occasional use.



### Electronic Crimpers/Decappers

Rechargeable electronic crimpers or decappers are designed to crimp or decap hundreds of vials per charge. They can be set electronically to the precise level required for reliable, reproducible crimping, and they fit comfortably in the user's hand. Easy operation eliminates risk of RSI from vial handling. Battery and charger are included.





# WHEATON SAMPLING DEVICES



Wheaton Science Products offers both commodity-like and leading edge products for the pharmaceutical and life-sciences research and pilot-scale laboratories and general analytical laboratories.

*Chromatographic Specialties Inc. offers the full line of quality Wheaton Products. These are a few examples:*

## PASTEUR PIPETTE ADAPTER

Allows fitting of Pasteur pipettes on Acura® manual 5 mL model in addition to Polypropylene tips. Adapter has two O-rings guaranteeing proper holding and tightness of standard 2 mL Pasteur pipettes.



Product Number	Description	Price
NW820023	Pasteur Pipette Adapter	\$71.20

## WHEATON MICRO-KUDERNA DANISH CONCENTRATOR

Wheaton connectors eliminate ground glass joints or hooks and springs and also allow standard 4 mL vials to be used for final concentration.



Product Number	Description	Price
N297770	Wheaton Micro-Kuderna danish Concentrator	\$183.20

Wheaton specialty glassware for Organic chemistry:

Diazomethane Generators  
Arsine Generators  
Cyanide Distillation  
Micro Soxhlet

## Acura® MANUAL 835 ADJUSTABLE VOLUME AND 835F FIXED VOLUME MACROPIPETTES

### Acura® Manual 835 Adjustable Volume Macropipettes

- Equipped with a precision setting mechanism, the line is continuously adjustable down to a very fine volume resolution
- Single-handed volume setting easy when other hand busy
- Click stops, together with freely rotating *Smartie* plunger button cap ensure setting stability while pipetting
- Two macropipettes ranging 0.5 - 5 mL and 1 - 10 mL



### Acura® Manual 835F Fixed Volume Macropipettes

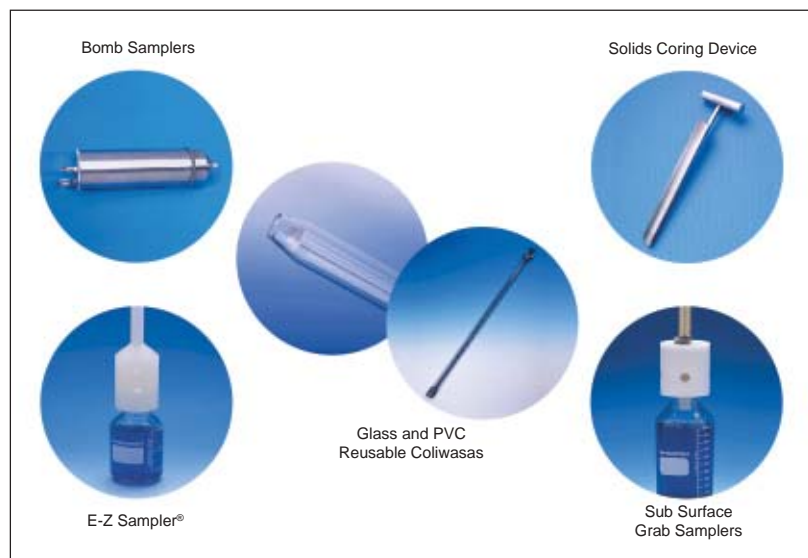
- Now macro-volumes also available in fixed version with 2, 2.5, 5 and 10 mL. Please inquire.

*An autopipette with an optional Pasteur Pipette Adapter for use with aggressive solvents.*

Wheaton carries a wide range of SOCOREX products. Please contact our Technical Support Group for further information.

Product Number	Description	Accuracy Increments(μL)	Reproducibility CV%	Volume (μL)	Price
NW810316	Acura® Manual 835 Adjustable Volume Macropipette	0.01 mL	0.4	0.5 - 5 mL	\$185.80
NW810318	Acura® Manual 835 Adjustable Volume Macropipette	0.01 mL	0.2	1 - 10 mL	185.80

## WHEATON ENVIRONMENTAL SAMPLING DEVICES



For a copy of the Wheaton Product Catalogue, please request literature code **WHE01**.

## GREINER Masterblock® DEEP WELL MICROPLATES

- Made of high quality, virgin polypropylene in a standard microplate footprint
- Offers superior chemical and temperature resistance
- Also available in a variety of colours and in sterile formats

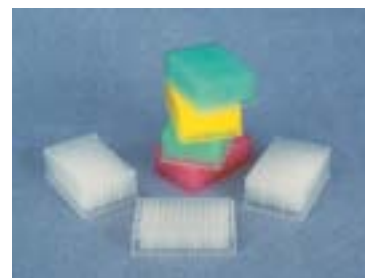
Product Number	Colour	Bottom Style	Sterile	Well Volume	Pkg Size	Price
<b>96-WELL POLYPROPYLENE</b>						
GR786201	Natural	Conical	No	0.75 mL	80	\$232.50
GR786261	Natural	Conical	Yes	0.5 mL	80	249.90
GR780201	Natural	Round	No	1.2 mL	50	160.80
GR780203	Red	Round	No	1.2 mL	50	160.80
GR780204	Blue	Round	No	1.2 mL	50	160.80
GR780205	Green	Round	No	1.2 mL	50	160.80
GR780206	Yellow	Round	No	1.2 mL	50	160.80
GR780210	Natural	Round	No	1.2 mL	50	156.50
GR780261	Natural	Round	Yes	1.2 mL	50	160.80
GR780270	Natural	Conical	No	2.4 mL	50	160.80
GR780271	Natural	Conical	Yes	2.4 mL	50	161.20
GR780273	Red	Conical	Yes	2.4 mL	50	160.80
GR780274	Blue	Conical	Yes	2.4 mL	50	151.00
GR780275	Green	Conical	Yes	2.4 mL	50	151.00
GR780276	Yellow	Conical	Yes	2.4 mL	50	151.00
GR780285	Natural	Conical	No	2.4 mL	50	151.00

## 384-WELL POLYPROPYLENE

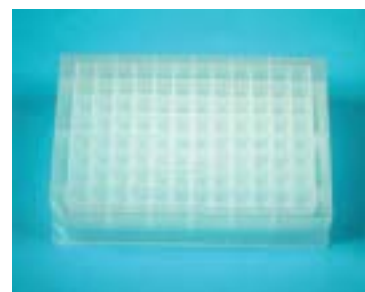
GR781270	Natural	Conical	No	240 µL	60	\$208.10
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## 1536-WELL POLYPROPYLENE

GR782270	Natural	Conical	No	20 µL	60	\$1,514.60
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Greiner  
Masterblock® Deep Well Microplates

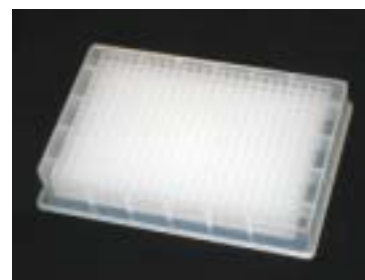


Seahorse Labware  
96-Well Storage Plate

## SEAHORSE LABWARE STORAGE PLATES

- Molded in natural polypropylene
- Chemical and heat resistant
- Low binding
- Raised wells for sealing

Product Number	Description	Well Volume	Pkg Size	Price
<b>24-WELL PLATES</b>				
IMS30024	Plate, Pyramid Bottom, Square Well	10 mL	60	\$181.50
<b>48-WELL PLATES</b>				
IMS30011	Plate, Flat Bottom, Rectangle Well	1.5 mL	50	\$167.10
IMS30004	Plate, Pyramid Bottom, Rectangle Well	5 mL	25	176.70
IMS30003	Plate, Pyramid Bottom, Rectangle Well	7.5 mL	30	250.60
IMS30000	Frame for 10 mL Pyramid Bottom Strips	-	100	276.30
IMS30001	8 Well Strip, Pyramid Bottom, Rectangle Well	10 mL	150	192.80
IMS30002	Assembly: 1 Frame, 6 Strips, Pyramid Bottom, Rectangle Well	10 mL	20	269.90
<b>96-WELL PLATES</b>				
IMS30012	Plate, Flat Bottom, Square Well	0.7 mL	50	\$167.10
IMS30026	Plate, V Bottom, Square Well	1.1 mL	25	126.90
IMS30009	Plate, Pyramid Bottom, Square Well	2 mL	25	110.50
IMS30006	Frame for 4 mL Pyramid Bottom Strips	-	100	224.90
IMS30007	8 Well Strip, Pyramid Bottom, Square Well	4 mL	300	385.60
IMS30008	Assembly: 1 Frame, 12 Strips, Pyramid Bottom, Square Well	4 mL	20	385.60
<b>384-WELL PLATES</b>				
IMS30033	Plate, Spherical Bottom, Square Well	35 µL	60	\$257.00
IMS30025	Plate, Pyramid Bottom, Square Well	160 µL	25	93.20



Seahorse Labware  
384-Well Storage Plate



**Greiner 96-Well Clear  
Polystyrene Microplates**



**Greiner 384-Well Black and White  
Polystyrene Microplates**



**Greiner Microplates**

## GREINER MICROPLATES

- A wide variety of microplates available in virgin polystyrene or polypropylene resin with standard dimensions
- Numerous formats are available including clear, white and black plates with flat, round (U), conical (V) or C bottoms.
- RNase and DNase free, non-pyrogenic and free of DNA-polymerase inhibitors
- Custom bar-codes can be applied according to your specifications

Product Number	Colour	Bottom Style	Other	Pkg Size	Price
<b>96-WELL POLYSTYRENE</b>					
GR655101	Clear	Flat	Chimney Style	100	\$64.10
GR655180	Clear	Flat	TC Treated, Sterile with Lid	60	96.70
GR650101	Clear	Round	-	100	59.80
GR651101	Clear	Conical	-	100	59.80
GR655075	White	Flat	Chimney Style	40	64.10
GR655083	White	Flat	TC Treated, Sterile with Lid	32	83.70
GR655076	Black	Flat	Chimney Style	40	64.10
GR655086	Black	Flat	TC Treated, Sterile with Lid	32	81.50

<b>96-WELL POLYPROPYLENE</b>					
GR655201	Clear	Flat	Chimney Style	100	\$134.70
GR650201	Clear	Round	Chimney Style	100	134.70
GR651201	Clear	Conical	Chimney Style	100	134.70
GR655209	Black	Flat	Chimney Style	100	145.60
GR650209	Black	Round	Chimney Style	100	136.70
GR651209	Black	Conical	Chimney Style	100	145.60

<b>384-WELL POLYSTYRENE</b>					
GR781101	Clear	Flat	-	100	\$265.10
GR781182	Clear	Flat	TC Treated, Sterile with Lid	32	113.00
GR781075	White	Flat	-	40	166.50
GR781080	White	Flat	TC Treated, Sterile with Lid	32	150.50
GR781076	Black	Flat	-	40	158.50
GR781086	Black	Flat	TC Treated, Sterile with Lid	32	150.50

<b>384-WELL POLYPROPYLENE</b>					
GR781201	Clear	Flat	-	100	\$232.50
GR781280	Clear	Conical	-	100	293.40
GR781209	Black	Flat	-	100	282.50

<b>1536-WELL POLYSTYRENE</b>					
GR783101	Clear	Flat	LoBase*	60	\$1,086.50
GR783075	White	Flat	LoBase*	60	1,086.50
GR783076	Black	Flat	LoBase*	60	1,086.50

\* LoBase: Designed for applications where bottom imaging or viewing is required.

## SEAHORSE LABWARE FILTER PLATES

- Chemical resistant/Biologically inert
- Industry standard dimensions
- Low binding
- Long and short drip directors
- Robotic friendly
- Fits standard vacuum manifolds

Product Number	Description	Drip	Pkg Size	Price
IMF20000	96-well Fritted Plate, 2 mL, 25 µm PE Frit	Long	25	\$591.20
IMF20007	96-well Filter Plate, 800 µL, Glass Fiber 1.0 µm	Long	25	482.00
IMF20020	96-well Filter Plate, 800 µL, UHMW PE 25 µm	Short	25	482.00
IMF20078	384-well Filter Plate, 140 µL, Glass Fiber 0.7 µm	Long	25	308.40
IMF20071	384-well Filter Plate, 140 µL, Glass Fiber 1.2 µm	Short	10	308.40



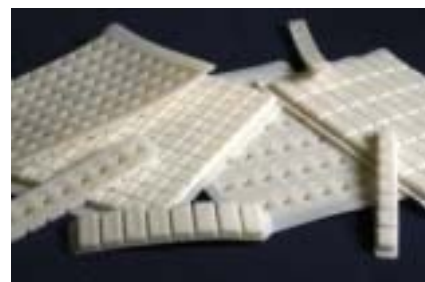
**Seahorse Labware Filter Plates**



## SEAHORSE LABWARE SEALERS

- Chemical and heat resistant, autoclavable, sealing integrity up to -20°C

Product Number	Description	Compatibility	Pierceable	Pkg Size	Price
IMP40000	48 Well Seal Strip	10 mL Storage Plate	Yes	600	\$642.60
IMP40001	48 Well Seal Strip	10 mL Storage Plate	No	600	642.60
IMP40002	48 Well Seal	7.5 and 5 mL Storage Plate	Yes	100	321.30
IMP40003	48 Well Seal	7.5 and 5 mL Storage Plate	No	100	321.30
IMP40004	96 Well Seal Strip	4 mL Storage Plate	Yes	600	449.80
IMP40005	96 Well Seal Strip	4 mL Storage Plate	No	600	449.80
IMP40006	96 Well Seal Strip	2 mL Storage Plate	Yes	100	321.30
IMP40007	96 Well Seal Strip	2 mL Storage Plate	No	100	321.30
IMP40008	96 Well Bottom Seal	2 mL Fritted Filter Plate	No	100	321.30
IMP40009	24 Well Seal Strip	10 mL Storage Plate	Yes	100	321.30



## GREINER MICROPLATE SEALER FAMILY

- Withstand temperatures from -70°C (cryo-storage) to +110°C (thermal cycling)
- Compatible with aqueous solutions and organic solvents
- RNase- and DNase-free, non-pyrogenic

Product Number	Description	Colour	Pkg Size	Price
GR676001	EASYseal™, Classic	Clear	100	\$46.90
GR676070	VIEWseal™, Advanced	Clear	100	198.90
GR676090	SILVERseal™, Pierce-able	Silver	100	83.60



## MICRONIC CAPCLUSTERS

- Capcluster is made of 2 components, the caps and a removable retaining film
- Each hydrophobic cap is multi-pierceable (up to 12 times) without a loss in seal integrity
- TPE caps have a high chemical resistance and a temperature range of -80°C to 80°C

Product Number	Description	Colour	Pkg Size	Price
MSM53004P	Pierceable TPE	Blue	50	\$304.20
MSM53005P	Pierceable TPE	Green	50	304.20
MSM53006P	Pierceable TPE	Grey	50	304.20
MSM53007P	Pierceable TPE	Pink	50	304.20
MSM53008P	Pierceable TPE	Brown	50	304.20
MSM53009P	Pierceable TPE	Black	50	304.20
MSM53010P	Pierceable TPE	Yellow	50	304.20
MSM53001P	Pierceable TPE	Natural	50	304.20
MSM53026P	Split Cap, Pierceable TPE	Natural	50	334.60



## SUN MicroMat™ AND MicroMat™ CLR MICROPLATE MAT

- Autoclavable, Resealable
- MicroMat™ features a thick layer of Teflon which provides an inert seal
- MicroMat™ CLR is pure silicone giving the mat excellent flexibility
- MicroMat™ CLR compatible with Greiner™, Porvair™, Matrix™, Whatman Polyfiltronics™, NUNC™, Costar®, Simport™, MJ Research™, Dynex™ and Varian™.

Product Number	Description	Compatible 96-Well Plate			Pkg Size	Price
		Standard	1.2 mL Deep Well	2.4 mL Deep Well		
SB400066	MicroMat™, round well	•	•		2	\$39.80
SB400067	MicroMat™, round well	•	•		10	199.440
SB400071	MicroMat™ II, round well	•	•		2	39.80
SB400073	MicroMat™ II, round well	•	•		10	199.40
SB300002	MicroMat™ CLR, round well	•	•		10	93.90
SB300005	MicroMat™ CLR, round well, Pre-Slit	•	•		10	117.30
SB300010	MicroMat™ CLR, square well			•	2	28.20
SB300011	MicroMat™ CLR, square well			•	10	117.30





# GAS SAMPLING BAGS



## Applications:

- Assessing exposure from spills and leaks
- Calibration gas standards
- Gas blending
- GROB sampling
- Groundwater testing
- Hazardous waste site sampling
- Indoor air sampling
- Leaking underground storage tanks
- Magnetic imaging
- Sampling flues and vents
- Soil gas sampling
- Stack sampling



Locking Combo Valve

For alternative fittings and sizes, please contact our Technical Support Group at 1-800-267-8103 or by email [tech@chromspec.com](mailto:tech@chromspec.com)

## Inert Teflon® FEP or Tedlar Gas Sampling Bags

A convenient, reliable and economical way of collecting airborne chemical hazards, especially where concentrations are above detection limits of analytical instruments.

### Teflon® FEP Gas Sampling Bags

The most chemically inert sample bag material available. Works well in extreme temperatures ranging from -400° to 400° F, allowing it to be used in all stack-sampling conditions. 5 mil FEP film is completely chemically resistant to the most severe corrosives. Relatively low permeability results in minimal sample loss. Heavier gauge film allows FEP bags to be specified for applications involving rough handling or difficult service conditions.

### Tedlar® Gas Sampling Bags

Tedlar® inert gas sampling bags, made of 2 mil Tedlar film, offer an economical alternative to Teflon® FEP bags. Tedlar® is less permeable than Teflon® FEP film and is unaffected by the chemical components of gases generally sampled such as carbon monoxide, sulfur dioxide, hydrogen sulfide, radon and mercaptans. High tensile strength resists puncture in the field, and allows for reuse. Tedlar® gas sampling bags can withstand continuous use at temperatures ranging from -98° to 225° F. Recommended in many EPA testing methods.

### Available in your choice of fittings:

- **Locking Combo Valve® with Septum** allows easy one hand operation, making it the most user-friendly combination valve and septum fitting available. When the valve stem is pulled out and the stem is turned 1/8" clockwise, the user is assured the valve is completely closed and will remain so during transit. Stem is 3/16" O.D. and is suitable for use with most 1/4" plastic and Teflon® tubing.
- **Roberts On/Off Valve**, nickel plated, twist action, 1/4" O.D. barbed stem.
- **Jaco Plastic Septum fitting** with Teflon® faced silicone tubing. Also adaptable for 1/4" O.D. tubing connection.
- **Swagelok® Stainless Steel fitting**, for 1/4" O.D. tubing.
- **Screw Cap Combo Valve** for use with Tedlar and FEP Gas Sampling Bags. This easy-to-use valve incorporates on-off capability with a septum in 1 fitting.

### Gas Sampling Bags with 2-N-1 Combo Valve

Size Inches	Capacity Litres	Tedlar		Teflon®	
		Each	Pkg. 10	Each	Pkg. 10
7 x 7	1	TDP0707 \$15.80	TDP070710 \$141.30	TDPF0707 \$24.50	TDPF070710 \$219.10
9 x 9	2	TDP0909 \$16.10	TDP090910 \$143.70	TDPF0909 \$32.80	TDPF090910 \$293.80
9 x 12	3	TDP0912 \$19.20	TDP091210 \$172.10	TDPF0912 \$39.80	TDPF091210 \$356.80
12 x 12	5	TDP1212 \$21.10	TDP121210 \$189.50	TDPF1212 \$46.60	TDPF121210 \$417.10
12 x 17	8	TDP1217 \$25.60	TDP121710 \$229.80	—	—
12 x 19	10	TDP1219 \$26.10	TDP121910 \$233.70	TDPF1219 \$59.60	TDPF121910 \$533.50
12 x 21	12	TDP1221 \$26.60	TDP122110 \$238.20	—	—
18 x 18	16	TDP1818 \$27.40	TDP181810 \$245.10	TDPF1818 \$72.10	
18 x 24	25	TDP1824 \$30.30	TDP182410 \$270.80	TDPF1824 \$76.40	
24 x 24	40	TDP2424 \$34.80	TDP242410 \$311.10	TDPF2424 \$108.80	

# LIFE SCIENCES

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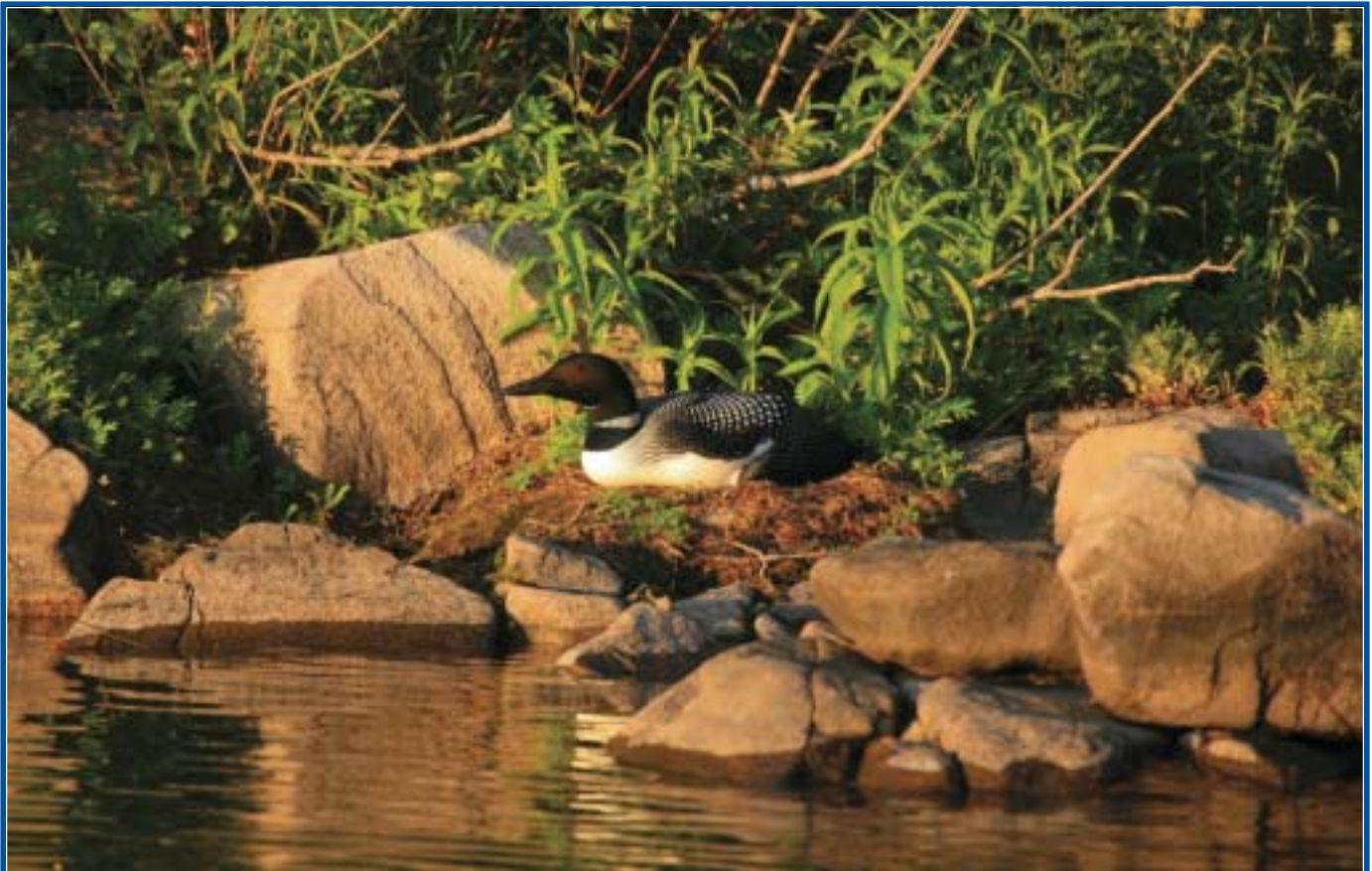
## Capillary Electrophoresis

Chromatographic Specialites Inc. offers a range of products for Capillary Electrophoresis. Please contact our Technical Support Group at 1-800-267-8103 or email [tech@chromspec.com](mailto:tech@chromspec.com) for more information.



***For more information or to request an  
MJS BioLynx catalogue contact:  
1-888-593-5969 • [tech@biolynx.ca](mailto:tech@biolynx.ca)  
[www.biolynx.ca](http://www.biolynx.ca)***

*Our sister company, <sup>MJS</sup> BioLynx, is a Canadian supplier of innovative research products for protein chemistry, immunology, molecular biology and microbiology. Modelled after CSI's success, BioLynx offers Canadian LifeScience Researchers access to a host of world-renowned products, excellent customer service and superior technical support. Their bilingual staff and Canada-wide Technical Sales Force work hard keeping their customers informed of new products, new techniques and cutting-edge technologies. To simplify your purchasing, BioLynx products can be ordered through Chromatographic Specialties and vice versa.*



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  - Protein Assay Reagents
  - Products for Western Blotting
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- Antibodies
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- [www.meridianlifescience.com](http://www.meridianlifescience.com)



- Transcription Factor Analysis Kits
  - Products for Cell Biology
- [www.activemotif.com](http://www.activemotif.com)



- Biochemicals and Molecular Biology Products
- [www.usbweb.com](http://www.usbweb.com)



- Immunoassay and Detection Kits
- [www.assaydesigns.com](http://www.assaydesigns.com)



- Laboratory Accessories
- [www.heathrowscientific.com](http://www.heathrowscientific.com)



- Yeast 2-Hybrid Systems to Study Protein:Protein Interactions
- [www.dualsystems.com](http://www.dualsystems.com)



- Bioanalyzer • Lab Chips • Microarrays
- [www.agilent.com](http://www.agilent.com)



- Cytokines • Chemokines
- [www.peprotech.com](http://www.peprotech.com)



- Microbiology Slides, Stains and Accessories
- [www.scientificdevice.com](http://www.scientificdevice.com)



- Oligonucleotide Probe Tools
- [www.biosearchtech.com](http://www.biosearchtech.com)



- Polyclonal Antibodies
  - ELISA Kits
  - Custom Services
- [www.bethyl.com](http://www.bethyl.com)



- Density Gradient Media
- [www.axis-shield.com](http://www.axis-shield.com)



- Endotoxin (LAL) and Glucan Products
- [www.acciusa.com](http://www.acciusa.com)



- RNA Amplification for Microarray and Q-PCR
- [www.nugeninc.com](http://www.nugeninc.com)



- Antibodies • Custom Services
- [www.abgent.com](http://www.abgent.com)



- Transfection Reagents
- [www.polyplus-transfection.com](http://www.polyplus-transfection.com)



- Carbohydrate Chemistry
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- [www.acciusa.com](http://www.acciusa.com)



**greiner bio-one**

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- [www.greinerbioone.com](http://www.greinerbioone.com)



- Centrifuges • Incubators • Dry Baths
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- Lipids • Inositol Phosphates • Fatty Acids
- [www.matreya.com](http://www.matreya.com)



- Custom Microplates
- [www.seahorselabware.com](http://www.seahorselabware.com)



- Nucleic Acid and Protein Purification
- [www.mn-net.com](http://www.mn-net.com)



- Pipette Tips • Labware
- [www.usascientific.com](http://www.usascientific.com)



- Cell Culture Systems
- [www.opticell.com](http://www.opticell.com)



- Electrophoresis Apparatus
  - Beta/Gamma Radiation Products
- [www.scie-plas.co.uk](http://www.scie-plas.co.uk)



- Disposable Labware
- [www.simport.com](http://www.simport.com)



- Nucleic Acid Analysis Systems
- [www.elchrom.com](http://www.elchrom.com)



- Pre-cast Electrophoresis Gels
- [www.pagegel.com](http://www.pagegel.com)



- Basement Membrane Proteins
  - Assay Kits
- [www.trevigen.com](http://www.trevigen.com)

Please visit our website at [www.biolynx.ca](http://www.biolynx.ca) if you would like to be added to our mailing list.

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# ASSOCIATES OF CAPE COD, INC. ENDOTOXIN TESTING

Associates of Cape Cod, Inc. (ACC) offers a full line of endotoxin and glucan detection products and services. *Limulus* Amebocyte Lysate (LAL) tests detect and quantify bacterial endotoxins extracted from the outer wall of gram negative bacteria. The critical component of the LAL reagents used in endotoxin tests is derived from blood cells (amebocytes) of the horseshoe crab, *Limulus polyphemus*. It contains the proteins of the blood clotting mechanism, which is triggered by endotoxins.



## ACC Pyrotell®

### Gel-clot Formulation

Pyrotell® lysate was the first LAL gel-clot reagent licensed by the US FDA. It is easy to use and is available in both economical multi-test vials and convenient single-test vials. Pyrotell® lysate is a robust reagent, producing firm, easily read clots and is resistant to interfering substances. The gel-clot test does not require sophisticated capital equipment or software and is the simplest LAL test to implement.



Product Number	Description	Sensitivity	Pkg Size*	Price
SKG5003	Multi-Test Pyrotell®	0.03 EU/mL	5 mL	\$78.90
SKG5006	Multi-Test Pyrotell®	0.06 EU/mL	5 mL	78.90
SKG5125	Multi-Test Pyrotell®	0.125 EU/mL	5 mL	78.90
SKG5250	Multi-Test Pyrotell®	0.25 EU/mL	5 mL	78.90

\* Pyrotell® is also available in multi-test 2 mL vials and single-test vials with variable sensitivities ranging from 0.03 up to 0.5 EU/mL. Please contact our Technical Support Department at 1-888-593-5969 for the full range of Pyrotell® products.

## ACC LAL REAGENT WATER (LRW)

LRW is specially processed water intended for reconstitution of LAL reagents and CSE, and to dilute samples and standards for LAL assays. Not for human or animal injection.

Product Number	Description	Pkg Size	Price
SKW0051	LAL Reagent Water	5.5 mL	\$8.30
SKW0504	LAL Reagent Water	50 mL	24.90
SKWP0501	LAL Reagent Water (Plastic Bottle)	50 mL	12.50
SKW1004	LAL Reagent Water	100 mL	29.10



## ACC Control Standard Endotoxin (CSE)

### Standard controls for LAL testing

CSE is a widely used standard for endotoxin testing. It is a purified extract of *E. coli* O113:H10, the same endotoxin as the USP and EP reference standard endotoxin (RSE).

- CSE is a premium, stable, preparation of endotoxin that can be used in all LAL testing
- CSE is especially useful for depyrogenation studies, e.g., oven control vials
- Certificates of Analysis for each CSE-lysate lot combination give users greater security when testing because the potency is known precisely
- CSE can be reconstituted to achieve specific endotoxin concentrations

CSE is reconstituted with LRW (or equivalent). Please refer to the Certificate of Analysis when using CSE. A Certificate of Analysis exists for each CSE-lysate lot combination.

Product Number	Description	Pkg Size	Price
SKE0005	Control Standard Endotoxin - <i>Escherichia coli</i> O113:H10	0.5 µg	\$27.00
SKE0125	Control Standard Endotoxin - <i>Escherichia coli</i> O113:H10	125 µg	78.90
SKEC010	Control Standard Endotoxin - <i>Escherichia coli</i> O113:H10 for use with Pyrochrome® kits	5 x 10 ng	66.40
SKPC010	Positive Control for Single Test Vial, CSE concentration is 0.1 ng/mL	10 x 0.2 mL	83.00

Note: Endotoxin free tubes and pipette tips are available. Please contact our Technical Support Department at 1-888-593-5969 for more information.

## PYROSOL BUFFER

Pyrosol buffer is recommended for reconstituting Pyrotell® reagents when testing strong electrolytes, strongly buffered solutions and solutions that are difficult to adjust within the required pH range using an acid or base. Contains a pH indicator.

Product Number	Description	Price
SKBR051	Pyrosol Buffer	\$14.50



# Macherey-Nagel DNA ISOLATION

## MACHEREY-NAGEL NucleoSpin® BLOOD

### DNA purification from whole blood

NucleoSpin® Blood Kits are designed for rapid purification of genomic DNA from whole blood, serum, plasma, and body fluids (amniotic fluid, etc.). Animal or human blood samples with citrate, EDTA, heparin, or CPDA, and frozen blood samples can be processed conveniently.

- Silica-membrane technology
- Complete removal of PCR inhibitors
- DNA ready to use in less than 30 minutes
- Sample size: up to 200 µL
- Typical yield: 4 - 6 µg DNA
- Available in 3 column sizes



The NucleoSpin® Blood QuickPure Kit features a new specially treated silica membrane which allows speeding up the procedure by combining washing/drying steps. Hands-on time is less than 10 minutes.

Product Number	Description	Pkg Size	Price
MCN74095110	NucleoSpin® Blood Kit, 10 Preps <i>For sample sizes of up to 200 µL</i> Includes: NucleoSpin® Blood Columns, 2 mL Collection Tubes, Buffers and Proteinase K	Kit	\$30.40
MCN74095150	NucleoSpin® Blood Kit, 50 Preps <i>For sample sizes of up to 200 µL</i> Includes: NucleoSpin® Blood Columns, 2 mL Collection Tubes, Buffers and Proteinase K	Kit	117.20
MCN74056910	NucleoSpin® Blood QuickPure Kit, 10 Preps <i>For sample sizes of up to 200 µL</i> Includes: NucleoSpin® Blood QuickPure Columns, 2 mL Collection Tubes, Buffers and Proteinase K	Kit	30.40
MCN74056950	NucleoSpin® Blood QuickPure Kit, 50 Preps <i>For sample sizes of up to 200 µL</i> Includes: NucleoSpin® Blood QuickPure Columns, 2 mL Collection Tubes, Buffers and Proteinase K	Kit	119.70
MCN74095420	NucleoSpin® Blood L Kit, 20 Preps <i>For sample sizes of up to 2 mL</i> Includes: NucleoSpin® Blood L Columns, 15 mL Collection Tubes, 15 mL Elution Tubes, Buffers and Proteinase K	Kit	146.30
MCN74095010	NucleoSpin® Blood XL Kit, 10 Preps <i>For sample sizes of up to 10 mL</i> Includes: NucleoSpin® Blood XL Columns, 50 mL Collection Tubes, 50 mL Elution Tubes, Buffers and Proteinase K	Kit	146.30

## MACHEREY-NAGEL NucleoSpin® DNA TRACE

### DNA isolation from forensic samples

NucleoSpin® DNA Trace is designed for the preparation of highly pure genomic DNA from small amounts of any tissue, cell and forensic sample. DNA amounts in the nanogram range can be processed with high recovery.

Isolated DNA is ready-to-use for common downstream applications like PCR, real-time PCR or other enzymatic reactions.

- Samples can be extracted with up to 8 mL lysis buffer
- Closed system - no cross contamination

Product Number	Description	Pkg Size	Price
MCN7409424	NucleoSpin® DNA Trace Kit, 4 Preps Includes: NucleoSpin® Funnel Columns 50 mL Polyethylene Tubes with screw caps 0.5 mL Elution Tubes Buffers and Proteinase K	Kit	\$104.50
MCN74094225	NucleoSpin® DNA Trace Kit, 25 Preps Includes: NucleoSpin® Funnel Columns 50 mL Polyethylene Tubes with screw caps 0.5 mL Elution Tubes Buffers and Proteinase K	Kit	414.80

## MACHEREY-NAGEL NucleoSpin® FOOD

### DNA isolation from food and feed

NucleoSpin® nucleic acid isolation technology from MACHEREY-NAGEL and GMO experience from GEN-IAL were combined to provide an optimal lysis and purification system for nearly all types of food samples. NucleoSpin® Food guarantees good recovery rates even for small genomic DNA fragments (<1 kb) out of processed, complex food matrices (e.g. ketchup or spices), which generally have very low DNA contents as well as poor quality, degraded DNA.

- DNA ready-to-use for real-time PCR
- Typical yield: 0.1 - 10 µg DNA

Product Number	Description	Pkg Size	Price
MCN74094510	NucleoSpin® Food, 10 Preps Includes: NucleoSpin® Food Columns 2 mL Collection Tubes Buffers and Proteinase K	Kit	\$35.70
MCN74094550	NucleoSpin® Food, 50 Preps Includes: NucleoSpin® Food Columns 2 mL Collection Tubes Buffers and Proteinase K	Kit	166.00

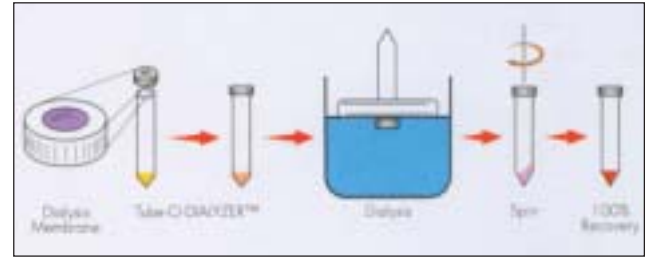
\* Please contact our Technical Support Department at 1-888-593-5969 for the full range of Macherey-Nagel Nucleic Acid Isolation Products.

**MJS BioLynx also offers USB ExoSAP-IT™ for easy PCR Product Clean Up.**  
**Email us at [tech@biolynx.ca](mailto:tech@biolynx.ca) or call 1-888-593-5969 for more information.**

## G-BIOSCIENCES Tube-O-DIALYZER™

### No loss dialyzer for small and precious samples

- Eliminates the major concern when dialyzing small samples i.e. the loss of samples due to transfer in and out of dialysis bags and handling.
- A simple design converts a sample tube into a Tube-O-DIALYZER™. The tube cap is adapted with a dialysis membrane made of a neutral no-binding membrane.
- Place your sample in the tube and close the cap adapted with the dialysis membrane. Invert the Tube-O-DIALYZER™ in a dialysis tank and dialyze your samples.
- Salts and other molecules rapidly exchange across the dialysis membrane mounted on the cap.
- When dialysis is complete, spin the tube for a brief 5 seconds and collect 100% of your sample.
- After dialysis, replace the dialyzing cap with a normal cap for storage of the sample.
- Supplied as 1000, 4000, 8000, 15,000 and 50,000 molecular weight cut off limits.



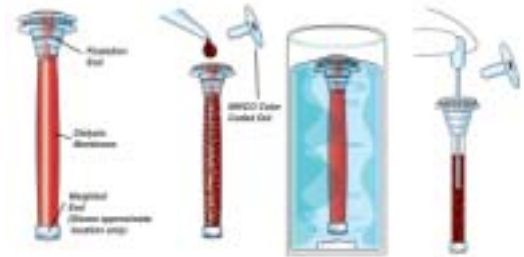
Product Number	Description*	Pkg Size	Price
<b>Tube-O-DIALYZER™ Micro — Suitable for 20-250 µL Sample Sizes</b>			
GB7861411K	Tube-O-DIALYZER™, Micro, 1000MW	50	\$222.50
GB7861414K	Tube-O-DIALYZER™, Micro, 4000MW	50	222.50
GB7861418K	Tube-O-DIALYZER™, Micro, 8000MW	50	222.50
GB78614115K	Tube-O-DIALYZER™, Micro, 15,000MW	50	231.50
GB78614150K	Tube-O-DIALYZER™, Micro, 50,000MW	50	231.50
<b>Tube-O-DIALYZER™ Medi — Suitable for 200 µL to 2.5 mL Sample Sizes</b>			
GB7861421K	Tube-O-DIALYZER™, Medi, 1000MW	50	\$249.50
GB7861424K	Tube-O-DIALYZER™, Medi, 4000MW	50	249.50
GB7861428K	Tube-O-DIALYZER™, Medi, 8000MW	50	249.50
GB78614215K	Tube-O-DIALYZER™, Medi, 15,000MW	50	249.50
GB78614250K	Tube-O-DIALYZER™, Medi, 50,000MW	50	255.90

\* Each order of Tube-O-DIALYZER™ is supplied with 4 floats.

## SPECTRUM LABS Spectra/Por® Float-A-Lyzer®

### Ultra performance dialysis for sample volumes from 300 µL to 10 mL

- Dialysis membrane tube pre-sealed at one end that attaches to a floatable cap at the other end.
- Features innovative Spectra/Por® membranes with thirteen available Molecular Weight Cut Offs (MWCO) ranging from 100 to 100,000 Daltons for all types of separation applications such as proteins, peptides, antibodies, DNA, etc.
- There is no risk of puncturing the membrane when loading or recovering sample with hypodermic needles and syringes.
- The floatable cap makes it easy to load and recover sample with the provided pipette as well as to access the sample during dialysis.
- Each Float-A-Lyzer® is individually packaged wet in 1% hydrogen peroxide preservative.



### Spectra/Por® Float-A-Lyzer® with Biotech Cellulose Ester Membranes — Pkg. Size: 10

MWCO	300 µL		500 µL		1 mL		3 mL		5 mL		10 mL	
100	ST235001	\$100.20	ST235013	\$100.20	ST235025	\$104.10	ST235037	\$104.10	ST235049	\$111.80	ST235061	\$111.80
500	ST235002	100.20	ST235014	100.20	ST235026	104.10	ST235038	104.10	ST235050	111.80	ST235062	111.80
1,000	ST235003	100.20	ST235015	100.20	ST235027	104.10	ST235039	104.10	ST235051	111.80	ST235063	111.80
2,000	ST235004	100.20	ST235016	100.20	ST235028	104.10	ST235040	104.10	ST235052	111.80	ST235064	111.80
3,500	ST235005	100.20	ST235017	100.20	ST235029	104.10	ST235041	104.10	ST235053	111.80	ST235065	111.80
5,000	ST235006	100.20	ST235018	100.20	ST235030	104.10	ST235042	104.10	ST235054	111.80	ST235066	111.80
8,000	ST235116	100.20	ST235118	100.20	ST235130	104.10	ST235142	104.10	ST235154	111.80	ST235166	111.80
10,000	ST235007	100.20	ST235019	100.20	ST235031	104.10	ST235043	104.10	ST235055	111.80	ST235067	111.80
15,000	ST235008	100.20	ST235020	100.20	ST235032	104.10	ST235044	104.10	ST235056	111.80	ST235068	111.80
25,000	ST235009	100.20	ST235021	100.20	ST235033	104.10	ST235045	104.10	ST235057	111.80	ST235069	111.80
50,000	ST235010	100.20	ST235022	100.20	ST235034	104.10	ST235046	104.10	ST235058	111.80	ST235070	111.80
100,000	ST235011	100.20	ST235023	100.20	ST235035	104.10	ST235047	104.10	ST235059	111.80	ST235071	111.80



MJS BioLynx Mini-Centrifuge

## MJS BIOLYNX MINI-CENTRIFUGE

- Fits six 1.5 mL tubes and includes adapters for 0.5 mL tubes
- Fixed-angle rotor
- Ambient operating temperature
- RPM 6,000; RCF 2,000 g
- One year warranty

Product Number	Description	Pkg Size	Price
CLSD110	Desktop Personal Mini-Centrifuge	Each	\$241.50

## GREINER CENTRIFUGE TUBES

- Superior chemical resistance and thermal characteristics
- RNase-free, DNase-free and non-pyrogenic
- Microcentrifuge tubes are manufactured from highly transparent, inert polypropylene resin
- 15 mL and 50 mL centrifuge tubes are made of ClearChoice™ polypropylene which offers excellent optical clarity
- All microcentrifuges are autoclavable
- All 1.5 mL tubes are graduated
- Microcentrifuge tubes can withstand centrifugation forces up to 18 000g
- 15 mL tubes can withstand centrifugation forces up to 3 500g (non-supported rotor) or 113 000g (supported rotor)
- 50 mL tubes can withstand centrifugation forces up to 3 200g (non-supported rotor) or 9 500g (supported rotor)

Product Number	Dimensions	Description	Cap	Bottom	Pkg Size	Price
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### MICROCENRIFUGE NON-STERILE

GR616201	-	1.5 mL PP (Natural)	Hinged	Conical	4000	\$91.80
GR616273	-	1.5 mL PP (Red)	Hinged	Conical	4000	91.80
GR616274	-	1.5 mL PP (Blue)	Hinged	Conical	4000	91.80
GR616275	-	1.5 mL PP (Green)	Hinged	Conical	4000	91.80
GR616276	-	1.5 mL PP (Yellow)	Hinged	Conical	4000	91.80
GR616281	-	1.5 mL PP (Assorted)	Hinged	Conical	4000	91.80
GR667201	-	0.5 mL PP (Natural)	Hinged	Conical	10000	312.90
GR742270	-	0.5 mL PP (Blue)	Hinged	Conical	15000	328.10

### 15 mL STERILE

GR188261	17 x 120 mm	PP tubes, racked	Blue, Screw	Conical	500	\$79.80
GR188271	17 x 120 mm	PP tubes	Blue, Screw	Conical	1000	133.80

### 50 mL STERILE

GR210261	30 x 115 mm	PP tubes	Blue, Screw	Skirted	450	\$93.80
GR210270	30 x 115 mm	PP tubes, racked	Blue, Screw	Skirted	300	79.60
GR227261	30 x 115 mm	PP tubes	Blue, Screw	Conical	500	94.70
GR227270	30 x 115 mm	PP tubes, racked	Blue, Screw	Conical	300	58.10

## HEATHROW 4-WAY MICROTUBE RACK

- Holds four 50 mL conical tubes, twelve 15 mL conical tubes, thirty-two 1.5 mL microtubes, or thirty-two 0.5 mL microtubes
- Made of heavy-duty autoclavable polypropylene
- Multiple racks can be linked together

Product Number	Description	Colour	Pkg Size	Price
HS29022A	4-Way Microtube Rack	Natural	5	\$31.40
HS29022B	4-Way Microtube Rack	Blue	5	31.40
HS29022C	4-Way Microtube Rack	Green	5	31.40
HS29022D	4-Way Microtube Rack	Pink	5	31.40
HS29022E	4-Way Microtube Rack	Yellow	5	31.40
HS29022F	4-Way Microtube Rack	Orange	5	31.40
HS29022G	4-Way Microtube Rack	Assorted	5	31.40



Greiner Microcentrifuge Tubes



Greiner Centrifuge Tubes



Heathrow 4-Way Microtube Racks

## MICRONIC STARTER PACKS

- Convenient, cost effective way to set up a traceable sample storage system
- Everything needed to store, locate and handle your precious samples
- Includes reader, software, caps, racks, 2D coded tubes, sealer and decappers
- Provides a quick and easy introduction to using coded sample tubes

### Tube Features:

- Clean room manufactured from medical grade polypropylene – solvent resistant, contaminant-free
- Ideal for use with robotic equipment
- Available uncoded, with alphanumeric code or featuring one of two 2D coding systems
- Codes enable sample integrity and traceability

### TraXis® features:

**Global sample security** – unparalleled code security

**Conformity** – fully traceable coding system for regulated environments

**Versatility** – strict separation of code cells ensures accurate reading even in dusty, low or non-uniform light environments

**Durability** – laser encryption ensures long-term code stability

### TrackerDM™ features:

**Industry standard** – 10MIL open code format

**Error correction** – partial damage of code will not effect readability

**Human readable code** – allows tube identification without using a reader

**Versatile** – ready integration with LIMS and databases, compatible with Matrix systems



Micronic Starter Pack

Product Number	Description	Pkg Size	Price
MSM50000	<b>TraXis® 1.4 mL Starter Pack</b> Includes: TraXis® 1.4 mL tubes in RoBo Racks, 1 case Table model reader TPE Capclusters, 100 Manual cap sealer Single cap decappers, 2 Eight cap decappers, 2	Kit	\$6,630.00
MSM50100	<b>TrackerDM™ 1.4 mL Starter Pack</b> Includes: TrackerDM™ 1.4 mL tubes in RoBo Racks, 1 case Table model reader TPE Capclusters, 100 Manual cap sealer Single cap decappers, 2 Eight cap decappers, 2	Kit	6,630.00
MSM50001	<b>TraXis® 0.65 mL Starter Pack</b> Includes: TraXis® V bottom, 0.65 mL tubes in LoBo Racks, 1 case Table model reader TPE Capclusters, 50 Manual cap sealer with adapter Single cap decappers, 2 Eight cap decappers, 2	Kit	5,610.00
MSM50101	<b>TrackerDM™ 0.65 mL Starter Pack</b> Includes: TrackerDM™ V bottom, 0.65 mL tubes in LoBo Racks, 1 case Table model reader TPE Capclusters, 50 Manual cap sealer with adapter Single cap decappers, 2 Eight cap decappers, 2	Kit	5,610.00



Micronic TrackerDM™ and TraXis® 2D Coded Tubes

## SEAHORSE LABWARE

### Design your own application-specific microplate

- Custom design and manufacture of microplates according to your application and specifications
- Timely, cost-effective engineering solutions to your plastic labware requirements
- Rigorous quality control and ISO 9000 certified
- Variety of standard microplates also available

Product Number	Description	Price
	Custom Microplates	Inquire



Seahorse Labware Custom Microplates

Chromatographic Specialties Inc. also carries a full range of microplates.  
Please refer to pages 337-339 for details.



### HAMILTON SOFTGRIP™ PIPETTES

Like the look? You'll love the feel! These newly redesigned pipettes feature:

- **Soft Contoured Handle** — Reduces strain on the user resulting from continuous and repetitive operation.
- **Curved Hilt** — Allows the pipette to hang freely from the hand further reducing hand strain.
- **Low Plunger and Ejector Force** — Soft plunger spring and enlarged ejector button minimize the force required for operation.
- **Isolated Volume Adjustment** — Unique location of volume adjustment ring reduces accidental volume changes.
- **Slim Ejector Sleeve** — Allows the pipette to reach the bottom of narrow tubes. Made of high strength, chemically resistant polymer.
- **Simple Calibration** — Calibration requires only minutes to perform with the Universal Calibration Key.
- **Fully Autoclavable**

#### Fixed Volume Pipettes

\*Accuracy and precision values are determined at 100% of pipette volume.

Product Number	Volume	Increments (μL)	Colour	Accuracy Within ±%*	Precision Within ±%*	Price
H5501901	5 μL	Fixed	Steel Blue	1.40	0.75	\$206.40
H5501903	10 μL	Fixed	Purple	0.80	0.40	206.40
H5501905	25 μL	Fixed	Forest Green	0.80	0.30	206.40
H5501907	50 μL	Fixed	Sandstone	0.60	0.30	206.40
H5501909	100 μL	Fixed	Violet	0.50	0.20	206.40
H5501911	200 μL	Fixed	Mustard	0.40	0.18	206.40
H5501913	250 μL	Fixed	Burnt Orange	0.40	0.18	206.40
H5501915	300 μL	Fixed	Brick Red	0.40	0.18	206.40
H5501917	500 μL	Fixed	Olive Green	0.40	0.18	206.40
H5501919	1 mL	Fixed	Sky Blue	0.30	0.12	206.40

#### Adjustable Volume Pipettes

\*Accuracy and precision values are determined at 100% of pipette volume.

Product Number	Volume	Increments (μL)	Colour	Accuracy Within ±%*	Precision Within ±%*	Price
H5501930	0.2 - 2 μL	0.002	Aqua	1.20	0.60	\$346.00
H5501932	1 - 10 μL	0.02	Purple	0.80	0.40	346.00
H5501934	2.5 - 25 μL	0.02	Forest Green	0.80	0.20	315.60
H5501936	10 - 100 μL	0.2	Violet	0.60	0.15	315.60
H5501938	30 - 300 μL	0.2	Brick Red	0.40	0.15	315.60
H5501940	100 μL - 1 mL	2.0	Sky Blue	0.30	0.12	315.60

#### Multichannel Pipettes

				At 10% of Pipette Volume		At 100% of Pipette Volume		
Product Number	Volume	Increments (µL)	Colour	Accuracy Within ±%	Precision Within ±%	Accuracy Within ±%	Precision Within ±%	Price
8 Channel Pipettes								
H5501950	5 - 50 µL	0.02	Sandstone	2.00	2.00	0.80	0.35	\$825.50
H5501952	30 - 300 µL	0.2	Brick Red	1.20	0.70	0.50	0.30	825.50
12 Channel Pipettes								
H5501954	5 - 50 µL	0.02	Sandstone	5.00	2.00	1.00	0.50	971.20
H5501956	30 - 300 µL	0.2	Brick Red	2.40	1.20	1.00	0.50	971.20

Chromatographic Specialties Inc. also carries a variety of pipette tips at very competitive prices.  
For more information, please refer to page 349 or request literature code #BL08.



A free-standing rack that holds 6 pipettes is also available.  
(H5357801 . . . \$97.10)

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- Tips fit most popular pipettes
- Gentle pressure is all that is needed to form a proper seal
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- Uniform, burr-free tip orifice prevents sample hold up
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TipOne®



USA Scientific TipOne® Bulk Bag



USA Scientific TipOne® Rack



USA Scientific TipOne® Reload Wafers

Product Number	Colour	Sterility	Style	Format	Pkg Size	Price
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### 0.1 – 10 µL

US11113000	Natural	-	-	Bulk	1000 tips/bag	\$23.60
US11113800	Natural	-	-	Rack	96 tips/rack 10 racks/case	49.30
US11113810	Natural	Sterile	-	Rack	96 tips/rack 10 racks/case	48.60
US11113700	Natural	-	-	Reload Wafer	96 tips/wafer 10 wafers/case	31.00
US11213810	Natural	Sterile	Filter	Rack	96 tips/rack 10 racks/case	76.80
US11113500	Natural	-	-	-	<b>Starter System</b>	102.60

### 1 – 200 µL

US11110000	Natural	-	-	Bulk	1000 tips/bag	\$20.60
US11110800	Natural	-	-	Rack	96 tips/rack 10 racks/case	42.30
US11110810	Natural	Sterile	-	Rack	96 tips/rack 10 racks/case	47.90
US11110700	Natural	-	-	Reload Wafer	96 tips/wafer 10 wafers/case	26.60
US11110500	Natural	-	-	-	<b>Starter System</b>	81.60

### 101 – 1000 µL

US11112020	Natural	-	Graduated	Bulk	1000 tips/bag	\$24.10
US11112820	Natural	-	Graduated	Rack	96 tips/rack 10 racks/case	54.00
US11112830	Natural	Sterile	Graduated	Rack	96 tips/rack 10 racks/case	52.20
US11267810	Natural	Sterile	Filter	Rack	96 tips/rack 10 racks/case	93.00
US11112720	Natural	-	Graduated	Reload Wafer	96 tips/wafer 10 wafers/case	38.10
US11112520	Natural	-	Graduated	-	<b>Starter System</b>	114.30

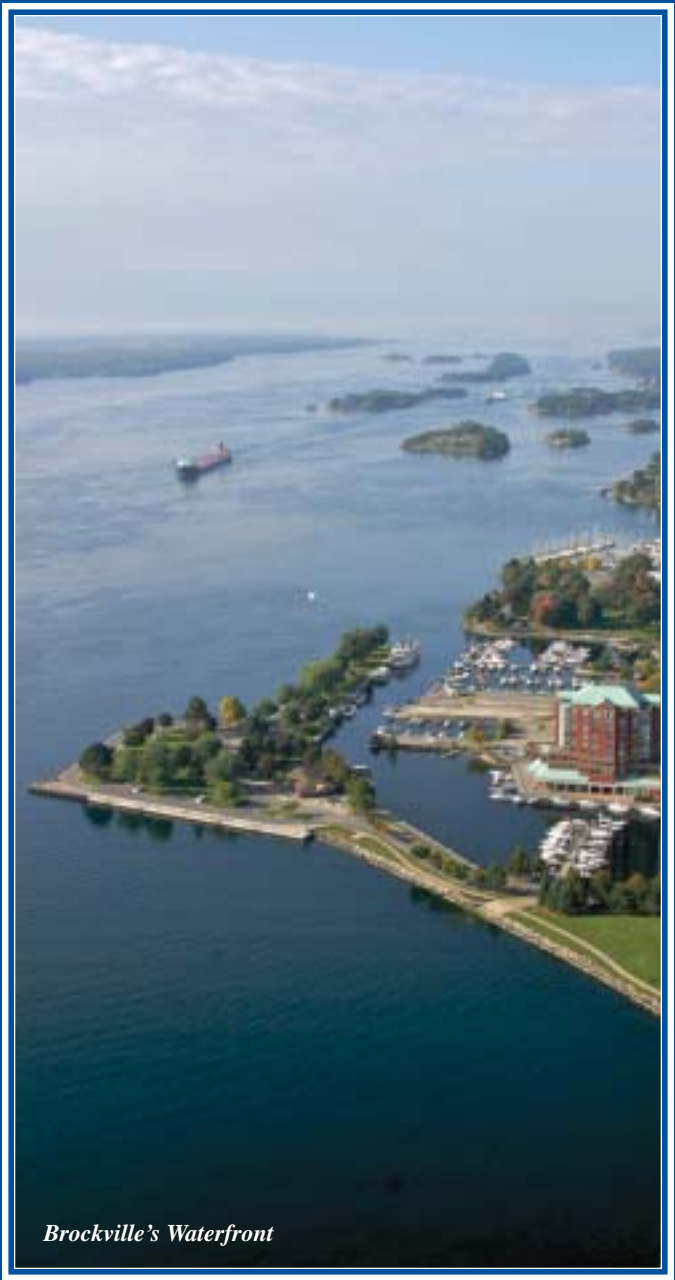
### 101 – 1250 µL

US11122000	Natural	-	-	Bulk	1000 tips/bag	\$26.20
US11122800	Natural	-	-	Rack	96 tips/rack 10 racks/case	48.10
US11122810	Natural	Sterile	-	Rack	96 tips/rack 10 racks/case	49.10
US11122700	Natural	-	-	Reload Wafer	96 tips/wafer 10 wafers/case	36.20
US11122500	Natural	-	-	-	<b>Starter System</b>	102.00

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RK27127	86	RK42001	19	RK70640	31	RK9176575	132	RK957930210	133	SB401350	296	SR86101003	220
RK27128	86	RK42002	19	RK70642	31	RK9177355	132	RK957930220	133	SB401352	296	SR86101004	220
RK27129	86	RK42003	19	RK70643	31	RK9178315	132	RK9579315	133	SB40725GM	297	SR86400010	223
RK27130	86	RK42010	19	RK70651	31	RK9178358	132	RK9579335	133	SB41225GM	297	SR86800353	223
RK27131	86	RK42011	19	RK70652	31	RK9178368	132	RK9579355	133	SB42225CA	263	SR86900007	223
RK27132	86	RK42012	19	RK70654	31	RK9178565	132	RK9579365	133	SB42225NN	263	SR86900010	223
RK27133	86	RK45001	21	RK70655	31	RK9178575	132	RT201007	257	SB42225NP	263	SR86900015	223
RK27134	86	RK45002	21	RK70657	31	RK9181565	132	RT201009	257	SB42225PP	263	SR86900017	223
RK27135	86	RK45003	21	RK70658	31	RK9201565	134	RT201010	257	SB42225PV	263	SR86900020	223
RK27136	86	RK45010	21	RK70666	31	RK9201575	134	RT270092	257	SB42225SCA	263	SR86900023	223
RK27137	86	RK45011	21	RK70667	31	RK9202565	134	RT270111	256	SB42725GM	297	SR86900025	223
RK27138	86	RK45012	21	RK70669	31	RK9202575	134	RT270112	256	SB44525CA	263	SR86900030	223
RK27139	86	RK49314	26	RK70670	31	RK9203515	134	RT270113	256	SB44525NC	263	SR86900034	223
RK27140	86	RK49315	26	RK70672	31	RK9203535	134	RT270114	256	SB44525NN	263	SR86900040	223
RK27141	86	RK49414	26	RK72021	31	RK9203555	134	RT270117	256	SB44525NP	263	SR86900045	223
RK27142	86	RK49415	26	RK72022	31	RK9203565	134	RT270121	256	SB44525PC	263	SR86900051	223
RK27143	86	RK49914	26	RK72024	31	RK9203575	134	RT270122	256	SB44525PP	263	SR86900052	223
RK27144	86	RK49915	26	RK72025	31	RK9204515	134	RT270123	256	SB44525PS	263	SR86900053	223
RK27145	86	RK70080	63	RK72027	31	RK9204535	134	RT270124	256	SB44525PV	263	SR86900063	223
RK27146	86	RK70081	63	RK72028	31	RK9204555	134	RT270127	256	SB45025NN	263	SR86900065	223
RK27147	86	RK70083	63	RK72036	31	RK9204565	134	RT270131	256	SB500058	320	SR86900070	223
RK27148	86	RK70084	63	RK72037	31	RK9204575	134	RT270132	256	SB500060	320	SR86900072	223
RK27149	86	RK70086	63	RK72039	31	RK9205565	134	RT270133	256	SB500067	318	SR86900075	223
RK27150	86	RK70087	63	RK72040	31	RK9205575	134	RT270134	256	SB500070	320	SR86900080	223
RK27151	86	RK70089	63	RK72042	31	RK9205585	134	RT270150	256	SB500072	320	SR86900081	223
RK27152	86	RK70090	63	RK72043	31	RK9205595	134	RT270151	256	SB500114	317	SR86900085	223
RK27153	86	RK70101	30	RK72051	31	RK9210315	134	RT270152	256	SB500124	317	SR86900088	223
RK27154	86	RK70102	30	RK72052	31	RK9210335	134	RT270401	256	SB500141	334	SR86901080	223
RK27155	86	RK70105	30	RK72054	31	RK9210355	134	RT270402	256	SB500142	334	SR86901088	223
RK27156	86	RK70106	30	RK72055	31	RK9210565	134	RT270403	256	SB500144	334	SR86902007	223
RK27157	86	RK70109	30	RK72057	31	RK9210575	134	RT270451	256	SB500194	317	SR86902026	223
RK27158	86	RK70114	30	RK72058	31	RK9213315	134	RT270453	256	SB500210	317	SS10012	66
RK27159	86	RK70116	30	RK72066	31	RK9213335	134	RT270455	256	SB500306	318	SS1003	66
RK27160	86	RK70117	30	RK72067	31	RK9213355	134	RT270457	256	SB500309	318	SS1006	66
RK27161	86	RK70120	30	RK72069	31	RK9213565	134	RT270458	256	SB500322	318	SS1008R4	66
RK27162	86	RK70121	30	RK72070	31	RK9213575	134	RT270501	256	SB500765	320	SS1021	66
RK27163	86	RK70122	30	RK72072	31	RK9214315	134	RT270502	256	SB501300	311	SS1031	66
RK27164	86	RK70123	30	RK72073	31	RK9214335	134	RT270503	256	SB501302	311	SS1041	66
RK27165	86	RK70124	30	RK72082	31	RK9214355	134	RT270504	256	SB501313	311	SS1054	67
RK27166	86	RK70125	30	RK72083	31	RK9214365	134	RT270505	256	SB501317	311	SS1054	67
RK27167	86	RK70126	30	RK72088	31	RK9214575	134	RT270509	256	SB501362	318	SS20012	66
RK27168	86	RK70127	30	RK80486800	31	RK9215315	134	RT270593	256	SB501368	318	SS2003	66
RK27169	86	RK70128	30	RK9100315	132	RK9215335	134	RT270594	256	SB501370	297	SS2006	66
RK27170	86	RK70129	30	RK9100565	132	RK9215355	134	RT270601	256	SB502370	322	SS20061	66
RK27171	86	RK70135	30	RK9100575	132	RK9215565	134	RT270602	256	SCT107019	142	SS20072	66
RK30096	254	RK70136	30	RK9103315	132	RK9215575	134	RT270611	257	SCT107029	142	SS20074	66
RK30097	254	RK70137	30	RK9103565	132	RK9216315	134	RT270612	257	SCT107030	142	SS20083	66
RK30098	254	RK70138	30	RK9103575	132	RK9216335	134	RT270651	256	SCT107031	142	SS20084	66
RK30099	254	RK70139	30	RK9105315	132	RK9216355	134	RT270652	256	SCT107032	142	SS2021	66
RK30100	254	RK70140	30	RK9105565	132	RK9216565	134	RT270815	257	SCT107033	142	SS2031	66
RK31064	255	RK70141	30	RK9105575	132	RK9216575	134	RT270816	257	SCT107034	142	SS2041	66
RK31222	255	RK70142	30	RK9106315	132	RK9217315	134	RT270841	257	SCT107036	142	SS2071	67
RK31223	255	RK70143	30	RK9106565	132	RK9217335	134	RT270843	257	SCT107094	142	SS2MG	67
RK31233	254	RK70144	30	RK9106575	132	RK9217355	134	RT270851	257	SCT107119	142	SS2P4T	67
RK31234	254	RK70150	30	RK9107315	132	RK9217565	134	RT270853	257	SCT107121	142	SS2012	66
RK31235	254	RK70151	30	RK9107565	132	RK9217575	134	RT440001	257	SCT107319	142	SS3003	66
RK31236	254	RK70152	30	RK9107575	132	RK9410212	134	RT440003	257	SCT107615	142	SS3006	66
RK31239	254	RK70153	30	RK9160313	132	RK9410232	134	RT640110	257	SCT107621	143	SS30062	66
RK31807	107	RK70154	30	RK9160353	132	RK9410252	134	RT640113	257	SCT107622	143	SS30082	66
RK31840	107	RK70155	30	RK9160552	132	RK9410565	134	RT640114	257	SCT107624	143	SS30084	66
RK32441	132	RK70156	30	RK9160553	132	RK9410575	134	RT970069	257	SCT107808	143	SS3021	66
RK35000	107	RK70157	30	RK9160555	132	RK9413315	134	RT970130	59, 257	SCT107810	143	SS3031	66
RK35002	107	RK70158	30	RK9160565	132	RK9413335	134	RT970131	59, 257	SCT107811	143	SS3041	66
RK35003	107	RK70159	30	RK9160573	132	RK9413355	134			SCT107812	143	SS40012	66
RK36006	255	RK70167	30	RK9160575	132	RK9413565	134			SCT107813	143	SS4003	66
RK36007	255	RK70170	30	RK9161313	132	RK9413575	134			SCT107814	143	SS4006	66
RK36008	255	RK70173	30	RK9161353	132	RK9414212	134			SCT107816	143	SS40062	66
RK36009	255	RK70177	30	RK9161358	132	RK9414252	134			SCT107817	143	SS40063	66
RK40101	15	RK70179	30	RK9161368	132	RK9414252	134			SCT107819	142	SS40074	66
RK40102	15	RK70181	30	RK9161552	132	RK9414315	134			SCT107810	142	SS40082	66
RK40103	15	RK70182	30	RK9161553	132	RK9414335	134			SCT107811	143	SS4021	66
RK40110	15	RK70183	30	RK9161555	132	RK9414355	134			SCT107812	143	SS4031	66
RK40111	15	RK70184	30	RK9161565	132	RK9414565	134			SCT107914	143	SS4041	66
RK40112	15	RK70185	30	RK9161573	132	RK9414575	134			SCT107920	142	SS41GS2	67
RK40201	16	RK70187	30	RK9161575	132	RK9416565	134			SCT107922	142	SS42GS4	67
RK40202	16	RK70188	30	RK9164313	132	RK9416575	134			SCT107923	142	SS4F7	67
RK40203	16	RK70189	30	RK9164353	132	RK9510552	133			SCT107930	142	SS4MG	67
RK40210	16	RK70191	30	RK9164552	132	RK9510562	133			SCT107935	142	SS4P4T	67
RK40211	16	RK70192	30	RK9164553	132	RK9510563	133			SCT107942	142	SS4SS4	67
RK40212	16	RK70193	30	RK9164555	132	RK9510565	133			SCT107979	142	SSOGS2	67
RK40301	18	RK70199	30	RK9164565	132	RK9510573	133			SCT107982	143	SSOV52	67
RK40302	18	RK70221	30	RK9164573	132	RK9510575	133			SCT107985	143	ST235001	345
RK40303	18	RK70222	30	RK9164575	132	RK9512552	133			SCT107986	143	ST235002	345
RK40310	18	RK70224	30	RK9165595	132	RK9512562	133			SCT107992	143	ST235003	345
RK40311	18	RK70225	30	RK9165613	132	RK9512563	133			SCT107993	143	ST235004	345
RK40312	18	RK70227	30	RK9166353	132	RK9512565	133			SCT108021	143	ST235005	345
RK40401	20	RK70228	30	RK9166358	132	RK9512573	133			SCT108022	143	ST235006	345
RK40402	20	RK70236	30	RK9166368	132	RK9512575	133			SCT108032	142	ST235007	345
RK40403	20	RK70237	30	RK9166552	132	RK9513552	133			SCT108151	142	ST235008	345
RK40410	20	RK70239	30	RK9166553	132								



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ST235043	345	UCTCDAU203	278	UCTCUCX111	275	UCTEUCTVAC390	272	UCTWORCNP105	283	VCFL1R	141	VE506B	180
ST235044	345	UCTCDAU206	278	UCTCUCX123	275	UCTEUCTVAC647	272	UCTWORCNP11	283	VCFL1Y	141	VE506C	180
ST235045	345	UCTCDAU303	278	UCTCUCX122	275	UCTEUCTVAC690	272	UCTWORCNP13	283	VCFL2A	141	VE508B	180
ST235046	345	UCTCDAU503	278	UCTCUCX156	275	UCTECUN1525	272	UCTWORNAX105	283	VCFL2APK	141	VE508C	180
ST235047	345	UCTCDAU506	278	UCTCUCX1M6	275	UCTECUNIC18	272	UCTWORNAX11	283	VCFL2BE	141	VE510B	180
ST235049	345	UCTCDAU5M25	278	UCTCUCX211	277	UCTECUNIOAG	272	UCTWORNAX13	283	VCFL2BK	141	VE510C	180
ST235050	345	UCTCDAUM15	278	UCTCUCX212	277	UCTECUNIPAH	272	UCTWORPHY105	283	VCFL2G	141	VE603B	180
ST235051	345	UCTCEC08110M75	274	UCTCUCX223	277	UCTFEC1812M20	282	UCTWORPHY11	283	VCFL2R	141	VE603C	180
ST235052	345	UCTCEC08111	274	UCTCUCX22M15	277	UCTFEC1812S20	282	UCTWORPHY13	283	VCFL2Y	141	VE604B	180
ST235053	345	UCTCEC08123	274	UCTCUCX223	277	UCTFEC1840M12	282	UCTWOROAX105	283	VCFLCB1KF	141	VE604C	180
ST235054	345	UCTCEC0812M15	274	UCTCUCX253	277	UCTFEC1840S12	282	UCTWOROAX11	283	VCFLCB1PK	141	VE606B	180
ST235055	345	UCTCEC08156	274	UCTCUCX256	277	UCTFEC1865M6	282	UCTWOROAX13	283	VCFLCB2KF	141	VE606C	180
ST235056	345	UCTCEC0815M25	274	UCTCUCX25Z	277	UCTFR20011P	281	UCTWORSIL105	283	VCFLCB2PK	141	VE608B	180
ST235057	345	UCTCEC0815Z	274	UCTCUCX2L1	277	UCTFR20041P	281	UCTWORSIL11	283	VCFSAO1525025B	52	VE608C	180
ST235058	345	UCTCEC081L1	274	UCTCUCX2M6	277	UCTFR20081P	281	UCTWORSIL13	283	VCFSAO1525025U	52	VE610B	180
ST235059	345	UCTCEC081M6	274	UCTCUCNP111	274	UCTFR20101P	281	UCTZCDAU020	278	VCFSAO3025025B	52	VE610C	180
ST235061	345	UCTCEC18110M75	274	UCTCUCNP113	274	UCTFR20151P	281	UCTZCGHB020	278	VCFSAO3025025U	52	VE703N	180
ST235062	345	UCTCEC18111	274	UCTCUCNP123	274	UCTFR20251P	281	UCTZSDAU020	278	VCFSB01525025B	52	VE704N	180
ST235063	345	UCTCEC18123	274	UCTCUCNP12Z	274	UCTFR20751P	281	UCTZSGHB020	278	VCFSB03025025B	52	VE704N	180
ST235064	345	UCTCEC1812M15	274	UCTCUCNP156	274	UCTFUSIL12M20	282	UCTZZ3801	280	VCFSG03025025A	52	VE706C	180
ST235065	345	UCTCEC18156	274	UCTCUCNP15Z	274	UCTFUSIL12S20	282	US11110000	349	VCFSG06025025A	52	VE706N	180
ST235066	345	UCTCEC1815M25	274	UCTCUCNP1M6	274	UCTFUSIL40M12	282	US11110500	349	VCIAUJWP1	181	VE708C	180
ST235067	345	UCTCEC1815Z	274	UCTCUCNP211	277	UCTFUSIL40S12	282	US11110700	349	VCSL10	183	VE708N	180
ST235068	345	UCTCEC181M6	274	UCTCUCNP21Z	277	UCTFUSIL65M6	282	US11110800	349	VCSL10	183	VE710C	180
ST235069	345	UCTCEC181M6	274	UCTCUCNP223	277	UCTLUER50	281	US11110810	349	VCSL10K	183	VE710N	180
ST235070	345	UCTCFQAX111	275	UCTCUCNP22M15	277	UCTMDKENVII	280	US11112020	349	VCSL1K	183	VEA03B	180
ST235071	345	UCTCFQAX123	275	UCTCUCNP22Z	277	UCTMDKIEXI	280	US11112520	349	VCSL2	183	VEA03C	180
ST235116	345	UCTCFQAX12Z	275	UCTCUCNP253	277	UCTMDKNPEI	280	US11112720	349	VCSL20	183	VEA04B	180
ST235118	345	UCTCFQAX156	275	UCTCUCNP256	277	UCTMDKPHMIII	280	US11112820	349	VCSL250	183	VEA04C	180
ST235130	345	UCTCFQAX1M6	275	UCTCUCNP25Z	277	UCTMDKPUI	280	US11112830	349	VCSL2K	183	VEA06B	180
ST235142	345	UCTCHQAX111	275	UCTCUCNP2L1	277	UCTMDKPIEXII	280	US11113000	349	VCSL5	183	VEA06C	180
ST235154	345	UCTCHQAX123	275	UCTCUCNP2M6	277	UCTMDKTOXII	280	US11113500	349	VCSL50	183	VEA08B	180
ST235166	345	UCTCHQAX12Z	275	UCTCULF111	274	UCTMEC18110M75	282	US11113700	349	VCSL500	183	VEA08C	180
		UCTCHQAX156	275	UCTCULF113	274	UCTMEC18120M75	282	US11113800	349	VCSL5K	183	VEA10B	180
		UCTCHQAX1M6	275	UCTCULF123	274	UCTMEC18125M150	282	US11113810	349	VCVIA10GS1	73	VEA10C	180
		UCTCLTP050	278	UCTCULF12Z	274	UCTMEC18150M150	282	US11122000	349	VCVIA10GS2	73	VEH	188
T1031	95	UCTCSDAU131	278	UCTCULF156	274	UCTMEC18170M150	282	US11122500	349	VCVIA150S1	73	VEMH	188
T1041	95	UCTCSDAU133	278	UCTCULF15Z	274	UCTMUSIL110M75	282	US11122700	349	VCVIA150S2	73	VEMT	188
T2031	95	UCTCSDAU1M6	278	UCTCULF1S1M6	274	UCTMUSIL120M75	282	US11122800	349	VCVIA1KY51	73	VET	188
T2041	95	UCTCSDAU203	278	UCTCUMPS52CT	273	UCTMUSIL125M150	282	US11123810	349	VCVIA1KY52	73	VF3660	192
T3031	95	UCTCSDAU206	278	UCTCUMPS18CT	273	UCTMUSIL150M150	282	US11213810	349	VCVIA500BS1	73	VF3665	192
T3041	95	UCTCSDAU303	278	UCTCUMPSCB2CT	273	UCTMUSIL170M150	282	US11267810	349	VCVIA500BS2	73	VF3668	193
T4031	95	UCTCSDAU503	278	UCTCUNAX111	275	UCTRFV0001P	281, 290			VCVIA50RS1	73	VF3670	193
T4041	95	UCTCSDAU506	278	UCTCUNAX123	275	UCTRFV0004P	281, 290			VCVIA50RS2	73	VF3675	192
T8131	95	UCTCSDAU5M25	278	UCTCUNAX12Z	275	UCTRFV0008P	281, 290			VD1320	189	VF3835	193
T8141	95	UCTCSDAU1M6	278	UCTCUNAX156	275	UCTRFV0010P	281			VD1324	189	VF4095	113
TD0707	340	UCTCSGHB203	278	UCTCUNAX1M6	275	UCTRFV0015P	281			VD2	225	VFC22AS1K	73
TD070710	340	UCTCUALA111	274	UCTCUNAX211	277	UCTRFV0025P	281			VD2220	225	VFC22AV1K	73
TD0909	340	UCTCUALA113	274	UCTCUNAX21Z	277	UCTRFV0075P	281, 290			VD31HP	225	VFRK1	94
TD090910	340	UCTCUALA123	274	UCTCUNAX223	277	UCTRFV02F1P	290			VD31HP220	225	VFS1255	193
TD0912	340	UCTCUALA12Z	274	UCTCUNAX22M15	277	UCTRFV02F4P	290			VD41	225	VFS145	193
TD091210	340	UCTCUALA156	274	UCTCUNAX22Z	277	UCTSSBCX031	279			VD41220	225	VIZ2697	188
TD1212	340	UCTCUALA15Z	274	UCTCUNAX253	277	UCTSSBCX033	279			VD41HP58	225	VK1C06	181
TD121210	340	UCTCUALA1M6	274	UCTCUNAX256	277	UCTSSBCX056	279			VD41HP58220	225	VK1C1	181
TD1217	340	UCTCUALB111	274	UCTCUNAX25Z	277	UCTSSC18031	279			VD41SH14R	225	VK1C2	181
TD121710	340	UCTCUALB113	274	UCTCUNAX2L1	277	UCTSSC18033	279			VD41SH14R220	225	VK1C5	181
TD1219	340	UCTCUALB123	274	UCTCUNAX2M6	277	UCTSSC18056	279			VD41SH17R	225	VK1N06	181
TD121910	340	UCTCUALB12Z	274	UCTCUPAX111	275	UCTSSDBX031	279			VD41SH17R220	225	VK1N1	181
TD1221	340	UCTCUALB156	274	UCTCUPAX123	275	UCTSSDBX033	279			VD41TOR	225	VK1N2	181
TD122110	340	UCTCUALB15Z	274	UCTCUPAX12Z	275	UCTSSDBX056	279			VD41TOR220	225	VK1N5	181
TD1818	340	UCTCUALB1M6	274	UCTCUPAX156	275	UCTSSDV8031	279			VD41VA38R	225	VK2C06	181
TD181810	340	UCTCUALN111	274	UCTCUPAX1M6	275	UCTSSDV8033	279			VD41VA38R220	225	VK2C1	181
TD1824	340	UCTCUALN113	274	UCTCUPCX113	275	UCTSSDV8056	279			VD56890	225	VK2C2	181
TD182410	340	UCTCUALN123	274	UCTCUPCX123	275	UCTSSQA0X31	279			VD56890220	225	VK2C5	181
TD2424	340	UCTCUALN12Z	274	UCTCUPCX12Z	275	UCTSSQA0X33	279			VD6HP58	225	VK2N06	181
TD242410	340	UCTCUALN156	274	UCTCUPCX156	275	UCTSSQA0X56	279			VD6HP58220	225	VK2N1	181
TDPF0707	340	UCTCUALN15Z	274	UCTCUPCX1M6	275	UCTSTFAI01	258			VD6SH17R	225	VK2N2	181
TDPF070710	340	UCTCUALN1M6	274	UCTCUPCX211	277	UCTSTFAI05	258			VD6SH17R220	225	VK2N5	181
TDPF0909	340	UCTCUBX111	275	UCTCUPCX21Z	277	UCTSTFPAH10	258			VD6TTR	225	VK3C06	181
TDPF090910	340	UCTCUBX123	275	UCTCUPCX22Z	277	UCTVMF016GL	281			VD6TR220	225	VK3C1	181
TDPF0912	340	UCTCUBX12Z	275	UCTCUPCX22M15	277	UCTVMF02024	281			VD6VA36R	225	VK3C2	181
TDPF091210	340	UCTCUBX156	275	UCTCUPCX22Z	277	UCTVMF02116	281			VD6VA36R220	225	VK3C5	181
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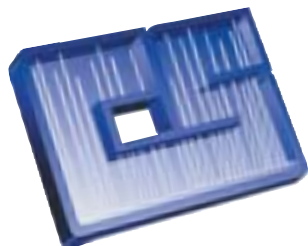


# AVAILABLE LITERATURE

Title	Literature Code	Title	Literature Code
<b>GAS CHROMATOGRAPHY</b>		<b>SAMPLE PREPARATION</b>	
Agilent Catalogue . . . . .	AG01	UCT SPE Catalogue (CD only) . . . . .	UCT01
Agilent — J & W GC Column Selection Guide . . . . .	AG07	UCT — Vacuum Manifolds . . . . .	UCT02
Agilent — Maintaining Your Agilent GC and GC/MS . . . . .	AG11	UCT — ENVIROCLEAN® Products . . . . .	UCT09
Agilent — Duraguard Columns - Built in Protection . . . . .	AG16	UCT — CLEANSCREEN® for Drugs of Abuse . . . . .	UCT12
Agilent GC Inlet Resource Guide . . . . .	AG18	UCT — XTRACK-T® SPE Columns . . . . .	UCT15
Agilent GC Troubleshooting Guide (poster) . . . . .	AG25	UCT — CLEAN-UP® SPE Columns . . . . .	UCT16
Agilent HP-5MSi Column . . . . .	AG35	Horizon Technologies Automated SPE Systems . . . . .	HZ01
Agilent 6890 Series GC Supplies . . . . .	AG41	Macherey-Nagel ChromaBond® SPE . . . . .	MN09
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CHROMSPEC™ GC Septa and Glass Unions . . . . .	CS11		
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Restek Chromatography Products Catalogue . . . . .	RK01	AccuStandard Product Catalogue . . . . .	A01
Restek — Guide to Direct On-Column . . . . .	RK04	AccuStandard Inorganic Catalogue . . . . .	A02
Flash Vaporization Injection . . . . .		AccuStandard Petroleum Products . . . . .	A07
Restek — Guide to Injecting Dirty Samples . . . . .	RK05	AccuStandard EPA Supplement . . . . .	A10
Restek — Selection Guide for Polar Wax GC Phases . . . . .	RK11	Restek — Chemical Standards . . . . .	RK09
Restek — Passive Air Sampling Kits . . . . .	RK13		
Restek — Genuine Restek Replacement Parts Agilent GCs . . . . .	RK20	<b>VALVES AND FITTINGS</b>	
Restek — Packed Column Product Guide . . . . .	RK29	Hamilton Catalogue . . . . .	H01
Restek — GC Essentials . . . . .	RK40	Valco Product Catalogue . . . . .	V01
Restek — GC Columns . . . . .	RK77		
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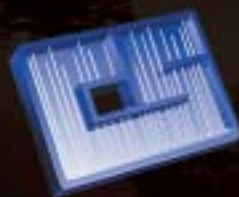


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