



**Thermo Scientific**  
Chromatography Columns  
and Consumables 2016-2017

# Connected chromatography solutions

# Samples are complex. Separating them shouldn't be.

Every breakthrough starts with a challenge. We believe that challenge should be your science, not your instrument. The **Thermo Scientific™ Vanquish™ UHPLC** delivers better separations, more results, and easier interaction than ever before. In 2010 we embraced UHPLC as the standard for all of our liquid chromatography solutions, and we have designed the Vanquish UHPLC as the instrument to solve your chromatographic challenges and achieve that breakthrough.

## Vanquish UHPLC System

• [Discover more at thermoscientific.com/Vanquish](http://thermoscientific.com/Vanquish)



**Thermo Scientific™  
Accucore™ Vanquish™ C18+ Columns**  
1.5 µm solid core particles for unmatched  
resolution and throughput



**Vanquish UHPLC with Charger**  
Highest throughput analysis with  
added sample capacity



**Thermo Scientific™ Dionex™ Chromeleon™  
Chromatography Data System**  
Operational simplicity with eWorkflows  
and simplified data handling

# Cross-technique application expertise in a single online location

Thermo Scientific™ AppsLab Library of Analytical Applications provides more than 1300 detailed application examples for the columns listed in the 2016–2017 Chromatography Columns and Consumables Catalog. Search, filter and download complete methods to optimize your separation or implement validated methods using Thermo Scientific™ Dionex™ Chromeleon™ Chromatography Data System (CDS) software. AppsLab Library makes our global application expertise accessible to you—online and downloadable!

## Introducing: AppsLab Library

• Visit [thermoscientific.com/AppsLab](http://thermoscientific.com/AppsLab)

**Thermo**  
SCIENTIFIC  
A Thermo Fisher Scientific Brand



- Access GC, IC, LC, GC-MS, and LC-MS application notes in a single online location
- Download one-click workflows: immediately ready to run in Chromeleon CDS
- Compare results and identify optimum chromatographic separation conditions quickly and easily
- Visible to all users. Register once for free and download complete separation methods.





# Connected solutions

**Welcome to the 2016 – 2017 Chromatography Columns and Consumables Catalog.** A great tool that provides a comprehensive portfolio of products delivering connected chromatography solutions across key market workflows. You can view these workflow capabilities at the start of the catalog. Look out for some of our new product innovations including SMART Digest Kits, Virtuoso Vial Identification System, Bio LC Columns, Accucore Vanquish Columns, GC Septa and the LinerGOLD Range. Technical resource pages have been introduced that will direct you to **[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)**, an online portal that will help you in every aspect of your analysis. Finally, 2016 marks the 40<sup>th</sup> anniversary of Hypersil chromatography media, we will build on this legacy and bring to market even more innovative products which will enable our customers to make the world healthier, cleaner and safer.

**[www.thermoscientific.com/chromatography](http://www.thermoscientific.com/chromatography)**



# Chromatography Columns and Consumables

## Application and Technical Support

Do you have a question about chromatography, or are you searching for the best conditions for your analysis?

Are you looking for advice on what products to select from the catalog?

Do you require assistance when using your chromatography consumables?

We have a dedicated team of technical support specialists and application chemists available to help you with any of the above. Our experts have access to the latest chromatography technology and will act as your trusted advisors.

For application and technical support visit:

[www.thermoscientific.com/  
chromexpert](http://www.thermoscientific.com/chromexpert)



### Applications Resources for Chromatography and Sample Preparation

- **AppsLab**  
Cross-technique analytical applications in a single online location
- **Sample Preparation**  
A searchable database of application notes

### Cross Reference Resource Tools

- **Vials and Closures**  
You can enter the part number of any autosampler consumable (vial, closure or combination pack) and get the Thermo Scientific equivalent
- **GC Columns**  
Look up the Thermo Scientific equivalent for a GC column
- **HPLC/UHPLC Columns**  
Look up the Thermo Scientific equivalent for an LC column
- **SPE Product and Method Selection**  
Simply answer the questions presented and this tool will identify the part and generic method needed

### Contact our Technical Support Team

- **Product Selection**
- **Care and Use of your Chromatography Products**
- **Discuss a Method or Product Issue**

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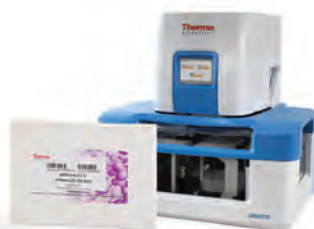
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# for **biopharmaceutical markets**

A wide range of Thermo Scientific™ capability solutions which are built for biopharma.

## **MSIA™ D.A.R.T.s Versette™ Automated Liquid Handler**

Reproducible, automated affinity purification



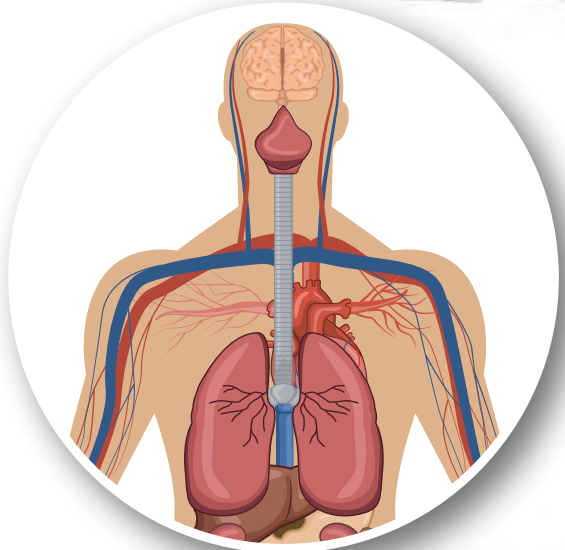
## **SMART Digest™ Kits**

Facilitating perfect digestion



## **SOLAμ™ SPE Plates**

Increased sensitivity



## Sample Preparation

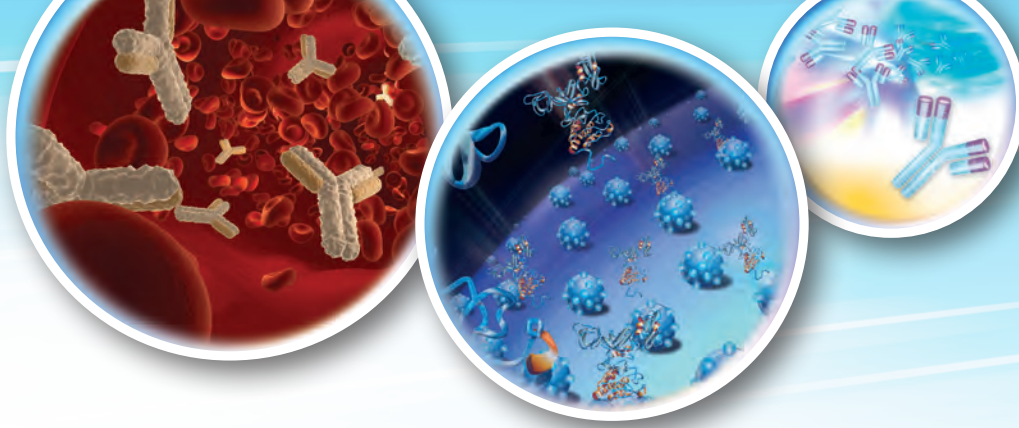
## Data Management



**Watson LIMS™ and Data Manager**  
Powerful data processing, reporting  
and SDMS



**Chromleon™  
Chromatography Data System**  
Streamlining laboratory workflow



**WebSeal™**  
Sample integrity  
and cleanliness



**Varioskan LUX™ Multimode  
Microplate Reader**



**Orbitor™ RS  
Microplate Mover**  
High-throughput lab automation



## Sample Handling

## Separation and Detection



**BioLC/UHPLC  
Columns**  
Separation technologies  
for every workflow



**Orbitrap Fusion™ Lumos™  
Tribid™ Mass Spectrometer**  
The new standard in characterization  
and quantitation



**Vanquish™ UHPLC Systems**  
Built for every biopharma workflow



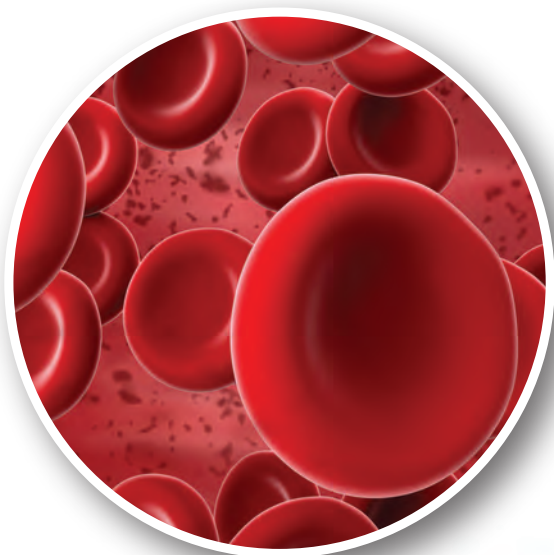
# for **pharmaceutical** and **clinical markets**

Innovative, reliable and easy-to-use Thermo Scientific™ solutions to help you meet the demanding needs at every stage of your workflow.

**SOLA™ Products**  
Increased sensitivity



Sample Preparation



Data Management



**Watson LIMS™ and Data Manager**  
Powerful data processing, reporting  
and SDMS

**Chromeleon™**  
**Chromatography Data System**  
Streamlining laboratory workflow



### Virtuoso™ Vials

The highest level of sample integrity and sample information possible



### Virtuoso™ Vial Identification System



### Orbitor™ RS Microplate Mover

High-throughput lab automation



## Sample Handling

## Separation and Detection



### TSQ Quantiva™ Triple Quadrupole Mass Spectrometer

exceeds stringent analytical requirements with superb sensitivity, speed and dynamic range



### Vanquish™ UHPLC Systems

Built for every biopharma workflow



### HPLC/UHPLC Columns

# for food and beverage markets

Whether you are testing for contaminants or developing a new production process, we are here to help. Our innovative Thermo Scientific™ products and range of solutions allow you to deliver safe, high-quality food products that consumers expect.

## QuEChERS Products

Convenient and effective approach for determining pesticide residues



## Sample Preparation



## Data Management



## Chromeleon™

Chromatography Data System

Streamlining laboratory workflow



### Virtuoso™ Vials

The highest level of sample integrity and sample information possible



### Virtuoso™ Vial Identification System



### HPLC/UHPLC Columns



## Sample Handling

## Separation and Detection



### Vanquish™ UHPLC Systems

Built for every biopharma workflow



### GC Columns



### Q Exactive™ GC Orbitrap™ GC-MS/MS System

Unprecedented depth in GC-MS analysis



### TRACE™ 1300 Series GC

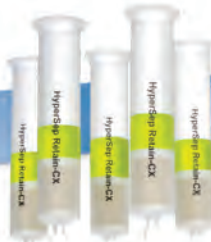
Simplify workflow and increase analytical performance

# for environmental analysis markets

A range of Thermo Scientific™ capabilities for air, water and soil analysis that provide reliable, accurate, and precise results that can make compliance simpler and help minimize regulatory risks.

## SPE Products

Reproducible and clean sample extractions



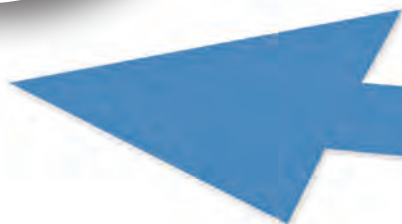
## Syringe Filters

Reliable elimination of particles and micro organisms



## Sample Preparation

## Data Management



**Chromeleon™**  
**Chromatography Data System**  
Streamlining laboratory workflow



**Virtuoso™ Vials**

The highest level of sample integrity and sample information possible



**Virtuoso™ Vial Identification System**



**HPLC/UHPLC Columns**



**Sample Handling**

**Separation and Detection**



**Vanquish™ UHPLC Systems**

Built for every biopharma workflow



**GC Columns**



**Q Exactive™ GC Orbitrap™ GC-MS/MS System**

Unprecedented depth in GC-MS analysis



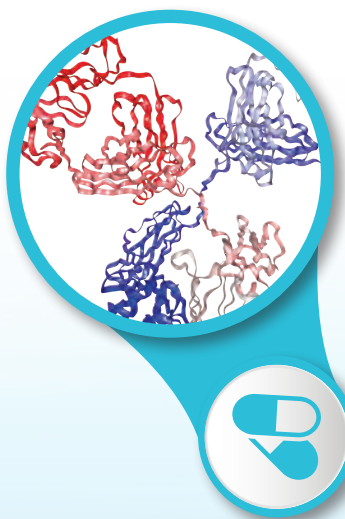
**TRACE™ 1300 Series GC**

Simplify workflow and increase analytical performance

# Sample Preparation Products

Your sample is precious and you cannot afford failures. We have a comprehensive range of products delivering clean and consistent extractions using innovative sample preparation technologies for your analytical needs.

## Featured Products



### SMART Digest Kits

Designed for biopharmaceutical and proteomic applications that require highly reproducible, sensitive and fast analyses of proteins often in high throughput workflows.

**PAGE 1-004**



### SOLA Products

This first fritless SPE product range which has been specifically designed for bioanalysis provides greater reproducibility with cleaner, more consistent extracts. Thermo Scientific™ SOLA™ products provide unparalleled performance characteristics compared to conventional SPE, phospholipid removal and protein precipitation products.

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### QuEChERS

A quick and easy sample preparation approach for pesticide analysis. Convenient extraction and clean-up of pesticides in food and other complex matrices.

**PAGE 1-030**



### Syringe Filters

Providing cleaner sample extracts by removing interfering materials and fine particles. Delivering high quality, robust solutions for a wide range of samples and applications.

**PAGE 1-034**



# Sample Preparation

## Technical Resources



visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)  
to access the following information:

- SPE Phase Selection
- SPE Phase Selection by Manufacturer
- SPE Procedure - Six Steps for a Clean Extract
- Method Development Optimization in SPE



# SMART Digest Kits

## Facilitating perfect digestion

Thermo Scientific™ SMART Digest™ kits are designed for biopharmaceutical and proteomic applications that require:

- High analytical reproducibility
- High sensitivity
- Fast analysis
- High throughput workflows

They achieve this due to the optimized heat stable immobilized trypsin design. It offers significant benefits over existing conventional in-solution digestion protocols:

- Simple process
- Significantly faster than in-solution digestion
- More reproducible than in-solution digestion
- Higher sensitivity
- Higher throughput
- Ability to automate

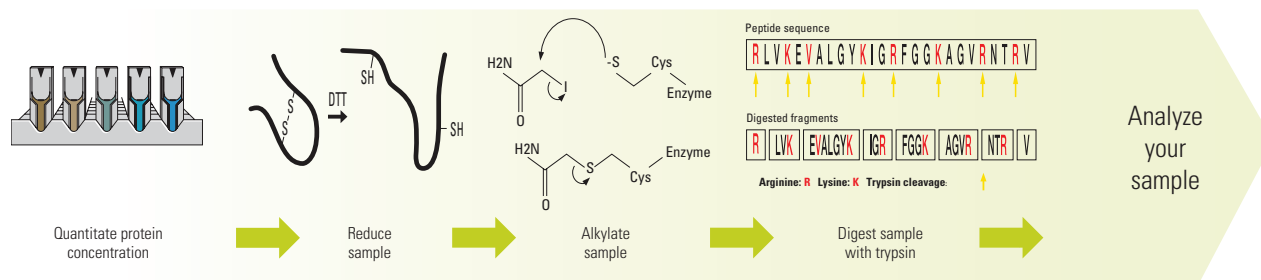


### Simplicity of use with SMART Digest Kits

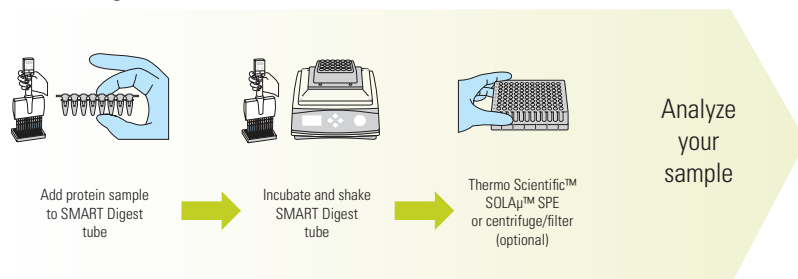
Current sample preparation protocols for the digestion of proteins are multifaceted and laborious. Without a single source solution, errors are far more likely to occur. Therefore, the overall protocol is subject to irreproducibility and significant sample processing time.

The SMART Digest kit overcomes these barriers by providing a simple to implement, integrated process (see the diagram below), which provides high data confidence and significantly increased reproducibility. The entire protocol can be easily automated for high throughput processing.

### Standard Digest



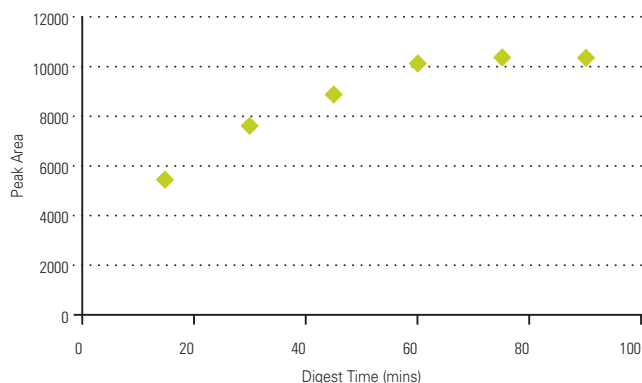
### SMART Digest



## Fast digestion with SMART Digest Kits

The SMART Digest process is not only simple, but significantly reduces the time from sample preparation to analysis. Typically it takes less than 60 minutes, dependent on sample complexity; to achieve full digestion as can be seen in the IgG example below, full digestion is achieved in 60 minutes.

### IgG Assay m/z- 937



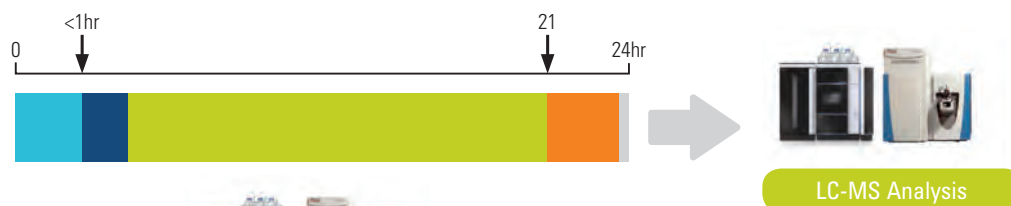
### Recommended digestion starting conditions for known proteins\*

Protein	Digest Time (min)
Insulin	4
BSA	< 5
Carbonic anhydrase	< 5
Lysozyme	< 5
Apo-B	30
IgG	45
IgG in 50 $\mu$ L plasma	75
Ribonuclease A	150
Thyroglobulin	240
C-reactive protein	240

\*200 $\mu$ L protein solutions were used for all samples. A concentration of 100 $\mu$ g/mL was used for all samples, except IgG in plasma which used 17.5mg/mL

### SMART Digest vs. conventional in-solution digest protocol

#### In-solution digest



#### SMART Digest

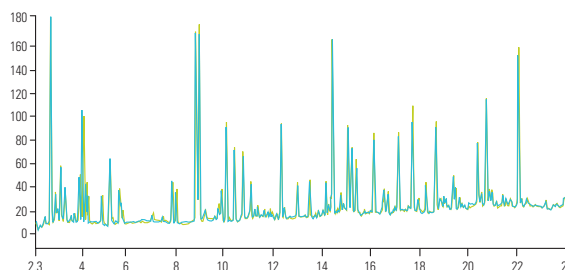


- Sample preparation
- Digestion
- Spin down
- SPE + dry/reconstitute

### Reproducibility of digestion with the SMART Digest Kits

The SMART Digest kit provides significant improvements in reproducibility over existing protocols, which results in fewer sample failures, higher throughput and the ability to more easily interrogate data.

The chromatogram to the right shows two overlaid traces of BSA digests produced by two separate users who had never performed a digestion protocol before.

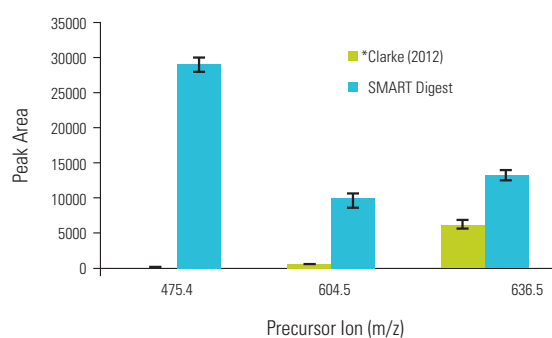


### Higher sensitivity with the SMART Digest Kits

The SMART Digest kit can provide higher sequence coverage due to more efficient digestion and the reduced number of chemicals used, resulting in less ion suppression during LC-MS analysis. The reduced use of chemicals also decreases the number of chemically-induced post-translational modifications.

The mass spectrometry (MS) peak area response comparison on the right shows how Thyroglobulin, digested using the SMART Digest kit, provides higher levels of sensitivity compared to a standard in-solution digest. In addition to this the SMART Digest protocol took two hours compared to twenty hours for the in-solution protocol.

### Comparison to Historical Method



\*Clarke, N. J., et al.; *J. Inv. Med.* **2012**, *60*, 1157-1163

### SMART Digest Kits

Description	Cat No.
Smart Digest kit	<b>60109-101</b>
Smart Digest kit with 96 well filter plate	<b>60109-102</b>
Smart Digest kit with SOLA $\mu$ HRP SPE plate	<b>60109-103</b>

Find out more about how SMART Digest Kits can benefit your workflow at:  
[www.thermoscientific.com/SMARTdigest](http://www.thermoscientific.com/SMARTdigest)

# SOLA SPE Products

## Consistent excellence for bioanalysis

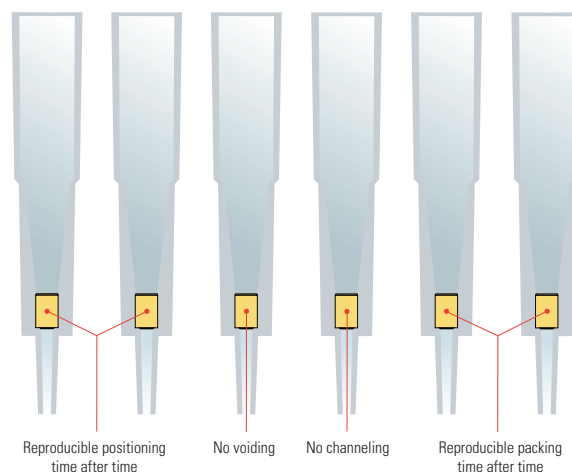
Thermo Scientific SOLA products are designed for bioanalytical and clinical research analysts who are tasked with providing high quality analytical results from complex biological samples in a high throughput environment, while complying with strict legislation. These demands are compounded by the continued push to higher efficacy drugs and long acting formulations which continue to drive sensitivity requirements to lower levels to enable accurate quantification.



In order to meet these demands, bioanalytical methods must provide:

- Robustness – low analytical failure rates
- Ability to process low sample volumes
- High sensitivity
- High reproducibility
- Ease of use
- High throughput processing
- Efficient and fast processes

The SOLA SPE range meets these demands due to the unique and innovative frit-less SPE technology which eliminates the issues with traditional loose-packed SPE formats (see figure to the right). Combining the support material and active media components into a solid, uniform sorbent bed provides stable and controllable flow through characteristics and has an added advantage when dealing with viscous biological samples, as it prevents blocking and enables high throughput processing.

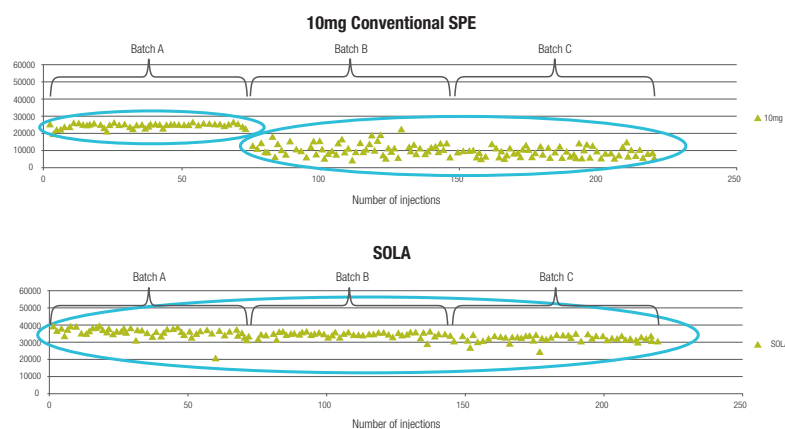


SOLAμ SPE design – limiting issues associated with conventional SPE formats

The manufacturing process also allows for high levels of reproducibility, not only from cartridge to cartridge or well to well but also batch to batch (see figure to the right).

The SOLAμ SPE range has the added benefit of being able to provide:

- Up to a 20 fold increase in sensitivity
- Ability to process samples restricted in volume
- Increased workflow efficiency and sample integrity

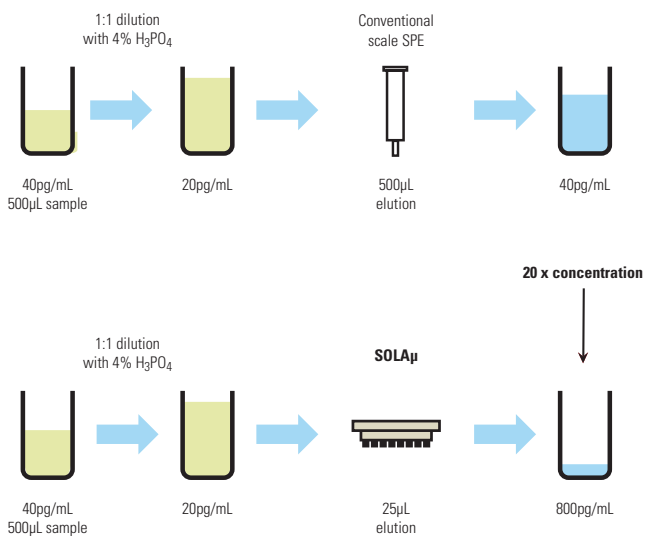


Batch to batch reproducibility of SOLA compared to a conventional SPE product

### Increase your MS sensitivity

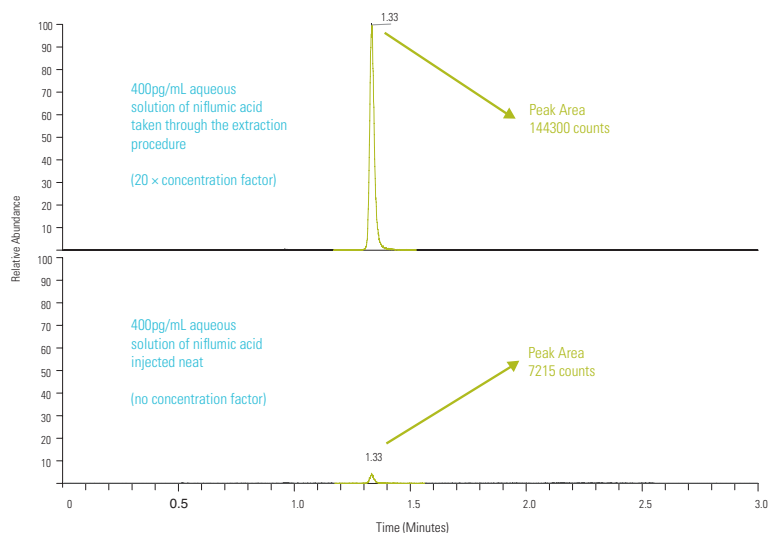
Up to 20 times increase in sensitivity can be achieved by loading a large volume of sample and eluting in a low volume.

In the following example 500µL of human plasma was loaded onto the SOLAµ plate for the analysis of niflumic acid. The compound was eluted in 25µL, providing a 20 times increase in concentration whilst maintaining excellent precision.



**The problem:**  
improvement in assay sensitivity required

**SOLAµ solution:**  
SOLAµ for up to 20 times increase in concentration of sample without changes to workflow

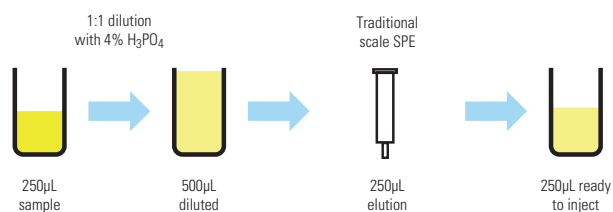


	Precision Data for Niflumic Acid Peak Area Ratio (%RSD) n = 18	Recovery of Niflumic Acid (%)	Matrix Effects (%)
QC Low (0.4ng/mL)	1.31	89.9	8.63
QC High (30ng/mL)	1.06	94.0	3.21

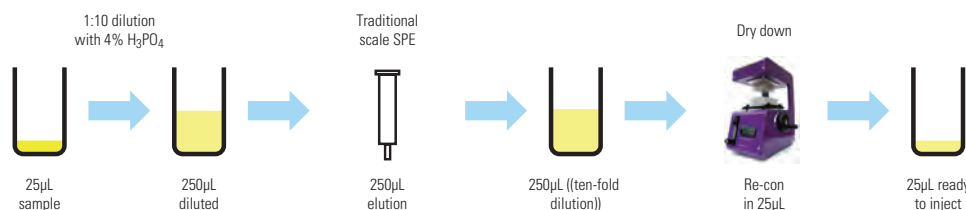
### Sample limited assays

SOLA $\mu$  allows you to directly scale down the volumes used in analytical methods, allowing for a reduction in sample usage and eliminating issues caused by evaporation, without compromising the sensitivity of your assay. This is also an important consideration when sample volumes are limited.

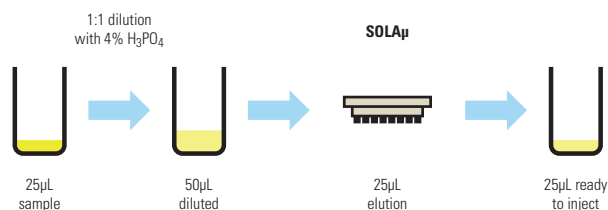
The following example shows that by loading 25 $\mu$ L of niflumic acid sample onto the SOLA $\mu$  plate and eluting in a total volume of 25 $\mu$ L, a ten-fold decrease in sample volume was achieved when compared to a traditional scale higher bed weight product. Equivalent method performance and high levels of reproducibility provided by SOLA technology were still maintained.



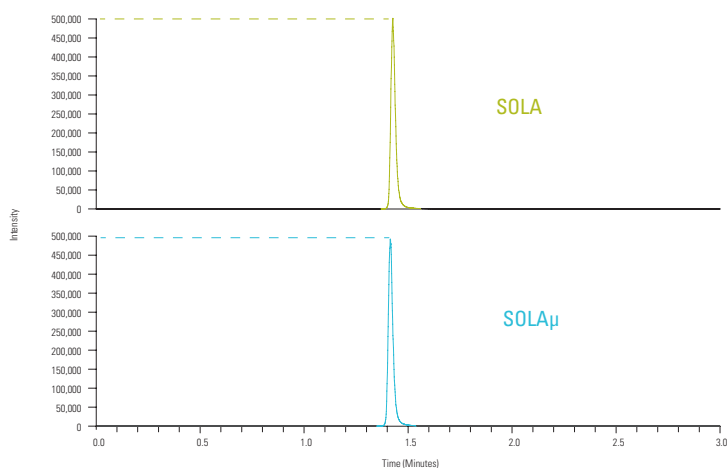
**Problem:**  
large sample volume  
requires reduction



**Option 1:**  
introduce additional  
steps with  
associated issues



**Option 2:**  
scale volumes  
directly with no other  
method changes



Equivalent peak response achieved for Niflumic Acid with SOLA $\mu$  using 25 $\mu$ L of sample compared with 250 $\mu$ L of sample with a 10mg SOLA SPE device

Precision Data for Niflumic Acid		
	Analyte Peak Area (%RSD)	Peak Area Ratio (%RSD)
Low QC	7.32	0.356
High QC	5.33	0.195

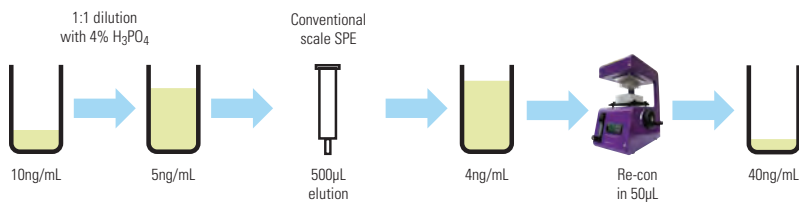


### Increased workflow efficiency

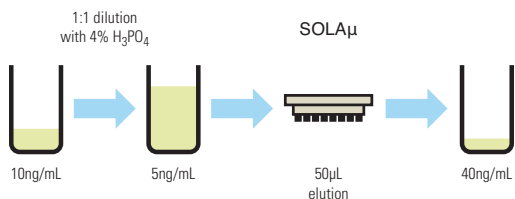
With traditional SPE the eluted sample is typically dried down to increase the concentration of the sample and thus improve the sensitivity. This causes an issue for certain compound types which can be lost during this step, resulting in reduced sensitivity.

SOLA $\mu$  allows the sample to be extracted without the need for dry down and reconstitution. Not only does this maximize recovery of the analytes it also improves workflow efficiency and increases productivity.

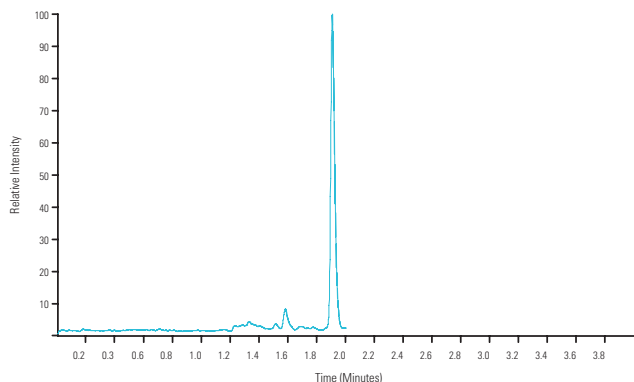
In the case of extraction of ibuprofen a four-fold pre-concentration was achieved without the need for dry down by loading 200 $\mu$ L of sample onto the SOLA $\mu$  plate and eluting in a total of 50 $\mu$ L. The results demonstrate that even with this low elution volume, excellent reproducibility was achieved.



**The problem:**  
workflow requires dry down to achieve sensitivity



**SOLA $\mu$  solution:**  
low elution volume allows removal of dry down



Peak response for ibuprofen

	Ibuprofen (%RSD) n=18	Ibuprofen recovery (%)
Low QC (25ng/mL)	4.00	90
High QC (750ng/mL)	1.70	95

### SOLA and SOLA $\mu$ meet bioanalytical needs by providing:

- A robust low sample volume preparation platform
- Reproducibility at low sample and solvent levels
- Increased workflow efficiency and throughput
- Sample enrichment (20 times)
- Mitigation against solvation and non-specific binding issues

**SOLA $\mu$  96 Well Plates**

Description	Bed Weight (mg)	Column Volume (mL)	Cat No.	Quantity
SOLA $\mu$ HRP	2	1	<b>60209-001</b>	1 Each
SOLA $\mu$ SCX	2	1	<b>60209-002</b>	1 Each
SOLA $\mu$ SAX	2	1	<b>60209-003</b>	1 Each
SOLA $\mu$ WCX	2	1	<b>60209-004</b>	1 Each
SOLA $\mu$ WAX	2	1	<b>60209-005</b>	1 Each

**SOLA SPE Cartridges**

Description	Bed Weight (mg)	Column Volume (mL)	Cat No.	Quantity
SOLA HRP	10	1	<b>60109-001</b>	100 Pack
SOLA SCX	10	1	<b>60109-002</b>	100 Pack
SOLA SAX	10	1	<b>60109-003</b>	100 Pack
SOLA WCX	10	1	<b>60109-004</b>	100 Pack
SOLA WAX	10	1	<b>60109-005</b>	100 Pack

**SOLA 96 Well Plates**

Description	Bed Weight (mg)	Well Volume (mL)	Cat No.	Quantity
SOLA HRP	10	2	<b>60309-001</b>	1 Each
SOLA SCX	10	2	<b>60309-002</b>	1 Each
SOLA SAX	10	2	<b>60309-003</b>	1 Each
SOLA WCX	10	2	<b>60309-004</b>	1 Each
SOLA WAX	10	2	<b>60309-005</b>	1 Each

# HyperSep SLE Cartridges and Plates

Solid supported liquid/liquid extraction (SLE) is a fast and effective sample preparation technique that provides considerable benefits over liquid-liquid extraction (LLE) protocols for removal of phospholipids from biological samples.

SLE offers the following advantages:

- Greater reproducibility and recoveries compared to LLE techniques
- Prevents emulsification often associated with LLE
- Reduced solvent requirements compared to LLE
- Can be completely automated unlike LLE
- Improved cleanliness of sample extract compared to protein precipitation techniques
- Improved sensitivity compared to protein precipitation techniques



Thermo Scientific™ HyperSep™ SLE is available in cartridge and 96 well plate formats and in acidified or basified formats to help simplify the protocol when acidic or basic mobile phases are used.

## HyperSep SLE Cartridges

Special treated diatomite SLE	Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
pH=7	200	3	<b>60109-200-3-7</b>	50 Pack
	500	3	<b>60109-500-3-7</b>	50 Pack
	500	6	<b>60109-500-6-7</b>	30 Pack
	1,000	6	<b>60109-1000-6-7</b>	30 Pack
	2,000	12	<b>60109-2000-12-7</b>	20 Pack
	4,000	25	<b>60109-4000-25-7</b>	15 Pack
	20,000	60	<b>60109-20000-60-7</b>	10 Pack
pH=9	200	3	<b>60109-200-3-9</b>	50 Pack
	500	3	<b>60109-500-3-9</b>	50 Pack
	500	6	<b>60109-500-6-9</b>	30 Pack
	1,000	6	<b>60109-1000-6-9</b>	30 Pack
	2,000	12	<b>60109-2000-12-9</b>	20 Pack
	4,000	25	<b>60109-4000-25-9</b>	15 Pack
	20,000	60	<b>60109-20000-60-9</b>	10 Pack

## HyperSep SLE 96 Well Plates

Special treated diatomite SLE	Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
pH=7	200	2	<b>60109-200-2-7W</b>	1 Each
	300	2	<b>60109-300-2-7W</b>	1 Each
	400	2	<b>60109-400-2-7W</b>	1 Each
	500	2	<b>60109-500-2-7W</b>	1 Each
pH=9	200	2	<b>60109-200-2-9W</b>	1 Each
	300	2	<b>60109-300-2-9W</b>	1 Each
	400	2	<b>60109-400-2-9W</b>	1 Each
	500	2	<b>60109-500-2-9W</b>	1 Each

# HyperSep Protein Precipitation Plate

Provides a quick and effective approach for removal of proteins from biological compounds using the protein crash technique. In combination with SPE and SLE, the Protein Precipitation Plate offers a comprehensive range of options for sample preparation of biological based compounds. The 96 well plate format provides a high throughput functionality which lends itself to full automation.

- Dual frit design
- Hydrophobic/oleophobic frits to enable only precipitation of proteins
- Pore size optimized for ideal flow rate
- Specially selected polypropylene for low extractables



## HyperSep Protein Precipitation Plate

Description	Cat. No.	Quantity
Protein Precipitation Plate	60304-201	1 Each



# Microscale SPE Plates and Tips

## HyperSep Lab Plates

For the purification and sample preparation of proteins, DNA, RNA and other biomolecules

- Sample concentration of small-scale samples
- Available in a range of chromatographic materials
- 96 well plate format with media embedded at the bottom of the plate
- Can be processed manually or using a liquid-handling robot
- Not suitable for use with a vacuum

### Applications:

- Tissue culture and separation of products
- Sample concentration
- Sample clean-up
- Collection of sample after chromatography

### HyperSep Lab Plates

Description	Cat. No. (Polystyrene)	Cat. No. (Polypropylene)	Quantity
C18	60110-201	60110-301	5 Pack
C8	60110-202	60110-302	5 Pack
C4	60110-203	60110-303	5 Pack
Hypercarb	60110-204	60110-304	5 Pack
Hypercarb and C18 (Mixed Mode)	60110-205	60110-305	5 Pack
Zirconium Dioxide	60110-206	60110-306	5 Pack
Titanium Dioxide	60110-207	60110-307	5 Pack
SCX	60110-208	60110-308	5 Pack
SAX	60110-209	60110-309	5 Pack

## HyperSep Filter Plates

For effective clean-up of small-scale samples

- 96 well plate for the purification and separation of proteins, peptides, DNA, RNA and other biomolecules
- Clean up of microgram-level samples
- Available in a range of chromatographic materials
- Can be used under vacuum

### HyperSep Filter Plates

Description	Cat. No. (5-7 $\mu$ L Bed Volume)	Cat. No. (40 $\mu$ L Bed Volume)	Quantity
C18	60110-401	60110-501	1 Each
C8	60110-402	60110-502	1 Each
C4	60110-403	60110-503	1 Each
Hypercarb	60110-404	60110-504	1 Each
Hypercarb and C18 (Mix Mode)	60110-405	60110-505	1 Each
Zirconium Dioxide	60110-406	60110-506	1 Each
Titanium Dioxide	60110-407	60110-507	1 Each
SCX	60110-408	60110-508	1 Each
SAX	60110-409	60110-509	1 Each

## HyperSep Microscale Solid Phase Extraction Tips

Revolutionary micropipette tip for sample preparation

- Faster sample preparation with minimal sample loss
- Patented micropipette tip in which the chromatographic material is directly attached to its inner surface
- No contamination from the supporting matrix
- Separation in volumes as low as 100nL
- Applications include mass spectrometry, desalting, protein purification and electrophoresis



### HyperSep Tip Microscale Solid Phase Extraction Tips

Description	Cat. No. (1-10 $\mu$ L Capacity)	Cat. No. (10-200 $\mu$ L Capacity)	Quantity
Thermo Scientific™ BioBasic™ 18	60109-201	60109-209	96 Pack
BioBasic 8	60109-202	60109-210	96 Pack
BioBasic 4	60109-203	60109-211	96 Pack
Hypercarb	60109-204	60109-212	96 Pack
Hypercarb and C18 (mix mode)	60109-205	60109-213	96 Pack
HILIC	60109-206	60109-214	96 Pack
Trypsin	60109-207	60109-215	96 Pack
Titanium Dioxide	60109-208	60109-216	96 Pack
Zirconium Dioxide	60109-217	60109-218	96 Pack

## HyperSep SpinTip Microscale Solid Phase Extraction Tips

Revolutionary micropipette tip for sample preparation

- Pipette tips with a 1 to 2 $\mu$ m wide slit at the bottom that permits the liquid to pass through but retains the chromatographic material (20 to 30 $\mu$ m)
- Faster sample preparation with minimal sample loss
- No contamination from the supporting matrix
- Separation in volumes as low as 100nL



### HyperSep SpinTip Microscale Solid Phase Extraction Tips

Description	Cat. No. (1-10 $\mu$ L Capacity)	Cat. No. (10-200 $\mu$ L Capacity)	Quantity
C18	60109-401	60109-412	96 Pack
C8	60109-402	60109-413	96 Pack
C4	60109-403	60109-414	96 Pack
Hypercarb	60109-404	60109-415	96 Pack
Hypercarb and C18 (mix mode)	60109-405	60109-416	96 Pack
HILIC	60109-406	60109-417	96 Pack
Trypsin	60109-407	60109-418	96 Pack
POROS Weak Anion Exchanger	60109-408	60109-419	96 Pack
POROS Strong Anion Exchanger	60109-409	60109-420	96 Pack
POROS Strong Cation Exchanger	60109-410	60109-421	96 Pack
Titanium Dioxide	60109-411	60109-422	96 Pack
Zirconium Dioxide	60109-424	60109-425	96 Pack

# HyperSep SPE Cartridges and Plates

## HyperSep Retain SPE Cartridges and Plates

Versatile polymeric materials for retention of polar, non-polar, basic and acidic drugs

- Exceptional recoveries for polar and non-polar analytes
- High and consistent recoveries
- High capacity, high purity, highly porous polystyrene DVB material modified with functional groups
  - PEP - urea for polar and non-polar analytes
  - CX - Sulfonic acid for basic analytes
  - AX - Quaternary amine for acidic analytes
- Fast and easy sample preparation and method development
- pH stable 0 to 14



### HyperSep Retain PEP/CX/AX SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Retain PEP Cat No.	Retain CX Cat No.	Retain AX Cat No.	Quantity
30	1	60107-201	60107-301	60107-401	100 Pack
30	3	60107-202	60107-302	60107-402	50 Pack
60	3	60107-203	60107-303	60107-403	50 Pack
60	6	60107-208	60107-308	60107-408	30 Pack
100	3	60107-217	60107-317	60107-417	50 Pack
100	6	60107-207	60107-307	60107-407	30 Pack
150	3	60107-209	60107-309	60107-413	30 Pack
150	6	60107-211	60107-311	60107-411	30 Pack
200	3	60107-204	60107-304	60107-404	50 Pack
200	6	60107-212	60107-314	60107-412	30 Pack
500	3	60107-205	60107-305	60107-405	50 Pack
500	6	60107-206	60107-306	60107-406	30 Pack
500	15	60107-219	60107-319	60107-419	20 Pack
1,000	25	60107-215	60107-315	60107-415	20 Pack
1,000	6	60107-218	60107-318	60107-418	30 Pack
2,000	25	60107-214	60107-312	60107-414	20 Pack

**Note:** For bed weights less than 30mg please refer to SOLA SPE products on page 1-011.

### HyperSep Retain PEP/CX/AX 96 Fixed Well Plates

Bed Weight (mg)	Well Volume (mL)	Retain PEP Cat No.	Retain CX Cat No.	Retain AX Cat No.	Quantity
30	1	60306-207	60306-303	60306-403	1 Each
60	1	60306-208	60306-304	60306-404	1 Each

**Note:** For bed weights less than 30mg please refer to SOLA SPE products on page 1-011.

### HyperSep Retain PEP/CX/AX 96 Removable Well Plate

Bed Weight (mg)	Volume (mL)	Retain PEP Cat No.	Retain CX Cat No.	Retain AX Cat No.	Quantity
30	1	60303-207	60303-307	60303-407	1 Each
60	1	60303-208	60303-308	60303-408	1 Each

**Note:** For bed weights less than 30mg please refer to SOLA SPE products on page 1-011.

### Retain PEP Applications

- Drugs and metabolites in biological fluids
- Peptides in serum, plasma or biological fluids
- Environmental samples

### Retain CX Applications

- Analysis of a wide range of drugs of abuse including basic and neutral drugs

### Retain AX Applications

- Analysis of THC and its metabolites

## HyperSep Hypercarb SPE Cartridges and Plates

Unique material for retention of highly polar compounds

- Thermo Scientific™ HyperSep™ Hypercarb™ SPE contains flat, 100% porous graphitic carbon (PGC) with selectivity for structurally similar compounds, offering separation of compounds with simple solvents
- pH stable 0 to 14
- High batch-to-batch reproducibility
- Strong retention properties allow use of low bed weights for concentrated extracts
- Interaction mechanism with polar molecules



### HyperSep Hypercarb SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
25	1	<b>60106-304</b>	50 Pack
50	1	<b>60106-303</b>	50 Pack
100	1	<b>60106-302</b>	30 Pack
200	3	<b>60106-301</b>	30 Pack
500	6	<b>60106-402</b>	20 Pack
1,000	6	<b>60106-403</b>	10 Pack
2,000	15	<b>60106-404</b>	10 Pack

### HyperSep Hypercarb 96 Fixed Well Plates

Bed Weight (mg)	Well Volume (mL)	Cat. No.	Quantity
10	1	<b>60306-501</b>	1 Each
25	1	<b>60306-502</b>	1 Each
50	1	<b>60306-503</b>	1 Each

### HyperSep Hypercarb 96 Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Cat. No.	Quantity
10	1	<b>60302-606</b>	1 Each
25	1	<b>60302-607</b>	1 Each
50	1	<b>60302-608</b>	1 Each



## HyperSep C18 SPE Cartridges and Plates

Feature a highly retentive alkyl-bonded phase for extraction of non-polar to moderately polar compounds

### HyperSep C18 SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
25	1	<b>60108-376</b>	100 Pack
50	1	<b>60108-390</b>	100 Pack
100	1	<b>60108-302</b>	100 Pack
100	3	<b>60108-765</b>	50 Pack
200	3	<b>60108-303</b>	50 Pack
500	3	<b>60108-304</b>	50 Pack
500	6	<b>60108-305</b>	30 Pack
500	10	<b>60108-786</b>	50 Pack
1,000	6	<b>60108-301</b>	30 Pack
1,000	15	<b>60108-776</b>	20 Pack
2,000	15	<b>60108-701</b>	20 Pack
2000	25	<b>60108-780</b>	20 Pack
5,000	25	<b>60108-702</b>	20 Pack
10,000	75	<b>60108-703</b>	10 Pack

### HyperSep C18 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-201</b>	<b>60300-425</b>	1 Each
25	1	<b>60307-202</b>	<b>60300-426</b>	1 Each
50	1	<b>60307-203</b>	<b>60300-427</b>	1 Each
100	1	<b>60307-204</b>	<b>60300-428</b>	1 Each

## HyperSep C8 SPE Cartridges and Plates

Less retentive alternative to C18 for polar and non-polar compounds

### HyperSep C8 SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
50	1	<b>60108-391</b>	100 Pack
100	1	<b>60108-392</b>	100 Pack
200	3	<b>60108-393</b>	50 Pack
500	3	<b>60108-309</b>	50 Pack
500	6	<b>60108-394</b>	30 Pack
1,000	6	<b>60108-427</b>	30 Pack
2,000	15	<b>60108-704</b>	20 Pack
5,000	25	<b>60108-705</b>	20 Pack
10,000	75	<b>60108-706</b>	10 Pack

### HyperSep C8 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-211</b>	<b>60300-445</b>	1 Each
25	1	<b>60307-212</b>	<b>60300-446</b>	1 Each
50	1	<b>60307-213</b>	<b>60300-447</b>	1 Each
100	1	<b>60307-214</b>	<b>60300-448</b>	1 Each

#### Applications:

- Retentive for non-polar compounds
- Retains most organic analytes from aqueous matrices

#### Applications:

- Drugs and their metabolites in biological samples
- Peptides in biological samples

## HyperSep Silica SPE Cartridges and Plates

A polar sorbent primarily used to retain analytes in non-polar matrices

### HyperSep Silica SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
50	1	<b>60108-409</b>	100 Pack
100	1	<b>60108-317</b>	100 Pack
200	3	<b>60108-410</b>	50 Pack
500	3	<b>60108-315</b>	50 Pack
500	6	<b>60108-411</b>	30 Pack
500	10	<b>60108-793</b>	50 Pack
1,000	6	<b>60108-426</b>	30 Pack
2,000	15	<b>60108-710</b>	20 Pack
5,000	25	<b>60108-711</b>	20 Pack
10,000	25	<b>60108-853</b>	20 Pack
10,000	75	<b>60108-712</b>	10 Pack
50,000	150	<b>60108-850</b>	10 Pack
20,000	75	<b>60108-851</b>	10 Pack
70,000	150	<b>60108-852</b>	10 Pack

### HyperSep Silica 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-231</b>	<b>60300-485</b>	1 Each
25	1	<b>60307-232</b>	<b>60300-486</b>	1 Each
50	1	<b>60307-233</b>	<b>60300-487</b>	1 Each
100	1	<b>60307-234</b>	<b>60300-488</b>	1 Each

### Applications:

- Extraction of polar compounds including aldehydes, amines, drugs, pesticides and herbicides
- Extraction of carotenoids, fat-soluble vitamins, aflatoxins in food matrices
- Extraction of fatty acids and phospholipids

## HyperSep Acid Wash Silica SPE Cartridges and Plates

### HyperSep Acid Wash Silica SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
50	1	<b>60108-901</b>	100 Pack
100	1	<b>60108-902</b>	100 Pack
100	10	<b>60108-903</b>	50 Pack
200	3	<b>60108-904</b>	50 Pack
200	10	<b>60108-905</b>	50 Pack
500	3	<b>60108-906</b>	50 Pack
500	6	<b>60108-907</b>	30 Pack
500	10	<b>60108-908</b>	50 Pack
1,000	6	<b>60108-909</b>	30 Pack
2,000	15	<b>60108-910</b>	20 Pack
5,000	25	<b>60108-911</b>	20 Pack
10,000	75	<b>60108-912</b>	10 Pack

### Applications:

- Extraction of polar compounds from ground, waste and drinking water
- Extraction of polar compounds from food and beverages

### HyperSep Acid Wash Silica 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-321</b>	<b>60300-831</b>	1 Each
25	1	<b>60307-322</b>	<b>60300-832</b>	1 Each
50	1	<b>60307-323</b>	<b>60300-833</b>	1 Each
100	1	<b>60307-324</b>	<b>60300-834</b>	1 Each

## HyperSep Phenyl SPE Cartridges and Plates

Offer alternative selectivity for retention of basic compounds

### HyperSep Phenyl SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
50	1	<b>60108-516</b>	100 Pack
100	1	<b>60108-386</b>	100 Pack
200	3	<b>60108-387</b>	50 Pack
500	3	<b>60108-388</b>	50 Pack
500	6	<b>60108-389</b>	30 Pack
1,000	6	<b>60108-517</b>	30 Pack
2,000	15	<b>60108-707</b>	20 Pack
5,000	25	<b>60108-708</b>	20 Pack
10,000	75	<b>60108-709</b>	10 Pack

### Applications:

- Extraction of aromatic compounds
- Extraction of basic analytes

### HyperSep Phenyl 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-221</b>	<b>60300-685</b>	1 Each
25	1	<b>60307-222</b>	<b>60300-686</b>	1 Each
50	1	<b>60307-223</b>	<b>60300-687</b>	1 Each
100	1	<b>60307-224</b>	<b>60300-688</b>	1 Each

## HyperSep Diol SPE Cartridges and Plates

Ideal for the extraction of polar compounds

### HyperSep Diol SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
50	1	<b>60108-571</b>	100 Pack
100	1	<b>60108-572</b>	100 Pack
200	3	<b>60108-573</b>	50 Pack
500	3	<b>60108-574</b>	50 Pack
500	6	<b>60108-575</b>	30 Pack
1,000	6	<b>60108-576</b>	30 Pack
2,000	15	<b>60108-755</b>	20 Pack
5,000	25	<b>60108-756</b>	20 Pack
10,000	75	<b>60108-757</b>	10 Pack

### Applications:

- Normal phase extraction of polar compounds
- Purification of polar compounds

### HyperSep Diol 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-311</b>	<b>60300-630</b>	1 Each
25	1	<b>60307-312</b>	<b>60300-631</b>	1 Each
50	1	<b>60307-313</b>	<b>60300-632</b>	1 Each
100	1	<b>60307-314</b>	<b>60300-633</b>	1 Each

## HyperSep Verify CX SPE Cartridges and Plates

Features non-polar and ionic characteristics for improved analysis of drugs of abuse

### HyperSep Verify CX SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
50	1	<b>60108-741</b>	100 Pack
130	1	<b>60108-719</b>	100 Pack
130	10	<b>60108-769</b>	50 Pack
200	3	<b>60108-777</b>	50 Pack
200	6	<b>60108-722</b>	50 Pack
200	10	<b>60108-742</b>	50 Pack
300	3	<b>60108-720</b>	50 Pack
500	3	<b>60108-721</b>	50 Pack
500	6	<b>60108-723</b>	30 Pack
1,000	6	<b>60108-724</b>	30 Pack

### Applications:

- Analysis of a wide range of drugs of abuse from biological matrices, including basic and neutral drugs

### HyperSep Verify CX 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-261</b>	<b>60300-805</b>	1 Each
25	1	<b>60307-262</b>	<b>60300-806</b>	1 Each
50	1	<b>60307-263</b>	<b>60300-807</b>	1 Each
100	1	<b>60307-264</b>	<b>60300-808</b>	1 Each

## HyperSep Verify AX SPE Cartridges and Plates

Features non-polar and ionic characteristics for improved analysis of acidic drugs and metabolites

### HyperSep Verify AX SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
130	1	<b>60108-727</b>	100 Pack
130	10	<b>60108-767</b>	50 Pack
200	3	<b>60108-768</b>	30 Pack
200	6	<b>60108-730</b>	50 Pack
200	10	<b>60108-764</b>	50 Pack
300	3	<b>60108-728</b>	50 Pack
500	3	<b>60108-729</b>	50 Pack
500	6	<b>60108-731</b>	30 Pack
1,000	6	<b>60108-732</b>	30 Pack

### Applications:

- Analysis of THC and its metabolites

### HyperSep Verify AX 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-271</b>	<b>60300-813</b>	1 Each
25	1	<b>60307-272</b>	<b>60300-814</b>	1 Each
50	1	<b>60307-273</b>	<b>60300-815</b>	1 Each
100	1	<b>60307-274</b>	<b>60300-816</b>	1 Each

## HyperSep Strong Cation Exchanger (SCX) SPE Cartridges and Plates

A strong cation exchange sorbent for extraction of charged basic compounds

### HyperSep Strong Cation Exchanger (SCX) SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
50	1	<b>60108-420</b>	100 Pack
100	1	<b>60108-421</b>	100 Pack
200	3	<b>60108-422</b>	50 Pack
500	3	<b>60108-423</b>	50 Pack
500	6	<b>60108-520</b>	30 Pack
1,000	6	<b>60108-433</b>	30 Pack
2,000	15	<b>60108-716</b>	20 Pack
5,000	25	<b>60108-717</b>	20 Pack
10,000	75	<b>60108-718</b>	10 Pack
20,000	75	<b>60108-857</b>	10 Pack
50,000	150	<b>60108-858</b>	10 Pack

#### Applications:

- Isolation of cationic compounds from complex samples
- Removal of basic drugs
- Organic bases
- Nucleic acid bases, nucleotides and surfactants

### HyperSep Strong Cation Exchanger (SCX) 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-251</b>	<b>60300-585</b>	1 Each
25	1	<b>60307-252</b>	<b>60300-586</b>	1 Each
50	1	<b>60307-253</b>	<b>60300-587</b>	1 Each
100	1	<b>60307-254</b>	<b>60300-588</b>	1 Each

## HyperSep Strong Anion Exchanger (SAX) SPE Cartridges and Plates

Strong anion exchange sorbent for extraction of weak acids

### HyperSep Strong Anion Exchanger (SAX) SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
50	1	<b>60108-417</b>	100 Pack
100	1	<b>60108-418</b>	100 Pack
200	3	<b>60108-419</b>	50 Pack
500	3	<b>60108-521</b>	50 Pack
500	6	<b>60108-360</b>	30 Pack
1,000	6	<b>60108-434</b>	30 Pack
2,000	15	<b>60108-713</b>	20 Pack
5,000	25	<b>60108-714</b>	20 Pack
10,000	75	<b>60108-715</b>	10 Pack

#### Applications:

- Isolation of anionic compounds from complex samples
- Removal of acidic food pigments
- Isolation of phenolic compounds
- Nucleic acids, nucleotides and surfactants

### HyperSep Strong Anion Exchanger (SAX) 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-241</b>	<b>60300-565</b>	1 Each
25	1	<b>60307-242</b>	<b>60300-566</b>	1 Each
50	1	<b>60307-243</b>	<b>60300-567</b>	1 Each
100	1	<b>60307-244</b>	<b>60300-568</b>	1 Each

## HyperSep Carboxylic Acid (WCX) SPE Cartridges and Plates

Weak cation exchange sorbent for extraction of strong bases

### HyperSep Carboxylic Acid (WCX) SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
50	1	<b>60108-201</b>	100 Pack
100	1	<b>60108-202</b>	100 Pack
200	3	<b>60108-203</b>	50 Pack
200	10	<b>60108-207</b>	50 Pack
500	3	<b>60108-204</b>	50 Pack
500	6	<b>60108-205</b>	30 Pack
1,000	6	<b>60108-206</b>	30 Pack
2,000	15	<b>60108-208</b>	20 Pack
5,000	25	<b>60108-209</b>	20 Pack

#### Applications:

- Drugs and metabolites in biological fluids
- Peptides in serum, plasma or biological fluids
- Pesticides in water, food and beverages
- Nucleic acids, nucleotides and surfactants

### HyperSep Carboxylic Acid (WCX) 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-331</b>	<b>60300-841</b>	1 Each
25	1	<b>60307-332</b>	<b>60300-842</b>	1 Each
50	1	<b>60307-333</b>	<b>60300-843</b>	1 Each
100	1	<b>60307-334</b>	<b>60300-844</b>	1 Each

## HyperSep Aminopropyl (WAX) SPE Cartridges and Plates

Weak anion exchange sorbent for extraction of strong acids

### HyperSep Aminopropyl (WAX) SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
50	1	<b>60108-424</b>	100 Pack
50	3	<b>60108-429</b>	50 Pack
100	1	<b>60108-364</b>	100 Pack
200	3	<b>60108-425</b>	50 Pack
500	3	<b>60108-518</b>	50 Pack
500	6	<b>60108-519</b>	30 Pack
1,000	6	<b>60108-432</b>	30 Pack
2,000	15	<b>60108-738</b>	20 Pack
5,000	25	<b>60108-739</b>	20 Pack
10,000	75	<b>60108-740</b>	10 Pack

#### Applications:

- Separation of structural isomers
- Drugs and metabolites in biological fluids
- Separation of saccharides, phenols and petroleum products

### HyperSep Aminopropyl (WAX) 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-291</b>	<b>60300-505</b>	1 Each
25	1	<b>60307-292</b>	<b>60300-506</b>	1 Each
50	1	<b>60307-293</b>	<b>60300-507</b>	1 Each
100	1	<b>60307-294</b>	<b>60300-508</b>	1 Each

## HyperSep Florisil SPE Cartridges and Plates

Ideal for the isolation of polar compounds from non-polar matrices

### HyperSep Florisil SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
50	1	<b>60108-402</b>	100 Pack
100	1	<b>60108-403</b>	100 Pack
200	3	<b>60108-404</b>	50 Pack
500	3	<b>60108-405</b>	50 Pack
500	6	<b>60108-500</b>	30 Pack
1,000	6	<b>60108-431</b>	30 Pack
2,000	6	<b>60108-758</b>	30 Pack
2,000	15	<b>60108-735</b>	20 Pack
5,000	25	<b>60108-736</b>	20 Pack
10,000	75	<b>60108-737</b>	10 Pack

### HyperSep Florisil 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-281</b>	<b>60300-725</b>	1 Each
25	1	<b>60307-282</b>	<b>60300-726</b>	1 Each
50	1	<b>60307-283</b>	<b>60300-727</b>	1 Each
100	1	<b>60307-284</b>	<b>60300-728</b>	1 Each

## HyperSep Cyano SPE Cartridges and Plates

Optimized for the retention of moderately polar compounds from non-polar matrices

### HyperSep Cyano SPE Cartridges

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
50	1	<b>60108-746</b>	100 Pack
100	1	<b>60108-745</b>	100 Pack
200	3	<b>60108-747</b>	50 Pack
500	3	<b>60108-748</b>	50 Pack
500	6	<b>60108-749</b>	30 Pack
1,000	6	<b>60108-750</b>	30 Pack
2,000	15	<b>60108-751</b>	20 Pack
5,000	25	<b>60108-752</b>	20 Pack
10,000	75	<b>60108-753</b>	10 Pack

### HyperSep Cyano 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	<b>60307-301</b>	<b>60300-821</b>	1 Each
25	1	<b>60307-302</b>	<b>60300-822</b>	1 Each
50	1	<b>60307-303</b>	<b>60300-823</b>	1 Each
100	1	<b>60307-304</b>	<b>60300-824</b>	1 Each



### Applications:

- Extraction of pesticides using official methods
- Polychlorinated biphenyls in transformer oil
- Alcohol, aldehydes, amines and drugs

### Applications:

- Retaining polar compounds from hexane and oils
- Reversed phase extraction of moderately polar compounds

## SPE Manifolds and Accessories

A comprehensive range of accessories to improve your sample preparation workflow

### HyperSep Positive Pressure Manifold

#### HyperSep Positive Pressure Manifold

Description	Cat. No.	Quantity
Positive Pressure Manifold with 13mm Collection Rack	<b>60104-236</b>	1 Each
Positive Pressure Manifold with 16mm Collection Rack	<b>60104-274</b>	1 Each
Adaptor Plate for 1mL Cartridges for PP Manifold	<b>60104-265</b>	1 Each
Adaptor Plate for 3mL Cartridges for PP Manifold	<b>60104-266</b>	1 Each
Adaptor Plate for 6mL Cartridges for PP Manifold	<b>60104-267</b>	1 Each
Adaptor Plate for 10mL/15mL Cartridges for PP Manifold	<b>60104-271</b>	1 Each
Collection Rack for 13mm Tubes	<b>60104-268</b>	1 Each
Collection Rack for 16mm Tubes	<b>60104-269</b>	1 Each
Pre-Drilled Waste Container	<b>60104-270</b>	1 Each
Installation Kit	<b>60104-272</b>	1 Each
In Line Air Filter	<b>60104-273</b>	1 Each





## HyperSep Universal Vacuum Manifold

- Accommodates both SPE cartridges and 96 well plates
- System supplied with: Manifold, base/gauge, flask and stopper, tubing and spigots



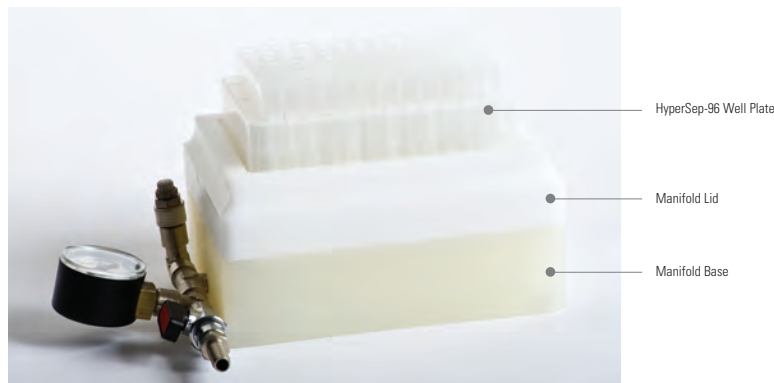
### HyperSep Universal Vacuum Manifold

Description	Cat. No.	Quantity
Universal Vacuum Manifold	<b>60104-230</b>	1 Each
Vacuum Pump, European Version	<b>60104-241</b>	1 Each
Vacuum Pump, North American Version	<b>60104-243</b>	1 Each
24 Well Extraction Plate	<b>60104-284</b>	1 Each
48 Well Extraction Plate	<b>60104-289</b>	1 Each
Plugs for 24-position Extraction Plate	<b>60104-234</b>	24 Pack
Plugs for 48-position Extraction Plate	<b>60104-235</b>	48 Pack

## HyperSep-96 Well Plate Vacuum Manifold

Included with system:

- Base
- Lid
- Waste collection tray



HyperSep-96 well plate is not included and needs to be purchased separately.

### HyperSep-96 Well Plate Manifolds

Description	Cat. No.	Quantity
HyperSep-96 Vacuum Manifold	<b>60103-351</b>	1 Each
Vacuum Pump, European Version	<b>60104-241</b>	1 Each
Vacuum Pump, North American Version	<b>60104-243</b>	1 Each

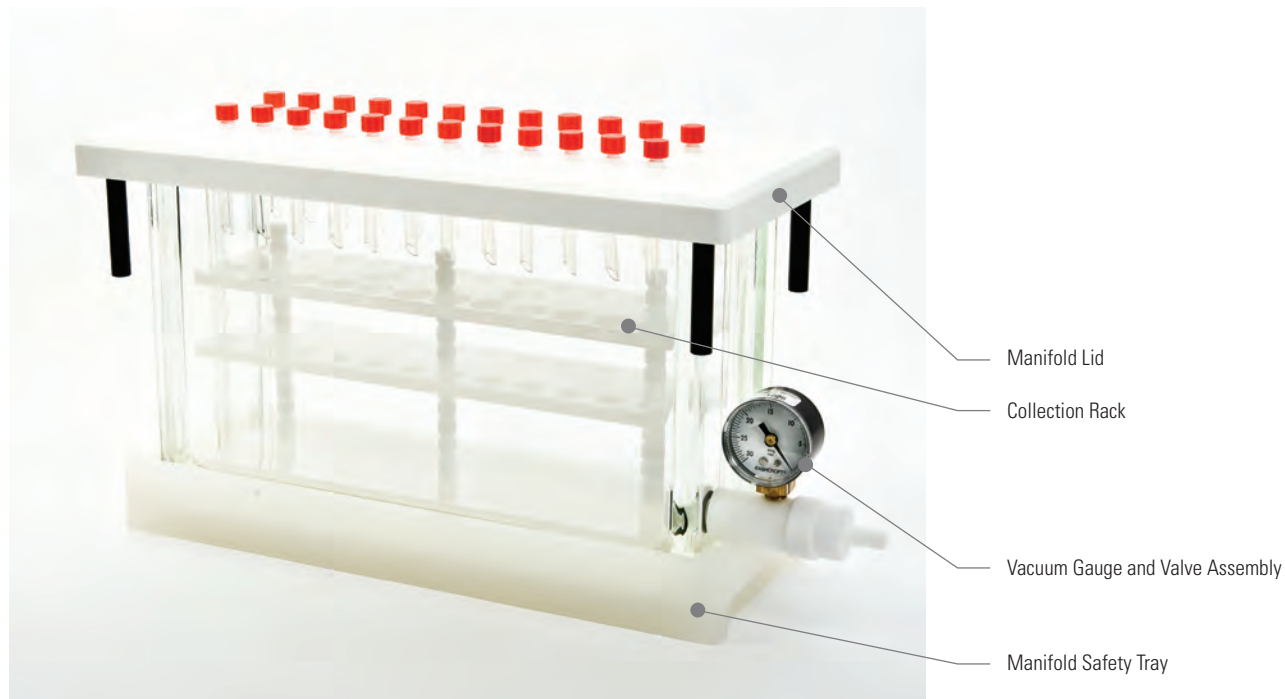
## HyperSep Glass Block Manifolds

16-Port Vacuum Manifold:

- Glass Block, Corian Manifold Lid, Cover Gasket, Vacuum Gauge and Valve Assembly, 16 Tips, Adjustable Collection Rack, Bulkhead Luer Fittings, 16 Plugs and Manifold Safety Tray

24-Port Vacuum Manifold:

- Glass Block, Corian Manifold Lid, Cover Gasket, Vacuum Gauge and Valve Assembly, 24 Tips, Adjustable Collection Rack, Bulkhead Luer Fittings, 24 Plugs and Manifold Safety Tray



Luer Lock Plugs  
(Cat. No. 60104-258)



Retaining Clips for Collection Rack  
(Cat. No. 60104-255)



Bulkhead Luer Fittings  
(Cat. No. 60104-256)



Collection Rack  
(Cat. No. 60104-251 (16 port),  
60104-252 (24 port))



Vacuum Gauge  
(Cat. No. 60104-240)



Valve Assembly  
(Cat. No. 60104-261)



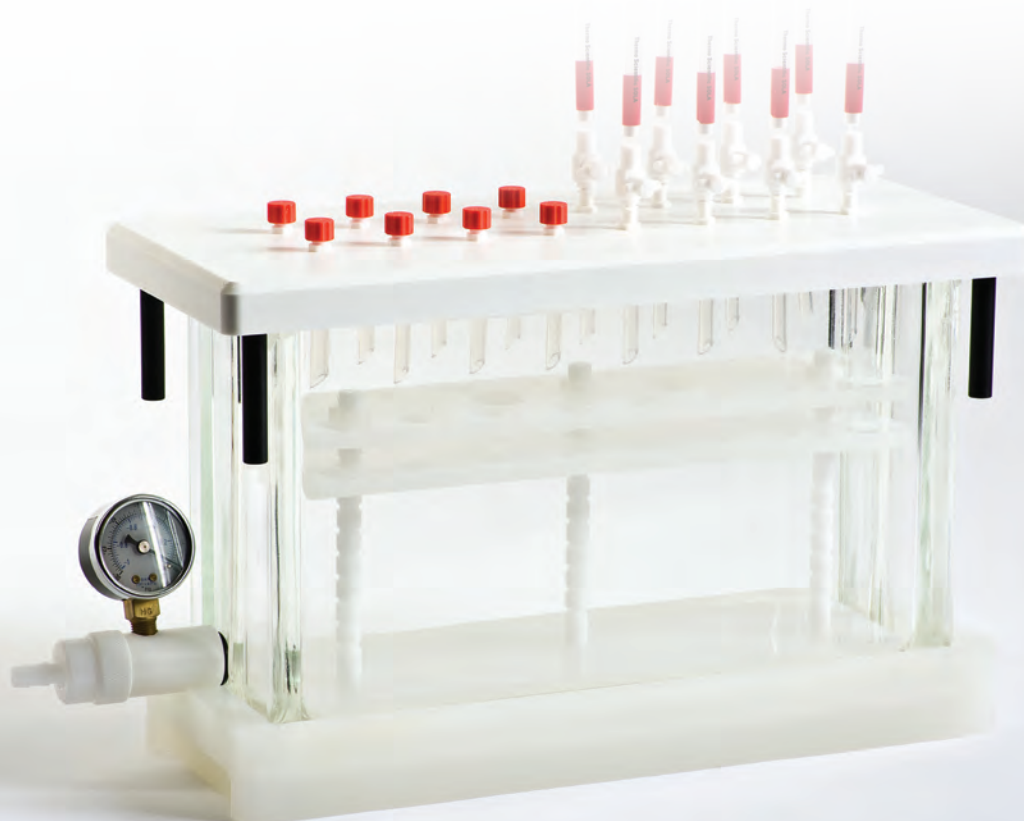
Tips  
(Cat. No. 60104-245)



Manifold Lid Legs  
(Cat. No. 60104-257)

## HyperSep Glass Block Manifolds

Description	Cat. No.	Quantity
16-port Vacuum Manifold	<b>60104-232</b>	1 Each
24-port Vacuum Manifold	<b>60104-233</b>	1 Each
Vacuum Pump, European Version	<b>60104-241</b>	1 Each
Vacuum Pump, North American Version	<b>60104-243</b>	1 Each
<b>Replacement Parts</b>		
Vacuum Gauge	<b>60104-240</b>	1 Each
Stopcocks for 16-port Vacuum Manifold	<b>60104-242</b>	16 Pack
Stopcocks for 24-port Vacuum Manifold	<b>60104-244</b>	24 Pack
Tips for Vacuum Manifold	<b>60104-245</b>	12 Pack
Lid for 16-port Glass Block Manifold	<b>60104-262</b>	1 Each
Lid for 24-port Glass Block Manifold	<b>60104-248</b>	1 Each
Gasket for 16-port Manifold	<b>60104-249</b>	1 Each
Gasket for 24-port Manifold	<b>60104-250</b>	1 Each
Collection Rack for 16-port Vacuum Manifold	<b>60104-251</b>	1 Each
Collection Rack for 24-port Vacuum Manifold	<b>60104-252</b>	1 Each
Glass Block for 16-port Vacuum Manifold	<b>60104-253</b>	1 Each
Glass Block for 24-port Vacuum Manifold	<b>60104-254</b>	1 Each
Retaining Clips for Collection Rack	<b>60104-255</b>	12 Pack
Bulkhead Luer Fittings	<b>60104-256</b>	12 Pack
Manifold Lid Legs	<b>60104-257</b>	4 Pack
Luer Lock Plugs	<b>60104-258</b>	12 Pack
Column Adaptors	<b>60104-259</b>	15 Pack
Manifold Safety Tray	<b>60104-260</b>	1 Each
Vacuum Gauge and Valve Assembly	<b>60104-261</b>	1 Each
Collection Rack Posts	<b>60104-264</b>	3 Pack



## HyperSep Online SPE Products

Retain specific analytes in a sample matrix when used with an appropriate HPLC column



- Effective removal of contaminants such as proteins from samples
- Compatible with conventional HPLC systems
- Fast and effective clean-up and concentration of target compounds

### HyperSep Javelin Direct-Connect Online SPE Columns

ID (mm)	Length (mm)	Retain PEP	Retain CX	Retain AX	Hypercarb	Quantity
2.1	10	<b>60310-201</b>	<b>60310-301</b>	<b>60310-401</b>	<b>60310-501</b>	4 Pack
3.0	10	<b>60310-202</b>	<b>60310-302</b>	<b>60310-402</b>	<b>60310-502</b>	4 Pack

### HyperSep UNIGUARD Direct-Connect Online SPE Cartridges


ID (mm)	Length (mm)	Retain PEP	Retain CX	Retain AX	Hypercarb	Quantity
2.1	10	<b>60311-201</b>	<b>60311-301</b>	<b>60311-401</b>	<b>60311-501</b>	4 Pack
3.0	10	<b>60311-202</b>	<b>60311-302</b>	<b>60311-402</b>	<b>60311-502</b>	4 Pack

### HyperSep HPLC Columns for Online SPE

ID (mm)	Length (mm)	Retain PEP	Retain CX	Retain AX	Hypercarb	Quantity
2.1	20	<b>60312-201</b>	<b>60312-301</b>	<b>60312-401</b>	<b>60312-501</b>	1 Each
3.0	20	<b>60312-202</b>	<b>60312-302</b>	<b>60312-402</b>	<b>60312-502</b>	1 Each

*Perform Better. Live Longer.*

*Discover our Accucore Solid Core LC Columns*

 Visit **PAGE 4-005**





## HyperSep Dispersive SPE (QuEChERS)

### Fast, easy and robust sample preparation of food for pesticide analysis

QuEChERS dispersive SPE products provide a Quick, Easy, Cheap, Effective, Rugged and Safe sample preparation technique for multi-residue pesticide analysis. Products are available in a wide range of formats to meet application requirements.

QuEChERS methods overcome problems associated with time consuming, expensive and labor intensive multi-residue methods (MRM).

- **Fast and Easy Sample Preparation**
- **Robust and Reproducible Process**
- **High Recovery and Reproducibility**



Learn more about HyperSep Dispersive SPE at  
[www.thermoscientific.com/samplepreparation](http://www.thermoscientific.com/samplepreparation)

## HyperSep Dispersive SPE

### Considerations in method development

- Determine the properties of the pesticides of interest:
  - Base sensitive compounds - use extraction product with sodium acetate
  - pH dependent
  - Non-base sensitive compounds - use extraction product with sodium chloride or sodium citrate
- Determine the properties of the sample matrix:
  - General
  - Fatty
  - Pigmented
  - Highly pigmented

### Product Selection – Sample Cleanup

Matrix Type	Examples	Sorbent Requirements
General Matrices	Apples Cucumber Melon	Magnesium sulfate, PSA
Fatty Matrices	Milk Cereals Fish	Magnesium sulfate, PSA, C18
Pigmented Matrices	Lettuce Carrot Wine	Magnesium sulfate, PSA, C18, GCB
High Pigmented Matrices	Spinach Red Peppers	Magnesium sulfate, PSA, C18, GCB



### QuEChERS Troubleshooting

Problem	Causes	Recommended Solutions
Loss of planar pesticides	Presence of GCB may result in a loss of planar compounds	Use a product with less GCB Use the Dual Phase QuEChERS product
Loss of acidic compounds e.g. 2,4-D from starting matrix	Presence of PSA will extract acidic compounds from matrix	Use a product containing magnesium sulfate and C18
Loss of compounds during subsequent analysis	Some compounds are unstable and can break down during analysis	Use an analyte protectant e.g. toluene or sorbitol
Addition of sample to QuEChERS extraction tube containing sorbent causes an exothermic reaction	Exothermic reaction between water in sample and magnesium sulfate	Add the sample to the tube, then the solvents, then the sorbent materials
Poor recovery of pesticide compounds	Sample not in appropriate homogenization state	Wrong products used in method Ensure sample is hydrated to 80% or higher Verify nature of pesticides e.g. are base sensitive compounds present

# HyperSep Dispersive SPE Extraction Products

## HyperSep Dispersive SPE Pre-Packed Extraction Products

Description	Capacity (mL)	Cat. No. (250 Pack)	Cat. No. (25 Pack)
6000mg anhydrous magnesium sulfate, 1500mg anhydrous sodium acetate	50	<b>60105-210</b>	<b>60105-310</b>
4000mg anhydrous magnesium sulfate, 1000mg anhydrous sodium chloride	50	<b>60105-211</b>	<b>60105-311</b>
4000mg anhydrous magnesium sulfate, 1000mg sodium chloride, 1000mg sodium citrate tribasic dihydrate, 500mg disodium citrate sesquihydrate	50	<b>60105-216</b>	<b>60105-316</b>
6000mg anhydrous magnesium sulfate, 1500mg sodium chloride, 1500mg sodium citrate tribasic dihydrate, 750mg disodium citrate sesquihydrate	50	<b>60105-212</b>	<b>60105-312</b>
1500mg magnesium sulfate, 500mg C18	50	<b>60105-234</b>	–

**Each pack contains centrifuge tubes pre-packed with sorbents**

## HyperSep Dispersive SPE Multipacks

Description	Cat. No.	Quantity
4000mg anhydrous magnesium sulfate, 1000mg sodium chloride	<b>60105-332</b>	50 Pack
4000mg anhydrous magnesium sulfate, 1000mg sodium chloride, 500mg sodium citrate dibasic sesquihydrate, 1000mg sodium citrate tribasic	<b>60105-333</b>	50 Pack
4000mg anhydrous magnesium sulfate, 1000mg sodium acetate	<b>60105-334</b>	50 Pack
6000mg anhydrous magnesium sulfate, 1500mg sodium acetate	<b>60105-335</b>	50 Pack
6000mg anhydrous magnesium sulfate, 1500mg sodium chloride	<b>60105-336</b>	50 Pack
6000mg anhydrous magnesium sulfate, 1500mg magnesium sulfate, 1500mg sodium citrate dihydrate, 750mg disodium citrate sesquihydrate	<b>60105-337</b>	50 Pack
8000mg anhydrous magnesium sulfate, 2000mg of sodium chloride	<b>60105-338</b>	50 Pack
8000mg anhydrous magnesium sulfate, 3500mg of sodium chloride	<b>60105-339</b>	50 Pack

**Each pack contains centrifuge tubes and sorbents packaged in mylar pouches**

## HyperSep Dispersive SPE Mylar Pouches

Description	Cat. No.	Quantity
4000mg anhydrous magnesium sulfate, 1000mg sodium chloride	<b>60105-340</b>	50 Pack
6000mg anhydrous magnesium sulfate, 1500mg sodium acetate (anhydrous)	<b>60105-341</b>	50 Pack
6000mg anhydrous magnesium sulfate, 1500mg sodium chloride	<b>60105-342</b>	50 Pack
6000mg anhydrous magnesium sulfate, 1500mg sodium chloride, 1500mg sodium citrate dihydrate, 750mg disodium citrate sesquihydrate	<b>60105-343</b>	50 Pack
4000mg anhydrous magnesium sulfate, 1000mg sodium chloride, 500mg sodium citrate dibasic sesquihydrate, 1000mg sodium citrate tribasic	<b>60105-344</b>	50 Pack
1200mg sodium chloride	<b>60105-345</b>	50 Pack
4000mg sodium sulfate and 500mg anhydrous magnesium sulfate	<b>60105-346</b>	50 Pack
4000mg anhydrous magnesium sulfate, 1000mg sodium chloride, 1500mg sodium citrate dibasic dihydrate	<b>60105-347</b>	100 Pack
4000mg anhydrous magnesium sulfate, 2000mg sodium chloride, 1500mg sodium citrate dibasic dihydrate	<b>60105-348</b>	100 Pack

**Each pack contains sorbents packaged in mylar pouches (no centrifuge tubes provided)**

## HyperSep Dispersive SPE Clean-Up Products

### HyperSep Dispersive SPE Clean-Up Products

Description	Capacity (mL)	Cat. No. (100 Pack)	Cat. No. (10 Pack)
150mg anhydrous magnesium sulfate, 50mg PSA, 50mg GCB	2	60105-202	60105-302
150mg anhydrous magnesium sulfate, 50mg PSA	2	60105-203	60105-303
150mg anhydrous magnesium sulfate, 50mg PSA, 50mg C18	2	60105-204	60105-304
150mg anhydrous magnesium sulfate, 25mg PSA	2	60105-219	60105-319
150mg anhydrous magnesium sulfate, 25mg PSA, 25mg C18	2	60105-220	60105-320
150mg anhydrous magnesium sulfate, 25mg PSA, 2.5mg GCB	2	60105-221	60105-321
150mg anhydrous magnesium sulfate, 25mg PSA, 7.5mg GCB	2	60105-222	60105-322
150mg anhydrous magnesium sulfate, 50mg PSA, 50mg C18, 50mg GCB	2	60105-223	60105-323
150mg anhydrous magnesium sulfate, 50mg PSA, 50mg chlorofiltr™	2	60105-232	-
150mg anhydrous magnesium sulfate, 150mg PSA	2	-	60105-350

Description	Capacity (mL)	Cat. No. (100 Pack)	Cat. No. (10 Pack)
900mg anhydrous magnesium sulfate, 300mg PSA, 150mg GCB	15	60105-205	60105-305
900mg anhydrous magnesium sulfate, 300mg PSA, 150mg C18	15	60105-206	60105-306
750mg anhydrous magnesium sulfate, 250mg PSA, 250mg C18, 250mg GCB	15	60105-213	60105-313
900mg anhydrous magnesium sulfate, 300mg PSA	15	60105-214	60105-314
900mg anhydrous magnesium sulfate, 150mg PSA	15	60105-215	60105-315
900mg anhydrous magnesium sulfate, 150mg PSA, 45mg GCB	15	60105-217	60105-317
900mg anhydrous magnesium sulfate, 150mg PSA, 15mg GCB	15	60105-218	60105-318
1200mg anhydrous magnesium sulfate, 400mg PSA	15	60105-224	60105-324
1200mg anhydrous magnesium sulfate, 400mg PSA, 400mg C18	15	60105-225	60105-325
1200mg anhydrous magnesium sulfate, 400mg PSA, 400mg C18, 400mg GCB	15	60105-226	60105-326
900mg anhydrous magnesium sulfate, 150mg PSA, 150mg C18	15	60105-227	60105-327
150mg anhydrous magnesium sulfate, 50mg PSA, 50mg GCB	15	60105-230	60105-330
150mg anhydrous magnesium sulfate, 300mg PSA, 150mg chlorofiltr	15	60105-231	60105-331
1200mg anhydrous magnesium sulfate, 900mg PSA	15	60105-235	-
4000mg anhydrous magnesium sulfate, 1000mg sodium chloride, 1000mg sodium citrate tribasic dihydrate, 500mg sodium citrate dibasic sesquihydrate	15	60105-236	-
150mg anhydrous magnesium sulfate, 150mg PSA, 50mg C18	15	60105-238	-

**Each pack contains centrifuge tubes pre-packed with sorbents**

### Homogenizers

Description	Cat. No.	Quantity
Homogenizers for 15mL QuEChERS tubes	60106-421	50 Pack
Homogenizers for 50mL QuEChERS tubes	60106-422	50 Pack

### HyperSep Dispersive SPE Clean-Up Products for Schenck Method

Description	Capacity (mL)	Cat. No.	Quantity
400mg PSA on bottom, 200mg GCB on top, separated by a frit	6	60105-207	30 Pack
500mg PSA on bottom, 250mg GCB on top, separated by a frit	6	60105-208	30 Pack
500mg PSA on bottom, 500mg GCB on top, separated by a frit	6	60105-209	30 Pack





## Syringes and Filtration

### Providing high quality filtration solutions for a variety of samples and applications

Choose from a variety of syringe filter sizes, membranes and housings for a wide range of laboratory applications.

- **High Quality Filtration**  
Low extractable membranes and solvent-resistant housing
- **Titan3 Color Coded Ring**  
For easy selection of correct membrane and pore size
- **High Burst Pressures**  
For enhanced robustness in sample processing



The syringe filter web page contains the latest news, applications and downloads for the range.  
Visit [www.thermoscientific.com/syringefilters](http://www.thermoscientific.com/syringefilters)

# Syringes and Filtration

## Technical Resources



visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)  
to access the following information:

- Membrane Selection Guide
- Membrane Compatibility Chart



## Titan3 Syringe Filters

- Low extractable membranes and housing
- HPLC performance tested
- Color coding for easy selection of the correct membrane and pore size
- Enhanced Luer Lock inlet which prevents leakage
- Most 30mm devices are provided with a 1mm boro-silicate glass pre-filter  
This is of benefit for high solids samples with larger size particulates
- Integral ring provides greater strength to the housing preventing leakage and bursting
- 30mm products pressure rated to 120psi
- Packed in re-usable rigid transparent color coded containers



### Titan3 Nylon Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	<b>42204-NN</b>	100 Pack
	0.45	No	<b>44504-NN</b>	100 Pack
17	0.2	No	<b>42213-NN</b>	200 Pack
	0.45	No	<b>44513-NN</b>	200 Pack
30	0.2	Yes	<b>42225-NN</b>	100 Pack
	0.45	Yes	<b>44525-NN</b>	100 Pack
	0.45	No	<b>44526-NN</b>	100 Pack
	1.5	No	<b>41225-NN</b>	100 Pack
	5	No	<b>45025-NN</b>	100 Pack

### Titan3 PTFE (Hydrophobic) Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	<b>42204-NP</b>	100 Pack
	0.45	No	<b>44504-NP</b>	100 Pack
17	0.2	No	<b>42213-NP</b>	200 Pack
	0.45	No	<b>44513-NP</b>	200 Pack
30	0.2	Yes	<b>42225-NP</b>	100 Pack
	0.45	Yes	<b>44525-NP</b>	100 Pack
	1.0	No	<b>41025-NP</b>	100 Pack

### Titan3 PTFE (Hydrophilic) Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
17	0.2	No	<b>42213-NPL</b>	200 Pack
	0.45	No	<b>44513-NPL</b>	200 Pack
30	0.2	No	<b>42225-NPL</b>	100 Pack
	0.45	No	<b>44525-NPL</b>	100 Pack

### Titan3 PVDF Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	<b>42204-PV</b>	100 Pack
	0.45	No	<b>44504-PV</b>	100 Pack
17	0.2	Yes	<b>42213-PV</b>	200 Pack
	0.45	No	<b>44513-PV</b>	200 Pack
30	0.2	Yes	<b>42225-PV</b>	100 Pack
	0.45	No	<b>44525-PV</b>	100 Pack

### Applications:

- General laboratory filtration
- Filtration for most HPLC samples

### Applications:

- Filtration of aggressive organic, highly basic or hot solutions, transducer protectors
- Filter aqueous solutions after prewetting with an alcohol

### Applications:

- Filtration of aggressive organic, highly basic or hot solutions, without the need pre-wet membrane
- Filter aqueous solutions without prewetting with an alcohol

### Applications:

- General biological filtration
- Filtration of samples where high protein recovery is desired

**Titan3 Regenerated Cellulose Syringe Filters**

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	<b>52204-RC</b>	100 Pack
	0.45	No	<b>54504-RC</b>	100 Pack
17	0.2	Yes	<b>52213-RC</b>	200 Pack
	0.45	No	<b>54513-RC</b>	200 Pack
30	0.2	Yes	<b>52225-RC</b>	100 Pack
	0.45	No	<b>54525-RC</b>	100 Pack

**Titan3 PES (Polyethersulfone) Syringe Filters**

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
17	0.2	No	<b>42213-PS</b>	200 Pack
	0.45	No	<b>44513-PS</b>	200 Pack
30	0.2	Yes	<b>42225-PS</b>	100 Pack
	0.45	No	<b>44525-PS</b>	100 Pack

**Titan3 GMF (Glass Microfiber) Syringe Filters**

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
30	0.7	No	<b>40725-GM</b>	100 Pack
	1.2	No	<b>41225-GM</b>	100 Pack
	3.1	No	<b>42725-GM</b>	100 Pack

**Titan3 Polypropylene Syringe Filters**

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
17	0.2	No	<b>42213-PP</b>	200 Pack
	0.45	No	<b>44513-PP</b>	200 Pack
30	0.2	No	<b>42225-PP</b>	100 Pack
	0.45	No	<b>44525-PP</b>	100 Pack

**Titan3 Cellulose Acetate Syringe Filters**

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	<b>42204-CA</b>	100 Pack
	0.45	No	<b>44502-CA</b>	100 Pack
17	0.2	No	<b>42213-CA</b>	100 Pack
	0.45	No	<b>44513-CA</b>	100 Pack
30	0.2	No	<b>42225-CA</b>	100 Pack
	0.45	No	<b>44525-CA</b>	100 Pack

**Applications:**

- Low non-specific binding applications
- Tissue culture media filtration and general biological sample filtration

**Applications:**

- Ion chromatography
- Tissue culture filtration, filtration of proteins and nucleic acids
- High-temperature liquids

**Applications:**

- Dissolution testing
- General filtration

**Applications:**

- Filtration of biological samples
- Filtration of aggressive organic solutions

**Applications:**

- Tissue culture media filtration, sensitive biological samples



## Target2 Syringe Filters

- Low extractable membranes and housing
- HPLC performance tested
- Plain polypropylene housing
- 30mm products pressure rated to 100psi
- Enhanced Luer Lock inlet which prevents leakage



### Target2 Nylon Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	<b>F2504-2</b>	100 Pack
	0.45	No	<b>F2504-1</b>	100 Pack
17	0.2	No	<b>F2513-2</b>	100 Pack
	0.45	No	<b>F2513-1</b>	100 Pack
30	0.2	No	<b>F2500-2</b>	100 Pack
		Yes	<b>F2502-2</b>	100 Pack
	0.45	No	<b>F2500-1</b>	100 Pack
		Yes	<b>F2502-1</b>	100 Pack
	1.5	No	<b>F2500-12</b>	100 Pack
	5.0	No	<b>F2500-50</b>	100 Pack

### Target2 PTFE Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	<b>F2504-4</b>	100 Pack
	0.45	No	<b>F2504-3</b>	100 Pack
17	0.2	No	<b>F2513-4</b>	100 Pack
	0.45	No	<b>F2513-3</b>	100 Pack
30	0.2	No	<b>F2500-4</b>	100 Pack
		No	<b>F2500-3</b>	100 Pack
	Yes	<b>F2502-3</b>	100 Pack	
	1.0	No	<b>F2500-13</b>	100 Pack

### Target2 PVDF Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	<b>F2504-6</b>	100 Pack
	0.45	No	<b>F2504-5</b>	100 Pack
17	0.2	No	<b>F2513-6</b>	100 Pack
	0.45	No	<b>F2513-5</b>	100 Pack
30	0.2	No	<b>F2500-6</b>	100 Pack
	0.45	No	<b>F2500-5</b>	100 Pack

#### Applications:

- General laboratory filtration
- Filtration for most HPLC samples

#### Applications:

- Filtration of aggressive organic, highly basic or hot solutions, transducer protectors
- Filter aqueous solutions after prewetting with an alcohol

#### Applications:

- General biological filtration
- Filtration of samples where high protein recovery is desired

**Target2 Regenerated Cellulose Syringe Filters**

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	<b>F2504-8</b>	100 Pack
	0.45	No	<b>F2504-7</b>	100 Pack
17	0.2	No	<b>F2513-8</b>	100 Pack
	0.45	No	<b>F2513-7</b>	100 Pack
30	0.2	No	<b>F2500-8</b>	100 Pack
	0.45	No	<b>F2500-7</b>	100 Pack

**Target2 PES (Polyethersulfone) Syringe Filters**

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
17	0.2	No	<b>F2513-17</b>	100 Pack
	0.45	No	<b>F2513-14</b>	100 Pack
30	0.2	No	<b>F2500-17</b>	100 Pack
	0.45	No	<b>F2500-14</b>	100 Pack

**Target2 GMF (Glass Microfiber) Syringe Filters**

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
30	0.7	No	<b>F2500-18</b>	100 Pack
	1.2	No	<b>F2500-19</b>	100 Pack
	3.1	No	<b>F2500-20</b>	100 Pack

**Target2 Polypropylene Syringe Filters**

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	<b>F2504-10</b>	100 Pack
	0.45	No	<b>F2504-9</b>	100 Pack
17	0.2	No	<b>F2513-10</b>	100 Pack
	0.45	No	<b>F2513-9</b>	100 Pack
30	0.2	No	<b>F2500-10</b>	100 Pack
	0.45	No	<b>F2500-9</b>	100 Pack
		Yes	<b>F2502-9</b>	100 Pack

**Target2 Cellulose Acetate Syringe Filters**

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	<b>F2504-16</b>	100 Pack
	0.45	No	<b>F2504-15</b>	100 Pack
17	0.2	No	<b>F2513-16</b>	100 Pack
	0.45	No	<b>F2513-15</b>	100 Pack
30	0.2	No	<b>F2500-16</b>	100 Pack
	0.45	No	<b>F2500-15</b>	100 Pack

**Applications:**

- Low non-specific binding applications
- Tissue culture media filtration and general biological sample filtration

**Applications:**

- Ion chromatography
- Tissue culture filtration, filtration of proteins and nucleic acids
- High-temperature liquids

**Applications:**

- Dissolution testing
- General filtration

**Applications:**

- Filtration of biological samples
- Filtration of aggressive organic solutions

**Applications:**

- Tissue culture media filtration, sensitive biological samples

## All-Plastic Disposable Syringes

Disposable syringes with polyethylene barrels and polypropylene plungers; use for all syringe filter applications

- Two-part, all-plastic construction eliminates the need for rubber or synthetic plunger gaskets
- No silicone or oil lubricant is required in the barrel
- Choose Luer-Slip or Luer Lock syringes, in capacities ranging from 1 to 50mL



### All-Plastic Disposable Syringes

Capacity (mL)	Cat. No.	Quantity
<b>Luer-Slip Syringes</b>		
1	<b>S7510-1</b>	100 Pack
3	<b>S7510-3</b>	100 Pack
5	<b>S7510-5</b>	100 Pack
10	<b>S7510-10</b>	100 Pack
20	<b>S7510-20</b>	100 Pack
30	<b>S7510-30</b>	50 Pack
50	<b>S7510-50</b>	30 Pack
<b>Luer Lock Syringes</b>		
3	<b>S7515-3</b>	100 Pack
5	<b>S7515-5</b>	100 Pack
10	<b>S7515-10</b>	100 Pack
20	<b>S7515-20</b>	100 Pack

## 750 $\mu$ L Micro-Centrifugal Filters, Non-Sterile

Filter volumes as low as 50 $\mu$ L with low hold-up volume

- Filter volumes as low as 50 $\mu$ L up to 750 $\mu$ L with low hold-up volume
- Use with any laboratory microcentrifuge
- Virgin polypropylene filter housing with tapered 2mL, capped receiver tube
- 10,000xG maximum centrifugal force



### 750 $\mu$ L Micro-Centrifugal Filters, Non-Sterile

Material	Pore Size ( $\mu$ m)	Cat. No.	Quantity
Cellulose Acetate	0.2	<b>F2517-1</b>	100 Pack
Cellulose Acetate	0.45	<b>F2517-2</b>	100 Pack
Nylon	0.2	<b>F2517-3</b>	100 Pack
Nylon	0.45	<b>F2517-4</b>	100 Pack
PVDF	0.2	<b>F2517-5</b>	100 Pack
PVDF	0.45	<b>F2517-6</b>	100 Pack
Regenerated Cellulose	0.2	<b>F2517-7</b>	100 Pack
Regenerated Cellulose	0.45	<b>F2517-8</b>	100 Pack
PTFE	0.2	<b>F2517-9</b>	100 Pack
PTFE	0.45	<b>F2517-10</b>	100 Pack

## 2mL Centrifugal Filters, Non-Sterile

- Filter sample volumes up to 2mL
- Virgin polypropylene filter housing with tapered 5mL, capped receiver tube
- Use with benchtop or floor model centrifuges
- 5,000xG maximum centrifugal force



### 2mL Centrifugal Filters, Non-Sterile

Material	Pore Size (µm)	Cat. No.	Quantity
Cellulose Acetate	0.2	<b>F2520-1</b>	25 Pack
Cellulose Acetate	0.45	<b>F2520-2</b>	25 Pack
Nylon	0.2	<b>F2520-3</b>	25 Pack
Nylon	0.45	<b>F2520-4</b>	25 Pack
PVDF	0.2	<b>F2520-5</b>	25 Pack
PVDF	0.45	<b>F2520-6</b>	25 Pack
PTFE	0.2	<b>F2520-7</b>	25 Pack
PTFE	0.45	<b>F2520-8</b>	25 Pack

## 25mL Centrifugal Filters, Non-Sterile

- Filter sample volumes up to 25mL
- Virgin polypropylene filter housing with conical receiver
- Use with benchtop or floor model centrifuges
- 2,500xG maximum centrifugal force



### 25mL Centrifugal Filters, Non-Sterile

Material	Pore Size (µm)	Cat. No.	Quantity
Cellulose Acetate	0.2	<b>F2519-1</b>	50 Pack
Cellulose Acetate	0.45	<b>F2519-2</b>	50 Pack
Nylon	0.2	<b>F2519-3</b>	50 Pack
Nylon	0.45	<b>F2519-4</b>	50 Pack
PVDF	0.2	<b>F2519-5</b>	50 Pack
PVDF	0.45	<b>F2519-6</b>	50 Pack



# Sample Handling Products

Our portfolio includes over 850 Thermo Scientific vials and closures products designed for any instrument and any application. Our pages have been arranged by product line and vial size, allowing you to quickly find the most appropriate products for your lab.

## Featured Products



### SureStop 9mm Vials

Removing any subjectivity around achieving the optimal compression when sealing a vial. Analytical results are improved as a result of the elimination of evaporation differences between samples.

**PAGE 2-005**



### Virtuoso Vial Identification System

A fast sample identity and security system that provides reliable and accurate customized sample information printed directly onto a vial.

**PAGE 2-007**



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### Tools and Accessories

Crimpers and decrimpers (manual and electronic) providing an adjustable crimp with reproducible results

**PAGE 2-092**



### Webseal Well Plates

A comprehensive range of well plate solutions for high density sample handling in chromatography

**PAGE 2-094**

# Sample Handling

## Technical Resources



visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)  
to access the following information:

- MS Certified Vials Technical Information
- Septum Selection Guide
- Deactivated Glass Vials and Inserts
- Seal Hardness
- Solvent Compatibility
- Chemical Resistance Reference Chart
- Properties of Glass
- Autosampler Compatibility Chart





## Vials and Closures

Our portfolio contains the most comprehensive selection of vials and closures from microsampling to headspace to match all of your application and autosampler requirements. The portfolio focuses on improved sample security and integrity with the Thermo Scientific™ AVCS™ 9mm closures and the Thermo Scientific™ SureStop™ 9mm screw top vial range. Our portfolio of vials and closures offer you the assurance of uninterrupted productivity on every separation and analysis.

- **AVCS Closures and SureStop Vials**

AVCS Closures together with SureStop vials significantly reduce the error rate of analysis that results from evaporation of solvent in vials which are not sealed correctly.

- **Virtuoso Vial Identification System**

Bringing time savings, greater productivity and increased sample security to your laboratory by eliminating manual vial labeling.

- **National Vials and Closures**

Choose from a large selection of Thermo Scientific™ National™ vials and closures to match your application and autosampler requirements.

- **MS Certified Vials**

The first and only pre-cleaned, low particle, low background chromatography vial.

- **Chromacol Vials and Closures**

Choose from a large selection of Thermo Scientific™ Chromacol™ vials and closures to match your application and autosampler requirements.

- **Crimping and Decrimping Tools**

Speed up your workflow with our tools for opening, closing and disposing of vials.



The vials and closures web page contains the latest news, applications and downloads for the range. Visit [www.thermoscientific.com/vials](http://www.thermoscientific.com/vials)

# AVCS Closures and SureStop Vials

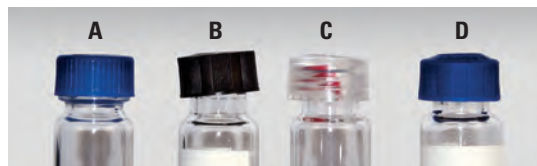
Thermo Scientific™ AVCS Closures and SureStop™ Vials – The next generation of sample handling

## Top reasons why chemists should consider Advanced Vial Closure System (AVCS) closures and SureStop vials

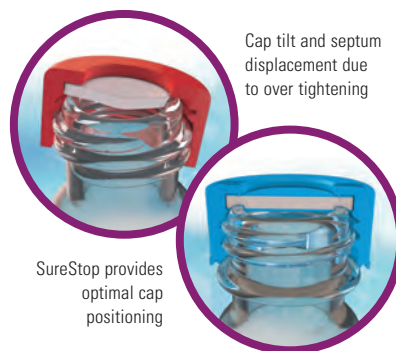
Features of 9mm wide opening, integral membrane and solid top closures:

1. AVCS closures along with SureStop vials significantly reduce the error rate of analysis that results from evaporation of solvent in improperly sealed vials
2. Re-analysis costs are reduced, sample data integrity and sample throughput increases
3. No need to use bulky crimpers – AVCS closures with SureStop vials seal as well as crimp top vials
4. The leveling feature of AVCS designed vials gives more autosampler compatibility with less autosampler interruptions, due to mishandled vials
5. AVCS design allows for consistent sealing, eliminating user-to-user variance
6. SureStop design provides a positive feedback closure that creates more consistent data, which for a researcher is almost as important as the actual result

A study of the effects of the typical operator response to evaporative sample loss and septum dislodging during the use of 9 mm screw thread and 11 mm crimp vials and closures was conducted. Sample losses were measured for both overtightened vials and for vials perceived to be optimally tightened and these were compared to losses from new vials designed to provide a definite sealing point.



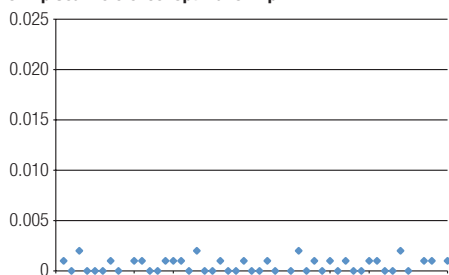
Examples of vial and closure misalignment/deformation. (A) SureStop vial self-aligning cap; (B) generic vial, cap tilt; (C) generic vial, septum dislodged; and (D) generic vial, deformed top.



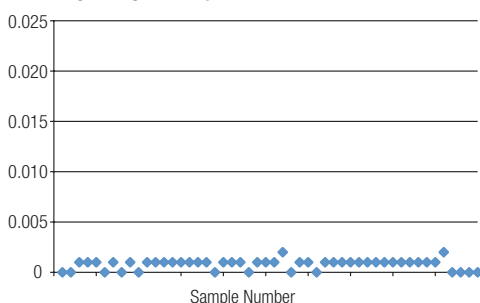
## Test conditions

- 1.3 mL of pure methanol was added to each vial (always 50 in total)
- All vials were incubated at a temperature of 40 °C for 72 hours
- After 72 hours the final weight was taken and subtracted from the initial 40 °C temperature weight to yield the sample loss in grams

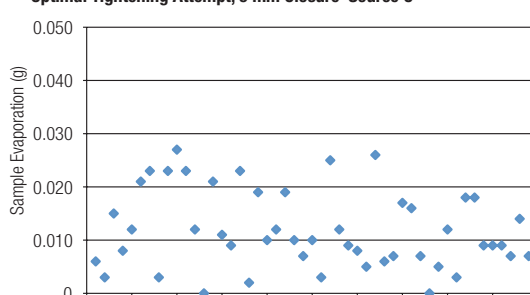
Crimp Seal Reference: Optimal Crimp



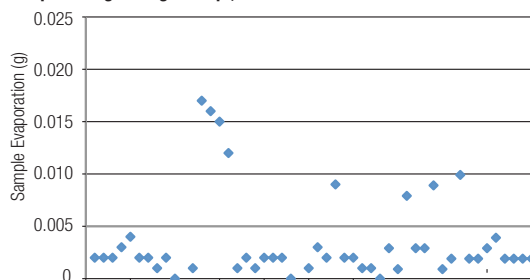
Normal Tightening, SureStop Vial/AVCS Closure

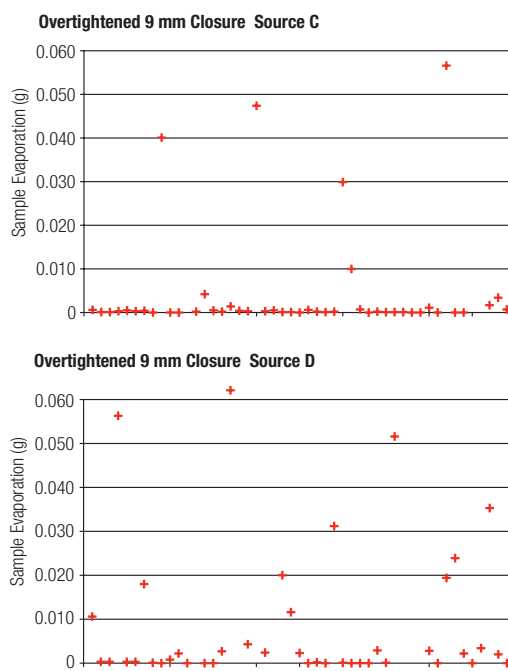
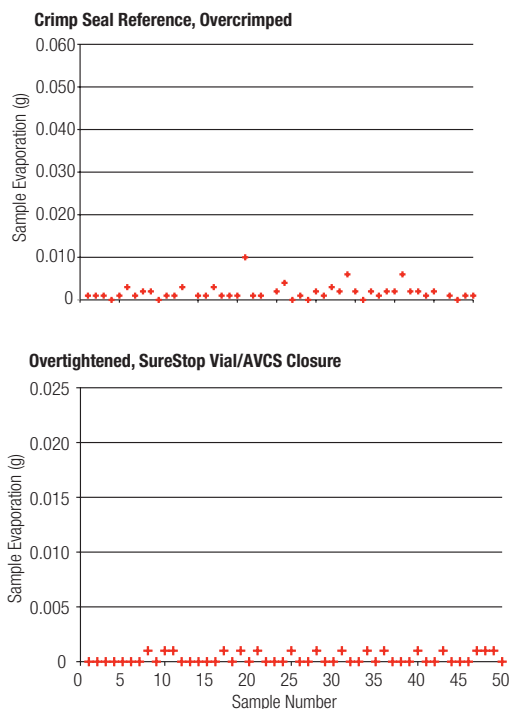


Optimal Tightening Attempt, 9 mm Closure Source C



Optimal Tightening Attempt, 9 mm Closure Source D





### Are you currently using crimp caps?

Changing to AVCS closures and SureStop vials will provide the following benefits:

- The hassle of crimping is removed; crimping and de-capping tools are not required. Screw thread closures are easier to attach and remove reducing time required for sample prep. Additionally, there can be repetitive stress issues related to high volume crimping that will be alleviated with screw thread vials
- AVCS closures and SureStop vials offer identical performance to crimp caps (based on solvent loss studies), which make SureStop products a viable alternative for GC use
- AVCS and SureStop provides a “like crimped” product tightness and reliable quantification even for low boiling compounds; you remove user-to-user vial/closure sealing variability that results from user subjectivity of when they “think” the vial is properly sealed

### Are you currently using snap caps?

Changing to AVCS closures and SureStop vials will provide the following benefits:

- Positive feedback makes AVCS and SureStop as convenient to use as snap cap
- Provides a fast closing alternative for volatile solvents/compounds of interest
- Eliminates variable evaporation rates that can be caused by environmental conditions

### Are you currently using expensive bonded caps?

Changing to AVCS closures and SureStop vials and will provide the following benefits:

- Septum push through is eliminated with the AVCS screw-top closure and SureStop vial design. (See illustration below)
- Multiple septa qualities available (bonded caps very limited in septa offering)
- AVCS closures and SureStop vials seal more securely than bonded caps
- AVCS closures and SureStop vials are considerably less expensive than bonded caps and vials



Non-AVCS push through examples

AVCS no push through

# Virtuoso Vial Identification System

Providing the next generation in sample security

From sample entry to final reports, everything an analytical lab does revolves around ensuring accurate data and reliable results. Chromatography vial sample identification can be complicated, because once the sample is in the vial, there is no easy way to identify it. Current methods, like hand written or adhesive labels, can be illegible or time consuming, and no accurate, reliable and efficient system for vial sample identification existed...until now.

The Thermo Scientific™ Virtuoso™ Vial Identification System is the most innovative device for ensuring sample identity and sample security ever developed. By providing a fast, accurate, detailed and reproducible system for producing customized sample information directly onto a vial, Virtuoso has revolutionized vial identification.



**Load a single vial, or up to 10 with the included multi-vial sleeve**

**File management made easy**

Virtuoso's network connectivity allows you to transfer label information from your files

**Add text and barcodes**

Virtuoso comes loaded with templates to make accurate labeling quick and easy, or easily create your own custom format

**Input data instantly from the touch screen interface , or via the Pi Gateway Software interface**

**Start-to-finish in 5 seconds**

Fully labeled vial completed in just 5 seconds



## Virtuoso Vial Identification System

Virtuoso vials and accessories designed exclusively for use with the Virtuoso enabling the highest level of sample integrity available for chromatographers

### Virtuoso Vial Identification System

Description	Cat. No.	Pack of
Virtuoso Vial Identification System	<b>60180-VT100</b>	1
Virtuoso 9mm Wide Opening SureStop Screw Thread Vial, 2mL, Clear Glass with V-Patch	<b>60180-VT300</b>	100
Virtuoso 9mm Wide Opening SureStop Screw Thread Vial, 2mL, Amber Glass with V-Patch	<b>60180-VT301</b>	100
Virtuoso 11mm Wide Opening Crimp Top Vial, 2mL, Clear Glass with V-Patch	<b>60180-VT302</b>	100
Virtuoso 11mm Wide Opening Crimp Top Vial, 2mL, Amber Glass with V-Patch	<b>60180-VT302A</b>	100
Virtuoso 11mm Wide Opening Snap-It Vial, 2mL, Clear Glass with V-Patch	<b>60180-VT303</b>	100
Virtuoso 11mm Wide Opening Snap-It Vial, 2mL, Amber Glass with V-Patch	<b>60180-VT303A</b>	100
Virtuoso 9mm SureStop Screw Thread High Recovery Vial 2mL, Clear Glass with V-Patch	<b>60180-VT309</b>	100
Virtuoso 9mm SureStop Screw Thread Total Recovery Vial 2mL, Clear Glass with V-Patch	<b>60180-VT309TR</b>	100
Virtuoso 9mm SureStop Screw Thread Fused Insert MacroVial, 350uL, Clear Glass with V-Patch	<b>60180-VT310</b>	100
Virtuoso 9mm SureStop Screw Thread Fused Insert MacroVial, 350uL, Amber Glass with V-Patch	<b>60180-VT310A</b>	100
Virtuoso 9mm Wide Opening SureStop Screw Thread Vial, Convenience Kit Kit Contains 60180-VT300 & C5000-53B	<b>60180-VT400</b>	100
Virtuoso 9mm Wide Opening SureStop Screw Thread Vial, Convenience Kit Kit Contains 60180-VT300 & C5000-51B	<b>60180-VT401</b>	100
Virtuoso 9mm Wide Opening SureStop Screw Thread Vial, Convenience Kit Kit Contains 60180-VT300 & C5000-54B	<b>60180-VT402</b>	100
Virtuoso 11mm Wide Opening Crimp Top Vial, Convenience Kit Kit Contains 60180-VT302 & C4011-1AP	<b>60180-VT403</b>	100
Virtuoso 11mm Wide Opening Snap-It Vial Convenience Kit, Kit Contains 60180-VT303A & C4011-54	<b>60180-VT404A</b>	100
Virtuoso 9mm Wide Opening SureStop Screw Thread Vial, Convenience Kit Kit Contains 60180-VT300 & C5000-55B	<b>60180-VT405</b>	100
Virtuoso Mass Spec Certified 9mm SureStop Kit, Kit Contains 60180-VT310A & C5000-64B	<b>60180-VTMSC72LV</b>	100
Virtuoso Mass Spec Certified 9mm SureStop Kit, Kit Contains MSCERT60180-VT301 & MSC5000-44B	<b>60180-VTMSC402A</b>	100
Virtuoso Replacement Tape	<b>60180-VT500</b>	1
Virtuoso Multi Vial Holder	<b>60180-VT501</b>	5
Virtuoso Vial Collection Tray	<b>60180-VT502</b>	3
Virtuoso Screen Protector	<b>60180-VT503</b>	1
Virtuoso Multi Vial Guide	<b>60180-VT504</b>	1

## Innovative Vial Unmatched Performance



- Consistent sealing
- Optimal cap alignment
- Advanced Vial Closure System (AVCS)
- AVCS improves autosampler compatibility

SureStop™ Vials with AVCS Closures

# Premium Vials and Closures

## 8mm Screw Vials and Closures

8-425 thread finish, standard opening, 2mL, 12x32mm

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber, meets all requirements of Pharm. US, EU, JPN
- Open top caps are designed to be used with any of our 8mm septa
- Polypropylene caps are chemically inert and suitable for most chromatography applications
- Flanged caps are particularly suitable for many Japanese autosamplers
- Pre-assembled caps and septa are convenient and minimize contamination from handling



### Recommended for the following instruments:

- Thermo Scientific™ Dionex™ Ultimate™ 3000 HPLC
- Thermo Scientific Accela HPLC
- Thermo Scientific™ Surveyor™ LC autosampler
- Beckman
- CTC
- Gilson
- Knauer
- Shimadzu
- Spark
- Varian
- VWR (Merck)/Hitachi

For autosampler compatibility visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

### 8mm, 2mL, 12x32mm Standard Opening Screw Thread Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (mL)	Usable Volume (mL)	Residual (µL)	Cat. No.	Pack of
8-425 Screw Thread Vial	Clear	Yes	12x32	Flat Bottom	2.0	1.5	<170	<b>60180-508</b>	100
	Amber	Yes	12x32	Flat Bottom	2.0	1.5	<170	<b>60180-560</b>	100

### 8-425 Screw Thread Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
8mm Open Top Screw Cap, 8-425 thread, 5.5mm hole	Black	Polypropylene	–	–	–	<b>60180-514</b>	100
8mm Open Top Screw Cap, flanged, 8-425 thread, 5.5mm hole	Pink	Polypropylene	–	–	–	<b>60180-660</b>	100
Septum for 8-425 Screw Caps	–	–	Blue Silicone/PTFE	30	1.1	<b>60180-515</b>	500
	–	–	White Silicone/Red PTFE	50	1.5	<b>60180-562</b>	100
8mm Open Top Screw Cap with flange, 8-425 thread, 5.5mm hole	Pink	Polypropylene	Red PTFE/White Silicone	45	1.3	<b>60180-661</b>	100
	Pink	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	0.9	<b>60180-662</b>	100
8mm Open Top Screw Cap, 8-425 thread, 5.5mm hole	Pink	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	<b>60180-665</b>	100
	Pink	Polypropylene	Red PTFE/White Silicone/Red PTFE	45	1.0	<b>60180-666</b>	100
	Pink	Polypropylene	Red PTFE/White Silicone	45	1.3	<b>60180-667</b>	100

For 8mm screw vial convenience kits look on page **2-010**

## 8mm Standard Opening Screw Thread Vial Convenience Kits

- Includes 100 vials and 100 caps with pre-assembled septa
- Caps feature pre-inserted septa for added convenience during sample preparation

### 8mm Standard Opening Screw Thread Vial Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap/Septum Cat. No.	Cat. No.	Pack of
Convenience Kit, Standard Opening Screw Vial	Clear	Yes	Black	Blue Silicone/PTFE	60180-508	60180-514/60180-515	<b>60180-596</b>	1000
	Clear	Yes	Black	Red PTFE/White Silicone	60180-508	60180-514/60180-562	<b>60180-600</b>	100

## 9mm Wide Opening Screw Thread Vials and Closures

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber, meets all requirements of Pharm. US, EU, JPN
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts
- Easy-on, easy-off convenience with just one turn
- Caps with bonded septa resist dislodging during injection when using large diameter blunt needles
- Closures have the profile of a crimp or snap closure for compatibility with robotic autosamplers

### Compatible with:

- Thermo Scientific TRACE 1300 GC
- Thermo Scientific TriPlus RSH autosampler
- Most other HPLC and GC autosamplers

For autosampler compatibility visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



\* This vial fits Thermo Scientific AS 3000 and TriPlus only

### 9mm Wide Opening Screw Thread Vials

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (mL)	Usable Volume (mL)	Residual (μL)	Cat. No.	Pack of
9mm Screw Thread Thermo Scientific™ Micro+™ Vial 300μL, Fused Insert	Clear	Yes	12x32	Insert Vial	0.3	250μL	<3	<b>60180-507</b>	100
9mm Screw Thread Vial	Clear	Yes	12x32	Flat Bottom	2.0	1.5	<170	<b>60180-509</b>	100
	Clear	No	12x32	Flat Bottom	2.0	1.5	<170	<b>60180-723</b>	1000
	Amber	Yes	12x32	Flat Bottom	2.0	1.5	<170	<b>60180-561</b>	100
	Amber	Yes	12x32	Flat Bottom	2.0	1.5	<170	<b>60180-724</b>	1000
	Clear	No	15x46	Flat Bottom	4.0	3.5	<500	<b>60180-510</b>	125



### 9mm Short Screw Thread Vial Closures

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
9mm Open Top Short Screw Cap, 6mm hole	Blue	Polypropylene	Clear PTFE/Blue Silicone	30	1.0	<b>60180-516</b>	100
	Blue	Polypropylene	Red PTFE/White Silicone	55	1.0	<b>60180-729</b>	1000
	Blue	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	<b>60180-728</b>	1000
	Pink	Polypropylene	Red PTFE/White Silicone	55	1.0	<b>60180-671</b>	100
	Pink	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	<b>60180-669</b>	100
	Pink	Polypropylene	Red PTFE/White Silicone/Red PTFE	45	1.0	<b>60180-670</b>	100
	Pink	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>60180-672</b>	100

### 9mm Convenience Kits

- Includes 100 vials and 100 caps with pre-assembled septa
- Caps feature pre-inserted septa for added convenience during sample preparation



Items not shown to scale

### 9mm Wide Opening Screw Thread Vials Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit, Wide Open Short Screw Vial	Clear	Yes	Blue	Blue Silicone/PTFE	60180-509	60180-516	<b>60180-599</b>	100
	Clear	Yes	Pink	Red PTFE/White Silicone	60180-723	60180-671	<b>60180-694</b>	100
	Amber	No	Pink	Red PTFE/White Silicone	60180-724	60180-671	<b>60180-698</b>	100

## 11mm Wide Opening Crimp Top Vials, 2mL, 12x32mm and Closures

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber meets all requirements of Pharm. US, EU, JPN
- Aluminum crimp seals with prefitted septa for all 11mm crimp top and snap cap vials
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Aluminum seals must be applied with a crimping tool



### Compatible with:

Most HPLC and GC autosamplers  
For autosampler compatibility visit  
[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

### 11mm Wide Opening Crimp Top Vials, 2mL, 12x32mm

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (mL)	Usable Volume (mL)	Residual (µL)	Cat. No.	Pack of
11mm Crimp Top Vial, Wide Opening	Clear	Yes	12x32	Flat Bottom	2.0	1.5	<170	<b>60180-502</b>	100

### 11mm Crimp Top Vial Closures

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
11mm Crimp Cap, 6mm center hole	Blue	Aluminum	Blue Silicone/Red PTFE	20	1.4	<b>60180-526</b>	100
11mm Crimp Cap, 5.5mm center hole	Silver	Aluminum	Red PTFE/White Silicone	45	1.3	<b>60180-706</b>	1000

## 11mm Crimp Top Convenience Kits

- Includes 100 vials and 100 caps with pre-assembled septa
- Caps feature pre-assembled septa for added convenience during sample preparation

### 11mm Crimp Top Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit, Wide Opening Crimp Top Vial	Clear	Yes	Blue	Blue Silicone/Red PTFE	60180-502	60180-526	<b>60180-597</b>	100
	Clear	Yes	Silver	White Silicone/Red PTFE	60180-502	60180-706	<b>60180-598</b>	100

### 11mm Crimping Tool

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 11mm aluminum crimp seals	<b>60180-543</b>	1

We offer electronic crimping options

➤ Visit **PAGE 2-092**

## 11mm Snap Cap Vials, Wide Opening, 2mL, 12x32mm and Closures

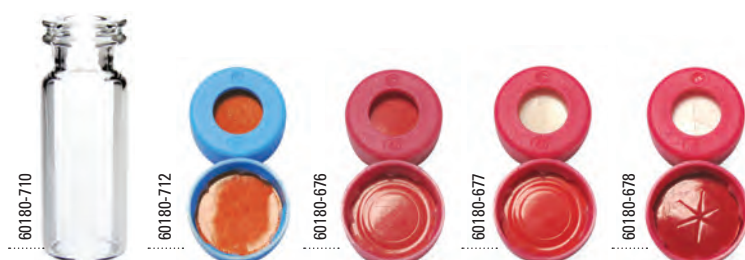
- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber, meets all requirements of Pharm. US, EU, JPN
- Crimp/Snap vials can be used with snap caps or aluminum crimp seal closures
- Snap Caps eliminate the need for crimping or decrimping tools
- Polyethylene caps are chemically inert and suitable for most chromatography applications

### Compatible with:

Most HPLC and GC autosamplers

For autosampler compatibility visit

[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### 11mm Snap Cap Vials, Wide Opening, 2mL, 12x32mm

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (mL)	Usable Volume (mL)	Residual (μL)	Cat. No.	Pack of
11mm Crimp/Snap Vial	Clear	No	12x32	Flat Bottom	2.0	1.5	<170	<b>60180-710</b>	1000

### 11mm Snap Cap Vial Closures

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
11mm Snap Cap, 6mm hole	Blue	Polyethylene	Clear PTFE/Synthetic Red Rubber	60	1.0	<b>60180-712</b>	1000
	Pink	Polyethylene	Clear PTFE/Synthetic Red Rubber	60	1.0	<b>60180-676</b>	100
	Pink	Polyethylene	Red PTFE/White Silicone	45	1.3	<b>60180-677</b>	100
	Pink	Polyethylene	Red PTFE/White Silicone, Star-slit	45	1.3	<b>60180-678</b>	100

## 11mm Wide Opening Snap Cap Convenience Kits

- Includes 100 vials and 100 caps with pre-assembled septa
- Caps feature pre-assembled septa for added convenience during sample preparation

### 11mm Snap Cap Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit, Wide Opening Snap Cap Vial	Clear	No	Pink	Clear PTFE/Red Rubber	60180-710	60180-676	<b>60180-679</b>	100
	Clear	No	Pink	Red PTFE/White Silicone	60180-710	60180-677	<b>60180-680</b>	100

## 20mm Headspace Crimp Top Vials and Closures

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber, meets all requirements of Pharm. US, EU, JPN



### Applications:

Recommended for operation of Thermo Scientific TriPlus HS Autosampler

Clear glass vials with 20mm crimp seal finish are designed to fit most headspace autosamplers

For autosampler compatibility visit

[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

Images shown are 70% to scale

### 20mm Crimp Top Headspace Vials

Description	Glass	Patched	Dimension (mm)	Finish	Profile	Total Volume (mL)	Usable Volume (mL)	Cat. No.	Pack of
20mm Headspace Crimp Vial	Clear	Yes	22.5x46	Beveled Edge	Round Bottom	12	10	<b>60180-504</b>	125
	Amber	No	22.5x46	Beveled Edge	Round Bottom	12	10	<b>60180-505</b>	125
	Clear	Yes	22.5x75	Beveled Edge	Round Bottom	21	20	<b>60180-506</b>	125
	Clear	No	22.5x75	Beveled Edge	Round Bottom	21	20	<b>60180-741</b>	1000



Images shown are 70% to scale

### 20mm Crimp Top Vial Closures

Description	Cap Color	Cap Material	Septum	Hardness shore	Thickness (mm)	Cat. No.	Pack of
20mm Crimp Cap, 9.5mm hole	Silver	Aluminum	–	–	–	<b>60180-512</b>	100
20mm Composite Magnetic Crimp Cap, 8mm hole	Blue	Alu/Tinplate	–	–	–	<b>60180-519</b>	100
Stopper for 20mm Crimp Caps	–	–	20mm Gray Butyl Stopper	37	3.0	<b>60180-744</b>	1000
Septum for 20mm Crimp Caps	–	–	Natural PTFE/Blue Silicone	45	3.2	<b>60180-521</b>	100
20mm Crimp Cap, 8mm hole	Silver	Aluminum	20mm Gray Chlorobutyl/Gray PTFE	52	3.0	<b>60180-513</b>	100
20mm Crimp Cap, 9.5mm hole	Silver	Aluminum	Natural PTFE/Blue Silicone	45	3.2	<b>60180-511</b>	100
20mm Composite Magnetic Crimp Cap, 8mm hole	Blue	Alu/Tinplate	Natural PTFE/Blue Silicone	45	3.2	<b>60180-520</b>	100

### 20mm Crimping and Decrimping Tools

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 20mm crimp seals	<b>60180-544</b>	1
Manual Decrimper	Removes 20mm crimp seals without vial damage	<b>60180-557</b>	1

For electronic crimpers and decrimpers look on page **2-092**

# National Vials and Closures

More laboratory professionals look to Thermo Scientific National products to meet their critical sampling needs than any other company

- Comprehensive instrument compatibility, "correct fit"
- The industry's widest selection of vials and closures for every application, from economical to high end products
- Innovative products for challenging applications
- Quality products in glass (1st hydrolytic class glass (Type 1) in clear and amber, meets all requirements of Pharm. US, EU, JPN)
- Certified and Mass Spec Certified Vial Kits
- The leading manufacturer of vials and closures in North America since 1986
- In-house product development team
- Leading company in convenience and assembled kits





# MS Certified Vials

The first and only pre-cleaned, low particle, low background chromatography vial

When your instrumentation, sample handling and methodology is pushing the limits, a chromatography vial that can keep up is essential

- The only chromatography vials pre-cleaned to provide unmatched consistency
- The first low particle, low background chromatography vials
- Pre-cleaned vial packaging protects the product integrity
- Tested and certified for up to 15 critical physical characteristics affecting vial performance
- Positive ESI LC-MS and GC-MS chromatograms included in each pack

## Low particle background

The presence of inorganic sub-micron particles in all glass vials as a byproduct of the manufacturing process is a little known phenomenon that has not been extensively studied. Gas chromatographers depend on injection port liners to act as traps for particulates while the HPLC chromatographer takes extensive steps to eliminate them during sample preparation. This has been an effective strategy for routine analytical methods, but the need to work with even lower concentrations of analytes creates the possibility of interactions with compounds of interest.

Thermo Scientific MS Certified Vials undergo a proprietary cleaning process that greatly reduces the background particulates along with their potential effect on high sensitivity chromatography. The table gives a comparison of the particle distribution obtained from an analysis of standard vials versus the Thermo Scientific MS Certified Vials. All MS Certified Vials are processed and tested for background particulates. A typical vial that has not been processed can exhibit particle counts exceeding 5000 particles per mL with the highest counts occurring in the range below 0.5 $\mu$ m. This has traditionally been of little concern when GC inlet liners or HPLC guard

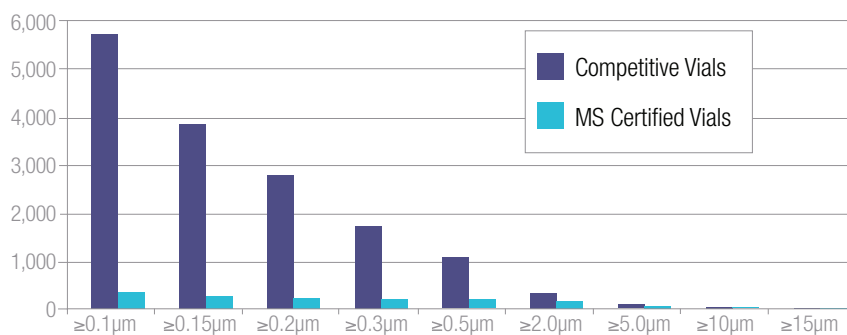
columns are used. GC techniques employing on-column injection create the need for a sample vial with minimal background particulates to prevent an accumulation of foreign material at the head of the column that might adversely affect a separation. Similarly newer techniques employing finely packed HPLC columns, capillary columns and direct connection of the analytical column to the

sample valve also require the elimination of as much particulate matter as possible from the sample stream.

The table below shows the results obtained from particulate analysis of a typical unprocessed vial compared to the Thermo Scientific MS Certified Vials. The processed vial shows a significant reduction in total particle counts.

VIAL	$\geq 0.1\mu\text{m}$	$\geq 0.15\mu\text{m}$	$\geq 0.2\mu\text{m}$	$\geq 0.2\mu\text{m}$	$\geq 0.5\mu\text{m}$	$\geq 2.0\mu\text{m}$	$\geq 5.0\mu\text{m}$	$\geq 10\mu\text{m}$	$\geq 15\mu\text{m}$
Competitive Vials	5,677	3,809	2,755	1,709	1,051	307	76	4	0
Thermo Scientific Vials	356	264	218	192	176	160	45	8	3

## Typical Cumulative Particle Counts



## MS Certified Vials Kits

### Unassembled and Assembled Vial Kits

Kit Type	Glass	Patched	Cap Color	Septum	Cat. No.	Pack of
Convenience Kit, 9mm SureStop Screw Vial, 2mL with AVCS Closure	Clear	Yes	Blue	Blue Silicone/PTFE	<b>MSCERT5000-34W</b>	100
	Amber	Yes	Blue	Blue Silicone/PTFE	<b>MSCERT5000-35W</b>	100
	Clear	Yes	Blue	Blue Silicone/PTFE, Pre-slit	<b>MSCERT5000-40W</b>	100
	Amber	Yes	Blue	Blue Silicone/PTFE, Pre-slit	<b>MSCERT5000-41W</b>	100
Convenience Kit, 9mm 200µL Fused Insert Screw Vial	Clear	Yes	Blue	Bonded Clear PTFE/Clear Silicone	<b>MSCERT5000-30LVW</b>	100
Convenience Kit, 9mm 350µL Fused Insert Screw Vial	Clear	Yes	Blue	Bonded Clear PTFE/Clear Silicone	<b>MSCERT5000-31LVW</b>	100
Convenience Kit, 9mm Wide Opening 1.7mL High Recovery Screw Vial with 30µL Reservoir	Clear	No	Blue	Bonded Clear PTFE/Clear Silicone	<b>MSCERT5000-32</b>	100
Convenience Kit, 9mm Wide Opening 1.5mL Total Recovery Screw Vial with 10µL Reservoir	Clear	No	Blue	Bonded Clear PTFE/Clear Silicone	<b>MSCERT5000-33TR</b>	100
Convenience Kit, 9mm Wide Opening Screw Vial, 2mL	Clear	Yes	Blue	Bonded Clear PTFE/Clear Silicone	<b>MSCERT5000-341W</b>	100
	Amber	Yes	Blue	Bonded Clear PTFE/Clear Silicone	<b>MSCERT5000-351W</b>	100
Convenience Kit, 9mm 200µL Fused Insert Screw Vial	Clear	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	<b>MSCERT5000-36LVW</b>	100
Convenience Kit, 9mm 350µL Fused Insert Screw Vial	Clear	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	<b>MSCERT5000-37LVW</b>	100
Convenience Kit, 9mm Wide Opening 1.7mL High Recovery Screw Vial with 30µL Reservoir	Clear	No	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	<b>MSCERT5000-38</b>	100
Convenience Kit, 9mm Wide Opening 1.5mL Total Recovery Screw Vial with 10µL Reservoir	Clear	No	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	<b>MSCERT5000-39TR</b>	100
Convenience Kit, 9mm Wide Opening Screw Vial, 2mL	Clear	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	<b>MSCERT5000-401W</b>	100
	Amber	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	<b>MSCERT5000-411W</b>	100
Convenience Kit, 9mm Wide Opening Screw Vial, 2mL, sterilized	Clear	Yes	Blue	Bonded Clear PTFE/Clear Silicone	<b>MSCERT5000-S34W</b>	100
	Amber	Yes	Blue	Bonded Clear PTFE/Clear Silicone	<b>MSCERT5000-S35W</b>	100
	Clear	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	<b>MSCERT5000-S40W</b>	100
	Amber	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	<b>MSCERT5000-S41W</b>	100
Convenience Kit, 11mm Snap Top Vial, 2mL	Clear	Yes	Red	Clear PTFE/Clear Silicone, Pre-slit	<b>MSCERT4011-74W</b>	100
Assembled Kit, 9mm Wide Opening Screw Vial, 2mL	Clear	Yes	Blue	Bonded Clear PTFE/Clear Silicone	<b>MSCERT5000-134W</b>	100
	Amber	Yes	Blue	Bonded Clear PTFE/Clear Silicone	<b>MSCERT5000-135W</b>	100
Assembled Kit, 13-425 Screw Vial, 4mL	Clear	Yes	Black	Bonded Clear PTFE/Clear Silicone	<b>MSCERT4015-135W</b>	100
	Amber	Yes	Black	Bonded Clear PTFE/Clear Silicone	<b>MSCERT4015-136W</b>	100



## National Certified Vials and Closures Convenience Kits

- National Certified Vial Kits are fully lot-tested including HPLC and GC analysis for 15 critical parameters
- Certificate of Conformance included in every pack
- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Fixed insert or conical base vials for limited volume sampling

### Unassembled kits

- Includes 100 vials and 100 caps with pre-assembled septa
- Reusable two compartment trays protect vials and closures while keeping matching supplies together
- Clear trays make it easy to keep track of available supplies without opening containers

### Assembled kits

- Include 100 vials with pre-attached caps and septa
- Packaged in convenient vial trays with clear covers



### National Certified Vials and Closures Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit, Certified 9mm Wide Opening SureStop Vial, 2mL	Clear	Yes	Blue	Ivory PTFE/Red Rubber	C5000-1W	C5000-51B	<b>CERT5000-580W</b>	100
	Amber	Yes	Blue	Ivory PTFE/Red Rubber	C5000-2W	C5000-51B	<b>CERT5000-582W</b>	100
	Clear	Yes	Blue	Red PTFE/White Silicone	C5000-1W	C5000-54B	<b>CERT5000-578W</b>	100
	Amber	Yes	Blue	Red PTFE/White Silicone	C5000-2W	C5000-54B	<b>CERT5000-575W</b>	100
	Clear	Yes	Blue	Blue PTFE/White Silicone, Pre-slit	C5000-1W	C5000-55B	<b>CERT5000-593W</b>	100
	Amber	Yes	Blue	Blue PTFE/White Silicone, Pre-slit	C5000-2W	C5000-55B	<b>CERT5000-576W</b>	100
	Clear	No	Blue	Ivory PTFE/Red Rubber	C4000-1	C5000-51B	<b>CERT5000-80</b>	100
Convenience Kit, Certified 9mm Wide Opening Screw Vial, 2mL	Clear	Yes	Blue	Ivory PTFE/Red Rubber	C4000-1W	C5000-51B	<b>CERT5000-80W</b>	100
	Amber	Yes	Blue	Ivory PTFE/Red Rubber	C4000-2W	C5000-51B	<b>CERT5000-82W</b>	100
	Clear	Yes	Blue	Red PTFE/White Silicone	C4000-1W	C5000-54B	<b>CERT5000-92W</b>	100
Convenience Kit, Certified 9mm Wide Opening High Recovery Screw Vial, 1.7mL	Clear	No	Black	Bonded Red PTFE/White Silicone	C4000-9	C5000-64B	<b>CERT5000-992</b>	100
Convenience Kit, Certified 9mm Wide Opening Screw Vial, 2mL	Clear	Yes	Black	Bonded Red PTFE/White Silicone	C4000-1W	C5000-64B	<b>CERT5000-78W</b>	100
	Amber	Yes	Black	Bonded Red PTFE/White Silicone	C4000-2W	C5000-64B	<b>CERT5000-75W</b>	100
Convenience Kit, Certified 9mm Screw Vial, 350µL Fused Insert	Clear	Yes	Black	Bonded Red PTFE/White Silicone	C4000-LV1W	C5000-64B	<b>CERT5000-80LV</b>	100
	Amber	Yes	Black	Bonded Red PTFE/White Silicone	C4000-LV2W	C5000-64B	<b>CERT5000-72LV</b>	100
Convenience Kit, Certified 10-425 Screw Vial, 2mL	Clear	Yes	Black	Bonded Red PTFE/White Silicone	C4015-11W	C4010-68A	<b>CERT4010-91</b>	100
Convenience Kit, Certified 13-425 Screw Vial, 4mL	Clear	No	Black	Bonded Red PTFE/White Silicone	C4015-1	C4015-67A	<b>CERT4015-83</b>	100
Convenience Kit, Certified 9mm Wide Opening High Recovery Screw Vial, 1.7mL	Clear	No	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	C4000-9	C5000-75C	<b>CERT5000-79</b>	100
Convenience Kit, Certified 9mm Wide Opening Screw Vial, 2mL	Clear	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	C4000-1W	C5000-75C	<b>CERT5000-93W</b>	100
	Amber	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	C4000-2W	C5000-75C	<b>CERT5000-76W</b>	100
Convenience Kit, Certified 9mm Wide Opening Total Recovery Screw Vial, w/10µL Reservoir	Clear	No	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	C4000-9TR	C5000-75C	<b>CERT5000-993</b>	100
Convenience Kit, Certified Shell Vial 1mL with SepCap	Clear	No	Natural	Integral Molded Polyethylene	–	–	<b>CERT4015-96</b>	200
Convenience Kit, Certified Crimp Top Vial, 2mL	Clear	Yes	Silver	PTFE/Synthetic Red Rubber	C4011-1W	–	<b>CERT4011-89W</b>	100
	Amber	Yes	Silver	PTFE/Synthetic Red Rubber	C4011-2W	–	<b>CERT4011-89W</b>	100
Assembled Kit, Certified 9mm Wide Opening Screw Vial, 2mL	Amber	Yes	Black	Bonded Red PTFE/White Silicone	C4000-2W	C5000-64B	<b>CERT5000-175W</b>	100
	Clear	Yes	Gray	Bonded Red PTFE/White Silicone, Pre-slit	C4000-1W	C5000-75C	<b>CERT5000-193W</b>	100
	Amber	Yes	Gray	Bonded Red PTFE/White Silicone, Pre-slit	C4000-2W	C5000-75C	<b>CERT5000-176W</b>	100

## National 8mm Crimp Top Vials

- Superior quality type 1 borosilicate clear and amber glass
- Low volume sample vials for 6mm, 7mm and 8mm autosampler trays
- 8mm crimp top seal minimizes exposure between sample solvent and septum
- A support sleeve may be required for some autosamplers



### Recommended for the following instruments:

- Thermo Scientific
- Agilent
- Beckman
- Carlo Erba
- CTC
- Fisons
- PerkinElmer
- Shimadzu
- VWR (Merck)/Hitachi

For autosampler compatibility visit  
[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

### National 8mm Crimp Top Vials

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (μL)	Usable Volume (μL)	Residual (μL)	Cat. No.	Pack of
8mm Crimp Top Vial	Clear	No	6x32	Round Base	325	250	<6	<b>C4008-632R</b>	100
	Clear	No	6x32	Conical Base	250	200	<2	<b>C4008-632C</b>	100
	Amber	No	7x30	Conical Base	550	400	<3	<b>C4008-730</b>	100
	Amber	No	7x40	Conical Base	575	450	<2	<b>C4008-740</b>	100
	Clear	No	7x40	Flat Base	775	650	<70	<b>C4008-741</b>	100
	Amber	No	7x40	Flat Base	775	650	<70	<b>C4008-742</b>	100
	Clear	No	8x30	Flat Base	800	800	<80	<b>C4008-1</b>	200

## National 8mm Crimp Top Closures

- Aluminum crimp seals with prefitted septa
- Provide a secure leak-resistant seal
- Pre-assembled caps and septa are convenient and minimize contamination from handling



### National 8mm Crimp Top Closures

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
8mm Crimp Cap, 4mm center hole	Silver	Aluminum	Clear PTFE/Red Rubber	45	1.0	<b>C4008-1A</b>	200
	Silver	Aluminum	Red PTFE/White Silicone/Red PTFE	45	1.0	<b>C4008-2A</b>	200
	Silver	Aluminum	Red PTFE/White Silicone	45	1.3	<b>C4008-4A</b>	200

## National 8mm Crimping and Decrimping Tools

- Crimping tools provide a reproducible, secure vial closure
- Easy and convenient handling
- High quality construction for durability and long life
- Painted, plated and coated for maximum corrosion resistance
- Textured handle surface provides an assured grip



Items not shown to scale

### National 8mm Crimping and Decrimping Tools

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 8mm aluminum crimp seals	<b>C4008-100</b>	1
Decapping Pliers	Removes 8mm aluminum crimp seals, Protective gloves recommended	<b>C4008-101</b>	1
Manual Decrimper	Removes 8mm aluminum crimp seals without vial damage	<b>C4008-102</b>	1

## National Standard Opening Screw Thread Vials

2mL, 12x32mm, 8mm standard opening screw thread vials and inserts

- 8-425 screw thread finish
- I-D vials feature a write-on patch with graduation for convenient sample identification
- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts
- Available silanized (deactivated) for optimal recovery of critical polar, labile or OH-interacting compounds\*
- Polyspring inserts are self-aligning and provide a cushion against needle contact
- Precision point insert minimizes residual sample loss
- Pulled point inserts are an economical choice for noncritical applications

### Recommended for the following instruments:

- Beckman
- CTC
- Gilson
- Knauer
- Shimadzu
- Spark Holland
- Varian
- VWR (Merck)/Hitachi

For autosampler compatibility visit

[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### National Standard Opening Screw Thread Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
8-425 Screw Thread Vial	Clear	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4013-1</b>	100
	Clear	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4013-1500</b>	1000
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4013-1W</b>	100
	Amber	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4013-2</b>	100
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4013-2W</b>	100
8-425 Screw Thread Vial, silanized*	Clear	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4013-S1</b>	100
8-425 Screw Thread 250µL Conical MicroVial	Polypropylene	No	12x32	Conical	475µL	250µL	<4	<b>C4013-11</b>	100
8-425 Screw Thread 600µL Tapered MicroVial	Polypropylene	No	12x32	High Recovery	850µL	675µL	<8	<b>C4013-13</b>	1000
200µL MicroSert Insert	Clear	–	5x31	Flat Bottom	250µL	200µL	<12	<b>C4012-465</b>	500
150µL Polyspring Insert	Clear	–	5x29	Pulled point	200µL	175µL	<1	<b>C4012-530</b>	100
150µL Insert	Clear	–	5x29	Pulled point	200µL	175µL	<1	<b>C4012-529</b>	100
125µL Polyspring Insert	Polypropylene	–	5x29	Precision point	175µL	125µL	<2	<b>C4012-530P</b>	100
150µL Polyspring Insert, silanized*	Clear	–	5x29	Pulled point	200µL	175µL	<1	<b>C4012-S530</b>	100

\* For information about silanized products visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

## National Screw Thread Caps and Septa

- Open top caps are designed to be used with any of our 8mm septa
- Phenolic caps are suitable for autoclaving and low temperature applications
- Polypropylene caps are chemically inert and suitable for most chromatography applications
- Flanged caps are preferred for Shimadzu, Hitachi and Tosoh autosamplers
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Closures are shipped in sealed polybags to prevent contamination during transport



### National 8-425 Screw Thread Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
8mm Open Top Cap 5.5mm hole	Black	Polypropylene	–	–	–	<b>C4013-1A</b>	100
8mm Open Top Cap with flange, 5.5mm hole	Black	Polypropylene	–	–	–	<b>C4013-3A</b>	100
	Yellow	Polypropylene	–	–	–	<b>C4013-98Y</b>	1000
	White	Polypropylene	–	–	–	<b>C4013-98W*</b>	100
Septum for 8-425 Screw Caps	–	–	White Virgin PTFE, 0.01" Septum	53	0.25	<b>C4013-10</b>	1000
	–	–	Ivory PTFE/Red Rubber Septum	45	1.00	<b>C4013-30</b>	100
	–	–	Blue PTFE/White Silicone, Pre-slit Septum	55	0.90	<b>C4013-32</b>	100
	–	–	Red PTFE/White Silicone/ Red PTFE Septum	45	1.00	<b>C4013-40</b>	100
	–	–	Red PTFE/White Silicone Septum	45	1.30	<b>C4013-60</b>	100
	–	–	Tan PTFE/White Silicone Septum	45	1.50	<b>C4013-61</b>	1000
8mm Open Top Cap, 5.5mm hole	Black	Polypropylene	Ivory PTFE/Red Rubber	45	1.00	<b>C4013-30A</b>	100
	Black	Polypropylene	Red PTFE/White Silicone/Red PTFE	45	1.00	<b>C4013-40A</b>	100
	Black	Polypropylene	Red PTFE/White Silicone	45	1.30	<b>C4013-60A</b>	100
	Pink	Polypropylene	Red PTFE/White Silicone	45	1.30	<b>C4013-60P</b>	100
8mm Open Top Cap with flange, 5.5mm hole	Black	Polypropylene	Red PTFE/White Silicone	45	1.30	<b>C4013-63A</b>	100
	White	Polypropylene	Red PTFE/White Silicone	45	1.30	<b>C4013-63W</b>	100
	Yellow	Polypropylene	Red PTFE/White Silicone	50	1.30	<b>C4013-63Y</b>	100
	Black	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	0.90	<b>C4013-64A</b>	100
	White	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	0.90	<b>C4013-64W</b>	100
8mm Open Top Cap, 5.5mm hole	Black	Phenol	Red PTFE/White Silicone	45	1.30	<b>C4013-74A</b>	100
8mm Open Top Cap with flange, 5.5mm hole	Black	Polypropylene	Red PTFE/White Silicone, Pre-slit	55	1.00	<b>C4013-77A</b>	100
8mm Solid Top Cap, 8-425 thread	White	Urea	PTFE/PE Foam Liner	–	1.30	<b>B7815-8</b>	100
8mm Open Top Cap, 5.5mm hole	Black	Polypropylene	Bonded Red PTFE/White Silicone, Pre-slit	45	1.30	<b>C4013-69A</b>	100
8mm Open Top Cap with flange with Integral PE Membrane	Yellow	Polyethylene	Polyethylene	N/A	N/A	<b>C4013-50Y</b>	1000

\* Additional colors on request

## National Standard Opening Screw Thread Vial Convenience Kits

- Save time during sample preparation
- Reduce the risk of contamination

### Unassembled kits

- Includes 100 vials and 100 caps with pre-assembled septa
- Reusable two compartment trays protect vials and closure while keeping matching supplies together
- Clear trays make it easy to keep track of available supplies without opening containers

### Assembled kits

- Include 100 vials with pre-attached caps and septa
- Packaged in convenient vial trays with clear covers or in economical polybags



Items not shown to scale

### National Standard Opening Screw Thread Vial Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap/Septum Cat. No.	Cat. No.	Pack of
Convenience Kit	Clear	No	Black, flanged	Red PTFE/White Silicone	C4013-1	C4013-63A	<b>C4013-14</b>	100
	Clear	No	Black	Red PTFE/White Silicone	C4013-1	C4013-60A	<b>C4013-15</b>	100
	Clear	No	Pink	Red PTFE/White Silicone	C4013-1	C4013-60P	<b>C4013-15P</b>	100
	Amber	No	Black	Red PTFE/White Silicone	C4013-2	C4013-60A	<b>C4013-17</b>	100
	Clear	Yes	Black, flanged	Red PTFE/White Silicone, Pre-slit	C4013-1W	C4013-77A	<b>C4013-95W</b>	100
	Clear	No	Black, phenolic	Red PTFE/White Silicone	C4013-1	C4013-74A	<b>C4013-492</b>	100
	Clear	Yes	Yellow, flanged	Red PTFE/White Silicone	C4013-1W	C4013-63Y	<b>C4013-54Y</b>	100
	Clear	Yes	Yellow, flanged	Red PTFE/White Silicone/Red PTFE	C4013-1W	C4013-67Y	<b>C4013-97Y</b>	100
Assembled Kit	Clear	No	Black	White Virgin PTFE, 0.01"	C4013-1	C4013-1A/ C4013-10	<b>C4013-10A</b>	100
	Clear	No	Black	Red PTFE/White Silicone	C4013-1	C4013-60A	<b>C4013-15A</b>	100
	Amber	No	Black	Red PTFE/White Silicone	C4013-2	C4013-60A	<b>C4013-17A</b>	100
	Clear	No	Black, flanged	Blue PTFE/White Silicone, Pre-slit	C4013-1	C4013-3A/ C4013-32	<b>C4013-32A</b>	100
	Clear	Yes	Yellow, flanged	Red PTFE/White Silicone, Pre-slit	C4013-1W	C4013-98Y/ C4013-60TW	<b>C4013-36A</b>	100
	Clear	No	Black, flanged	Red PTFE/White Silicone	C4013-1	C4013-63A	<b>C4013-57</b>	100
	Clear	No	White, flanged	Red PTFE/White Silicone	C4013-1	C4013-63W	<b>C4013-58</b>	100
	Clear	No	Black, phenolic	Red PTFE/White Silicone	C4013-1	C4013-74A	<b>C4013-492A</b>	100
	Amber	No	Black, phenolic	Red PTFE/White Silicone	C4013-2	C4013-74A	<b>C4013-494A</b>	100
Assembled Kit, in Polybag	Clear	No	Black	White Virgin PTFE, 0.01"	C4013-1	C4013-1A/ C4013-10	<b>C4013-010A</b>	100
	Clear	Yes	Yellow, flanged	Red PTFE/White Silicone	C4013-1W	C4013-63Y	<b>C4013-37Y</b>	100



## National Target DP 9mm Wide Opening Screw Thread Vials

2mL, 12x32mm, 9mm wide opening short screw thread vials and inserts

**Recommended for most brands of autosamplers:**

For autosampler compatibility visit  
[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

- C5000 SureStop 9mm vials as part of the Advanced Vial Closure System (AVCS) offer the sealing and performance characteristics of a crimp top vial and remove any subjectivity achieving optimal seal compression closing a vial by incorporating a definite stop point into the design of the vial finish. They should be used with AVCS C5000 closures in order to get the best possible performance, see pages **2-005** to **2-006**.
- Some vials feature an I-D write-on patch with graduation for convenient sample identification
- Wide neck opening design, allows easy filling, requires Micro-Inserts with a diameter of 6mm
- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts
- Available silanized (deactivated) for optimal recovery of critical polar compounds
- Polyspring inserts are self-aligning and provide a cushion against needle contact
- Precision point insert minimizes residual sample loss



### National 9mm Wide Opening Screw Thread Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
9mm SureStop Vial (AVCS)	Clear	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C5000-1</b>	100
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C5000-1W</b>	100
	Amber	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C5000-2</b>	100
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C5000-2W</b>	100
9mm Target DP Vial	Clear	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4000-1</b>	100
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4000-1W</b>	100
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4000-2W</b>	100
	Amber PP	Graduated	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4000-12</b>	100
	Clear PP	Graduated	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4000-14</b>	100
9mm Target DP ColorBand Vial	Clear	Blue**	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4000-1B</b>	100
	Clear	Green**	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4000-1G</b>	100
	Clear	Red**	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4000-1R</b>	100
	Clear	Yellow**	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4000-1Y</b>	100



### National Target DP 9mm Wide Opening Screw Thread Vials and Inserts (Continued)

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
9mm Target DP Vial, High Recovery with 30µL Reservoir	Clear	No	12x32	Tapered Base	1.7mL	1.3mL	<4	<b>C4000-9</b>	100
	Amber	No	12x32	Tapered Base	1.7mL	1.3mL	<4	<b>C4000-9A</b>	100
9mm Target DP Vial, Total Recovery with 10µL Reservoir	Clear	No	12x32	Deep Well Base	1.5mL	1.2mL	<1	<b>C4000-9TR</b>	100
9mm Target DP MacroVial 350µL, Fused Insert	Clear	No	12x32	Insert Vial	475µL	350µL	<2	<b>C4000-LV1</b>	100
	Clear	Yes	12x32	Insert Vial	475µL	350µL	<2	<b>C4000-LV1W</b>	100
	Amber	No	12x32	Insert Vial	475µL	350µL	<2	<b>C4000-LV2</b>	100
	Amber	Yes	12x32	Insert Vial	475µL	350µL	<2	<b>C4000-LV2W</b>	100
9mm Target DP MacroVial 200µL, Fused Insert	Clear	Yes	12x32	Insert Vial	375µL	240µL	<1	<b>C4000-LV3W</b>	100
9mm Target DP Micro-V Tapered MicroVial with 150µL reservoir	Clear	No	12x32	Tapered Base	1.4mL	1.0mL	<4	<b>C4000-V1</b>	100
	Amber	No	12x32	Tapered Base	1.4mL	1.0mL	<4	<b>C4000-V2</b>	100
9mm Target DP Vial, silanized*	Clear	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4000-S1</b>	100
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4000-S1W</b>	100
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4000-S2W</b>	100
9mm Target DP Vial, High Recovery, silanized*, with 30µL Reservoir	Clear	No	12x32	Tapered Base	1.7mL	1.3mL	<4	<b>C4000-S9</b>	100
9mm Target DP 300µL Vial	Polypropylene	No	12x32	Conical	400µL	300µL	<2	<b>C4000-11</b>	100
350µL Insert	Clear	–	6x31	Pulled Point	400µL	350µL	<4	<b>C4010-627L</b>	100
300µL Insert	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-629</b>	100
350µL Insert	Clear	–	6x31	Precision Point	400µL	350µL	<2	<b>C4010-629L</b>	100
300µL Insert, Graduation Marks	Polypropylene	–	6x30	Conical	325µL	250µL	<2	<b>C4010-629P</b>	100
300µL Polyspring Insert	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-630</b>	100
	Polypropylene	–	6x30	Conical	325µL	250µL	<2	<b>C4010-630P</b>	100
400µL MicroSert Insert	Clear	–	6x31	Flat Bottom	500µL	450µL	<25	<b>C4011-631</b>	100
	Polypropylene	–	6x31	Flat Bottom	500µL	450µL	<25	<b>C4011-631P</b>	500
300µL Insert, silanized*	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-S629</b>	100
300µL Polyspring Insert, silanized*	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-S630</b>	100
400µL MicroSert Insert, silanized*	Clear	–	6x31	Flat Bottom	500µL	450µL	<25	<b>C4011-S631</b>	500
300µL Polyspring Insert, Kimshield*	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-K630</b>	100

\* For information about silanized products visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

\*\*Target DP ColorBand vials are designed to provide full sample color coding for autosamplers with optical vial detection. Use the optimum cap for your instrument without sacrificing your color coding scheme.

## National 9mm Screw Caps and Septa

C5000 closures featuring AVCS technology (Advanced Vial Closure System)



- Elimination of septum “push-through”
- Increased sealing capability
- Improved autosampler compatibility
- Flexibility to select the best septum for your instrument and applications
- Cost efficient alternative to caps with bonded septa
- Optimized ergonomics, fine texturing and evenly spaced ribbing for superior handling

Further features are:

- Fully compatible with all National Target DP vials
- Easy-on, easy-off convenience with just one turn
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Polypropylene caps are chemically inert and suitable for most chromatography applications
- Closures have the profile of a crimp or snap closure for compatibility with robotic autosamplers
- Closures are shipped in sealed polybags to prevent contamination during transport



### National 9mm Screw Thread Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
9mm Open Top Screw Cap, 6mm hole	Blue	Polypropylene	–	N/A	N/A	<b>C5000-98B</b>	100
Septum for 9mm Screw Thread Cap	–	–	Ivory PTFE/Red Rubber	35	1.0	<b>C4000-30</b>	100
	–	–	Red PTFE/White Silicone/Red PTFE	45	1.0	<b>C4000-40</b>	100
	–	–	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>C4000-55</b>	100
	–	–	Red PTFE/White Silicone	50	1.0	<b>C4000-60</b>	100
	–	–	Yellow PTFE/White Silicone	40	1.0	<b>C4000-60Y</b>	100
	–	–	Yellow PTFE/White Silicone	40	1.0	<b>C4000-61</b>	1000
	–	–	Yellow PTFE/White Silicone/Yellow PTFE	40	1.0	<b>C4000-40Y</b>	100
	–	–	Yellow PTFE/White Silicone/Yellow PTFE	40	1.0	<b>C4000-41</b>	1000
9mm Open Top Cap, 6mm hole	Blue	Polypropylene	Soft septum, PTFE/Blue Silicone	30	1.0	<b>C5000-44B</b>	100
	Blue	Polypropylene	Soft septum, PTFE/Blue Silicone, Pre-slit	30	1.0	<b>C5000-45B</b>	100
	Black	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	<b>C5000-51A</b>	100
	Blue	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	<b>C5000-51B</b>	100
	Green	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	<b>C5000-51G</b>	100
	Red	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	<b>C5000-51R</b>	100
	Yellow	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	<b>C5000-51Y</b>	100
	Pink	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	<b>C5000-51P</b>	100



### National 9mm Screw Thread Caps and Septa (Continued)

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
9mm Open Top Cap, 6mm hole	Black	Polypropylene	Red PTFE/White Silicone/Red PTFE	50	1.0	<b>C5000-53A</b>	100
	Blue	Polypropylene	Red PTFE/White Silicone/Red PTFE	50	1.0	<b>C5000-53B</b>	100
	Green	Polypropylene	Red PTFE/White Silicone/Red PTFE	50	1.0	<b>C5000-53G</b>	100
	Red	Polypropylene	Red PTFE/White Silicone/Red PTFE	50	1.0	<b>C5000-53R</b>	100
	Yellow	Polypropylene	Red PTFE/White Silicone/Red PTFE	50	1.0	<b>C5000-53Y</b>	100
	Yellow	Polypropylene	Yellow PTFE/White Silicone/Yellow PTFE	40	1.0	<b>C5000-53YY</b>	100
	Green	Polypropylene	Yellow PTFE/White Silicone/Yellow PTFE	40	1.0	<b>C5000-53GY</b>	100
	Black	Polypropylene	Red PTFE/White Silicone	55	1.0	<b>C5000-54A</b>	100
	Blue	Polypropylene	Red PTFE/White Silicone	55	1.0	<b>C5000-54B</b>	100
	Green	Polypropylene	Red PTFE/White Silicone	55	1.0	<b>C5000-54G</b>	100
	Red	Polypropylene	Red PTFE/White Silicone	55	1.0	<b>C5000-54R</b>	100
	Yellow	Polypropylene	Red PTFE/White Silicone	55	1.0	<b>C5000-54Y</b>	100
	Pink	Polypropylene	Red PTFE/White Silicone	55	1.0	<b>C5000-54P</b>	100
	Yellow	Polypropylene	Yellow PTFE/White Silicone	40	1.0	<b>C5000-54YY</b>	100
	Green	Polypropylene	Yellow PTFE/White Silicone	40	1.0	<b>C5000-54GY</b>	100
	Red	Polypropylene	Yellow PTFE/White Silicone	40	1.0	<b>C5000-54RY</b>	100
	Blue	Polypropylene	Yellow PTFE/White Silicone	40	1.0	<b>C5000-54BY</b>	100
	Black	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>C5000-55A</b>	100
	Blue	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>C5000-55B</b>	100
Green	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>C5000-55G</b>	100	
Red	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>C5000-55R</b>	100	
Yellow	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>C5000-55Y</b>	100	
Pink	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>C5000-55P</b>	100	
Blue	Polypropylene	Ivory PTFE/Red Rubber, Pre-slit	45	1.0	<b>C5000-57B</b>	100	
Green	Polypropylene	Ivory PTFE/Red Rubber, Pre-slit	45	1.0	<b>C5000-57G</b>	100	
9mm Cap with Integral PP Membrane	Clear	Polypropylene	Polypropylene	N/A	N/A	<b>C5000-50</b>	100
	Blue	Polypropylene	Polypropylene	N/A	N/A	<b>C5000-50B</b>	100
9mm Solid Top Cap	Blue	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	<b>C5000-99B</b>	100
9mm Open Top Cap, 6mm hole	Black	Polypropylene	Bonded Red PTFE/White Silicone	45	1.0	<b>C5000-64B</b>	100
	Gray	Polypropylene	Bonded Red PTFE/White Silicone, Pre-slit	45	1.0	<b>C5000-75C</b>	100
	Blue	Polypropylene	Bonded Natural PTFE/Clear Silicone	45	1.3	<b>C5000-62B</b>	100
Magnetic 9mm Open Top Cap, 6mm hole	Blue	Polypropylene	Soft septum, PTFE/Blue Silicone	30	1.0	<b>C5000-46M</b>	100
	Blue	Polypropylene	Soft septum, PTFE/Blue Silicone, Pre-slit	30	1.0	<b>C5000-47M</b>	100
9mm Open Top Cap, 6mm hole	Blue	Polypropylene	Solid Aluminum Disk with Silicone sealing ring		0.06	<b>C5000-56AL</b>	100
	Blue	Polypropylene	Solid PTFE Disk with Silicone sealing ring	53	0.25	<b>C5000-52AE</b>	100

## National 9mm Screw Thread Vials Convenience Kits

- Save time during sample preparation
- Reduce the risk of contamination

### Unassembled kits

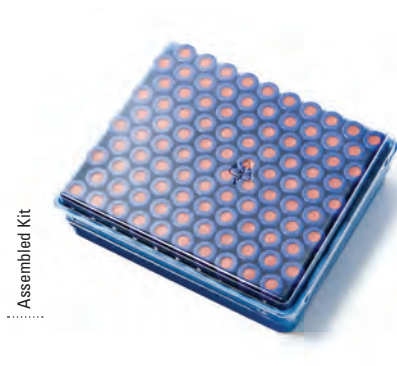
- Includes 100 vials and 100 caps with pre-assembled septa
- Reusable two compartment trays protect vials and closure while keeping matching supplies together
- Clear trays make it easy to keep track of available supplies without opening containers

### Assembled kits

- Include 100 vials with pre-attached caps and septa
- Packaged in convenient vial trays with clear covers



Convenience Kit



Assembled Kit

Items not shown to scale

## National 9mm Wide Opening Screw Thread Vials Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
SureStop Convenience Kit	Clear	No	Blue	Ivory PTFE/Red Rubber	C5000-1	C5000-51B	<b>C5000-580</b>	100
	Clear	Yes	Blue	Ivory PTFE/Red Rubber	C5000-1W	C5000-51B	<b>C5000-580W</b>	100
	Clear	No	Blue	Red PTFE/White Silicone	C5000-1	C5000-54B	<b>C5000-592</b>	100
	Clear	Yes	Blue	Red PTFE/White Silicone	C5000-1W	C5000-54B	<b>C5000-592W</b>	100
	Clear	Yes	Blue	Red PTFE/White Silicone/Red PTFE	C5000-1W	C5000-53B	<b>C5000-586W</b>	100
	Clear	Yes	Blue	Blue PTFE/White Silicone, Pre-slit	C5000-1W	C5000-55B	<b>C5000-595W</b>	100
AVCS Convenience Kit	Clear	No	Blue	Ivory PTFE/Red Rubber	C4000-1	C5000-51B	<b>C5000-80</b>	100
	Clear	Yes	Blue	Ivory PTFE/Red Rubber	C4000-1W	C5000-51B	<b>C5000-80W</b>	100
	Amber	Yes	Pink	Ivory PTFE/Red Rubber	C4000-2W	C5000-51P	<b>C5000-82P</b>	100
	Amber	Yes	Blue	Ivory PTFE/Red Rubber	C4000-2W	C5000-51B	<b>C5000-82W</b>	100
	Clear	Yes	Blue	Ivory PTFE/Red Rubber, Pre-slit	C4000-1W	C5000-57B	<b>C5000-83W</b>	100
	Clear	No	Blue	Red PTFE/White Silicone/Red PTFE	C4000-1	C5000-53B	<b>C5000-86</b>	100
	Clear	Yes	Blue	Red PTFE/White Silicone/Red PTFE	C4000-1W	C5000-53B	<b>C5000-86W</b>	100
	Amber	Yes	Blue	Red PTFE/White Silicone/Red PTFE	C4000-2W	C5000-53B	<b>C5000-88W</b>	100
	Polypropylene	No	Blue	Red PTFE/White Silicone	C4000-11	C5000-54B	<b>C5000-87</b>	100
	Clear	Yes	Black	Red PTFE/White Silicone	C4000-1W	C5000-54A	<b>C5000-91W</b>	100
	Clear	No	Blue	Red PTFE/White Silicone	C4000-1	C5000-54B	<b>C5000-92</b>	100
	Clear	No	Pink	Red PTFE/White Silicone	C4000-1	C5000-54P	<b>C5000-92P</b>	100
	Clear	Yes	Blue	Red PTFE/White Silicone	C4000-1W	C5000-54B	<b>C5000-92W</b>	100
	Amber	Yes	Blue	Red PTFE/White Silicone	C4000-2W	C5000-54B	<b>C5000-94W</b>	100
	Clear	No	Blue	Blue PTFE/White Silicone, Pre-slit	C4000-1	C5000-55B	<b>C5000-95</b>	100
Clear	Yes	Blue	Blue PTFE/White Silicone, Pre-slit	C4000-1W	C5000-55B	<b>C5000-95W</b>	100	
Clear	No	Blue	Blue PTFE/White Silicone, Pre-slit	C4000-LV1	C5000-55B	<b>C5000-LV95</b>	100	
Polypropylene	No	Blue	Blue PTFE/White Silicone, Pre-slit	C4000-11	C5000-55B	<b>C5000-97</b>	100	
Convenience Kit	Clear	Yes	Black	Bonded Red PTFE/White Silicone	C4000-1W	C5000-64B	<b>C5000-78W</b>	100
	Clear	Yes	Gray	Bonded Red PTFE/White Silicone, Pre-slit	C4000-1W	C5000-75C	<b>C5000-93W</b>	100

### National 9mm Wide Opening Screw Thread Vials Convenience Kits (Continued)

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit	Clear	Yes	Yellow	Ivory PTFE/Red Rubber	C4000-1W	C5000-51Y	<b>C5000-80WY</b>	100
	Clear	Yes	Yellow	Yellow PTFE/White Silicone	C4000-1W	C5000-54YY	<b>C5000-92WY</b>	100
	Clear	Yes	Yellow	Yellow PTFE/White Silicone/ Yellow PTFE	C4000-1W	C5000-53YY	<b>C5000-86WY</b>	100
	Amber	Yes	Yellow	Yellow PTFE/White Silicone	C4000-2W	C5000-54YY	<b>C5000-94WY</b>	100
Assembled AVCS Kit	Clear	No	Blue	Ivory PTFE/Red Rubber	C4000-1	C5000-51B	<b>C5000-180</b>	100
	Clear	Yes	Blue	Ivory PTFE/Red Rubber	C4000-1W	C5000-51B	<b>C5000-180W</b>	100
	Amber	Yes	Blue	Ivory PTFE/Red Rubber	C4000-2W	C5000-51B	<b>C5000-182W</b>	100
	Clear	Yes	Blue	Ivory PTFE/Red Rubber, Pre-slit	C4000-1W	C5000-57B	<b>C5000-183W</b>	100
	Amber	Yes	Blue	Ivory PTFE/Red Rubber, Pre-slit	C4000-2W	C5000-57B	<b>C5000-184W</b>	100
	Clear	No	Blue	Red PTFE/White Silicone/Red PTFE	C4000-1	C5000-53B	<b>C5000-186</b>	100
	Clear	Yes	Blue	Red PTFE/White Silicone/Red PTFE	C4000-1W	C5000-53B	<b>C5000-186W</b>	100
	Clear	Yes	Red	Red PTFE/White Silicone/Red PTFE	C4000-1W	C5000-53R	<b>C5000-186WR</b>	100
	Amber	Yes	Blue	Red PTFE/White Silicone/Red PTFE	C4000-2W	C5000-53B	<b>C5000-188W</b>	100
	Clear	Yes	Yellow	Yellow PTFE/White Silicone/ Yellow PTFE	C4000-1W	C5000-53YY	<b>C5000-186WY</b>	100
	Clear	No	Blue	Red PTFE/White Silicone	C4000-1	C5000-54B	<b>C5000-192</b>	100
	Clear	Yes	Blue	Red PTFE/White Silicone	C4000-1W	C5000-54B	<b>C5000-192W</b>	100
	Amber	Yes	Blue	Red PTFE/White Silicone	C4000-2W	C5000-54B	<b>C5000-194W</b>	100
	Clear	Yes	Blue	Blue PTFE/White Silicone, Pre-slit	C4000-1W	C5000-55B	<b>C5000-195W</b>	100
	Amber	Yes	Blue	Blue PTFE/White Silicone, Pre-slit	C4000-2W	C5000-55B	<b>C5000-196W</b>	100

### National 9mm Wide Opening Screw Thread Vial Storerooms

- Storerooms organize supplies and save valuable bench space
- Some storerooms are shipped fully stocked.
- 6 Drawer Mini-Storeroom holds 500 vials and closures
- 9 Drawer Storeroom holds 2000 vials and closures



Items not shown to scale

### National 9mm Wide Opening Screw Thread Vial Storerooms

Description	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap/Septum Cat. No.	Cat. No.	Pack of
SureStop 9 Drawer Storeroom , 2000 pieces Caps and Vials	Clear	No	Blue	Red PTFE/White Silicone/Red PTFE	C5000-1	C5000-53B	<b>C5075-211</b>	1
	Clear	Yes	Blue	Red PTFE/White Silicone/Red PTFE	C5000-1W	C5000-53B	<b>C5075-213</b>	1
	Clear	No	Blue	Red PTFE/White Silicone	C5000-1	C5000-54B	<b>C5075-219</b>	1
6 Drawer Mini-Storeroom – Cabinet Only	–	–	–	–	–	–	<b>C4000-MS</b>	1
9 Drawer Storeroom, Full Size – Cabinet Only	–	–	–	–	–	–	<b>C4075-500</b>	1

## National 10mm Wide Opening Screw Thread Vials

2mL, 12x32mm 10mm wide opening screw thread vials and inserts

- 10-425 thread finish
- I-D vials feature a write-on patch with graduation for convenient sample identification
- Wide neck opening design, allows easy filling, requires Micro-Inserts with a diameter of 6mm
- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts
- Optional silanized (deactivated) glass provides optimal recovery of critical polar, labile or OH-interacting compounds\*
- Polyspring inserts are self-aligning and provide a cushion against needle contact
- Precision point insert minimizes residual sample loss

### Recommended for the following instruments:

- Jasco
- PerkinElmer
- Shimadzu
- Varian
- Waters

For autosampler compatibility visit

[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### National 10mm Wide Opening Screw Thread Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
10-425 Screw Thread Vial	Clear	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4010-1</b>	100
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4010-1W</b>	100
	Amber	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4010-2</b>	100
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4010-2W</b>	100
10-425 Screw Thread MacroVial 350µL, Fused Insert	Clear	No	12x32	Insert Vial	450µL	350µL	<2	<b>C4010-LV1</b>	100
	Amber	No	12x32	Insert Vial	450µL	350µL	<2	<b>C4010-LV2</b>	100
10-425 Screw Thread Micro-V 1.5mL Tapered MicroVial with 150µL reservoir	Clear	No	12x32	Tapered Base	1.5mL	1.1mL	<4	<b>C4010-V1</b>	100
10-425 Screw Thread Vial, silanized*	Clear	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4010-S1</b>	100
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4010-S1W</b>	100
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>C4010-S2W</b>	100
10-425 Screw Thread Vial	Polypropylene	No	12x32	Conical	600µL	400µL	<6	<b>C4010-11</b>	100
	Polypropylene	No	12x32	Reservoir Base	750µL	550µL	<70	<b>C4010-14</b>	100

\* For information about silanized products visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### National 10mm Wide Opening Screw Thread Vials and Inserts (Continued)

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
350µL Insert	Clear	–	6x31	Pulled Point	400µL	350µL	<4	<b>C4010-627L</b>	100
300µL Insert	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-629</b>	100
350µL Insert	Clear	–	6x31	Precision Point	400µL	350µL	<2	<b>C4010-629L</b>	100
300µL Insert, Graduation Marks	Polypropylene	–	6x30	Conical	325µL	250µL	<2	<b>C4010-629P</b>	100
300µL Polyspring Insert	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-630</b>	100
	Polypropylene	–	6x30	Conical	325µL	250µL	<2	<b>C4010-630P</b>	100
400µL MicroSert Insert	Clear	–	6x31	Flat Bottom	500µL	450µL	<25	<b>C4011-631</b>	500
	Polypropylene	–	6x31	Flat Bottom	500µL	450µL	<25	<b>C4011-631P</b>	500
300µL Insert, silanized*	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-S629</b>	100
300µL Polyspring Insert, silanized*	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-S630</b>	100
400µL MicroSert Insert, silanized*	Clear	–	6x31	Flat Bottom	500µL	450µL	<25	<b>C4011-S631</b>	500
300µL Polyspring Insert, Kimshield*	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-K630</b>	100

\* For information about silanized products visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

Search thousands of applications at our chromatography resource center.

[www.thermoscientific.com/crc](http://www.thermoscientific.com/crc)



## National 10-425 Wide Opening Screw Caps and Septa

- Open top caps are designed to be used with any of our 10mm septa
- Polypropylene caps are chemically inert and suitable for most chromatography applications
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Closures are shipped in sealed polybags to prevent contamination during transport



### National 10-425 Wide Opening Screw Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
10mm Open Top Cap, 8.5mm hole	Light Blue	Polypropylene	–	–	–	<b>C4010-1A</b>	100
	White	Polypropylene	–	–	–	<b>C4010-98W</b>	100
	Black	Polypropylene	–	–	–	<b>C4010-98BLK</b>	100
Septum for 10-425 Screw Caps	–	–	White Virgin PTFE, 0.01" Septum	53	0.25	<b>C4010-10</b>	1000
	–	–	Red PTFE/White Silicone, Soft Septum	50	1.3	<b>C4010-35</b>	100
	–	–	Red PTFE/White Silicone/Red PTFE Septum	45	1.3	<b>C4010-40</b>	100
	–	–	Blue PTFE/White Silicone, Pre-slit Septum	55	1.5	<b>C4010-55</b>	100
	–	–	Red PTFE/White Silicone Septum	45	1.3	<b>C4010-60</b>	100
10mm Open Top Cap, 8.5mm hole	Black	Polypropylene	Tan PTFE/White Silicone	40	1.5	<b>C4010-62BLK</b>	100
	Black	Polypropylene	Tan PTFE/White Silicone, Pre-slit	40	1.5	<b>C4010-63BLK</b>	100
	Light Blue	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	<b>C4010-30A</b>	100
	Black	Polypropylene	Red PTFE/White Silicone, Soft	45	1.3	<b>C4010-35BLK</b>	100
	White	Polypropylene	Red PTFE/White Silicone, Soft	45	1.3	<b>C4010-35W</b>	100
	Light Blue	Polypropylene	Red PTFE/White Silicone/Red PTFE	45	1.0	<b>C4010-40A</b>	100
	Light Blue	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.5	<b>C4010-55A</b>	100
	Black	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.5	<b>C4010-55BLK</b>	100
	Light Blue	Polypropylene	Red PTFE/White Silicone	50	1.3	<b>C4010-60A</b>	100
	Red	Polypropylene	Red PTFE/White Silicone	50	1.3	<b>C4010-60AR</b>	1000
	White	Polypropylene	Red PTFE/White Silicone	50	1.3	<b>C4010-60AW</b>	1000
	Black	Polypropylene	Red PTFE/White Silicone	50	1.3	<b>C4010-60BLK</b>	100
	Light Blue	Polypropylene	Red PTFE/White Silicone, Star-slit	50	1.5	<b>C4010-65A</b>	100
10mm Solid Top Cap	White	Polyurethane	PTFE/PE Foam Liner	–	1.3	<b>C4010-99</b>	100
10mm Cap with integral PP Membrane	Clear	Polypropylene	Polypropylene	N/A	N/A	<b>C4010-5A</b>	100

## National 10mm Wide Opening Screw Thread Vials Convenience Kits

- Save time during sample preparation
- Reduce the risk of contamination

### Unassembled kits

- Includes 100 vials and 100 caps with pre-assembled septa
- Reusable two compartment trays protect vials and closure while keeping matching supplies together
- Clear trays make it easy to keep track of available supplies without opening containers

### Assembled kits

- Include 100 vials with pre-attached caps and septa
- Packaged in convenient vial trays with clear covers or in economical polybags



Items not shown to scale

### National 10mm Wide Opening Screw Thread Vials Convenience Kits

Description	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit	Clear	No	Light Blue	Red PTFE/White Silicone	C4010-1	C4010-60A	<b>C4010-88</b>	100
	Amber	Yes	Light Blue	Red PTFE/White Silicone	C4010-2W	C4010-60A	<b>C4010-88AW</b>	100
	Clear	Yes	Light Blue	Red PTFE/White Silicone	C4010-1W	C4010-60A	<b>C4010-88W</b>	100
	Clear	No	White	Red PTFE/White Silicone, Soft	C4010-1	C4010-35W	<b>C4010-95</b>	100
	Clear	Yes	White	Red PTFE/White Silicone, Soft	C4010-1W	C4010-35W	<b>C4010-95W</b>	100
	Clear	Yes	Black	Blue PTFE/White Silicone, Pre-slit	C4010-1W	C4010-55BLK	<b>C4010-97W</b>	100
Assembled Kit	Clear	No	Light Blue	Red PTFE/White Silicone	C4010-1	C4010-60A	<b>C4010-17</b>	100
	Clear	Yes	Light Blue	Red PTFE/White Silicone	C4010-1W	C4010-60A	<b>C4010-17W</b>	100
	Clear	No	Light Blue	White Virgin PTFE, 0.01"	C4010-1	C4010-1A/C4010-10	<b>C4010-21</b>	100
	Clear	No	White	Red PTFE/White Silicone, Soft	C4010-1	C4010-35W	<b>C4010-57</b>	100
	Amber	No	White	Red PTFE/White Silicone, Soft	C4010-2	C4010-35W	<b>C4010-57A</b>	100
	Amber	Yes	White	Red PTFE/White Silicone, Soft	C4010-2W	C4010-35W	<b>C4010-57AW</b>	100
	Clear	Yes	White	Red PTFE/White Silicone, Soft	C4010-1W	C4010-35W	<b>C4010-57W</b>	100
	Clear	No	Black	Red PTFE/White Silicone, Soft	C4010-1	C4010-35BLK	<b>C4010-67</b>	100
	Amber	No	Black	Red PTFE/White Silicone, Soft	C4010-2	C4010-35BLK	<b>C4010-67A</b>	100
	Amber	Yes	Black	Red PTFE/White Silicone, Soft	C4010-2W	C4010-35BLK	<b>C4010-67AW</b>	100
	Clear	Yes	Black	Red PTFE/White Silicone, Soft	C4010-1W	C4010-35BLK	<b>C4010-67W</b>	100
	Clear	No	Black	Tan PTFE/White Silicone, Pre-slit	C4010-1	C4010-63BKL	<b>C4010-59</b>	100
Assembled Kit, in Polybag	Amber	Yes	Light Blue	Red PTFE/White Silicone	C4010-2W	C4010-60A	<b>C4010-017AW</b>	100
	Clear	Yes	Light Blue	Red PTFE/White Silicone	C4010-1W	C4010-60A	<b>C4010-017W</b>	100
	Clear	No	Light Blue	Red PTFE/White Silicone/Red PTFE	C4010-1	C4010-40A	<b>C4010-019</b>	100

## National 11mm Crimp Top Vials

2mL, 12x32, crimp top vials and inserts

**Recommended  
for most brands...**

For autosampler compatibility visit  
[www.thermoscientific.com/  
chromexpert](http://www.thermoscientific.com/chromexpert)

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- I-D vials feature a write-on patch with graduation for convenient sample identification
- Standard opening vials require Micro-Inserts with a diameter of 5mm
- Wide opening vials, allow easy filling, require Micro-Inserts with a diameter of 6mm
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts
- Optional silanized (deactivated) glass provides optimal recovery of critical polar, labile or OH-interacting compounds\*
- Polyspring inserts are self-aligning and provide a cushion against needle contact
- Precision point insert minimizes residual sample loss
- Pulled point inserts are an economical choice for noncritical applications
- Glastic vial features a glass insert pre-inserted inside of a clear TPX vial



### National 11mm Standard Opening Crimp Top Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
11mm Standard Opening Crimp Top Vial	Clear	No	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4012-1</b>	100
	Clear	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4012-1W</b>	100
	Amber	No	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4012-2</b>	100
	Amber	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4012-2W</b>	100
11mm Standard Opening Crimp /Snap Top Vial 150µL Clear Solid Glass Microvial	Clear	No	12x32	Narrow Conical	425µL	200µL	<2	<b>C4012-10</b>	12
11mm – Crimp/Snap Glastic Glass Insert/TPX Vial	Clear	No	12x32	Insert Vial	475µL	350µL	<4	<b>C4012-15</b>	100
200µL MicroSert Insert	Clear	–	5x31	Flat Bottom	250µL	200µL	<12	<b>C4012-465</b>	500
150µL Polyspring Insert	Clear	–	5x29	Pulled point	200µL	175µL	<1	<b>C4012-530</b>	100
150µL Insert	Clear	–	5x29	Pulled point	200µL	175µL	<3	<b>C4012-529</b>	100
200µL Insert	Clear	–	5x31	Pulled point	200µL	170µL	<2	<b>C4012-529L</b>	100
125µL Polyspring Insert	Polypropylene	–	5x29	Precision point	175µL	125µL	<2	<b>C4012-530P</b>	100
150µL Polyspring Insert, silanized*	Clear	–	5x29	Pulled point	200µL	175µL	<1	<b>C4012-S530</b>	100

\* For information about silanized products visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### National 11mm Wide Opening Crimp Top Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
11mm Crimp Top Vial, Wide Opening	Clear	No	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-1</b>	100
	Clear	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-1W</b>	100
	Amber	No	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-2</b>	100
	Amber	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-2W</b>	100
11mm Crimp Top ColorBand Vial, Wide Opening	Clear	Blue*	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-1B</b>	100
	Clear	Green*	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-1G</b>	100
	Clear	Red*	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-1R</b>	100
	Clear	Yellow*	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-1Y</b>	100
11mm Crimp/Snap MacroVial 250µL, Fused Insert	Clear	No	12x32	Fused Conical	500µL	350µL	<2	<b>C4011-LV1</b>	100

\* ColorBand vials are designed to provide full sample color coding for autosamplers with optical vial detection. Use the optimum cap for your instrument without sacrificing your color coding scheme.



### National 11mm Crimp Top Vials and Inserts (Continued)

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
11mm Crimp Top MacroVial 250µL, Fused Insert	Clear	Yes	12x32	Fused Conical	500µL	350µL	<2	<b>C4011-LV1W</b>	100
11mm Crimp/Snap MacroVial 250µL, Fused Insert	Amber	No	12x32	Fused Conical	500µL	350µL	<2	<b>C4011-LV2</b>	100
11mm Crimp Top MacroVial 250µL, Fused Insert	Amber	Yes	12x32	Fused Conical	500µL	350µL	<2	<b>C4011-LV2W</b>	100
11mm Crimp Top Solid Glass MicroVials	Clear	No	12x32	Conical Base	650µL	500µL	<5	<b>C4011-10</b>	12
11mm Crimp Top Micro-V Microsampling Vial, 15µL Reservoir	Clear	No	12x32	High Recovery	1.5mL	1.1mL	<4	<b>C4011-V1</b>	100
11mm Crimp Top 1.5mL High Recovery MicroVial	Clear	No	12x32	High Recovery	1.7mL	1.3mL	<4	<b>C4011-9</b>	100
11mm Crimp Top, Wide Opening, silanized*	Clear	No	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-S1</b>	100
	Clear	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-S1W</b>	100
	Amber	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-S2W</b>	100
11mm Crimp/Snap 250µL MicroVial	Polypropylene	No	12x32	Conical Base	475µL	300µL	<2	<b>C4011-13</b>	100
11mm Crimp/Snap 600µL MicroVial	Polypropylene	No	12x32	Conical Base	600µL	400µL	<4	<b>C4011-16</b>	100
11mm Crimp/Snap 800µL MicroVial	Polypropylene	No	12x32	Conical Base	800µL	600µL	<6	<b>C4011-11</b>	100

\* For information about silanized products visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### National 11mm Crimp Top Vials and Inserts (Continued)

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
11mm Crimp/Snap 850µL AP-2000 MaxVial	Polypropylene	No	12x32	High Recovery	825µL	650µL	<8	<b>C4011-15</b>	1000
11mm Crimp/Snap 1mL Vial	Polypropylene	No	12x32	Flat Bottom	1000µL	800µL	<80	<b>C4011-14</b>	100
11mm Crimp/Snap 1mL TPX High Recovery Vial	TPX	No	12x32	High Recovery	1000µL	750µL	<8	<b>C4011-24</b>	100
350µL Insert	Clear	–	6x31	Pulled Point	400µL	350µL	<4	<b>C4010-627L</b>	100
300µL Insert	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-629</b>	100
350µL Insert	Clear	–	6x31	Precision Point	400µL	350µL	<2	<b>C4010-629L</b>	100
300µL Insert, Graduation Marks	Polypropylene	–	6x30	Conical	325µL	250µL	<2	<b>C4010-629P</b>	100
300µL Polyspring Insert	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-630</b>	100
	Polypropylene	–	6x30	Conical	325µL	250µL	<2	<b>C4010-630P</b>	100
400µL MicroSert Insert	Clear	–	6x31	Flat Bottom	500µL	450µL	<25	<b>C4011-631</b>	500
	Polypropylene	–	6x31	Flat Bottom	500µL	450µL	<25	<b>C4011-631P</b>	500
300µL Insert, silanized*	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-S629</b>	100
300µL Polyspring Insert, silanized*	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-S630</b>	100
400µL MicroSert Insert, silanized*	Clear	–	6x31	Flat Bottom	500µL	450µL	<25	<b>C4011-S631</b>	500
300µL Polyspring Insert, Kimshield*	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-K630</b>	100

\* For information about silanized products visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

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## National 11mm Crimp Top Closures

- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Aluminum crimp closures provide a secure leak-resistant seal
- Aluminum seals must be applied with a crimping tool
- Closures are shipped in sealed polybags to prevent contamination during transport
- Synthetic PTFE/Red Rubber seal is specially formulated for improved background performance
- First crimp cap with assembled aluminum liner for analysis of elastomers, polymers, phthalates, halogenated compounds and silicones
- First crimp cap with tight PTFE sealing disk due to additional silicone ring



### National 11mm Crimp Top Closures

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
11mm Crimp Cap, 5.5mm hole	Silver	Aluminum	Clear PTFE/Natural Red Rubber	60	1.0	<b>C4011-1AP</b>	100
	Silver	Aluminum	Clear PTFE/Natural Red Rubber	60	1.0	<b>C4011-1A</b>	1000
	Blue	Aluminum	Clear PTFE/Natural Red Rubber	60	1.0	<b>C4011-98B</b>	100
	Green	Aluminum	Clear PTFE/Natural Red Rubber	60	1.0	<b>C4011-98G</b>	100
	Red	Aluminum	Clear PTFE/Natural Red Rubber	60	1.0	<b>C4011-98R</b>	100
	Yellow	Aluminum	Clear PTFE/Natural Red Rubber	60	1.0	<b>C4011-98Y</b>	100
	Silver	Aluminum	Red PTFE/White Silicone/Red PTFE	45	1.0	<b>C4011-2A</b>	100
11mm Crimp Cap, 5.5mm hole	Silver	Aluminum	Red PTFE/White Silicone	45	1.3	<b>C4011-4A</b>	100
	Blue	Aluminum	Red PTFE/White Silicone	45	1.3	<b>C4011-4B</b>	100
	Green	Aluminum	Red PTFE/White Silicone	45	1.3	<b>C4011-4G</b>	100
	Red	Aluminum	Red PTFE/White Silicone	45	1.3	<b>C4011-4R</b>	100
	Silver	Aluminum	Solid PTFE Disk with Silicone sealing ring	53	0.25	<b>C4011-6AE</b>	100
	Silver	Aluminum	Solid PTFE Disk	53	0.25	<b>C4011-6A</b>	1000
	Silver	Aluminum	PTFE/Synthetic Red Rubber	35	1.0	<b>C4011-7A</b>	100
11mm Crimp Cap, 5.5mm hole, Mixed Color, 200 each	Blue	Aluminum	PTFE/Synthetic Red Rubber	35	1.0	<b>C4011-7B</b>	1000
	Green	Aluminum	PTFE/Synthetic Red Rubber	35	1.0	<b>C4011-7G</b>	1000
	Red	Aluminum	PTFE/Synthetic Red Rubber	35	1.0	<b>C4011-7R</b>	1000
	Yellow	Aluminum	PTFE/Synthetic Red Rubber	35	1.0	<b>C4011-7Y</b>	1000
	Silver, Blue, Green, Red, Yellow	Aluminum	PTFE/Synthetic Red Rubber	35	1.0	<b>C4011-7K</b>	1000
	11mm Crimp Cap, 5.5mm hole	Silver	Aluminum	Solid Aluminum Disk with Silicone sealing ring		0.06	<b>C4011-3AL</b>

## National 11mm Crimping and Decrimping Tools

- Crimping tools provide a reproducible, secure vial closure
- Manual decrimping tools allow easy removal of aluminum seals without breakage
- Decapping pliers are an economical choice for small quantities of vials
- Clean room crimpers and decrimpers can be autoclaved



Items not shown to scale

### National 11mm Crimping and Decrimping Tools

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 11mm aluminum crimp seals	<b>C4012-100</b>	1
Decapping Pliers	Removes 11mm aluminum crimp seals; protective gloves recommended	<b>C4012-101</b>	1
Manual Decrimper	Removes 11mm aluminum crimp seals	<b>C4012-102</b>	1
Manual stainless steel Cleanroom Crimper	Attaches 11mm crimp seals	<b>C4012-100SS</b>	1
Manual stainless steel Cleanroom Decrimper	Removes 11mm crimp seals without vial damage	<b>C4012-102SS</b>	1

For electronic crimpers and decrimpers look on page **2-092**

## National 11mm Crimp Top Convenience Kits

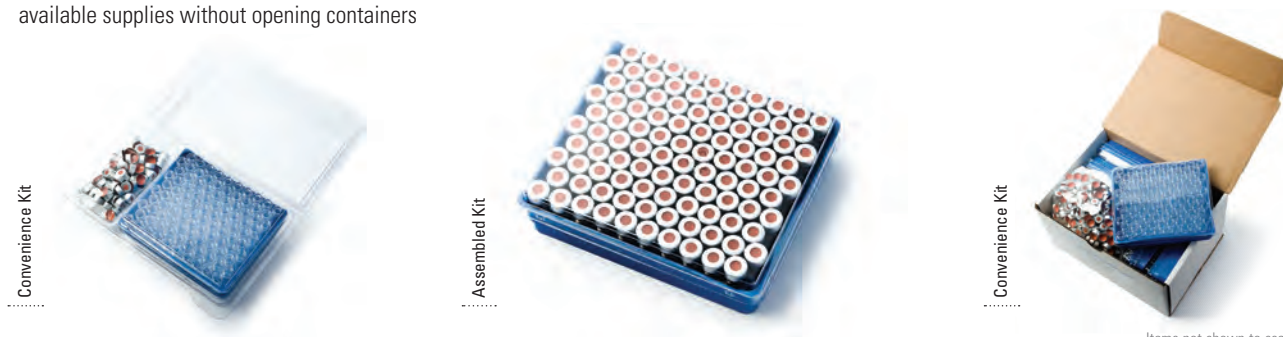
- Save time during sample preparation
- Reduce the risk of contamination

### Unassembled kits

- Includes 100 vials and 100 caps with pre-assembled septa
- Reusable two compartment trays protect vials and closure while keeping matching supplies together
- Clear trays make it easy to keep track of available supplies without opening containers

### Assembled kits

- Include 100 vials with pre-attached caps and septa
- Packaged in convenient vial trays with clear covers or in economical polybags



Items not shown to scale

### National 11mm Crimp Top Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat.No.	Cap Cat.No.	Cat. No.	Pack of
Convenience Kit, Standard Opening Crimp Top Vial	Clear	No	Silver	Clear PTFE/Red Rubber	C4012-1	C4011-1AHP	<b>C4012-88</b>	500
	Amber	No	Silver	Clear PTFE/Red Rubber	C4012-2	C4011-1AHP	<b>C4012-88A</b>	500
Convenience Kit, Wide Opening Crimp Top Vial	Clear	No	Silver	Clear PTFE/Red Rubber	C4011-1	C4011-1AP	<b>C4011-87</b>	100
	Clear	Yes	Silver	Clear PTFE/Red Rubber	C4011-1W	C4011-1AP	<b>C4011-87W</b>	100
	Amber	Yes	Silver	Clear PTFE/Red Rubber	C4011-2W	C4011-1AP	<b>C4011-87AW</b>	100
	Clear	No	Silver	Clear PTFE/Red Rubber	C4011-1	C4011-1AP	<b>C4011-88</b>	500
Kit includes Polyspring Tapered Insert for small sample volumes	Clear	Yes	Silver	Clear PTFE/Red Rubber	C4011-1W	C4011-1AP	<b>C4011-88W</b>	500
	Clear	No	Silver	PTFE/Synthetic Red Rubber	C4011-1	C4011-7A	<b>C4011-89W</b>	100
	Clear	No	Silver	Clear PTFE/Red Rubber	C4011-1/ C4010-630	C4011-1AP	<b>C4011-95</b>	100
Assembled Kit, Wide Opening Crimp Top Vial, Nitrogen purged	Clear	No	Silver	Clear PTFE/Red Rubber	C4011-1	C4011-1AP	<b>C4011-1CV</b>	100
	Amber	Yes	Silver	Clear PTFE/Red Rubber	C4011-2W	C4011-1AP	<b>C4011-2WCV</b>	100

## National 11mm Crimp Top Vial Storerooms

- Storerooms organize supplies and save valuable bench space
- 6 Drawer Mini-Storeroom holds 500 vials and closures
- 9 Drawer Storeroom holds 2000 vials and closures



Items not shown to scale

### National 11mm Crimp Top Vial Storerooms

Description	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
6 Drawer Mini-Storeroom, 500 pieces Caps and Vials	Clear	Yes	Silver	Clear PTFE/Red Rubber	C4011-1W	C4011-1AP	<b>C4011-688W</b>	1
6 Drawer Mini-Storeroom – Cabinet Only	–	–	–	–	–	–	<b>C4000-MS</b>	1
9 Drawer Storeroom – Cabinet Only	–	–	–	–	–	–	<b>C4075-500</b>	1

## National 11mm Crimp Top Vial Racks

- Polypropylene vial racks are resistant to most solvents
- Racks feature alphanumeric indexing for easier vial identification
- Racks can be stacked for efficient storage



Items not shown to scale

### National 11mm Crimp Top Vial Racks

Description	Capacity	Cat. No.	Pack of
PVC storage rack for 12x32mm vials with clear lid	100 vials, 10x10	<b>C4011-25</b>	1
Polypropylene storage rack for 12x32mm vials, no lid, reusable	50 vials, 5x10	<b>C4012-25</b>	1



## National 11mm Wide Opening Snap-It Vials

2mL, 12x32mm wide opening Snap-It vials and inserts

**Recommended for most brands of instruments:**

For autosampler compatibility visit  
[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- I-D vials feature a write-on patch with graduation for convenient sample identification
- Wide neck opening design, allows easy filling, requires Micro-Inserts with a diameter of 6mm
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts
- Optional silanized (deactivated) glass provides optimal recovery of critical polar, labile or OH-interacting compounds\*
- Polyspring inserts are self-aligning and provide a cushion against needle contact
- Precision point insert minimizes residual sample loss
- Pulled point inserts are an economical choice for noncritical applications
- Glastic vial features a glass insert pre-inserted inside of a clear TPX vial
- Snap-It vials can be used with snap caps or aluminum crimp seal closures



### National 11mm Wide Opening Snap-It Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
11mm Snap-It Vial	Clear	No	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-5</b>	100
	Clear	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-5W</b>	100
	Amber	No	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-6</b>	100
	Amber	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-6W</b>	100
11mm Snap-It MacroVial 250µL, Fused Insert	Clear	No	12x32	Fused Conical	500µL	350µL	<2	<b>C4011-LV1</b>	100
	Amber	No	12x32	Fused Conical	500µL	350µL	<2	<b>C4011-LV2</b>	100
11mm Snap-It High Recovery MicroVial, 1.5mL	Clear	No	12x32	High Recovery	1.7mL	1.3mL	<4	<b>C4011-4</b>	100
11mm Snap-It Vial, silanized*	Clear	No	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-S5</b>	100
	Clear	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-S5W</b>	100
	Amber	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	<b>C4011-S6W</b>	100
	Clear	No	12x32	High Recovery	1.5mL	1.1mL	<4	<b>C4011-S4</b>	100
11mm Snap-It Vial, Total Recovery with 10µL Reservoir	Clear	No	12x32	Deep Well Base	1.5mL	1.2mL	<1	<b>C4011-9TR</b>	100
11mm Snap-It 250µL MicroVial	Polypropylene	No	12x32	Conical Base	475µL	300µL	<2	<b>C4011-13</b>	100

\* For information about silanized products visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### National 11mm Wide Opening Snap-It Vials and Inserts (Continued)

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
11mm Snap-It 600µL MicroVial	Polypropylene	No	12x32	Conical Base	600µL	400µL	<4	<b>C4011-16</b>	100
11mm Snap-It 800µL MicroVial	Polypropylene	No	12x32	Conical Base	800µL	600µL	<6	<b>C4011-11</b>	100
11mm Snap-It 850µL AP-2000 MaxVial	Polypropylene	No	12x32	High Recovery	825µL	650µL	<8	<b>C4011-15</b>	1000
11mm Snap-It 1mL Vial	Polypropylene	No	12x32	Flat Bottom	1000µL	800µL	<80	<b>C4011-14</b>	100
11mm Snap-It 1mL TPX High Recovery Vial	TPX	No	12x32	High Recovery	1000µL	750µL	<8	<b>C4011-24</b>	100
11mm Snap-It Glastic Glass Insert/TPX Vial	Clear	No	12x32	Insert Vial	475µL	350µL	<4	<b>C4012-15</b>	100



### National 11mm Wide Opening Snap-It Vials and Inserts (Continued)

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
350µL Insert	Clear	–	6x31	Pulled Point	400µL	350µL	<4	<b>C4010-627L</b>	100
300µL Insert	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-629</b>	100
350µL Insert	Clear	–	6x31	Precision Point	400µL	350µL	<2	<b>C4010-629L</b>	100
300µL Insert, Graduation Marks	Polypropylene	–	6x30	Conical	325µL	250µL	<2	<b>C4010-629P</b>	100
300µL Polyspring Insert	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-630</b>	100
	Polypropylene	–	6x30	Conical	325µL	250µL	<2	<b>C4010-630P</b>	100
400µL MicroSert Insert	Clear	–	6x31	Flat Bottom	500µL	450µL	<25	<b>C4011-631</b>	500
	Polypropylene	–	6x31	Flat Bottom	500µL	450µL	<25	<b>C4011-631P</b>	500
300µL Insert, silanized*	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-S629</b>	100
300µL Polyspring Insert, silanized*	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-S630</b>	100
400µL MicroSert Insert, silanized*	Clear	–	6x31	Flat Bottom	500µL	450µL	<25	<b>C4011-S631</b>	500
300µL Polyspring Insert, Kimshield*	Clear	–	6x29	Conical	375µL	300µL	<1	<b>C4010-K630</b>	100

\* For information about silanized products visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

## National 11mm Wide Opening Snap-It Caps and Septa

- Redesign of locking tabs provides easier application and removal of caps
- Enlarged open area allows for needle penetration across the entire vial opening
- Textured outer surface for easier gripping and improved detection by autosamplers with optical vial sensors
- Fully compatible with all Snap-It vials
- Snap-It caps are easy to apply and easy to remove
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Snap-It caps eliminate the need for crimping or de-capping tools
- Polyethylene caps are chemically inert and suitable for most chromatography applications
- Closures are shipped in sealed polybags to prevent contamination during transport
- Integral Molded Polyethylene cap is an economical choice for routine HPLC applications, but with low sealing property and zero resealing capacity



### National 11mm Snap-It Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
11mm Snap-It Cap, thinned penetration area	Clear	Polyethylene	Integral Molded In Polyethylene	–	–	<b>C4011-50</b>	100
	Blue	Polyethylene	Integral Molded In Polyethylene	–	–	<b>C4011-50B</b>	100
	Green	Polyethylene	Integral Molded In Polyethylene	–	–	<b>C4011-50G</b>	100
	Red	Polyethylene	Integral Molded In Polyethylene	–	–	<b>C4011-50R</b>	100
11mm Snap-It Cap, 6mm hole	Clear	Polyethylene	Clear PTFE/Synthetic Red Rubber	60	1.0	<b>C4011-51</b>	100
	Blue	Polyethylene	Clear PTFE/Synthetic Red Rubber	60	1.0	<b>C4011-51B</b>	100
	Black	Polyethylene	Clear PTFE/Synthetic Red Rubber	60	1.0	<b>C4011-51BLK</b>	100
	Green	Polyethylene	Clear PTFE/Synthetic Red Rubber	60	1.0	<b>C4011-51G</b>	100
	Red	Polyethylene	Clear PTFE/Synthetic Red Rubber	60	1.0	<b>C4011-51R</b>	100
	Clear	Polyethylene	White Virgin PTFE, 0.01"	53	0.25	<b>C4011-52</b>	100
	Blue	Polyethylene	White Virgin PTFE, 0.01"	53	0.25	<b>C4011-52B</b>	100
	Green	Polyethylene	White Virgin PTFE, 0.01"	53	0.25	<b>C4011-52G</b>	100
	Red	Polyethylene	White Virgin PTFE, 0.01"	53	0.25	<b>C4011-52R</b>	100
	Yellow	Polyethylene	White Virgin PTFE, 0.01"	53	0.25	<b>C4011-52Y</b>	100
	Orange	Polyethylene	White Virgin PTFE, 0.01"	53	0.25	<b>C4011-52OR</b>	1000
	Orange	Polyethylene	Ivory PTFE/Red Rubber	45	1.0	<b>C4011-51OR</b>	100
	Orange	Polyethylene	Ivory PTFE/Red Rubber	45	1.0	<b>C4011-510OR</b>	1000
	Clear	Polyethylene	Red PTFE/White Silicone/Red PTFE	45	1.0	<b>C4011-53</b>	100
	Blue	Polyethylene	Red PTFE/White Silicone/Red PTFE	45	1.0	<b>C4011-53B</b>	100
	Red	Polyethylene	Red PTFE/White Silicone/Red PTFE	45	1.0	<b>C4011-53R</b>	100
	Yellow	Polyethylene	Red PTFE/White Silicone/Red PTFE	45	1.0	<b>C4011-53Y</b>	100
	Orange	Polyethylene	Red PTFE/White Silicone/Red PTFE	45	1.0	<b>C4011-53OR</b>	100
	Orange	Polyethylene	Red PTFE/White Silicone/Red PTFE	45	1.0	<b>C4011-530OR</b>	1000
	Clear	Polyethylene	Red PTFE/White Silicone	50	1.0	<b>C4011-54</b>	100
Blue	Polyethylene	Red PTFE/White Silicone	50	1.0	<b>C4011-54B</b>	100	
Black	Polyethylene	Red PTFE/White Silicone	50	1.0	<b>C4011-54BLK</b>	100	
Green	Polyethylene	Red PTFE/White Silicone	50	1.0	<b>C4011-54G</b>	100	

## National 11mm Snap-It Caps and Septa (Continued)

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
11mm Snap-It Cap, 6mm hole	Red	Polyethylene	Red PTFE/White Silicone	50	1.0	<b>C4011-54R</b>	100
	Yellow	Polyethylene	Red PTFE/White Silicone	50	1.0	<b>C4011-54Y</b>	100
	Orange	Polyethylene	Red PTFE/White Silicone	55	1.0	<b>C4011-54OR</b>	100
	Orange	Polyethylene	Red PTFE/White Silicone	55	1.0	<b>C4011-5400R</b>	1000
	Clear	Polyethylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>C4011-55</b>	100
	Blue	Polyethylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>C4011-55B</b>	100
	Black	Polyethylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>C4011-55BLK</b>	100
	Green	Polyethylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>C4011-55G</b>	100
	Red	Polyethylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>C4011-55R</b>	100
	Yellow	Polyethylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	<b>C4011-55Y</b>	100
	Clear	Polyethylene	Red PTFE/White Silicone, Star-slit	45	1.3	<b>C4011-59</b>	100
	Pink	Polyethylene	Red PTFE/White Silicone, Y-cut	45	1.3	<b>C4011-67P</b>	100
	Orange	Polyethylene	Red PTFE/White Silicone, Star-slit	55	1.0	<b>C4011-59OR</b>	100
	Orange	Polyethylene	Red PTFE/White Silicone, Star-slit	55	1.0	<b>C4011-5900R</b>	1000

## National 11mm Wide Opening Snap-It Cap Convenience Kits

- Save time during sample preparation
- Reduce the risk of contamination

## Unassembled kits

- Includes 100 vials and 100 caps with pre-assembled septa
- Reusable two compartment trays protect vials and closure while keeping matching supplies together
- Clear trays make it easy to keep track of available supplies without opening containers



Convenience Kit

Items not shown to scale

## National 11mm Wide Opening Snap-It Cap Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit, Wide Opening Snap Cap Vial	Clear	No	Clear	Clear PTFE/Red Rubber	C4011-5	C4011-51	<b>C4011-72</b>	100
	Amber	Yes	Clear	Clear PTFE/Red Rubber	C4011-6W	C4011-51	<b>C4011-72AW</b>	100
	Clear	No	Clear	Red PTFE/White Silicone	C4011-5	C4011-54	<b>C4011-73</b>	100
	Clear	Yes	Clear	Red PTFE/White Silicone	C4011-5W	C4011-54	<b>C4011-73W</b>	100
	Clear	No	Pink	Red PTFE/White Silicone	C4011-5	C4011-54P	<b>C4011-73P</b>	100
	Clear	Yes	Orange	Red PTFE/White Silicone	C4011-5W	C4011-54OR	<b>C4011-73ORW</b>	100
	Clear	Yes	Orange	Ivory PTFE/Red Rubber	C4011-5W	C4011-51OR	<b>C4011-72ORW</b>	100

## National 13mm Crimp/Snap Vials

4mL, 15x45mm crimp/snap cap vials and inserts

- Superior quality 1st hydrolytic class glass (Type 1) in clear feature a 13mm crimp/snap-ring finish – use with 13mm aluminum Seals or Kim-Snap closures
- Polyspring inserts are self-aligning and provide a cushion against needle contact



### Recommended for the following instruments:

- Thermo Scientific
- Shimadzu
- Spark Holland
- Varian
- VWR (Merck)/Hitachi
- Waters (Wisp 48 Position Carousel)

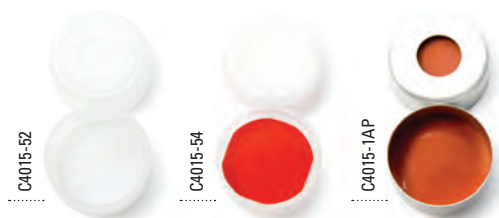
For autosampler compatibility visit  
[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

### National 13mm Crimp/Snap Cap Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
13mm Crimp/Snap Vial	Clear	No	15x45	Flat Bottom	4.8mL	4.25mL	<800µL	<b>C4015-4</b>	100
800µL Polyspring Conical Insert	Clear	–	8x38	Pulled Point	950µL	800µL	<9µL	<b>C4015-638</b>	100
350µL Conical Insert	Clear	–	6x40	Pulled Point	375µL	300µL	<8µL	<b>C4015-643</b>	100
Metal spring for glass inserts in 4mL vials	–	–	–	–	–	–	–	<b>C4015-640</b>	100

## National 13mm Crimp/Snap Caps and Septa

- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Aluminum crimp closures provide a secure leak-resistant seal
- Aluminum seals must be applied with a crimping tool
- Synthetic PTFE/red rubber seal is specially formulated for improved background performance
- Kim-Snap closures provide a tight seal without the need of a crimper



### National 13mm Crimp/Snap Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
13mm Kim-Snap Closure	Clear	Polypropylene	White Virgin PTFE, 0.01"	53	0.25	<b>C4015-52</b>	100
	Clear	Polypropylene	Red PTFE/White Silicone	45	1.3	<b>C4015-54</b>	100
13mm Crimp Cap, 6mm hole	Silver	Aluminum	Clear PTFE/Synthetic Red Rubber	65	1.3	<b>C4015-1AP</b>	144

## National 13mm Crimp/Snap Crimping and Decrimping Tools

- Crimping tools provide a reproducible, secure vial closure
- Manual decrimping tools allow easy removal of aluminum seals without breakage
- Decapping pliers are an economical choice for small quantities of vials
- Clean room crimpers and decrimpers can be autoclaved



Items not shown to scale

### National 13mm Crimp/Snap Crimping and Decrimping Tools

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 13mm aluminum crimp seals	<b>C4013-100</b>	1
Decapping Pliers	Removes 13mm aluminum crimp seals, Protective gloves recommended	<b>C4013-101</b>	1
Manual Decrimper	Removes 13mm aluminum crimp seals	<b>C4013-102</b>	1
Manual stainless steel Cleanroom Crimper	Attaches 13mm crimp seals	<b>C4013-100SS</b>	1
Manual stainless steel Cleanroom Decrimper	Removes 13mm crimp seals without vial damage	<b>C4013-102SS</b>	1

For electronic crimpers and decrimpers look on page **2-092**

## National 4mL Screw Thread Vials

4mL, 15x45mm screw thread vials and inserts

- 13-425 thread finish
- I-D vials feature a write-on patch with graduation for convenient sample identification
- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts
- Optional silanized (deactivated) glass provides optimal recovery of critical polar, labile or OH-interacting compounds\*
- Polyspring inserts are self-aligning and provide a cushion against needle contact

### Recommended for the following instruments:

- Thermo Scientific
- Shimadzu
- Spark Holland
- Varian
- VWR (Merck)/Hitachi
- Waters (Wisp 48 Position Carousel)

For autosampler compatibility visit  
[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### National 4mL Screw Thread Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
13-425 Screw Thread Vial	Clear	No	15x45	Flat Bottom	4mL	4mL	<800	<b>C4015-1</b>	100
	Clear	Yes	15x45	Flat Bottom	4mL	4mL	<800	<b>C4015-11W</b>	100
	Amber	No	15x45	Flat Bottom	4mL	4mL	<800	<b>C4015-2</b>	100
	Amber	Yes	15x45	Flat Bottom	4mL	4mL	<800	<b>C4015-2W</b>	100
13-425 Screw Thread AP2000 High Recovery Vial	Clear	No	15.25x45	Tapered Base	3.5mL	3.5mL	<15	<b>C4015-9</b>	100
	Polypropylene	No	15x45	Tapered Base	2.5mL	2mL	<15	<b>C4015-14</b>	100
13-425 Screw Thread Vial, silanized*	Clear	No	15x45	Flat Bottom	4mL	4mL	<800	<b>C4015-S1</b>	100
800µL Polyspring Conical Insert	Clear	–	8x38	Pulled Point	950µL	800µL	<9	<b>C4015-638</b>	100
350µL Conical Insert	Clear	–	6x40	Pulled Point	375µL	300µL	<8	<b>C4015-643</b>	100
Metal spring for glass inserts in 4mL vials	–	–	–	–	–	–	–	<b>C4015-640</b>	100

\* For information about silanized products visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

## National 13-425 Screw Thread Caps and Septa

- Polypropylene caps are chemically inert and suitable for most chromatography applications
- Phenolic resin caps perform well at high temperatures and are compatible with exposure to corrosives
- Open top caps are designed to be used with any of our 13mm septa
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Caps with bonded septa resist dislodging during injection when using large diameter blunt needles
- Integral Molded Polypropylene cap is an economical choice when septum resealing is not required



Images shown are 70% to scale

### National 13-425 Screw Thread Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
13mm Open Top Screw Cap, 13-425 thread, 8.5mm hole	Black	Polypropylene	—	—	—	<b>C4015-1A</b>	100
	White	Polypropylene	—	—	—	<b>C4015-1W</b>	100
	Black	Phenol	—	—	—	<b>C4015-66</b>	1000
Septum for 13-425 Screw Caps	—	—	White Virgin PTFE, 0.01"	53	0.25	<b>C4015-10</b>	1000
	—	—	Ivory PTFE/Red Rubber	35	1.5	<b>C4015-30</b>	100
	—	—	Red PTFE/White Silicone/Red PTFE	55	1.25	<b>C4015-40</b>	100
	—	—	Red PTFE/White Silicone, Soft	45	1.5	<b>C4015-45</b>	100
	—	—	Red PTFE/White Silicone	50	1.5	<b>C4015-60</b>	100
	—	—	Ivory PTFE/White Silicone	45	1.5	<b>C4015-61</b>	1000
13mm Open Top Screw Cap, 13-425 thread, 8.5mm hole	Black	Polypropylene	Ivory PTFE/Red Rubber	35	1.5	<b>C4015-30A</b>	100
	Black	Polypropylene	Red PTFE/White Silicone/Red PTFE	55	1.25	<b>C4015-40A</b>	100
	White	Polypropylene	Red PTFE/White Silicone, Soft	40	1.5	<b>C4015-45W</b>	100
	Black	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.5	<b>C4015-55BLK</b>	100
	White	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.5	<b>C4015-55W</b>	100
	Black	Polypropylene	Red PTFE/White Silicone	60	1.5	<b>C4015-75A</b>	100
	White	Polypropylene	Red PTFE/White Silicone	60	1.5	<b>C4015-75W</b>	100
13mm Single Piece Screw Cap, 13-425 thread	Natural	Polypropylene	Integral Molded Polypropylene	—	0.25	<b>C4015-5A</b>	100
13mm Open Top Screw Cap, 13-425 thread, 8.5mm hole	Black	Phenol	Red PTFE/White Silicone	60	1.5	<b>C4015-66A</b>	100
13mm Solid Top Storage Cap, 13-425 thread	White	Urea	PTFE/PE Foam Liner	—	1.25	<b>B7815-13</b>	100
13mm Open Top Screw Cap, 13-425 thread, 8.5mm hole	Black	Polypropylene	Bonded Red PTFE/White Silicone	45	1.5	<b>C4015-67A</b>	100



## National 4mL Screw Thread Convenience Kits

- Save time during sample preparation
- Reduce the risk of contamination

### Unassembled kits

- Includes 100 vials and 100 caps with pre-assembled septa



C4015-88

### Assembled kits

- Include 100 vials with pre-attached caps and septa
- Packaged in convenient vial trays with clear covers or in economical polybags



C4015-21



C4015-017

Items not shown to scale

### National 4mL Screw Thread Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap/Septum Cat. No.	Cat. No.	Pack of
Convenience Kit	Clear	No	Black	Red PTFE/White Silicone	C4015-1	C4015-75A	<b>C4015-88</b>	100
	Amber	Yes	Black	Red PTFE/White Silicone	C4015-2W	C4015-75A	<b>C4015-88AW</b>	100
Assembled Kit	Clear	No	Black	White Virgin PTFE, 0.01"	C4015-1	C4015-1A/C4015-10	<b>C4015-21</b>	100
	Clear	No	Black	Red PTFE/White Silicone	C4015-1	C4015-75A	<b>C4015-17</b>	100
	Amber	No	Black	Red PTFE/White Silicone	C4015-2	C4015-75A	<b>C4015-17A</b>	100
	Amber	Yes	Black	Red PTFE/White Silicone	C4015-2W	C4015-75A	<b>C4015-17AW</b>	100
	Clear	Yes	Black	Red PTFE/White Silicone	C4015-11W	C4015-75A	<b>C4015-17W</b>	100
	Clear	No	Black	PTFE/Red Rubber	C4015-1	C4015-66/73816T-13P	<b>C4015-482A</b>	100
Assembled Kit, in Polybag	Clear	No	Black	Red PTFE/White Silicone	C4015-1	C4015-75A	<b>C4015-017</b>	100
	Amber	No	Black	Red PTFE/White Silicone	C4015-2	C4015-75A	<b>C4015-017A</b>	100

## National 4mL Screw Thread Vial Racks

- Polypropylene vial racks are resistant to most solvents
- Racks feature alphanumeric indexing for easier vial identification
- Racks can be stacked for efficient storage



C4015-27



C4015-25

Items not shown to scale

### National 4mL Screw Thread Vial Racks

Description	Capacity	Cat. No.	Pack of
PVC storage rack for 15x45mm vials with clear lid	100 vials, 10x10	<b>C4015-27</b>	1
Polypropylene storage rack for 15x45mm vials, no lid, reusable	50 vials, 5x10	<b>C4015-25</b>	1

## National Shell Vials and Inserts

- Superior quality type 1 borosilicate and amber glass
- Polyethylene SepCap with starburst center design eases syringe needle penetration
- Convenient vial kits include equal quantities of vials and caps
- Polyspring inserts are self-aligning and provide a cushion against needle contact
- Microsampling vials allow maximum sample extraction without need for separate inserts

### Recommended for the following instruments:

- Alcott
- Gilson
- Shimadzu
- Waters (Wisp 96 respectively 48 Position Carousel)

For autosampler compatibility visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### National Shell Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
1mL Shell Vial with SepCap	Clear	No	8x40	Flat Bottom	1.25mL	1mL	<80	<b>C4015-96</b>	200
	Amber	No	8x40	Flat Bottom	1.25mL	1mL	<80	<b>C4015-99</b>	200
	Polypropylene	No	8x40	Flat Bottom	1.25mL	1mL	<80	<b>C4015-95P</b>	250
250µL Polyspring Conical Insert	Clear	–	5x34	Pulled Point	250µL	210µL	<3	<b>C4015-96A</b>	100
300µL Polyspring Conical Insert	Polypropylene	–	5x29	Precision Point	275µL	250µL	<3	<b>C4015-96PA</b>	100
0.7mL Accuform Shell Vial with SepCap	Polypropylene	No	8x40	Tapered Base	0.90mL	0.7mL	<8	<b>C4015-94</b>	1000
2mL Shell Vial with SepCap	Clear	No	12x32	Flat Bottom	2.4mL	1.8mL	<200	<b>C4011-80</b>	200
	Polypropylene	No	12x32	Flat Bottom	2.4mL	1.8mL	<200	<b>C4011-77P</b>	1000
4mL Shell Vial with SepCap	Clear	No	15x45	Flat Bottom	5.5mL	4mL	<800	<b>C4015-48</b>	100
	Polypropylene	No	15x45	Flat Bottom	5.5mL	4mL	<800	<b>C4015-47P</b>	100
800µL Polyspring Conical Insert	Clear	–	6x38	Pulled Point	950µL	800µL	<9	<b>C4015-638</b>	100
3mL Accuform Shell Vial with SepCap	Polypropylene	No	15x45	Tapered Base	3.75mL	2.9mL	<8	<b>C4015-46P</b>	1000
Positive Displacement Vial for Alcott with PE Plug Cap	Clear	No	8x35	Flat Bottom	1mL	900µL	–	<b>C4008-50</b>	1000

## National Headspace Vials

- Superior quality 1st hydrolytic class glass (Type 1)
- Headspace vials are available with either a round or flat base
- Round bottom vials are compatible with most autosamplers and more easily handled by robotic arms that lift the vial from the tray
- Flat bottom vials maximize heating efficiency in manual headspace sampling and are required for use in some instrument models
- Vials feature beveled or square edge finish
- The bevel edge on the lip of the vial provides additional sealing power for greater leak resistance under high pressure

**Recommended for most brands of instruments.**

For autosampler compatibility visit  
[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



Images shown are 90% to scale

### National Headspace Vials

Description	Glass	Dimension (mm)	Finish	Profile	Total Volume (mL)	Usable Volume (mL)	Cat. No.	Pack of
20mm Headspace Crimp Vial	Clear	22x38	Beveled Edge	Flat Bottom	9	6	<b>C4020-60</b>	1000
	Clear	22x38	Square Rim	Flat Bottom	9	6	<b>C4020-6</b>	1000
	Clear	23x46	Beveled Edge	Flat Bottom	12.5	10	<b>C4020-10</b>	100
	Clear	23x46	Beveled Edge	Round Bottom	12.5	10	<b>C4020-210</b>	100
	Clear	23x46	Square Rim	Flat Bottom	12.5	10	<b>C4020-410</b>	1000
	Clear	23x75	Beveled Edge	Flat Bottom	21.5	20	<b>C4020-20</b>	100
	Clear	23x75	Beveled Edge	Round Bottom	21.5	20	<b>C4020-2</b>	100
	Clear	23x75	Square Rim	Flat Bottom	21.5	20	<b>C4020-25</b>	1000
	Clear	30x60	Beveled Edge	Flat Bottom	27	25	<b>C4020-27</b>	1000
18mm Screw Top Headspace Vial	Clear	22.5x46	Screw Thread	Round Bottom	12	10	<b>C4020-180</b>	125
	Clear	22.5x76	Screw Thread	Round Bottom	21	20	<b>C4020-18</b>	125

## National Headspace Caps and Septa

- Aluminum seals are available in standard center hole and pressure release versions
- Pressure release seals (Aluminum-PR) are designed to open when internal pressure exceeds 3.0±0.5bar
- Use magnetic tinplate seals with CTC/Leap Technologies, Gerstel and other magnetic transport autosamplers
- Pre-assembled caps and septa are convenient and minimize contamination from handling



Images shown are 50% to scale

### National Headspace Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
20mm Crimp Cap, 9.5mm hole	Silver	Aluminum	–	–	–	<b>C4020-3A</b>	1000
20mm Tear-off Crimp Cap	Silver	Aluminum	–	–	–	<b>C4020-5A</b>	1000
20mm Pressure Release Crimp Cap, 7.5mm hole	Silver	Aluminum-PR	–	–	–	<b>C4020-6A</b>	1000
Septum for 20mm Crimp Caps	–	–	20mm Gray Bromobutyl Stopper	37	–	<b>C4020-30</b>	1000
	–	–	20mm Tan PTFE/White Silicone	45	3.2	<b>C4020-32</b>	100
	–	–	20mm Gray PTFE/Red Rubber	50	3.0	<b>C4020-34</b>	100
	–	–	20mm Gray PTFE/Black Butyl Molded	50	3.0	<b>C4020-36</b>	100
	–	–	Unfaced Black Rubber	55	3.0	<b>C4020-40</b>	100
20mm Crimp Cap, 9.5mm hole	Silver	Aluminum	Gray PTFE/Red Rubber	50	3.0	<b>C4020-34A</b>	100
20mm Pressure Release Crimp Cap, 8mm hole	Silver	Aluminum-PR	Gray PTFE/Red Rubber	50	3.0	<b>C4020-34AP</b>	100
20mm Crimp Cap, 9.5mm hole	Silver	Aluminum	Clear PTFE/Gray Butyl Rubber	50	3.0	<b>C4020-39A</b>	100
20mm Pressure Release Crimp Cap, 8mm hole	Silver	Aluminum-PR	Clear PTFE/Gray Butyl Rubber	50	3.0	<b>C4020-43AP</b>	100
20mm Crimp Cap, 9.5mm hole	Silver	Aluminum	Gray PTFE/Gray Butyl Rubber, Pharmafix	50	3.0	<b>C4020-36A</b>	100
20mm Pressure Release Crimp Cap, 8mm hole	Silver	Aluminum-PR	Gray PTFE/Gray Butyl Rubber, Pharmafix	50	3.0	<b>C4020-36AP</b>	100
20mm Crimp Cap, 9.5mm hole	Silver	Aluminum	Tan PTFE/White Silicone	45	3.2	<b>C4020-32A</b>	100
20mm Pressure Release Crimp Cap, 8mm hole	Silver	Aluminum-PR	Tan PTFE/White Silicone	45	3.2	<b>C4020-32AP</b>	100
20mm Magnetic Crimp Cap, 5mm hole	Gold	Tin-plated	Clear PTFE/Translucent Blue Silicone	45	3.0	<b>C4020-38A</b>	100
20mm Magnetic Crimp Cap, 8mm hole	Gold	Tin-plated	Clear PTFE/Translucent Blue Silicone	45	3.0	<b>C4020-42A</b>	100
20mm Pressure Release Crimp Cap, 7.5mm hole	Silver	Aluminum-PR	Clear PTFE/Translucent Blue Silicone	45	3.0	<b>C4020-42AP</b>	100
18mm Magnetic Screw Cap, 8mm hole	Silver	Steel	18mm Blue Silicone/Natural PTFE	45	2.0	<b>C4020-47</b>	125
18mm Magnetic Screw Cap, 8mm hole, SPME	Silver	Steel	18mm Blue Silicone/PTFE, not prefitted	30	1.0	<b>C4020-48</b>	125

Trying to decide what septum is right for you?

Use our selection guide visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

## National 20mm Crimp Top Headspace Unassembled Convenience Kits

- Include matched quantities of vials and silver aluminum seals with pre-assembled septa
- Convenience kits save time during sample preparation



### National 20mm Crimp Top Headspace Unassembled Convenience Kits

Item not shown to scale

Kit Type	Glass	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit, 20mm Headspace Crimp Vial, Beveled Edge, Round Bottom, Pressure Release Crimp Cap, 7.5mm hole	Clear	Silver	Gray PTFE/Black Butyl Rubber, Pharmafix	C4020-2	C4020-36AP	<b>C4020-139</b>	100
	Clear	Silver	Tan PTFE/White Silicone	C4020-2	C4020-32AP	<b>C4020-320</b>	1000

## National 20mm Headspace Crimping and Decrimping Tools

- Crimping tools provide a reproducible, secure vial closure
- Manual decrimping tools allow easy removal of aluminum seals without breakage
- Decapping pliers are an economical choice for small quantities of vials
- Clean room crimpers and decrimpers can be autoclaved



### National 20mm Headspace Crimping and Decrimping Tools

Items not shown to scale

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 20mm crimp seals	<b>C4020-100</b>	1
Decapping Pliers	Removes 20mm crimp seals, Protective gloves recommended	<b>C4020-101</b>	1
Manual Decrimper	Removes 20mm crimp seals	<b>C4020-102</b>	1
Manual stainless steel Cleanroom Crimper	Attaches 20mm crimp seals	<b>C4020-100SS</b>	1
Manual stainless steel Cleanroom Decrimper	Removes 20mm crimp seals without vial damage	<b>C4020-102SS</b>	1

For electronic crimpers and decrimpers look on page **2-092**

## National Sample Storage Screw Thread Vials

Sample storage screw thread vials, caps and septa

- Capacity ranges from 2-40mL
- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Eliminate leaching of ions
- Provide consistent pH for duration of sample storage life
- PTFE-Lined Solid-top storage caps
- PTFE film/PE foam backing offers broad chemical resistance
- Not autoclavable



Images shown are 70% to scale

### National Sample Storage Screw Thread Vials

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (mL)	Capacity (DRAMS)	Cat. No.	Pack of
8-425 Screw Vial	Clear	No	12x32	Flat Bottom	2	0.5	<b>B7999-1</b>	100
13-425 Screw Vial	Clear	No	15x45	Flat Bottom	4	1	<b>B7999-2</b>	100
15-425 Screw Vial	Clear	No	17x60	Flat Bottom	8	2	<b>B7999-3</b>	200
15-425 Screw Vial	Clear	No	19x65	Flat Bottom	12	3	<b>B7999-12</b>	200
18-400 Screw Vial	Clear	No	21x70	Flat Bottom	16	4	<b>B7999-4</b>	200
20-400 Screw Vial	Clear	No	23x85	Flat Bottom	22	6	<b>B7999-5</b>	200
24-400 Screw Vial	Clear	No	28x95	Flat Bottom	40	8	<b>B7999-6</b>	100
8-425 Screw Vial	Amber	No	12x32	Flat Bottom	2	0.5	<b>B7999-1A</b>	100
13-425 Screw Vial	Amber	No	15x45	Flat Bottom	4	1	<b>B7999-2A</b>	100
15-425 Screw Vial	Amber	No	17x60	Flat Bottom	8	2	<b>B7999-3A</b>	200
15-425 Screw Vial	Amber	No	19x65	Flat Bottom	12	3	<b>B7999-12A</b>	200
18-400 Screw Vial	Amber	No	21x70	Flat Bottom	16	4	<b>B7999-4A</b>	200
24-400 Screw Vial	Amber	No	28x95	Flat Bottom	40	8	<b>B7999-6A</b>	100



Images shown are 70% to scale

### National Sample Storage Screw Thread Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
8-425 Screw Cap	White	Urethane	PTFE/PE Foam Liner	75	1.3	<b>B7815-8</b>	100
13-425 Screw Cap	White	Urethane	PTFE/PE Foam Liner	75	1.3	<b>B7815-13</b>	100
15-425 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	75	1.3	<b>B7815-15</b>	100
18-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	75	1.3	<b>B7815-18</b>	100
20-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	75	1.3	<b>B7815-20</b>	100
24-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	75	1.3	<b>B7815-24</b>	100
Septum for 8-425 Screw Cap	—	—	0.01" White PTFE/0.05" Clear Silicone	50	1.5	<b>B7995-8</b>	100
Septum for 13-425 Screw Cap	—	—	0.01" White PTFE/0.05" Clear Silicone	50	1.5	<b>B7995-13</b>	100
Septum for 15-425 Screw Cap	—	—	0.01" White PTFE/0.09" Clear Silicone	50	2.6	<b>B7995-15</b>	100
Septum for 18-400 Screw Cap	—	—	0.01" White PTFE/0.05" Clear Silicone	50	1.5	<b>B7995-18</b>	100
Septum for 20-400 Screw Cap	—	—	0.01" White PTFE/0.05" Clear Silicone	50	1.5	<b>B7995-20</b>	100
Septum for 24-400 Screw Cap	—	—	0.01" White PTFE/0.09" Clear Silicone	50	2.6	<b>B7995-24</b>	100
Septum for 24-400 Screw Cap	—	—	0.013" White PTFE/0.120" Clear Silicone	50	3.3	<b>B7995-26</b>	100
Open top 8-425 Screw Cap	Black	Polypropylene	—	—	—	<b>B7807-8</b>	100
Open top 13-425 Screw Cap	Black	Polypropylene	—	—	—	<b>B7807-13</b>	100
Open top 15-425 Screw Cap	Black	Polypropylene	—	—	—	<b>B7807-15</b>	100
Open top 18-400 Screw Cap	Black	Polypropylene	—	—	—	<b>B7807-18</b>	100
Open top 20-400 Screw Cap	Black	Polypropylene	—	—	—	<b>B7807-20</b>	100
Open top 24-400 Screw Cap	White	Polypropylene	—	—	—	<b>B7807-24</b>	100

## National Sample Storage Convenience Kits

- Convenience kits save time during sample preparation
- Solid top convenience kits include matched quantities of vials and screw caps with pre-assembled septa
- Open top convenience kits contain shrink-wrapped vials and separately packaged caps and septa in polybags



B7990-2



B7800-20

Items not shown to scale

### National Sample Storage Convenience Kits

Kit Type	Glass	Total Volume (mL)	Cap Color	Cap Material	Septum	Vial Cat. No.	Cap/Septum Cat. No.	Cat. No.	Pack of
Screw Vial Convenience Kit, Solid-top Cap	Clear	2	White	Urethane	PTFE/Polyethylene Foam Liner	B7999-1	B7815-8	<b>B7800-1</b>	100
	Clear	4	White	Urethane		B7999-2	B7815-13	<b>B7800-2</b>	100
	Clear	8	White	Polypropylene		B7999-3	B7815-15	<b>B7800-3</b>	200
	Clear	12	White	Polypropylene		B7999-12	B7815-15	<b>B7800-12</b>	200
	Clear	16	White	Polypropylene		B7999-4	B7815-18	<b>B7800-4</b>	200
	Clear	22	White	Polypropylene		B7999-5	B7815-20	<b>B7800-5</b>	200
	Clear	40	White	Polypropylene		B7999-6	B7815-24	<b>B7800-6</b>	100
	Amber	2	White	Urethane		B7999-1A	B7815-8	<b>B7800-1A</b>	100
	Amber	4	White	Urethane		B7999-2A	B7815-13	<b>B7800-2A</b>	100
	Amber	8	White	Polypropylene		B7999-3A	B7815-15	<b>B7800-3A</b>	200
	Amber	12	White	Polypropylene		B7999-12A	B7815-15	<b>B7800-12A</b>	200
	Amber	16	White	Polypropylene		B7999-4A	B7815-18	<b>B7800-4A</b>	200
	Amber	40	White	Polypropylene		B7999-6A	B7815-24	<b>B7800-6A</b>	100
	Screw Vial Assembled Kit, Solid-top Cap	Clear	20	White		Polypropylene	PTFE/Polyethylene Foam Liner	B7920-V0	B7815-24
Amber		20	White	Polypropylene	B7921-V0	B7815-24		<b>B7800-20A</b>	100
Screw Vial Convenience Kit, Open top Cap	Clear	2	Black	Polypropylene	0.01" White PTFE/ 0.05" Clear Silicone	B7999-1	B7807-8/B7995-8	<b>B7990-1</b>	100
	Clear	4	Black	Polypropylene		B7999-2	B7807-13/B7995-13	<b>B7990-2</b>	100
	Clear	8	Black	Polypropylene		B7999-3	B7807-15/B7995-15	<b>B7990-3</b>	200
	Clear	12	Black	Polypropylene		B7999-12	B7807-15/B7995-15	<b>B7990-12</b>	200
	Clear	16	Black	Polypropylene		B7999-4	B7807-18/B7995-18	<b>B7990-4</b>	200
	Clear	22	Black	Polypropylene		B7999-5	B7807-20/B7995-20	<b>B7990-5</b>	200
	Clear	40	White	Polypropylene		B7999-6	B7807-24/B7995-24	<b>B7990-6</b>	100
	Amber	2	Black	Polypropylene		B7999-1A	B7807-8/B7995-8	<b>B7990-1A</b>	100
	Amber	4	Black	Polypropylene		B7999-2A	B7807-13/B7995-13	<b>B7990-2A</b>	100
	Amber	12	Black	Polypropylene		B7999-12A	B7807-15/B7995-15	<b>B7990-12A</b>	200
	Amber	40	White	Polypropylene		B7999-6A	B7807-24/B7995-24	<b>B7990-6A</b>	100



## National EPA Screw Vials

EPA screw vial convenience kits

- Convenience kits save time during sample preparation
- Unassembled convenience kits include shrink-wrapped vials and separately packaged caps and septa in polybags
- Assembled kits include vials with pre-assembled caps and septa
- Recommended for discrete water sampling under EPA 40 CFR 136 "Guidelines for Establishing Test Procedures for the Analysis of Pollutants" and EPA 40 CFR 141 "National Interim Primary Drinking Water Regulations: Control of Trihalomethanes in Drinking Water"



B7920

Items not shown to scale

### National EPA Screw Vial Convenience Kits

Kit Type	Glass	Total Volume (mL)	Dimension (mm)	Septum	Cat. No.	Pack of
EPA Screw Vial Convenience Kit	Clear	40	28x95	0.01" White PTFE/0.09" Clear Silicone	<b>B7950-B</b>	100
EPA Screw Vial Assembled Kit	Clear	40	28x95	0.01" White PTFE/0.09" Clear Silicone	<b>B7950</b>	100
	Amber	40	28x95	0.01" White PTFE/0.09" Clear Silicone	<b>B7951</b>	100
	Clear	20	28x57	0.01" White PTFE/0.09" Clear Silicone	<b>B7920</b>	100
	Amber	20	28x57	0.01" White PTFE/0.09" Clear Silicone	<b>B7921</b>	100



B7950-V0



B7951-V0



B7950-1A



B7995-24

### National EPA Screw Vials, Caps and Septa

\* 60% to scale

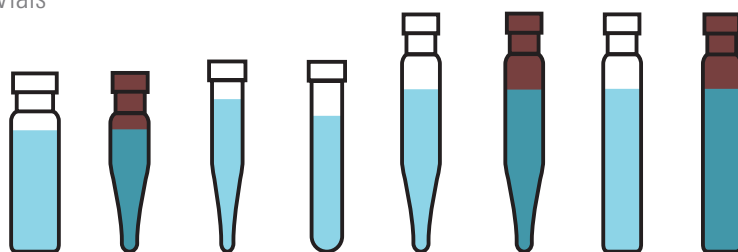
Description	Glass	Cap Color	Dimension (mm)	Total Volume (mL)	Material	Cat. No.	Pack of
24-400 EPA Screw Vial	Clear	—	28x95	40	—	<b>B7950-V0</b>	100
	Amber	—	28x95	40	—	<b>B7951-V0</b>	100
24-400 EPA Screw Cap	—	White	—	—	Polypropylene	<b>B7950-1A</b>	100
Septum for 24-400 Screw Cap	—	—	—	—	0.01" White PTFE/0.09" Clear Silicone	<b>B7995-24</b>	100

# National Vial Reference Chart

\* Drawing is valid for: C4000-1B, C4000-1G, C4000-1R, C4000-1Y

Images shown are 80% to scale

## 8mm Crimp Top Vials



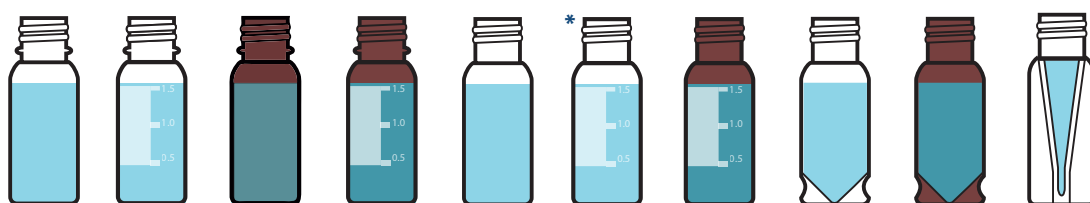
	<b>C4008-1</b>	<b>C4008-730</b>	<b>C4008-632C</b>	<b>C4008-632R</b>	<b>C4008-739</b>	<b>C4008-740</b>	<b>C4008-741</b>	<b>C4008-742</b>
Part No.	C4008-1	C4008-730	C4008-632C	C4008-632R	C4008-739	C4008-740	C4008-741	C4008-742
Dimensions	8x30	7x30	6x32	6x32	7x40	7x40	7x40	7x40
Common Description	0.8mL	0.5mL	0.2mL	0.3mL	0.7mL	0.7mL	0.8mL	0.8mL
Approx. Total Capacity	1mL	550µL	250µL	325µL	575µL	575µL	775µL	775µL
Rec. Usable Volume	0.8mL	400µL	200µL	250µL	450µL	450µL	650µL	650µL
Residual Volume	<80µL	<3µL	<3µL	<6µL	<2µL	<2µL	<70µL	<70µL
Composition	Glass	Amber	Glass	Glass	Glass	Amber	Glass	Amber

## Standard-Opening 8-425 Screw Thread Vials – 12x32mm



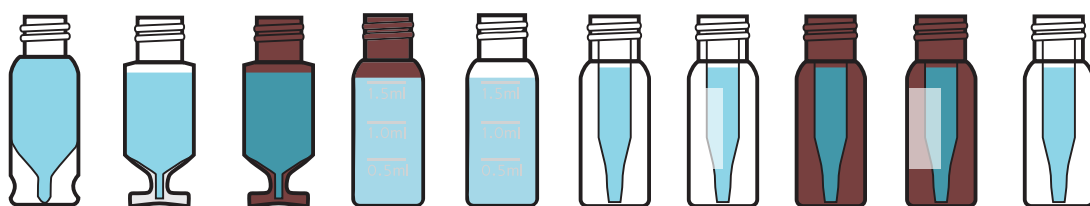
	<b>C4013-1</b>	<b>C4013-1W</b>	<b>C4013-2</b>	<b>C4013-2W</b>	<b>C4013-11</b>	<b>C4013-13</b>
Part No.	C4013-1	C4013-1W	C4013-2	C4013-2W	C4013-11	C4013-13
Common Description	2mL	2mL	2mL	2mL	250µL	600µL
Approx. Total Capacity	1.9mL	1.9mL	1.9mL	1.9mL	475µL	850µL
Rec. Usable Volume	1.5mL	1.5mL	1.5mL	1.5mL	250µL	675µL
Residual Volume	<170µL	<170µL	<170µL	<170µL	<3µL	<8µL
Composition	Glass	Glass	Amber	Amber	Polypro	Polypro

## Target DP 9mm Screw Vials 12x32mm



	<b>C5000-1</b>	<b>C5000-1W</b>	<b>C5000-2</b>	<b>C5000-2W</b>	<b>C4000-1</b>	<b>C4000-1W</b>	<b>C4000-2W</b>	<b>C4000-9</b>	<b>C4000-9A</b>	<b>C4000-11</b>
Part No.	C5000-1	C5000-1W	C5000-2	C5000-2W	C4000-1	C4000-1W	C4000-2W	C4000-9	C4000-9A	C4000-11
Common Description	2mL	2mL	2mL	2mL	2mL	2mL	2mL	1.5mL	1.5mL	450µL
Approx. Total Capacity	2mL	2mL	2mL	2mL	2mL	2mL	2mL	1.7mL	1.7mL	250µL
Rec. Usable Volume	1.5mL	1.5mL	1.5mL	1.5mL	1.5mL	1.5mL	1.5mL	1.3mL	1.3mL	250µL
Residual Volume	<170µL	<170µL	<170µL	<170µL	<170µL	<170µL	<170µL	<4µL	<4µL	<1µL
Composition	Glass	Glass	Amber	Amber	Glass	Glass	Amber	Glass	Amber	PolyPro

## Target DP 9mm Screw Vials 12x32mm

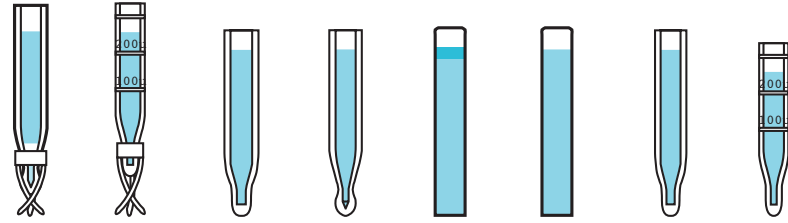


	<b>C4000-9TR</b>	<b>C4000-V1</b>	<b>C4000-V2</b>	<b>C4000-12</b>	<b>C4000-14</b>	<b>C4000-LV1</b>	<b>C4000-LV1W</b>	<b>C4000-LV2</b>	<b>C4000-LV2W</b>	<b>C4000-LV3W</b>
Part No.	C4000-9TR	C4000-V1	C4000-V2	C4000-12	C4000-14	C4000-LV1	C4000-LV1W	C4000-LV2	C4000-LV2W	C4000-LV3W
Common Description	1.5mL	1.5mL	1.5mL	2mL	2mL	350µL	350µL	350µL	350µL	200µL
Approx. Total Capacity	1.5mL	1.4mL	1.4mL	2mL	2mL	475µL	475µL	475µL	475µL	375µL
Rec. Usable Volume	1.2mL	1.0mL	1.0mL	1.5mL	1.5mL	350µL	350µL	350µL	350µL	240µL
Residual Volume	<1µL	<4µL	<4µL	<180µL	<180µL	<2µL	<2µL	<2µL	<2µL	<1µL
Composition	Glass	Glass	Amber	Amber PP	Clear PP	Glass	Glass	Amber	Amber	Glass

Target DP Microvolume Inserts

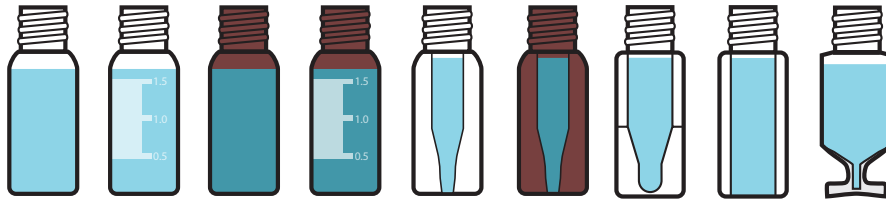
\*Drawing is valid for: C4011-1B, C4011-1G, C4011-1R, C4011-1Y

Images shown are 80% to scale



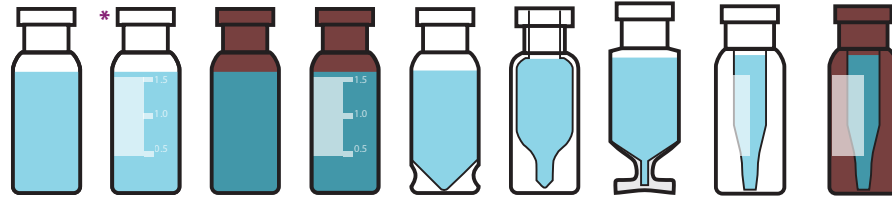
	<b>C4010-630</b>	<b>C4010-630P</b>	<b>C4010-627L</b>	<b>C4010-629L</b>	<b>C4011-631</b>	<b>C4011-631P</b>	<b>C4010-629</b>	<b>C4010-629P</b>
Part No.	C4010-630	C4010-630P	C4010-627L	C4010-629L	C4011-631	C4011-631P	C4010-629	C4010-629P
Dimensions	6x29mm	6x30mm	6x31mm	6x31mm	6x31mm	6x31mm	6x29mm	6x30mm
Common Description	300µL	300µL	350µL	350µL	400µL	300µL	300µL	300µL
Approx. Total Capacity	375µL	325µL	400µL	400µL	500µL	500µL	375µL	325µL
Rec. Usable Volume	300µL	250µL	350µL	350µL	400µL	400µL	300µL	250µL
Residual Volume	<1µL	<2µL	<4µL	<2µL	<25µL	<25µL	<4µL	<2µL
Composition	Glass	Polypro	Glass	Glass	Glass	Polypro	Glass	Polypro

10mm Wide Opening Screw Thread Vials – 12x32mm



	<b>C4010-1</b>	<b>C4010-1W</b>	<b>C4010-2</b>	<b>C4010-2W</b>	<b>C4010-LV1</b>	<b>C4010-LV2</b>	<b>C4010-11</b>	<b>C4010-14</b>	<b>C4010-V1</b>
Part No.	C4010-1	C4010-1W	C4010-2	C4010-2W	C4010-LV1	C4010-LV2	C4010-11	C4010-14	C4010-V1
Common Description	2mL	2mL	2mL	2mL	350µL	350µL	250µL	700µL	1.5mL
Approx. Total Capacity	2mL	2mL	2mL	2mL	450µL	450µL	600µL	750µL	1.5mL
Rec. Usable Volume	1.5mL	1.5mL	1.5mL	1.5mL	350µL	350µL	400µL	550µL	1.1mL
Residual Volume	<170µL	<170µL	<170µL	<170µL	<2µL	<2µL	<4µL	<70µL	<4mL
Composition	Glass	Glass	Amber	Amber	Glass	Amber	Polypro	Polypro	Glass

11mm Wide Opening Crimp Top Vials



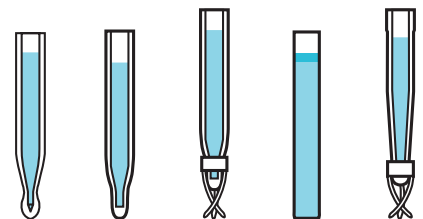
	<b>C4011-1</b>	<b>C4011-1W</b>	<b>C4011-2</b>	<b>C4011-2W</b>	<b>C4011-9</b>	<b>C4011-10</b>	<b>C4011-V1</b>	<b>C4011-LV1W</b>	<b>C4011-LV2W</b>
Part No.	C4011-1	C4011-1W	C4011-2	C4011-2W	C4011-9	C4011-10	C4011-V1	C4011-LV1W	C4011-LV2W
Common Description	2mL	2mL	2mL	2mL	1.5mL	400µL	1.5mL	250µL	250µL
Approx. Total Capacity	2mL	2mL	2mL	2mL	1.7mL	650µL	1.5mL	500µL	500µL
Rec. Usable Volume	1.5mL	1.5mL	1.5mL	1.5mL	1.3mL	500µL	1.1mL	350µL	350µL
Residual Volume	<170µL	<170µL	<170µL	<170µL	<4µL	<5µL	<4µL	<2µL	<2µL
Composition	Glass	Glass	Amber	Amber	Glass	Glass	Glass	Glass	Amber

11mm Standard-Opening Crimp Vials 12x32mm



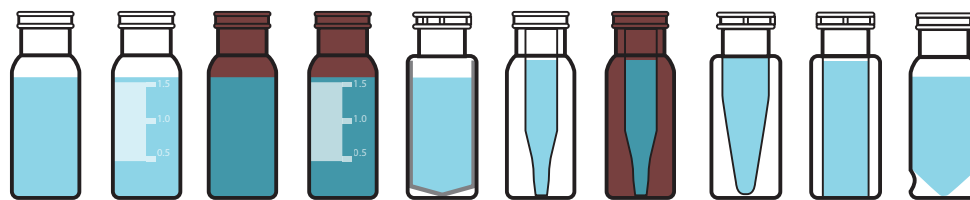
	<b>C4012-1</b>	<b>C4012-1W</b>	<b>C4012-2</b>	<b>C4012-2W</b>	<b>C4012-10</b>
Part No.	C4012-1	C4012-1W	C4012-2	C4012-2W	C4012-10
Common Description	2mL	2mL	2mL	2mL	100µL
Approx. Total Capacity	2mL	2mL	2mL	2mL	425µL
Rec. Usable Volume	1.5mL	1.5mL	1.5mL	1.5mL	200µL
Residual Volume	<170µL	<170µL	<170µL	<170µL	<2µL
Composition	Glass	Glass	Amber	Amber	Glass

Standard Microvolume Inserts



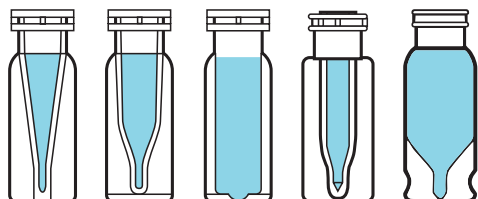
	<b>C4012-529</b>	<b>C4012-529L</b>	<b>C4012-530</b>	<b>C4012-465</b>	<b>C4012-530P</b>
Part No.	C4012-529	C4012-529L	C4012-530	C4012-465	C4012-530P
Dimensions	5x29mm	5x31mm	5x29mm	5x31mm	5x30mm
Common Description	150µL	150µL	150µL	200µL	125µL
Approx. Total Capacity	200µL	200µL	200µL	250µL	175µL
Rec. Usable Volume	175µL	170µL	170µL	200µL	150µL
Residual Volume	<3µL	<2µL	<1µL	<12µL	<2µL
Composition	Glass	Glass	Glass	Glass	Polypro

### 11mm Snap-It-Vials – 12x32mm



	<b>C4011-5</b>	<b>C4011-5W</b>	<b>C4011-6</b>	<b>C4011-6W</b>	<b>C4011-24</b>	<b>C4011-LV1</b>	<b>C4011-LV2</b>	<b>C4011-11</b>	<b>C4011-14</b>	<b>C4011-4</b>
Part No.	C4011-5	C4011-5W	C4011-6	C4011-6W	C4011-24	C4011-LV1	C4011-LV2	C4011-11	C4011-14	C4011-4
Common Description	2mL	2mL	2mL	2mL	700µL	350µL	350µL	800µL	3700µL	1.5mL
Approx. Total Capacity	2mL	2mL	2mL	2mL	1000µL	500µL	500µL	800µL	1000µL	1.7mL
Rec. Usable Volume	1.5mL	1.5mL	1.5mL	1.5mL	750µL	350µL	350µL	600µL	800µL	1.3mL
Residual Volume	<170µL	<170µL	<170µL	<170µL	<8µL	<2µL	<2µL	<6µL	<80µL	<4µL
Composition	Glass	Glass	Amber	Amber	TPX	Glass	Amber	Polypro	Polypro	Glass

### 11mm Snap-It-Vials – 12x32mm



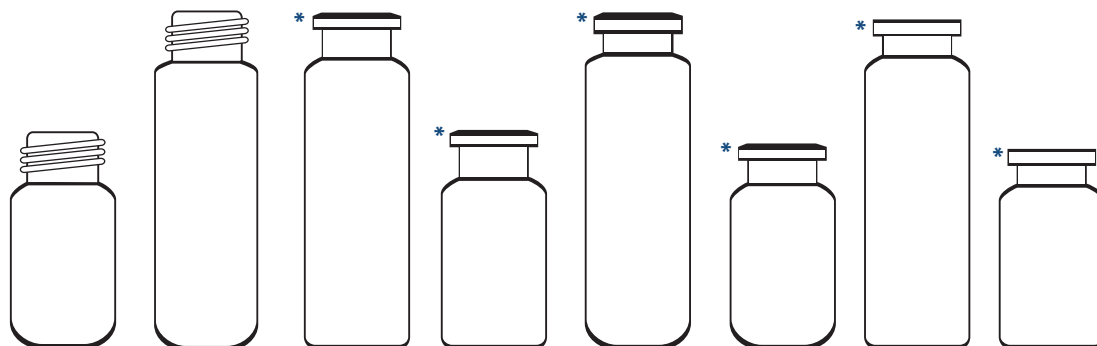
	<b>C4011-13</b>	<b>C4011-16</b>	<b>C4011-15</b>	<b>C4012-15</b>	<b>C4011-9TR</b>
Part No.	C4011-13	C4011-16	C4011-15	C4012-15	C4011-9TR
Common Description	250µL	600µL	850µL	250µL	1.5mL
Approx. Total Capacity	475µL	600µL	825µL	475µL	1.5mL
Rec. Usable Volume	300µL	400µL	650µL	350µL	1.2mL
Residual Volume	<2µL	<4µL	<8µL	<4µL	<1µL
Composition	Polypro	Polypro	Polypro	Glastic	Glass

### Headspace Vials



	<b>C4020-6</b>	<b>C4020-60</b>	<b>C4020-27</b>
Part No.	C4020-6	C4020-60	C4020-27
Common Description	6mL	6mL	27mL
Approx. Total Capacity	9mL	9mL	27mL
Composition	Glass	Glass	Glass

### Headspace Vials

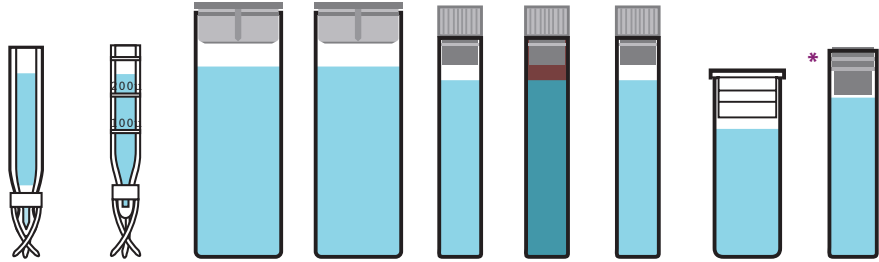


	<b>C4020-180</b>	<b>C4020-18</b>	<b>C4020-20</b>	<b>C4020-10</b>	<b>C4020-2</b>	<b>C4020-210</b>	<b>C4020-25</b>	<b>C4020-410</b>
Part No.	C4020-180	C4020-18	C4020-20	C4020-10	C4020-2	C4020-210	C4020-25	C4020-410
Common Description	10mL	20mL	20mL	10mL	20mL	10mL	20mL	10mL
Approx. Total Capacity	12mL	21mL	21.5mL	12.5mL	21.5mL	12.5mL	21.5mL	12.5mL
Composition	Glass	Glass	Glass	Glass	Glass	Glass	Glass	Glass

Images shown are 80% to scale

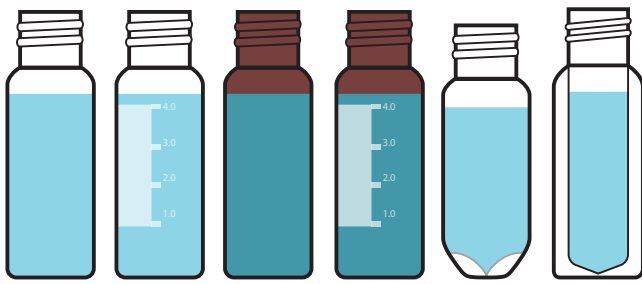
\* 60% to scale

Shell Vials and Inserts



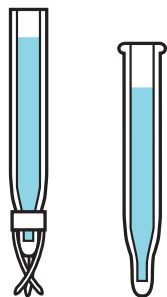
Part No.	<b>C4015-96A</b>	<b>C4015-96PA</b>	<b>C4015-48</b>	<b>C4015-47P</b>	<b>C4015-96</b>	<b>C4015-99</b>	<b>C4015-95P</b>	<b>C4011-80</b>	<b>C4008-50</b>
Dimensions	5x34mm	5x29mm	—	—	—	—	—	—	8x35mm
Common Description	250µL	275µL	4mL	4mL	1mL	1mL	1mL	2mL	1mL
Approx. Total Capacity	375µL	375µL	5.5mL	5.5mL	1.25mL	1.25mL	1.25mL	2.4mL	1mL
Rec. Usable Volume	210µL	250µL	4mL	4mL	1mL	1mL	1mL	1.8mL	850µL
Residual Volume	<3µL	<3µL	<800µL	<800µL	<80µL	<80µL	<80µL	<200µL	—
Composition	Glass	PolyPro	Glass	Polypro	Glass	Amber	PolyPro	Glass	Glass

15x45mm Screw Thread Vials



Part No.	<b>C4015-1</b>	<b>C4015-11W</b>	<b>C4015-2</b>	<b>C4015-2W</b>	<b>C4015-9</b>	<b>C4015-14</b>
Common Description	4mL	4mL	4mL	4mL	3.5mL	2.5mL
Approx. Total Capacity	5.2mL	5.2mL	5.2mL	5.2mL	4.5mL	2.5mL
Rec. Usable Volume	4mL	4mL	4mL	4mL	3.5mL	2mL
Residual Volume	<800µL	<800µL	<800µL	<800µL	<15µL	<15µL
Composition	Glass	Glass	Amber	Amber	Glass	Polypro

Microvolume Inserts for 15x45mm 4mL Vials



Part No.	<b>C4015-638</b>	<b>C4015-643</b>
Dimensions	6x38mm	6x42mm
Common Description	700µL	500µL
Approx. Total Capacity	950µL	375µL
Rec. Usable Volume	800µL	300µL
Residual Volume	<9µL	<8µL
Composition	Glass	Glass

Images shown are 80% to scale  
 \* 50% to scale  
 \* Positive Displacement Vial for Alcott 708

## Chromacol Vials and Closures

- Innovative products in micro- and precision sampling
- High quality, stringent manufacturing tolerances, have been extensively tested for comprehensive autosampler compatibility
- Products developed in close technical cooperation with the instrument manufacturers
- Detailed information regarding material specifications and compatibility
- Competent and experienced worldwide distributor network

### Approximate Chemical Composition for Borosilicate Glass

Description	SiO <sub>2</sub>	B <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>	CaO	MgO	Na <sub>2</sub> O	K <sub>2</sub> O	BaO
33 expansion Glass	80%	13%	3%	0.1%	–	4%	0.1%	<0.1%
N-51A Glass	72%	12%	7%	1%	–	6%	2%	<0.1%
Clear Borosilicate-GOLD Grade	80.6%	13%	2.3%	–	–	4%	–	–

For autosampler compatibility visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### Chromacol 8mm Crimp Top Vials

- The SCI-VI system gives the chromatography user the ability to inject reproducibly from glass vials with residual volumes as low as 1µL to 5µL in a full range of autosampler instruments
- Precision-machined sleeves that allow the vials to be used in the vast majority of commercial autosamplers
- Sleeves are reusable and support the crimped, sealed vials in the correct position within both the autosampler carousel or racks
- Allow movement of the vials as a unit to injection positions in both GC and HPLC autosamplers
- Thermo Scientific™ Chromacol GOLD™ glass quality, a low expansion high purity glass with an extremely low concentration of active sites
- Available in both clear and amber glass these vials can be used with 8mm crimp and snap caps



### Chromacol 8mm Crimp Top Vials

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (µL)	Usable Volume (µL)	Residual (µL)	Cat. No.	Pack of
0.3mL Sci-Vi Crimp Top Vial – GOLD Grade Glass	Clear	No	6x32	Round Bottom	325	250	<5	<b>03-CVG</b>	500
0.2mL Sci-Vi Crimp Top Vial – GOLD Grade Glass	Clear	No	6x32	Conical	250	200	<5	<b>02-CTVG</b>	500
0.2mL Sci-Vi Crimp Top Vial	Amber	No	6x32	Conical	250	200	<5	<b>02-CTV(A)</b>	500
0.1mL Sci-Vi Crimp Top Vial – GOLD Grade Glass	Clear	No	6x32	Round Bottom	125	80	<1	<b>01-CVG</b>	500
1.2mL Crimp Top Vial	Clear	No	8x40	Flat Bottom	1300	1200	<75	<b>1.2-CWV</b>	500
1mL Crimp Top Tapered Vial	Clear	No	8x40	Conical	1180	1000	<5	<b>1-CWV</b>	500
0.8mL Crimp Top Vial	Clear	No	8x30	Flat Bottom	1000	800	<80	<b>08-CV</b>	500
	Clear	No	7x40	Flat Bottom	775	650	<70	<b>08-CPV</b>	500
	Amber	No	7x32	Round Bottom	700	600	<30	<b>08-CRV(A)</b>	500
0.7mL Crimp Top Tapered Vial	Clear	No	7x40	Conical	575	450	<5	<b>07-CPV</b>	500
	Amber	No	7x40	Conical	575	450	<5	<b>07-CPV(A)</b>	500



### Chromacol 8mm Crimp Top Vials

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (µL)	Usable Volume (µL)	Residual (µL)	Cat. No.	Pack of
0.6mL Crimp Top Tapered Vial	Amber	No	7x32	Conical	600	550	<5	<b>06-CTV(A)</b>	500
0.5mL Crimp Top Tapered Vial	Amber	No	7x30	Conical	500	450	<5	<b>05-CTV(A)</b>	500
PTFE Vial Support Sleeve for 6x32mm vials, fits most autosamplers	PTFE	No	12x31	Flat Bottom	–	–	–	<b>SV-S1</b>	50
PTFE Vial Support Sleeve for 6x32mm vials, fits robotic autosamplers	PTFE	No	12x32	Flat Bottom	–	–	–	<b>SV-S11A</b>	25
Glass Vial Support Sleeve for 6x32mm vials, fits robotic autosamplers	Clear	Yes	12x32	Flat Bottom	–	–	–	<b>SV-S11G</b>	25
PTFE Vial Support Sleeve for 7x32mm vials, fits most autosamplers	PTFE	No	12x32	Flat Bottom	–	–	–	<b>WS-5</b>	40

Sleeves adapt 6x32mm vials for use in autosamplers designed for 12x32mm vials. Use sleeve SV-S1 for autosamplers that do not lift the vial from the tray. Use SV-S11A or SV-S11G for autosamplers that move the vial during sampling. Use WS-5 for 06-CTV(A) and 08-CRV(A).

## Chromacol 8mm Crimp Top Closures

- Aluminum crimp seals with prefitted septa
- Provide a secure leak-resistant seal
- Pre-assembled caps and septa are convenient and minimize contamination from handling

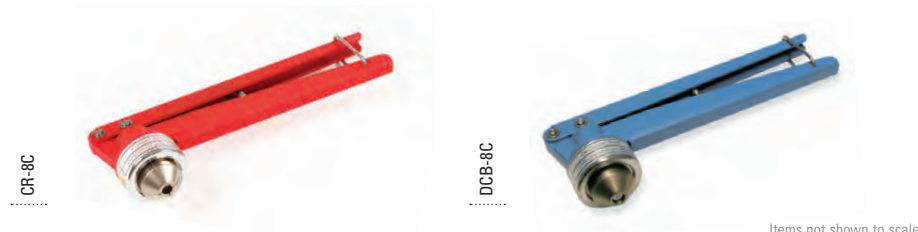


### Chromacol 8mm Crimp Top Closures

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
8mm Crimp Cap, 4mm hole, Type 6 Rubber/PTFE Liner	Silver	Aluminum	Red Natural Rubber/Clear PTFE	38	1.0	<b>8-AC6</b>	1000
	Blue	Aluminum	Red Natural Rubber/Clear PTFE	38	1.0	<b>8-AC6(B)</b>	1000
	Red	Aluminum	Red Natural Rubber/Clear PTFE	38	1.0	<b>8-AC6(R)</b>	1000
8mm Crimp Cap, 4mm hole, Type 7 Rubber/PTFE Liner	Silver	Aluminum	Red Natural Rubber/Clear PTFE	60	1.0	<b>8-AC7</b>	1000
8mm Crimp Cap, 4mm hole	Silver	Aluminum	—	—	—	<b>8-ACB</b>	1000
	Silver	Aluminum	Gray Chlorobutyl Rubber/Clear PTFE	52	1.0	<b>8-AC-CBT1</b>	500
	Blue	Aluminum	Blue Silicone/Red PTFE	20	1.4	<b>8-AC(B)-ST144</b>	500
	Silver	Aluminum	White Silicone/Red PTFE	50	1.3	<b>8-AC-ST15</b>	500
	Silver	Aluminum	Blue Silicone/PTFE	30	1.0	<b>8-AC-ST101</b>	500
	Silver	Aluminum	Blue Silicone/PTFE, Pre-slit	30	1.0	<b>8-AC-ST101X</b>	500
	Silver	Aluminum	White Virgin PTFE, 0.01"	53	0.2	<b>8-ACT</b>	1000
	Silver	Aluminum	Red PTFE/White Silicone/Red PTFE	57	1.0	<b>8-AC-TST1</b>	500
	8mm Snap Cap, Thinned penetration area	Clear	Polyethylene	Integral Molded In Polyethylene	—	—	<b>8-PEC1</b>
Clear		Polyethylene	Integral Molded In Polyethylene, Pre-cut	—	—	<b>8-PEC1X</b>	1000

## Chromacol 8mm Crimping and Decrimping Tools

- Crimping tools provide a reproducible secure closure
- High quality construction for durability and long life
- Fine textured surface (powder coated) for a better grip and corrosion resistance



### Chromacol 8mm Crimping and Decrimping Tools

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 8mm aluminum crimp seals	<b>CR-8C</b>	1
Manual Decrimper	Removes 8mm aluminum crimp seals without vial damage	<b>DCB-8C</b>	1

For electronic crimpers and decrimpers look on page **2-092**



## Chromacol 2mL, 12x32mm Standard Opening Screw Thread Vials and Inserts

- 8-425 thread finish vials are best suited for most instruments where the vial remains in the sample tray during injection
- Manufactured from superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- GOLD grade glass quality is a low expansion high purity glass with an extremely low concentration of active sites
- Available with a graduated, write-on patch for convenient sample identification
- Small opening requires Micro-Inserts with a diameter of 5mm
- While maintaining the standard outer dimensions the internal volumes of these vials range from below 300µL to 2mL
- Where levels of inorganic ions have to be kept to an absolute minimum the use of plastics may be preferred to the more conventional glass vials

### Recommended for the following instruments:

- Beckman
- CTC
- Gilson
- Knauer
- Shimadzu
- Spark Holland
- Varian
- VWR (Merck)/Hitachi

For autosampler compatibility visit

[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### Chromacol 2mL, 12x32 Standard Opening Screw Thread Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (mL)	Usable Volume (mL)	Residual (µL)	Cat. No.	Pack of
8-425 Screw Thread Vial	Clear	Yes	12x32	Flat Bottom	2.0	1.5	<170	<b>2-SV</b>	500
	Amber	Yes	12x32	Flat Bottom	2.0	1.5	<170	<b>2-SV(A)</b>	500
8-425 Screw Thread Vial – GOLD Grade Glass	Clear	No	12x32	Flat Bottom	2.0	1.5	<170	<b>2-SVG</b>	500
8-425 Screw Thread 1.1mL Vial – GOLD Grade Glass	Clear	No	12x32	Conical	1.2	1.1	<5	<b>1.1-STVG</b>	500
8-425 Screw Thread 0.3mL Vial	Polypropylene	No	12x32	Insert Vial	0.3	250µL	<3	<b>03-PPSV</b>	500
200µL Insert	Clear Glass	No	5x31	Flat Bottom	250µL	200µL	<12	<b>02-NV</b>	1000
	Clear Glass	No	5x30	Conical	200µL	160µL	<4	<b>02-MTV</b>	1000
Self-centering support device for tapered glass inserts	Polyethylene	–	–	–	–	–	–	<b>MTS-1</b>	500
Support Sleeve for 1.1-STVG	PTFE	–	–	–	–	–	–	<b>TTS-312</b>	50

Support sleeve allows conical tip vial to be used in standard 12x32mm autosampler trays

## Chromacol 8-425 Screw Thread Caps and Septa

- Open top caps are designed to be used with any of our 8mm septa
- Polypropylene caps are chemically inert and suitable for most chromatography applications
- Flanged caps are particularly suitable for Shimadzu and Tosoh autosamplers
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Closures are shipped in sealed polybags to prevent contamination during transport



### Chromacol 8-425 Screw Thread Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
8mm Open Top Screw Cap, 8-425 thread, 5mm hole	Black	Polypropylene	–	–	–	<b>8-SC</b>	500
	Red	Polypropylene	–	–	–	<b>8-SC(R)</b>	500
	White	Polypropylene	–	–	–	<b>8-SC(W)</b>	500
8mm Open Top Screw Cap with flange, 8-425 thread, 5mm hole	Black	Polypropylene	–	–	–	<b>8-SCJ</b>	500
	White	Polypropylene	–	–	–	<b>8-SCJ(W)</b>	500
Septum for 8-425 Screw Caps	–	–	Red Natural Rubber/Clear PTFE	38	1.0	<b>8-6RT1</b>	1000
	–	–	White Silicone/Red PTFE	45	1.3	<b>8-ST15</b>	500
	–	–	Blue Silicone/PTFE	50	1.2	<b>8-ST14</b>	500
	–	–	Blue Silicone/PTFE, Pre-slit	50	1.2	<b>8-ST14X</b>	500
	–	–	White Silicone/PTFE	20	1.4	<b>8-ST143</b>	500
	–	–	Blue Silicone/PTFE	30	1.0	<b>8-ST101</b>	500
	–	–	Red PTFE/White Silicone/Red PTFE	57	1.0	<b>8-TST1</b>	500
	–	–	White Virgin PTFE, 0.01"	53	0.3	<b>8-T02</b>	1000
	–	–	Blue Silicone/Red PTFE	20	1.4	<b>8-ST144</b>	500
8mm Open Top Screw Cap, 8-425 thread, 5mm hole, Type 8 Rubber/PTFE Liner	Black	Polypropylene	Red Natural Rubber/Clear PTFE	50	1.3	<b>8-SC-8RT1</b>	500
8mm Open Top Screw Cap, 8-425 thread, 5mm hole	Black	Polypropylene	White Silicone/Red PTFE	45	1.3	<b>8-SC-ST15</b>	500

## Chromacol Standard Opening Screw Thread Vial Convenience and Instrument Select (IS) Kits

- Convenience kits save time during sample preparation
- Includes 100 vials and 100 caps with pre-assembled septa for added convenience during sample preparation
- Reusable two compartment trays protect vials and closure while keeping matching supplies together



Convenience Kits

Items not shown to scale

### Chromacol Standard Opening Screw Thread Vial Convenience and Instrument Select (IS) Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap/Septum Cat. No.	Cat. No.	Pack of
Convenience Kit, Standard Opening Screw Vial	Clear	Yes	White, flanged	Blue Silicone/PTFE	2-SV	8-SCJ(W) + 8-ST101	<b>2-SVJ(W)101-CP</b>	100
IS Kit, Standard Opening Screw Vial for Shimadzu LC Autosamplers	Clear	Yes	White, flanged	Blue Silicone/PTFE	2-SV	8-SCJ(W) + 8-ST101	<b>SHL</b>	100
IS Kit, Standard Opening Screw Vial for Thermo Scientific LC Autosamplers	Clear	Yes	Black	White Silicone/Red PTFE	2-SV	8-SC-ST15	<b>TSL</b>	100

*Trying to decide what septum is right for you?*

➤ Use our selection guide at [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

## Chromacol 9mm Wide Opening Screw Thread Vials and Inserts

- SureStop 9mm vials as part of the Advanced Vial Closure System (AVCS)\* offer the sealing and performance characteristics of a crimp top vial and remove any subjectivity in achieving optimal seal compression closing a vial by incorporating a definite stop point into the design of the vial finish. See pages **2-005** to **2-006**
- SureStop 9mm vials should be used with AVCS 9-SCK closures in order to get the best possible performance
- Available with a graduated, write-on patch for convenient sample identification
- Wide neck opening design, allows easy filling, requires Micro-Inserts with a diameter of 6mm
- Manufactured from superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts

### Compatible with:

Most HPLC and GC autosamplers  
For autosampler compatibility visit  
[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### Chromacol 9mm Wide Opening Screw Thread Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
9mm SureStop Screw Thread Vial (AVCS) – GOLD Grade Glass	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>2-SVWGK</b>	100
9mm SureStop Screw Thread Vial (AVCS)	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>2-SVWK(A)</b>	100
9mm Screw Thread Vial	Clear	No	15x46	Flat Bottom	4.0mL	3.5mL	<500	<b>4-SVQ</b>	500
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>2-SVW</b>	500
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>2-SVW(A)</b>	500
9mm Screw Thread Vial, High Recovery with 30µL Reservoir	Clear	No	12x32	Tapered Base	1.5mL	1.3mL	<4	<b>1.5-HRSV</b>	100
9mm Screw Thread Vial, Ultra High Recovery with 10µL Reservoir	Clear	No	12x32	Mandrel Base	1.2mL	1.0mL	<2	<b>1.2-UHRSV</b>	100
9mm Screw Thread Vial 300µL, Fused Insert	Clear	Yes	12x32	Insert Vial	0.3mL	250µL	<3	<b>03-FISV</b>	500
	Amber	Yes	12x32	Insert Vial	0.3mL	250µL	<3	<b>03-FISV(A)</b>	500
9mm Screw Thread Vial 200µL, Fused Insert-GOLD grade glass	Clear	Yes	12x32	Insert Vial	0.2mL	180µL	<2	<b>02-FISVG</b>	500
300µL Insert	Clear	–	6x31	Flat Bottom	300µL	200µL	<12	<b>03-NV</b>	1000
200µL Insert – GOLD Grade Glass	Clear	–	6x30	Pulled Point	200µL	160µL	<4	<b>02-MTVWG</b>	1000
Self-centering support device for tapered glass inserts	Polyethylene	–	–	–	–	–	–	<b>MTS-1</b>	500
9mm Screw Thread Vial	Polypropylene	No	12x32	Insert Vial, Mandrel	300µL	200µL	<4	<b>03-PPSVW</b>	500

\* For information about AVCS see page **2-005**

## Chromacol 9mm Screw Thread Closures

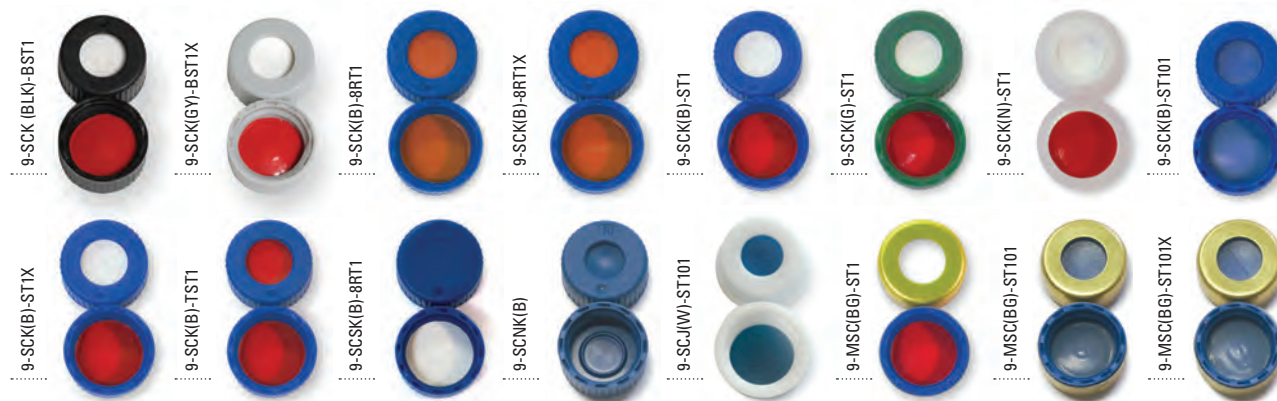


### K-Series closures featuring AVCS technology (Advanced Vial Closure System)

- Septa push through virtually eliminated due to improved interior geometry
- Improved sealing capability
- Improved autosampler compatibility
- AVCS provides the freedom to select the best septum for your instrument and applications
- Cost efficient alternative to caps with bonded septa
- Optimized ergonomics, fine texturing and evenly spaced ribbing for superior handling

Further features are:

- Easy-on, easy-off convenience with just one turn
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Polypropylene caps are chemically inert and suitable for most chromatography applications
- Closures have the profile of a crimp or snap closure for compatibility with robotic autosamplers
- Closures are shipped in sealed polybags to prevent contamination during transport
- Special caps for magnetic transport autosamplers
- Flanged caps suitable for Shimadzu, Hitachi and Tosoh instruments



### Chromacol 9mm Screw Thread Closures

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
9mm Open Top Short Screw Cap, 6mm hole	Black	Polypropylene	Bonded Red PTFE/White Silicone	57	1.0	<b>9-SCK (BLK)-BST1</b>	500
	Gray	Polypropylene	Bonded Red PTFE/White Silicone, Pre-slit	45	1.2	<b>9-SCK (GY)-BST1X</b>	500
9mm Open Top Short Screw AVCS Cap, 6mm hole	Blue	Polypropylene	Red Rubber/Clear PTFE	58	1.0	<b>9-SCK (B)-8RT1</b>	500
	Blue	Polypropylene	Red Rubber/Clear PTFE, Pre-slit	58	1.0	<b>9-SCK (B)-8RT1X</b>	500
	Blue	Polypropylene	White Silicone/Red PTFE	57	1.0	<b>9-SCK (B)-ST1</b>	500
	Green	Polypropylene	White Silicone/Red PTFE	57	1.0	<b>9-SCK (G)-ST1</b>	500
	Clear	Polypropylene	White Silicone/Red PTFE	57	1.0	<b>9-SCK (N)-ST1</b>	500
	Blue	Polypropylene	Blue Silicone/PTFE	30	1.0	<b>9-SCK (B)-ST101</b>	500
	Blue	Polypropylene	White Silicone/Red PTFE, Y-Pre-slit	57	1.0	<b>9-SCK (B)-ST1X</b>	500
	Blue	Polypropylene	Red PTFE/White Silicone/Red PTFE	57	1.0	<b>9-SCK (B)-TST1</b>	500
9mm Solid Top Short Screw AVCS Cap	Blue	Polypropylene	Red Natural Rubber/Beige PTFE	58	1.0	<b>9-SCSK (B)-8RT1</b>	500
9mm Short Screw AVCS Cap with Integral PP-Membrane	Blue	Polypropylene				<b>9-SCNK (B)</b>	500
9mm Open Top Short Screw Cap with flange, 6mm hole	White	HDPE	Blue Silicone/PTFE	30	1.0	<b>9-SCJ (W)-ST101</b>	500
9mm Open Top Short Screw AVCS Cap, 6mm hole, magnetic	Blue/Gold	PP/Steel	White Silicone/Red PTFE	57	1.0	<b>9-MSC (BG)-ST1</b>	100
	Blue/Gold	PP/Steel	Soft septum, Blue Silicone/PTFE	30	1.0	<b>9-MSC (BG)-ST101</b>	100
	Blue/Gold	PP/Steel	Soft septum, Blue Silicone/PTFE, Pre-slit	30	1.0	<b>9-MSC (BG)-ST101X</b>	100

## Chromacol 9mm Wide Opening Convenience and Instrument Select (IS) Kits

- Convenience kits save time during sample preparation
- Includes 100 vials and 100 caps with pre-assembled septa for added convenience during sample preparation
- Reusable two compartment trays protect vials and closure while keeping matching supplies together



2-SVWGK8-CPK

### Chromacol 9mm Wide Opening Screw Thread Vial Convenience and Instrument Select (IS) Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
SureStop Convenience Kit, GOLD Grade	Clear	Yes	Blue	Red Natural Rubber/Clear PTFE	2-SVWGK	9-SCK(B)-8RT1	<b>2-SVWGK8-CPK</b>	100
	Clear	Yes	Blue	White Silicone/Red PTFE	2-SVWGK	9-SCK(B)-ST1	<b>2-SVWGKST-CPK</b>	100
SureStop Convenience Kit	Amber	Yes	Blue	Red Natural Rubber/Clear PTFE	2-SVWK(A)	9-SCK(B)-8RT1	<b>2-SVWK(A)8-CPK</b>	100
	Amber	Yes	Blue	White Silicone/Red PTFE	2-SVWK(A)	9-SCK(B)-ST1	<b>2-SVWK(A)ST-CPK</b>	100
SureStop IS Kit, GOLD Grade, for Thermo GC Autosampler	Clear	Yes	Blue	Blue Silicone/PTFE	2-SVWGK	9-SCK(B)-ST101	<b>TTRGKK</b>	100
AVCS Convenience Kit	Clear	Yes	Blue	Red Natural Rubber/Clear PTFE	2-SVW	9-SCK(B)-8RT1	<b>2-SVW8-CPK</b>	100
	Clear	Yes	Blue	White Silicone/Red PTFE	2-SVW	9-SCK(B)-ST1	<b>2-SVWST-CPK</b>	100
	Amber	Yes	Blue	Red Natural Rubber/Clear PTFE	2-SVW(A)	9-SCK(B)-8RT1	<b>2-SVW(A)8-CPK</b>	100
	Amber	Yes	Blue	White Silicone/Red PTFE	2-SVW(A)	9-SCK(B)-ST1	<b>2-SVW(A)ST-CPK</b>	100
AVCS IS Kit, for Agilent LC Autosampler	Clear	Yes	Blue	Red Natural Rubber/Clear PTFE	2-SVW	9-SCK(B)-8RT1	<b>HPLSK</b>	100
AVCS IS Kit, for Thermo GC Autosampler	Clear	Yes	Blue	Blue Silicone/PTFE	2-SVW	9-SCK(B)-ST101	<b>TTRK</b>	100
AVCS Convenience Kit, for Varian GC Autosampler	Clear	Yes	Blue	White Silicone/Red PTFE	2-SVW	9-SCK(B)-ST1	<b>VAGK</b>	100
AVCS IS Kit, for Varian LC Autosampler	Clear	Yes	Blue	White Silicone/Red PTFE	2-SVW	9-SCK(B)-ST1	<b>VALK</b>	100
AVCS IS Kit, for Waters Alliance® LC Autosampler	Clear	Yes	Blue	White Silicone/Red PTFE	2-SVW	9-SCK(B)-ST1	<b>WALK</b>	100
AVCS IS Kit, for PerkinElmer LC Autosampler	Clear	Yes	Green	White Silicone/Red PTFE, Pre-slit	2-SVW	9-SCK(G)-ST1X	<b>PELK</b>	100
AVCS IS Kit, for Waters Alliance LC Autosampler	Clear	Yes	Black	Bonded Red PTFE/White Silicone	2-SVW	9-SCK(BLK)-BST1	<b>WALBK</b>	100
Convenience Kit	Clear	Yes	Gray	Bonded Red PTFE/White Silicone, Pre-slit	2-SVW	9-SCK(GY)-BST1X	<b>2-SVWBSTX-CPK</b>	100
	Amber	Yes	Gray	Bonded Red PTFE/White Silicone, Pre-slit	2-SVW(A)	9-SCK(GY)-BST1X	<b>2-SVW(A)BSTX-CPK</b>	100

## Chromacol 2mL, 12x32mm, 11mm Crimp Top Vials and Closures

- Thermo Scientific Chromacol GOLD glass quality, a low expansion high purity glass with an extremely low concentration of active sites
- Manufactured from superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Available with a graduated, write-on patch for convenient sample identification
- Wide neck opening design, allows easy filling, requires Micro-Inserts with a diameter of 6mm
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts
- Where levels of inorganic ions have to be kept to an absolute minimum the use of plastics may be preferred to the more conventional glass vials

### Compatible with:

Most HPLC and GC autosamplers

For autosampler compatibility visit

[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### Chromacol 2mL, 12x32mm, 11mm Crimp Top Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
11mm Crimp Top Vial, Wide Opening	Clear	Glass	15x46	Flat Bottom	4.0mL	3.5mL	<500	<b>4-CV</b>	500
	Clear	Glass	12x40	Flat Bottom	2.5mL	2.0mL	<170	<b>2.5-CV</b>	500
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>2-CV</b>	500
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>2-CV(A)</b>	500
11mm Crimp Top Vial, Wide Opening – GOLD Grade Glass	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>2-CVG</b>	500
11mm Crimp Top Vial, Wide Opening	Clear	Yes	12x32	Round Bottom	2.0mL	1.5mL	<170	<b>2-CRV</b>	500
11mm Crimp Top 1.5mL High Recovery Vial	Clear	No	12x32	High Recovery	1.5mL	1.3mL	<4µL	<b>1.5-HRCV</b>	100



### Chromacol 2mL, 12x32mm, 11mm Crimp Top Vials and Inserts (Continued)

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
11mm Crimp Top 1.1mL Vial, Wide Opening – GOLD Grade Glass	Clear	No	12x32	Conical	1.4mL	1.1mL	<5	<b>1.1-CTVG</b>	500
11mm Crimp Top 1.1mL Vial, Wide Opening	Amber	No	12x32	Conical	1.4mL	1.1mL	<5	<b>1.1-CTV(A)</b>	500
11mm Crimp Top 0.9mL Vial, Wide Opening	Clear	No	10x32	Conical	1.0mL	850µL	<5	<b>09-CTV</b>	500
	Clear	No	12x32	Insert Vial	0.9mL	830µL	<3	<b>09-FIV</b>	500
11mm Crimp Top 0.3mL Vial, Fused Insert	Clear	Yes	12x32	Insert Vial	0.3mL	250µL	<3	<b>03-FIV</b>	500
	Amber	Yes	12x32	Insert Vial	0.3mL	250µL	<3	<b>03-FIV(A)</b>	500
11mm Crimp Top 0.2mL Vial, Fused Insert – GOLD Grade Glass	Clear	Yes	12x32	Insert Vial	0.2mL	180µL	<2	<b>02-FIVG</b>	500



### Chromacol 2mL, 12x32mm, 11mm Crimp Top Vials and Inserts (Continued)

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
300µL Insert	Clear	–	6x31	Flat Bottom	300µL	200µL	<12	<b>03-NV</b>	1000
200µL Insert – GOLD Grade Glass	Clear	–	6x30	Pulled Point	200µL	160µL	<4	<b>02-MTVWG</b>	1000
Self-centering vial support device for tapered glass inserts	Polyethylene	–	–	–	–	–	–	<b>MTS-1</b>	500
PTFE Vial Support 1.1-CTVG	PTFE	–	–	–	–	–	–	<b>TTS-312</b>	50
Plastic Vial Support Sleeve for 09-CTV Only	Polyethylene	–	–	–	–	–	–	<b>WS-6</b>	100

Support sleeves allow conical tip vials to be used in standard 12x32mm autosampler trays



## Chromacol 11mm Crimp Top Closures

- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Aluminum crimp closures provide a secure leak-resistant seal
- Aluminum seals must be applied with a crimping tool
- Closures are shipped in sealed polybags to prevent contamination during transport
- First crimp cap with assembled aluminum liner for interference free analysis of Elastomers, Polymers, Phthalates, Halogenated compounds and Silicones
- First crimp cap with tight PTFE sealing disk due to additional silicone ring



### Chromacol 11mm Crimp Top Closures

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
Septum for 11mm Crimp Caps	–	–	Silicone/PTFE for liquid – liquid extraction	–	0.2	<b>11-LLX</b>	100
11mm Crimp Cap, 6mm hole	Silver	Aluminum	Solid Aluminum Disk with Silicone sealing ring		0.06	<b>11-AC-AL</b>	100
11mm Crimp Cap, 6mm center hole	Silver	Aluminum	–	–	–	<b>11-ACB</b>	500
11mm Crimp Cap, 6mm center hole, Type 6 Rubber/PTFE	Silver	Aluminum	Red Chlorobutyl Rubber/Clear PTFE,	40	1.0	<b>11-AC6</b>	500
	Red	Aluminum	Sulphur free	40	1.0	<b>11-AC6(R)</b>	500
11mm Crimp Cap, 6mm center hole, Type 7 Rubber/PTFE	Silver	Aluminum	Red Natural Rubber/Clear PTFE	60	1.0	<b>11-AC7</b>	500
	Blue	Aluminum		60	1.0	<b>11-AC7(B)</b>	500
	Red	Aluminum		60	1.0	<b>11-AC7(R)</b>	500
	Green	Aluminum		60	1.0	<b>11-AC7(G)</b>	500
	Gold	Aluminum		60	1.0	<b>11-AC7(GO)</b>	500



### Chromacol 11mm Crimp Top Closures (Continued)

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
11mm Crimp Cap, 6mm center hole	Blue	Aluminum	Gray Chlorobutyl/PTFE	52	1.0	<b>11-AC-CBT1</b>	500
	Blue	Aluminum	Blue Silicone/Red PTFE	20	1.4	<b>11-AC(B)-ST144</b>	500
	Silver	Aluminum	White Silicone/Red PTFE	50	1.3	<b>11-AC-ST15</b>	500
	Silver	Aluminum	Blue Silicone/PTFE	30	1.0	<b>11-AC-ST101</b>	500
	Silver	Aluminum	Blue Silicone/PTFE, Pre-slit	30	1.0	<b>11-AC-ST101X</b>	500
	Silver	Aluminum	White Virgin PTFE, 0.01" with clear Silicone sealing ring	53	0.25	<b>11-ACTS</b>	1000
	Silver	Aluminum	White Virgin PTFE, 0.01"	–	0.25	<b>11-ACT</b>	1000
	Silver	Aluminum	Red PTFE/White Silicone/Red PTFE	57	1.0	<b>11-AC-TST1</b>	500



### Chromacol 11mm Crimp Top Closures (Continued)

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
11mm Crimp Cap, magnetic	Silver	Steel	White Silicone/Red PTFE	57	1.3	<b>11-MC-ST15</b>	500
11mm Crimp Cap, magnetic, Type 8 Rubber/PTFE	Silver	Steel	Red Natural Rubber/Clear PTFE	38	1.0	<b>11-MC-8RT1</b>	500
11mm Crimp Cap, magnetic	Silver	Steel	Blue Silicone/PTFE	30	1.0	<b>11-MC-ST101</b>	500
11mm Snap Cap for Crimp Vials	Clear	Polyethylene	–	–	–	<b>11-PEC1</b>	1000
11mm Snap Cap for Crimp Vials, Pre cut	Clear	Polyethylene	–	–	–	<b>11-PEC1X</b>	1000
11mm Snap Cap for Crimp Vials	Clear	Polyethylene	White Silicone/Red PTFE	57	1.0	<b>11-PEC-ST1</b>	500

## Chromacol 11mm Crimp Top Convenience and Instrument Select (IS) Kits

- Convenience kits save time during sample preparation
- Include matched quantities of vials and aluminum seals with pre-assembled septa for added convenience during sample preparation
- Reusable two compartment trays protect vials and closure while keeping matching supplies together



Items not shown to scale

### Chromacol 11mm Crimp Top Convenience and Instrument Select (IS) Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit, Wide Opening Crimp Top Vial	Clear	Yes	Silver	Red Natural Rubber/Clear PTFE, Type 7	2-CV	11-AC7	<b>2-CV7-CP</b>	100
	Clear	Yes	Silver	White Silicone/Red PTFE	2-CV	11-AC-ST15	<b>2-CVST-CP</b>	100
	Amber	Yes	Silver	Red Natural Rubber/Clear PTFE, Type 7	2-CV(A)	11-AC7	<b>2-CV(A)7-CP</b>	100
	Amber	Yes	Silver	White Silicone/Red PTFE	2-CV(A)	11-AC-ST15	<b>2-CV(A)ST-CP</b>	100
IS Kit, Wide Opening Crimp Top Vial for Agilent GC Autosampler	Clear	Yes	Silver	Red Natural Rubber/Clear PTFE, Type 7	2-CV	11-AC7	<b>HPG</b>	100
IS Kit, Wide Opening Crimp Top Vial for Agilent LC Autosampler	Clear	Yes	Silver	Red Natural Rubber/Clear PTFE, Type 7	2-CV	11-AC7	<b>HPL</b>	100
IS Kit, Wide Opening Crimp Top Vial for VWR(Merck)-Hitachi LC Autosampler	Clear	Yes	Silver	Blue Silicone/PTFE-Pre-Cut	2-CV	11-AC-ST101X	<b>MEL</b>	100
IS Kit, Wide Opening Crimp Top Vial for PerkinElmer GC Autosampler	Clear	Yes	Silver	Red Natural Rubber/Clear PTFE, Sulphur free, Type 6	2-CV	11-AC6	<b>PEG</b>	100
IS Kit, Wide Opening Crimp Top Vial for Shimadzu LC Autosampler	Clear	Yes	Silver	Blue Silicone/PTFE	2-CV	11-AC-ST101	<b>SHG</b>	100
IS Kit, Wide Opening Crimp Top Vial for Thermo Scientific GC Autosamplers	Clear	Yes	Silver	Blue Silicone/Red PTFE	2-CV	11-AC(N)-ST144	<b>TQG</b>	100
IS Kit, Wide Opening Crimp Top Vial for Thermo LC Autosampler	Clear	Yes	Silver	White Silicone/Red PTFE	2-CV	11-AC-ST15	<b>TQL</b>	100

## Chromacol 11mm Crimping and Decrimping Tools

- Crimping tools provide a reproducible, secure vial closure for all 11mm vial and seal combinations
- Easy and convenient handling
- High quality construction for durability and long life
- Fine textured surface (powder coated) for a better grip and corrosion resistance



### Chromacol 11mm Crimpers and Decrimpers

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 11mm aluminum crimp seals	<b>CR-11C</b>	1
Decapping Pliers	Removes 11mm aluminum crimp seals, Protective gloves recommended	<b>DCR-11</b>	1
Manual Decrimper	Removes 11mm aluminum crimp seals without vial damage	<b>DCB-11C</b>	1

For electronic crimpers and decrimpers look on page **2-092**

## Chromacol 2mL, 12x32mm, 11mm Snap Cap Vials

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Available with a graduated, write-on patch for convenient sample identification
- Wide neck opening design, allows easy filling; requires Micro-Inserts with diameter of 6mm
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts
- Available silanized\* (deactivated) for optimal recovery of critical polar, labile or chelating compounds.
- Snap-Cap vials can be used with snap caps or aluminum crimp seal closures

### Compatible with:

Most HPLC and GC autosamplers  
 For autosampler compatibility visit  
[www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### Chromacol 2mL, 12x32mm, 11mm Snap Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
11mm Snap Cap Vial	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>2-RV</b>	500
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	<b>2-RV(A)</b>	500
11mm Snap Cap 1.5mL Vial	Clear	No	12x32	High Recovery	1.5mL	1.3mL	<4	<b>1.5-HRRV</b>	100
11mm Snap Cap 1.5mL Vial, silanized*	Clear	No	12x32	High Recovery	1.5mL	1.3mL	<4	<b>1.5-HRRV(S)</b>	100
11mm Snap Cap Vial, Ultra High Recovery with 10µL Reservoir	Clear	No	12x32	Mandrel Base	1.2mL	1mL	<2	<b>1.2-UHRRV</b>	100
11mm Snap Cap 300µL Vial, Fused Insert	Clear	Yes	12x32	Fused Conical	300µL	250µL	<3	<b>03-FIRV</b>	500
	Amber	Yes	12x32	Fused Conical	300µL	250µL	<3	<b>03-FIRV(A)</b>	500
11mm Snap Cap 200µL Vial, Fused Insert – GOLD grade glass	Clear	Yes	12x32	Fused Conical	200µL	180µL	<2	<b>02-FIRVG</b>	500
300µL Insert	Clear	–	6x31	Flat Bottom	300µL	200µL	<12	<b>03-NV</b>	1000
200µL Insert – GOLD Grade Glass	Clear	–	6x30	Pulled Point	200µL	160µL	<4	<b>02-MTVWG</b>	1000
Self-centering support device for tapered glass inserts	Polyethylene	–	–	–	–	–	–	<b>MTS-1</b>	500

\* For information about silanized products visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

## Chromacol 11mm Snap Closures

- New design of locking tabs provides easier application and removal of caps
- Enlarged open area allows for needle penetration across the entire vial opening
- Textured outer surface for easier gripping and improved detection by autosamplers with optical vial sensors
- Easy to apply and easy to remove from Snap vials without tools
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Snap caps eliminate the need for crimping or de-crimping tools
- Polyethylene caps are chemically inert and suitable for most chromatography applications
- Closures are shipped in sealed polybags to prevent contamination during transport
- Integral Molded Polyethylene cap is an economical choice for routine HPLC applications, but with low sealing properties and zero resealing capacity



### Chromacol 11mm Snap Closures

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
11mm Snap Cap, thinned penetration area	Blue	Polyethylene	Integral Molded In Polyethylene	–	–	<b>11-PSN(B)</b>	500
11mm Snap Cap, 6mm hole	Blue	Polyethylene	Red Natural Rubber/Clear PTFE	58	1.0	<b>11-PSN(B)-8RT1</b>	500
	Blue	Polyethylene	White Silicone/Red PTFE	57	1.0	<b>11-PSN(B)-ST1</b>	500
	Blue	Polyethylene	Blue Silicone/PTFE	30	1.0	<b>11-PSN(B)-ST101</b>	500
	Blue	Polyethylene	White Silicone/Blue PTFE, Pre-slit	57	1.0	<b>11-PSN(B)-ST1X</b>	500
	Blue	Polyethylene	Red PTFE/White Silicone/Red PTFE	57	1.0	<b>11-PSN(B)-TST1</b>	500
	Red	Polyethylene	White Virgin PTFE, 0.01"	53	0.3	<b>11-PSN(R)-T02</b>	500
	Blue	Polyethylene	White Virgin PTFE, 0.01"	53	0.3	<b>11-PSN(B)-T02</b>	500

## Chromacol 11mm Snap Cap Wide Opening Vial Convenience Kits

- Convenience kits save time during sample preparation
- Includes 100 vials and 100 caps with pre-assembled septa for added convenience during sample preparation
- Reusable two compartment trays protect vials and closure while keeping matching supplies together



### Chromacol 11mm Snap Cap Wide Opening Vial Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit, Wide Opening Snap Vial	Clear	Yes	Blue	White Silicone/Red PTFE	2-RV	11-PSN(B)-ST1	<b>2-RVST-CP</b>	100
	Clear	Yes	Blue	Red Natural Rubber/Clear PTFE	2-RV	11-PSN(B)-8RT1	<b>2-RV8-CP</b>	100

## Chromacol 13mm Screw Vials, 13-425 Thread Finish

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts



### Compatible with:

The 4mL vials are preferentially used on instruments of the following manufacturers:

- Thermo Scientific
- Shimadzu
- Spark Holland, Varian
- VWR (Merck)/Hitachi
- Waters (Wisp 48 Position Carousel)

For autosampler compatibility visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)

Images shown are 60% to scale  
\* 40% to scale

### Chromacol 13mm Screw Vials, 13-425 Thread Finish

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (mL)	Usable Volume (mL)	Residual (µL)	Cat. No.	Pack of
13-425 Screw Thread Vial	Clear	No	13x100	Round Bottom	10.0	8.5	<500	<b>10-SV</b>	125
	Clear	No	13x65	Round Bottom	5.0	4.5	<500	<b>5-SV</b>	125
	Clear	No	15x46	Flat Bottom	4.0	4.0	<800	<b>4-SV</b>	500
	Amber	No	15x46	Flat Bottom	4.0	4.0	<800	<b>4-SV(A)</b>	500
13-425 Screw Thread 3.5mL High Recovery Vial	Clear	No	15.25x46	High Recovery	3.5	3.0	<12	<b>3.5-HRSV</b>	250

## Chromacol 13-425 Thread Caps and Septa

- Open top caps are designed to be used with any of our 12mm septa
- Polypropylene caps are chemically inert and suitable for most chromatography applications
- Pre-assembled caps and septa are convenient and minimize contamination from handling



### Chromacol 13-425 Screw Thread Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
13mm Open Top Screw Cap, 13-425 thread, 8mm hole	Black	Polypropylene	–	–	–	<b>12-SC</b>	500
	White	Polypropylene	–	–	–	<b>12-SC(W)</b>	500
	Red	Polypropylene	–	–	–	<b>12-SC(R)</b>	500
	Yellow	Polypropylene	–	–	–	<b>12-SC(Y)</b>	500
13mm Solid Top Cap, 13-425 thread	Black	Polypropylene	–	–	–	<b>12-SCS</b>	500
PTFE Lined Solid Top Storage Cap for 13-425 Thread	White	Urea	PTFE/PE Foam Liner	–	–	<b>13-SCST</b>	100
Septum for 13-425 Screw Caps	–	–	Red Natural Rubber/Clear PTFE	38	1.0	<b>12-6RT1</b>	500
	–	–	White Silicone/Red PTFE	57	2.0	<b>12-ST2</b>	500
	–	–	Blue Silicone/PTFE	57	1.8	<b>12-ST18</b>	500
	–	–	Blue Silicone/PTFE	30	1.0	<b>12-ST101</b>	500
	–	–	White Virgin PTFE, 0.01"	53	0.25	<b>12-T02</b>	1000



### Chromacol 13-425 Screw Thread Caps and Septa (Continued)

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
13mm Open Top Screw Cap, 13-425 thread, 8mm hole	Black	Polypropylene	White Silicone/Red PTFE	57	1.3	<b>13-SC-ST15</b>	500
	Black	Polypropylene	Red Natural Rubber/Clear PTFE	58	1.0	<b>12-SC-8RT1</b>	500
	Black	Polypropylene	White Silicone/Red PTFE	57	2.0	<b>12-SC-ST2</b>	500

## Chromacol Shell/Neckless Vials

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Polyethylene cap with starburst center design eases syringe needle penetration
- Convenience kits include equal quantities of vials and caps

### Recommended for the following instruments:

- Alcott
- Gilson
- Shimadzu
- Waters (Wisp 96 and 48 Position Carousel)

For autosampler compatibility visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



### Chromacol Shell/Neckless Vials

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (mL)	Usable Volume (mL)	Residual (µL)	Cat. No.	Pack of
1mL Neckless/Shell Vial	Clear	No	8x40	Flat Bottom	1.25	1.0	<80	<b>1-NWV</b>	500
1mL Neckless/Shell Vial with PE-Cap	Clear	No	8x40	Flat Bottom	1.25	1.0	<80	<b>1-NWV-C</b>	200
1mL Neckless/Shell Vial with PE-Cap	Amber	No	8x40	Flat Bottom	1.25	1.0	<81	<b>1-NWV(A)-C</b>	200
2mL Neckless/Shell Vial	Clear	No	12x32	Flat Bottom	2.5	2.0	<175	<b>2.5-NV</b>	500
4mL Neckless/Shell Vial with PE-Cap	Clear	No	15x46	Flat Bottom	5.5	4.0	<350	<b>4-NWV-C</b>	100
8mm PE-Cap/Plug for 1mL Shell-Vial	Polyethylene	–	–	–	–	–	–	<b>8-NPWP</b>	1000
12mm Polyethylene Plug for 2mL Shell-Vial	Polyethylene	–	–	–	–	–	–	<b>12-NPEP4</b>	1000

Trying to decide what glass quality is right for you?



Use our selection guide at [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)



## Chromacol Headspace Vials

Glass vials with 20mm crimp seal or 18mm screw thread finish are designed to fit most headspace autosamplers

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber, meets all requirements of Pharm. US, EU, JPN
- Round bottom vials are compatible with most autosamplers and more easily handled by robotic arms that lift the vial from the tray
- Vials feature beveled edge 20mm crimp finish
- The bevel edge on the lip of the vial provides additional sealing power for greater leak resistance under high pressure
- Screw thread headspace vials are convenient and do not require tools
- Multiple turn threading maintains a tight seal through extreme heating cycles



### Chromacol Headspace Vials

Description	Glass	Patched	Dimension (mm)	Finish	Profile	Total Volume (mL)	Usable Volume (mL)	Cat. No.	Pack of
20mm Headspace Crimp Vial	Clear	No	30x60	Beveled Edge	Flat Bottom	27	27	<b>27-CV</b>	100
	Clear	No	23x75	Beveled Edge	Round Bottom	22	20	<b>22-CV</b>	125
	Clear	No	22.5x75	Beveled Edge	Round Bottom	21	20	<b>20-CV</b>	125
	Amber	No	22.5x75	Beveled Edge	Round Bottom	21	20	<b>20-CV(A)</b>	125
	Clear	No	18x65	Beveled Edge	Round Bottom	12	10	<b>12-CV</b>	100



### Chromacol Headspace Vials (Continued)

Description	Glass	Patched	Dimension (mm)	Finish	Profile	Total Volume (mL)	Usable Volume (mL)	Cat. No.	Pack of
20mm Headspace Crimp Vial	Clear	No	22.5x46	Beveled Edge	Round Bottom	12	10	<b>10-CV</b>	125
	Amber	No	22.5x46	Beveled Edge	Round Bottom	12	10	<b>10-CV(A)</b>	125
	Clear	No	18x50	Beveled Edge	Round Bottom	10	9	<b>9-CV</b>	100
	Clear	No	22x38	Beveled Edge	Round Bottom	8	6	<b>6-CV</b>	125
18mm Screw Top Headspace Vial	Clear	No	22.5x76	Screw Thread	Round Bottom	21	20	<b>20-HSV</b>	125
	Clear	No	22.5x46	Screw Thread	Round Bottom	12	10	<b>10-HSV</b>	125

## Chromacol 20mm Crimping and Decrimping Tools

- Crimping tools provide a reproducible, secure vial closure for all 20mm vial and seal combinations
- Easy and convenient handling
- High quality construction for durability and long life
- Fine textured surface (powder coated) for a better grip and corrosion resistance



Items not shown to scale

### Chromacol 20mm Crimping and Decrimping Tools

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 20mm crimp seals	<b>CR-20C</b>	1
Decapping Pliers	Removes 20mm crimp seals, Protective gloves recommended	<b>DCR-20</b>	1
Manual Decrimper	Removes 20mm crimp seals without vial damage	<b>DCB-20C</b>	1

For electronic crimpers and decrimpers look on page **2-092**

## Chromacol Headspace Caps and Septa

- Use magnetic seals with PAL/CTC/Leap Technologies, Gerstel and other magnetic transport autosamplers
- 20mm crimp seals must be applied with a crimping tool
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Extended temperature range products for high-temperature headspace applications



Images shown are 50% to scale

### Chromacol Headspace Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
20mm Crimp Cap, 9mm hole	Silver	Aluminum	–	–	–	<b>20-ACB</b>	500
20mm Magnetic Crimp Cap, 6mm hole	Silver	Tinplate	–	–	–	<b>20-MCB</b>	500
20mm Composite Magnetic Crimp Cap, 8mm hole	Blue	Alu/Tinplate	–	–	–	<b>20-MCBC</b>	500
	Red	Alu/Tinplate	–	–	–	<b>20-MCBC(R)</b>	500
18mm Magnetic Screw Cap, 8mm hole	Silver	Steel	–	–	–	<b>18-MSC</b>	125
Septum for 20mm Crimp Caps	–	–	20mm Gray Bromobutyl Stopper	55	3.0	<b>20-B3P</b>	500
	–	–	20mm Gray Butyl Freezer Bung	55	3.0	<b>20-2FB3</b>	2000
	–	–	20mm Molded Gray Chlorobutyl	52	3.0	<b>20-CB3</b>	1000
	–	–	20mm Molded Gray Bromobutyl/Gray PTFE	52	3.0	<b>20-CBT3</b>	1000
	–	–	20mm Molded Black Bromobutyl/Gray PTFE, Bellows Type	52	3.0	<b>20-CBT3B</b>	1000
	–	–	20mm Red Silicone/Aluminum Face Seal 3mm Thick, for >170°C.	45	3.0	<b>20-ASH3</b>	100
	–	–	20mm White Silicone/Aluminum Face Seal 3mm Thick, for <170°C.	45	3.0	<b>20-AS3</b>	100
	–	–	20mm Silicone/PTFE for liquid – liquid extraction	–	0.25	<b>20-LLX</b>	100
	–	–	20mm Blue Silicone/Natural PTFE	45	3.0	<b>20-ST3</b>	500
	–	–	20mm Red Silicone/Natural PTFE, high temperature	45	3.1	<b>20-ST3HT</b>	100
–	–	20mm Blue Silicone/Red PTFE Seal 1.5mm Thick	20	1.5	<b>20-ST15</b>	500	
–	–	20mm Blue Silicone/PTFE	30	1.0	<b>20-ST101</b>	500	



### Chromacol Headspace Caps and Septa (Continued)

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
Septum for 18mm Screw Caps	–	–	18mm Blue Silicone/PTFE	30	1.0	<b>18-ST101</b>	125
20mm Composite Magnetic Crimp Cap, 8mm hole	Blue	Alu/Tinplate	20mm Blue Silicone/Natural PTFE	45	3.0	<b>20-MCBC-ST3</b>	500
	Red	Alu/Tinplate	20mm Molded Gray Chlorobutyl	52	3.0	<b>20-MCBC(R)-CBT3</b>	500
	Red	Alu/Tinplate	20mm Blue Silicone/Natural PTFE	45	3.0	<b>20-MCBC(R)-ST3</b>	500
20mm Magnetic Tinplate Crimp Cap	Silver	Tinplate	20mm Blue Silicone/Natural PTFE	45	3.0	<b>20-MCB-ST3</b>	500
20mm Crimp Cap, 9mm hole	Silver	Aluminum	20mm Molded Gray/Bromobutyl/Gray PTFE	52	3.0	<b>20-AC-CBT3</b>	500
	Silver	Aluminum	20mm Blue Silicone/Natural PTFE	45	3.0	<b>20-AC-ST3</b>	500
18mm Magnetic Screw Cap, 8mm hole	Silver	Steel	18mm Molded Blue Chlorobutyl/Gray PTFE	52	3.0	<b>18-MSC-CBT3</b>	125
	Silver	Steel	18mm Blue Silicone/PTFE, not prefitted	30	1.0	<b>18-MSC-ST101</b>	125
	Silver	Steel	18mm Blue Silicone/Natural PTFE	45	2.0	<b>18-MSC-ST201</b>	125
20mm Plug	Natural	Polyethylene	PE Membrane	–	–	<b>20-PEPC5</b>	250
20mm Composite Magnetic Crimp Cap, 8mm hole	Natural	Alu/Tinplate	20mm Red Silicone/Natural PTFE, high temperature (250°C)	45	3.1	<b>20-MCBC(N)-ST3HT</b>	500
20mm Magnetic Tinplate Crimp Cap	Silver	Tinplate	20mm Red Silicone/Natural PTFE, high temperature (300°C)	45	3.1	<b>20-MCB-ST3HT</b>	500
18mm Magnetic Screw Cap, 8mm hole	Silver	Steel	18mm Red Silicone/Natural PTFE, high temperature (250°C)	45	3.1	<b>18-MSC-ST3HT</b>	125

## Chromacol Headspace Vial Convenience Kits

- Include matched quantities of vials and seals with pre-assembled septa for added convenience during sample preparation
- Convenience kits save time during sample preparation



20-HSVST201-CP



20-CVST3-CP

Items not shown to scale

### Chromacol Headspace Vial Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit, 20mL Headspace Screw Vial, Round Bottom, Steel Screw Cap, 8mm hole	Clear	No	Silver	18mm Blue Silicone/ Natural PTFE	20-HSV	18-MSC- ST201	<b>20-HSVST201-CP</b>	125
Convenience Kit, 20mL Headspace Crimp Vial, Beveled Edge, Round Bottom, Al Crimp Cap, 8mm hole	Clear	No	Silver	20mm Molded Blue Chlorobutyl/Gray PTFE	20-CV	20-AC-CBT3	<b>20-CVCBT3-CP</b>	125
Convenience Kit, 20mL Headspace Crimp Vial, Beveled Edge, Round Bottom, Al Crimp Cap, 8mm hole	Clear	No	Silver	20mm Blue Silicone/ Natural PTFE	20-CV	20-AC-ST3	<b>20-CVST3-CP</b>	125



## Chromacol Sample Storage Screw Thread Vials

- Capacity range up to 40mL
- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Provide consistent pH for duration of sample storage life
- PTFE-Lined Solid-top storage caps



Caps and Septa images 50% to scale

### Chromacol Sample Storage Screw Thread Vials

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (mL)	Capacity (DRAMS)	Cat. No.	Pack of
24-400 Screw Vial	Clear	No	28x95	Flat Bottom	40	8	<b>40-SV</b>	100
	Amber	No	28x95	Flat Bottom	40	8	<b>40-SV(A)</b>	100
20-400 Screw Vial	Clear	No	23x85	Flat Bottom	22	6	<b>22-SV</b>	200
18-400 Screw Vial	Clear	No	21x70	Flat Bottom	16	4	<b>16-SV</b>	200
	Amber	No	21x70	Flat Bottom	16	4	<b>16-SV(A)</b>	200
15-425 Screw Vial	Clear	No	19x65	Flat Bottom	12	3	<b>12-SV</b>	200
	Amber	No	19x65	Flat Bottom	12	3	<b>12-SV(A)</b>	200
15-425 Screw Vial	Clear	No	17x60	Flat Bottom	8	2	<b>8-SV</b>	200
	Amber	No	17x60	Flat Bottom	8	2	<b>8-SV(A)</b>	200

For smaller vials look at the previous sections



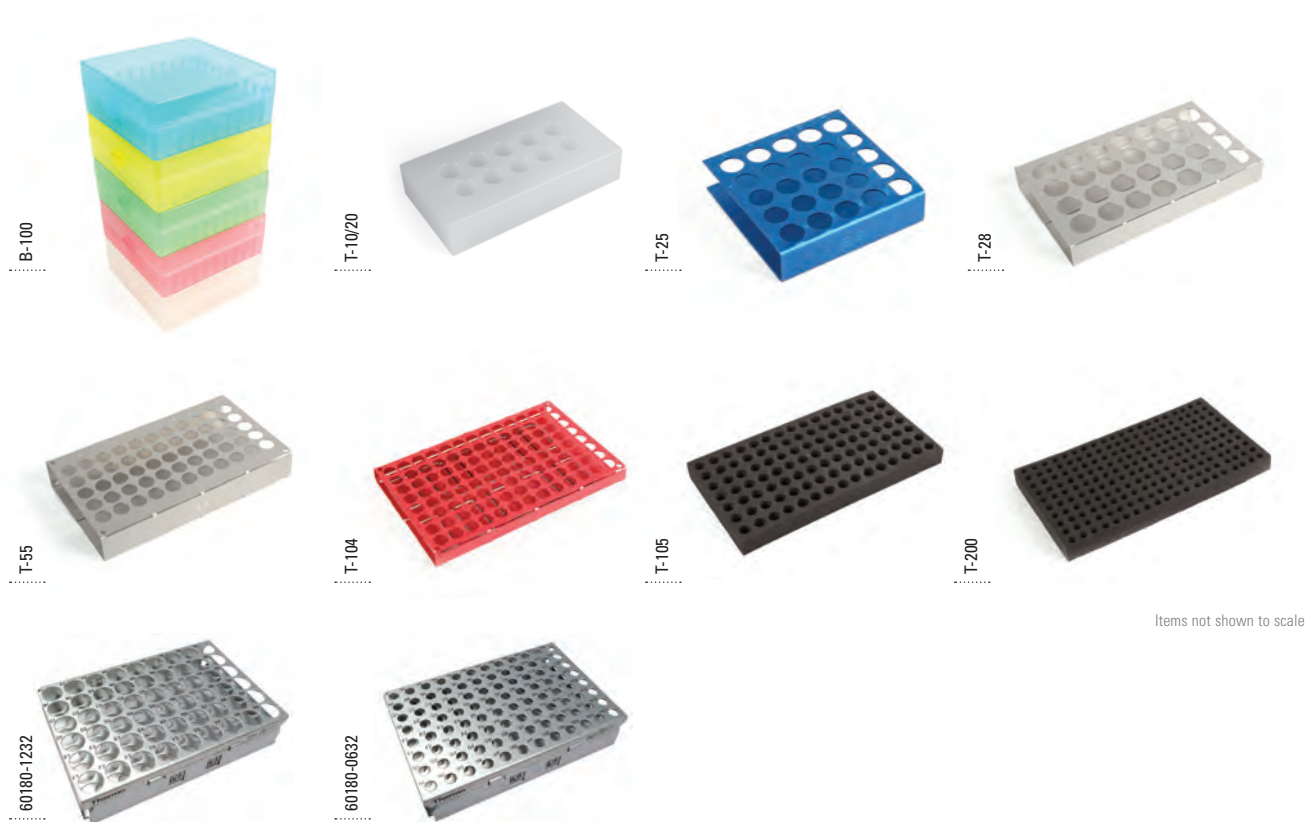
Caps and Septa images 50% to scale

### Chromacol Sample Storage Screw Thread Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
24-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	-	1.0	<b>24-SCST</b>	100
20-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	-	1.0	<b>20-SCST</b>	100
18-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	-	1.0	<b>18-SCST</b>	100
15-425 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	-	1.0	<b>15-SCST</b>	100
13-425 Screw Cap	White	Urea	PTFE/PE Foam Liner	-	1.0	<b>13-SCST</b>	100

## Chromacol Vial Racks and Storage Boxes

- For a safe working position on the lab bench and during transport
- Ideal for space-saving storage in fridges
- Temperature resistant from -90°C to 121°C (except Foam)
- Chemically resistant and fairly robust; autoclavable (except Foam)



Items not shown to scale

### Chromacol Vial Racks and Storage Boxes

Description	Color	Material	Dimension (mm)	No of Vials	OD of Vials (mm)	Stackable	Cat. No.	Pack of
Autoclavable freezer and storage box with lid, alphanumeric grid, -90°C to 121°C	5 assorted colors (red, yellow, blue, green, natural)	Polypropylene	155x140x5.5	100	12	Yes	<b>B-100</b>	5
Vial Tray	White	Polypropylene	195x103	10	22	No	<b>T-10/20</b>	1
Sci-Rack	Blue	Anodised Aluminum	85x85	25	12	No	<b>T-25</b>	1
	Silver	Anodised Aluminum	210x134	28	22	No	<b>T-28</b>	5
Vial Tray	Silver	Anodised Aluminum	210x134	55	15	Yes	<b>T-55</b>	5
	Red	Anodised Aluminum	210x134	104	12	Yes	<b>T-104</b>	5
Vial Tray	Black	Foam	210x134	105	12	No	<b>T-105</b>	5
	Black	Foam	210x134	200	8	No	<b>T-200</b>	5
SBS/ANSI standard footprint Vial Rack	Silver	Anodised Aluminum	127,8x85,5	54	12	No	<b>60180-1232</b>	1
	Silver	Anodised Aluminum	127,8x85,5	96	6	No	<b>60180-0632</b>	1

## Chromacol EPA , TOC and Scintillation Screw Vials

### Level 300 cleaned and certified

- Processed and packaged under a registered ISO Quality Management System
- Laboratory certified to meet U.S. EPA Super Fund Standards in accordance with the latest edition of EPA's "Specifications and Guidance for Contaminant Free Sample Containers"
- Every case of Level 300 product contains a Certificate of Analysis and is custody sealed to ensure reliable chain-of-custody

### Level 200 cleaned

- Processed and packaged under a strict registered ISO Quality Management System in the same manner as Level 300 products
- Level 200 products are not certified
- Every case of product is labeled with its production number and is custody sealed to ensure reliable chain-of-custody

### Level 100

- Level 100 products are not certified or pre-cleaned
- Every case of product is labeled with its production number and is custody sealed to ensure reliable chain-of-custody

### TOC vials

- The only low-level certified vials in the market for Total Organic Carbon testing and sampling
- Major TOC instrument manufacturers recommend these vials when analysis of low levels of TOC requires low background level assurance
- Each lot of vials is tested and certified to contribute less than 10ppb TOC as background or for less stringent applications the 20ppb TOC version

- Certificate of Analysis is included with lot production numbers

### Scintillation vials

- Provide the very lowest background count and benefit from very high optical clarity.
- Typical background count of 13CPM or lower, compared to an average 16-65CPM from competitive products
- Noise level of 2.28 and a quenching index factor of 349

### Chromacol EPA Screw Vial Kits

Kit Type	Glass	Dimension (mm)	Total Volume (mL)	Level	Septum	Cat. No.	Pack of
EPA Screw Vial Assembled Kit Vials/Septa/Caps	Clear	28x95	40	Level 100	0.01" White PTFE/ 0.09" Clear Silicone	<b>40-EPAVCS</b>	100
	Clear	28x95	40	Level 200 Pre-cleaned		<b>40-EPAVCS-PC</b>	72
	Clear	28x95	40	Level 300 Pre-cleaned	<b>40-EPAVCS-PC3</b>	72	
	Amber	28x95	40	Level 100	<b>40-EPAVCS(A)</b>	100	
	Amber	28x95	40	Level 200 Pre-cleaned	<b>40-EPAVCS(A)-PC</b>	72	
	Clear	28x57	20	Level 100	<b>20-EPAVCS</b>	100	
	Amber	28x57	20	Level 100	<b>20-EPAVCS(A)</b>	100	
	Clear	28x140	60	Level 100	<b>60-EPAVCS</b>	72	

### Chromacol TOC Vial Kits (Assembled)

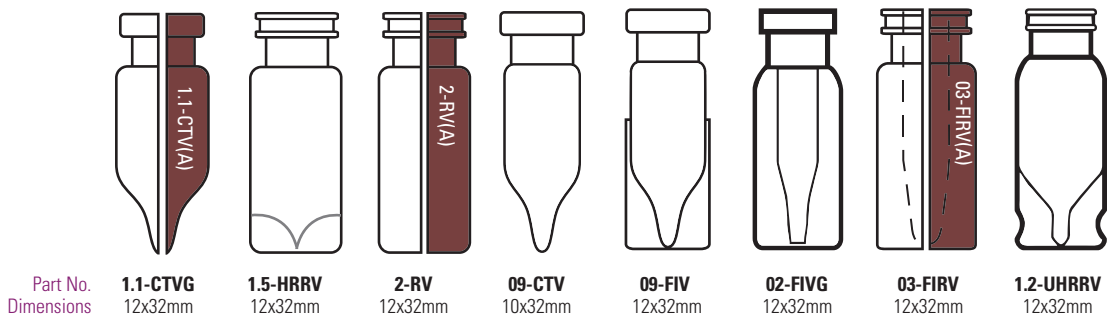
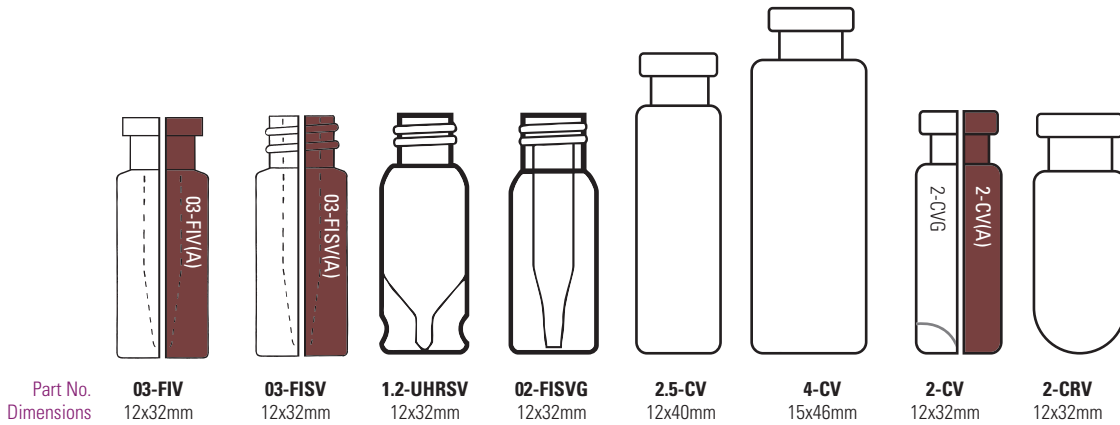
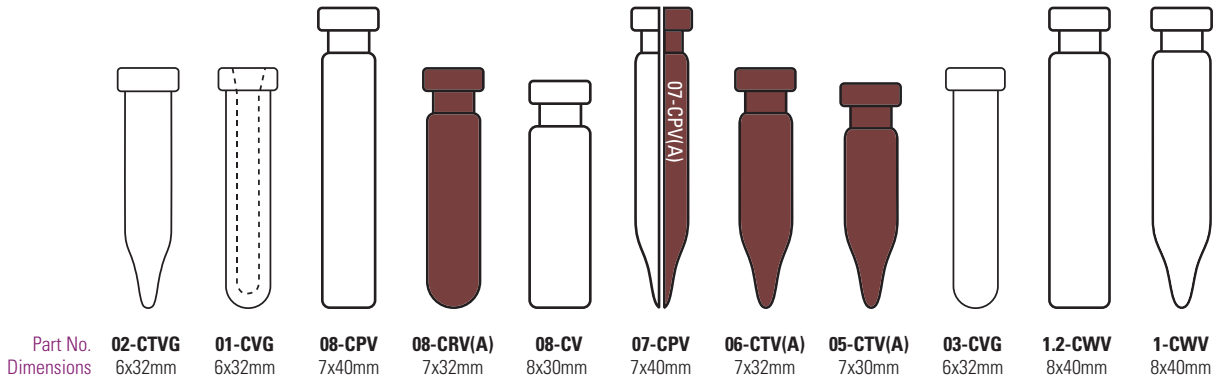
Description	Glass	Dimension (mm)	Total Volume (mL)	Cap Color	Cap Material	Septum	Cat. No.	Pack of
TOC clear vial with bonded cap cover, open top cap TOC 10ppb	Clear	28x96	40	White	Polypropylene	Beige PTFE/ White Silicone	<b>40-TOCSV-10</b>	72
TOC clear vial with cap bonded cover, open top cap TOC 20ppb	Clear	28x96	40	White	Polypropylene	Beige PTFE/ White Silicone	<b>40-TOCSV-20</b>	72

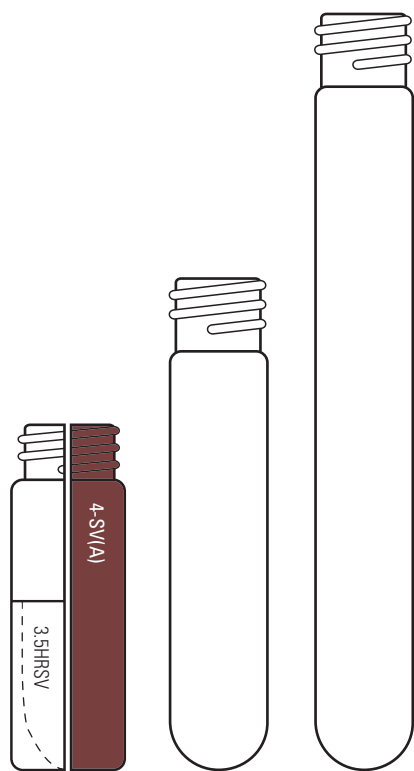
### Chromacol Scintillation Vial Kit

Description	Glass	Dimension (mm)	Total Volume (mL)	Noise	Background Count	Quenching Index Factor	Cat. No.	Pack of
20mL vial with foil lined caps	Clear	27x57	20	2.28	13 CPM	349	<b>20-EPSVCA</b>	500



# Chromacol Vial Comparison Chart



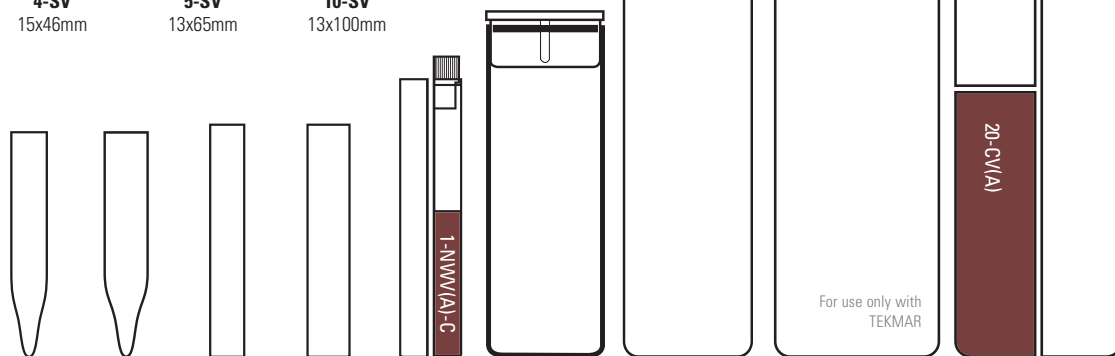


Part No.  
Dimensions

**4-SV**  
15x46mm

**5-SV**  
13x65mm

**10-SV**  
13x100mm



Part No.  
Dimensions

**02-MTV**  
5x30mm

**02-MTVVG**  
6x30mm

**02-NV**  
5x31mm

**03-NV**  
6x31mm

**1-NWV**  
8x40mm

**4-NWV-C**  
15x46mm

**12-CV**  
18x65mm

For use only with  
TEKMAR

**22-CV**  
22x75mm

**20-CV/20-HSV**  
22x75mm



Part No.  
Dimensions

**9-CV**  
18x50mm

**6-CV**  
22x38mm

**20-EPSVCA**  
27x57mm

**27-CV**  
30x60mm

**10-CV/10-HSV**  
22x45mm

# Chromacol Caps and Septa Comparison Chart

Part No. Dimensions	 <b>*8-AC6</b> 8x5mm	 <b>8-AC7</b> 8x5mm	 <b>8-ACB</b> 8x5mm	 <b>8-AC-CBT1</b> 8x5mm	 <b>8-AC-ST15</b> 8x5mm	 <b>8-AC-ST101</b> 8x5mm	 <b>8-AC-ST101X</b> 8x5mm	 <b>8-AC(B)-ST144</b> 8x5mm	
Part No. Dimensions	 <b>8-ACT</b> 8x5mm	 <b>8-AC-TST1</b> 8x5mm	 <b>8-PEC1</b> 8x5mm	 <b>8-PEC1X</b> 8x5mm	 <b>*8-SC</b> 8x9mm	 <b>*8-SCJ</b> 8x9mm	 <b>8-SC-8RT1</b> 8x9mm	 <b>8-SC-ST15</b> 8x9mm	
Part No. Dimensions	 <b>8-ST14</b> 8x1.4mm	 <b>8-ST14X</b> 8x1.4mm	 <b>8-ST143</b> 8x1.5mm	 <b>8-ST144</b> 8x1.4mm	 <b>8-6RT1</b> 8x1mm	 <b>8-ST101</b> 8x1mm	 <b>8-T02</b> 8x0.25mm	 <b>8-TST1</b> 8x1mm	 <b>8-ST15</b> 8x1.5mm
Part No. Dimensions	 <b>9-MS(BG)-ST1</b> 9x6.5mm	 <b>*9-SCK(B)-8RT1</b> 9x6.5mm	 <b>9-SCK(B)-ST101</b> 9x6.5mm	 <b>*9-SCK(B)-ST1</b> 9x6.5mm	 <b>9-SCK(B)-TST1</b> 9x6.5mm	 <b>9-SCSK-8RT1</b> 9x6.5mm	 <b>9-SCJ(W)-ST101</b> 12.9x7.9mm	 <b>*11-AC6</b> 11x6mm	
Part No. Dimensions	 <b>*11-AC7</b> 11x6mm	 <b>11-ACB</b> 11x6mm	 <b>11-AC-CBT1</b> 11x6mm	 <b>11-AC-ST101</b> 11x6mm	 <b>11-AC-ST101X</b> 11x6mm	 <b>11-AC(B)-ST144</b> 11x6mm	 <b>11-AC-ST15</b> 11x6mm	 <b>11-ACT</b> 11x6mm	
Part No. Dimensions	 <b>11-AC-TST1</b> 11x6mm	 <b>11-LLX</b> 11x3mm	 <b>11-PEC1</b> 11x6mm	 <b>11-PEC1X</b> 11x6mm	 <b>11-PEC-ST1</b> 11x7mm	 <b>11-MC-ST15</b>	 <b>11-MC-8RT1</b>	 <b>11-MC-ST101</b>	

\* Cap available in alternative colors. See below for more details

## Alternative Colors

### 8-AC6

-  8-AC6(R)
-  8-AC6(B)




### 8-SC

-  8-SC(R)
-  8-SC(W)






### 8-SCJ

-  8-SCJ(W)


### 9-SCK(B)-8RT1

-  9-SCK(G)-8RT1
-  9-SCK(N)-8RT1
-  9-SCK(B)-8RT1X

### 9-SCK(B)-ST1












































-  9-SCK(G)-ST1
-  9-SCK(N)-ST1
-  9-SCK(B)-ST1X
-  9-SC(BLK)-BST1
-  9-SC(GY)-BST1X

### 11-AC6

-  11-AC6(R)

### 11-AC7

-  11-AC7(R)
-  11-AC7(GO)
-  11-AC7(G)
-  11-AC7(B)

Part No. Dimensions	 <b>11-PSN(B)</b> 11x6.5mm	 <b>11-PSN(B)-ST101</b> 11x6.5mm	 <b>*11-PSN(B)-T02</b> 11x6.5mm	 <b>11-PSN(B)-TST1</b> 11x6.5mm	 <b>11-PSN(B)-8RT1</b> 11x6.5mm	 <b>*11-PSN(B)-ST1X</b> 11x6.5mm	 <b>11-PSN(B)-ST1</b> 11x6.5mm
Part No. Dimensions	 <b>*12-SC</b> 12x10mm	 <b>12-SCS</b> 12x10mm	 <b>12-SC-ST2</b> 12x10mm	 <b>12-SC-8RT1</b> 12x10mm	 <b>13-SC-ST15</b> 12x10mm	 <b>13-SCST</b> 12x10mm	
Part No. Dimensions	 <b>12-ST2</b> 12x2mm	 <b>12-ST18</b> 12x1.8mm	 <b>12-6RT1</b> 12x1mm	 <b>12-ST101</b> 12x1mm	 <b>12-T02</b> 12x0.25mm	 <b>8-NPWP</b> 8x9mm	 <b>12-NPEP4</b> 12x7mm
Part No. Dimensions	 <b>18-MSC</b> 18x13mm	 <b>18-MSC-CBT3</b> 18x13mm	 <b>18-MSC-ST201</b> 18x13mm	 <b>20-ACB</b> 20x7mm	 <b>20-MCB</b> 20x7mm	 <b>*20-MCBC</b> 20x7mm	
Part No. Dimensions	 <b>20-MCBC(R)-CBT3</b>	 <b>*20-MCBC-ST3</b> 20x7mm	 <b>20-AC-CBT3</b> 20x7mm	 <b>20-AC-ST3</b> 20x7mm	 <b>20-CB3</b> 20x3mm	 <b>20-CBT3</b> 20x3mm	
Part No. Dimensions	 <b>20-CBT3B</b> 20x3mm	 <b>20-ASH3</b> 20x1.5mm	 <b>20-LLX</b> 20x3mm	 <b>20-ST3</b> 20x3mm	 <b>20-ST3HT</b> 20x3.1mm	 <b>20-ST15</b> 20x1.5mm	
Part No. Dimensions	 <b>20-ST101</b> 20x1mm	 <b>18-ST101</b> 18x1mm	 <b>20-B3P</b> 20x9mm	 <b>20-2FB3</b> 20x13.4mm	 <b>20-PEPC5</b> 20x10mm		

\* Cap available in alternative colors. See below for more details

### Alternative Colors

#### 11-PSN(B)-T02

■ 11-PSN(R)-T02

#### 11-PSN(B)-ST1X

■ 11-PSN(G)-ST1X

#### 12-SC

■ 12-SC(R)

□ 12-SC(W)

■ 12-SC(Y)

#### 20-MCBC

■ 20-MCBC(R)

#### 20-MCBC-ST3

■ 20-MCBC(R)-ST3

□ 20-MCBC(N)-ST3

# Crimping and Decrimping Tools

Electronic crimpers and decrimpers provide an adjustable crimp with reproducible results.

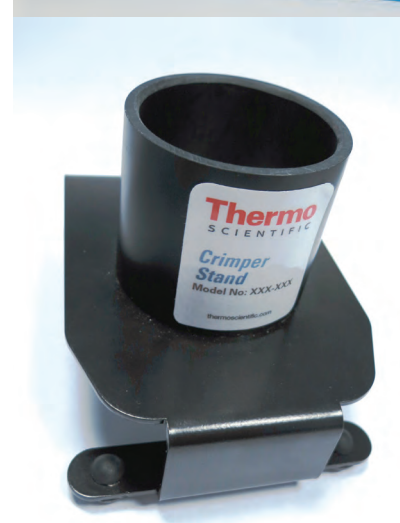
We offer electronic crimpers for crimping or removal of aluminum seals on 8, 11, 13 and 20mm vials. The crimper is a hand held device, which allows aluminum seals to be firmly attached to the vial while it remains in most sample trays with the touch of a button. A separate decrimper allows the removal of the seal just as easily. The instruments have an adjustment for septa of varying thicknesses. Power is supplied by rechargeable Lithium Ion Cells. The 7.5 volt DC power supply comes with a set of plug adaptors to fit power outlets for most countries.

## Electronic Crimpers and Decrimpers

- One hand, secure, reproducible crimps of 8, 11, 13 and 20mm vials with the push of a button
- Reduces hand strain compared to manual crimper operation
- Quick and easy removal of aluminum seals with the push of a button
- Ergonomic design eliminates wrist strain
- Vials can be crimped while they remain in most standard removable sample trays
- Adjustable crimp settings for compatibility with most vial/septum/seal combinations
- Fully rechargeable Lithium Ion Battery
- Provided with universal power supply/recharger and international plug adaptors

### Electronic Hand-Held Crimpers and Decrimpers

Description	Cat. No.	Pack of
Electronic Hand-held Crimper for 8mm Crimp Caps, Generation 3	<b>ECR-8C</b>	1
Electronic Hand-held Crimper for 11mm Crimp Caps, Generation 3	<b>ECR-11C</b>	1
Electronic Hand-held Crimper for 13mm Crimp Caps, Generation 3	<b>ECR-13C</b>	1
Electronic Hand-held Crimper for 20mm Crimp Caps, Generation 3	<b>ECR-20C</b>	1
Electronic Hand-held Decrimper for 11mm Crimp Caps, Generation 3	<b>EDCB-11C</b>	1
Electronic Hand-held Decrimper for 13mm Crimp Caps, Generation 3	<b>EDCB-13C</b>	1
Electronic Hand-held Decrimper for 20mm Crimp Caps, Generation 3	<b>EDCB-20C</b>	1
Replacement Battery, 6.4V Lithium Ion, For Generation 3 Electronic Crimpers and Decrimper	<b>ECR-CBATT</b>	1
Table/Wall Holder for Electronic Hand-held Crimper	<b>ECR-HOLDER</b>	1



## Programmable Electronic High Power Crimp Station

Fully programmable with quick exchange crimp and decrimp heads

We now offer a new fully programmable electronic Thermo Scientific High Power Crimper (HPC) station with adjustable accessory base, external power supply and exchangeable jaw sets for crimping or decrimping of aluminum and stainless steel seals on 8, 11, 13 and 20mm diameter vials. The crimper is a bench top tool, including a versatile height adjustable stand which frees both hands for faster crimping operations. The crimper can be used on the stand or as a hand-held device. For each set of crimping or decrimping jaws up to 10 individual programs can be easily saved, in order to automatically preset the correct head-adjustment for different cap/septum/vial combinations. Special jaws are available for 13mm and 20mm flip-off seals. The crimping force is higher than on battery powered units and is not limited by battery life or charge state. Power is supplied by the included 12 volt power supply (110 – 240V) for unlimited, consistent operation, superior compared to every similar hand held device.



### Product features and benefits

- Adjustable crimp settings for compatibility with most vial/septum/seal combinations including aluminum, steel and bi-metal seals
- Crimp-force sensing automatically determines when a proper seal has been formed and opens the jaws to release the vial
- Higher power, perfect for steel caps
- Exchangeable crimp and decrimp heads can be removed or installed in seconds
- For each head, a set of up to 10 adjustment programs are available and can be saved
- Fully electric operation eliminates the need for pressurized air supplies at the operation location

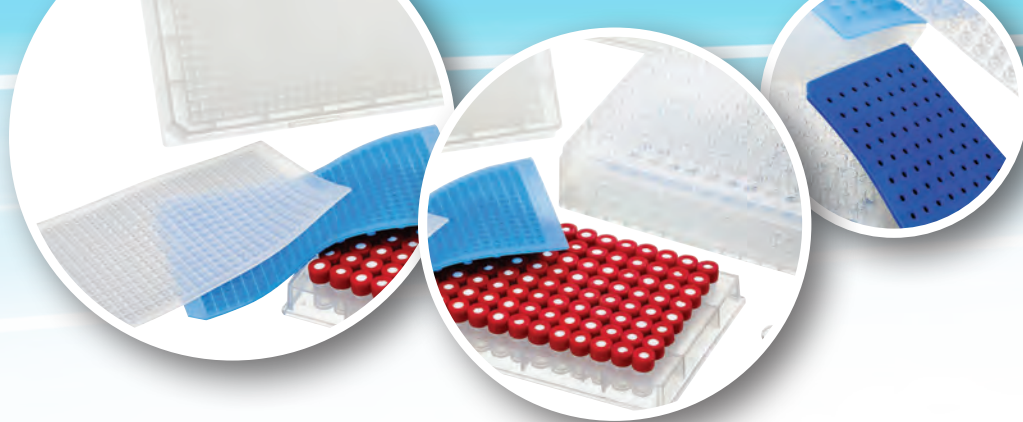
### Programmable Electronic High Power Crimp Station

Description	Cat. No.	Pack of
Programmable Electronic High Power Crimper* <i>Includes the basic high power crimper and the 12 volt DC supply with the power cord. (Accessory Base is not included)</i>	<b>ECRH-B</b>	1
Programmable Electronic High Power Crimper 11mm Kit* <i>Includes the basic high power crimper, the 12 volt DC supply with the power cord and a set of crimp heads: 1x11mm crimp head and 1x11mm decrimp head. (Accessory Base is not included)</i>	<b>ECRH-11KIT</b>	1
Programmable Electronic High Power Crimper 20mm Kit* <i>Includes the basic high power crimper, the 12 volt DC supply with the power cord and a set of crimp heads: 1x20mm crimp head and 1x20mm decrimp head. (Accessory Base is not included)</i>	<b>ECRH-20KIT</b>	1

### Replacement and Optional Parts

Description	Cat. No.	Pack of
Accessory Base for Electronic Crimpers (base plate and bar) <i>Adjustable in height, base plate is solvent resistant Dimensions: 37.6 × 25.4 × 17.7cm</i>	<b>ECRH-STAND</b>	1
8mm Crimper Jaw Set	<b>ECMJ-8</b>	1
11mm Crimper Jaw Set	<b>ECMJ-11</b>	1
11mm Decrimper Jaw Set	<b>ECDJ-11</b>	1
13mm Crimper Jaw Set	<b>ECMJ-13</b>	1
13mm Decrimper Jaw Set	<b>ECDJ-13</b>	1
13mm Flip-Off Crimper Jaw Set (for circular rim flip caps)	<b>ECMJ-13FO</b>	1
20mm Crimper Jaw Set	<b>ECMJ-20</b>	1
20mm Decrimper Jaw Set	<b>ECDJ-20</b>	1
20mm Flip-Off Crimper Jaw Set (for circular rim flip caps)	<b>ECMJ-20FO</b>	1

\* Crimping jaws for other seals available on request.



## Well Plates for Chromatography

### A comprehensive range of PP well plates

Our plate portfolio contains well plates which meets the requirements of today's chromatographer using autosampler for plates. Compatible with a broad range of instruments, our well plate range offers solutions from simple routine analyses to specific and challenging sample handling problems.

- **Handle More Samples in Less Time**  
Low volume and high recovery cavity
- **Solutions for all Applications**  
Chromatography tested for solvent compatibility and inertness
- **Autosampler Compatible**  
Using ANSI/SBS standards



The WebSeal web page contains the latest news, applications and downloads for the range. Visit [www.thermoscientific.com/webseal](http://www.thermoscientific.com/webseal)

## WebSeal Well Plates, Plastic, Non-Coated, Non-Sterile, Chromatography Tested

- Thermo Scientific™ WebSeal™ well plates are manufactured from a GC tested polypropylene material
- Microplates are chemically and thermally resistant and will tolerate temperatures from  $-80^{\circ}\text{C}$  to  $+121^{\circ}\text{C}$
- SBS and ANSI standard footprint design for broad instrument compatibility
- Microplates are ideal for pharmaceutical applications, sample collection and storage, combinatorial chemistry and HTS applications
- U- and V- bottom wells for optimal sample recovery
- Low binding PP for homogenous assays and storage



### WebSeal Well Plates, Plastic, Non-Coated, Non-Sterile, Chromatography Tested

Description	Material	Total Height	Well Format	Total Volume ( $\mu\text{L}$ )	Working volume range $\mu\text{L}/\text{well}$	Cat. No.	Pack of
96-Well Microplate, round well	PP	14.4	V-Shape, 8mm dia	450	10-400	<b>60180-P100</b>	20
	PP	14.4	V-Shape, 8mm dia	450	10-400	<b>60180-P130</b>	120
	PP	14.5	U-Shape, 8mm dia	500	20-450	<b>60180-P102</b>	10
	PP	14.5	U-Shape, 8mm dia	500	20-450	<b>60180-P132</b>	120
96 Well Plates, round well	PP	31.6	U-Shape, 8mm dia	1300	50-1000	<b>60180-P103</b>	5
	PP	31.6	U-Shape, 8mm dia	1300	50-1000	<b>60180-P133</b>	50
	PP	44.0	U-Shape, 8mm dia	2000	50-1900	<b>60180-P104</b>	5
	PP	44.0	U-Shape, 8mm dia	2000	50-1900	<b>60180-P134</b>	60
96-Well Square Well Microplate (-196°C to +121°C)	PP	44.0	V-Shape, square	2000	50-1900	<b>60180-P105</b>	5
	PP	44.0	V-Shape, square	2000	50-1900	<b>60180-P135</b>	50
384-Shallow Well Standard Height Microplate	PP	14.4	U-Shape, square	58	2-35	<b>60180-P106</b>	25
	PP	14.4	U-Shape, square	58	2-35	<b>60180-P136</b>	100
384-Well Microplate	PP	22.0	U-Shape, square	252	5-240	<b>60180-P107</b>	5
	PP	22.0	U-Shape, square	252	5-240	<b>60180-P137</b>	60
	PP	14.4	U-Shape, square	120	10-100	<b>60180-P108</b>	20
	PP	14.4	U-Shape, square	120	10-100	<b>60180-P138</b>	120
	PP	14.4	V-Shape, square	145	4-120	<b>60180-P109</b>	10
	PP	14.4	V-Shape, square	145	4-120	<b>60180-P139</b>	80

Mats and sealing tapes for these well plates can be found on the next two pages

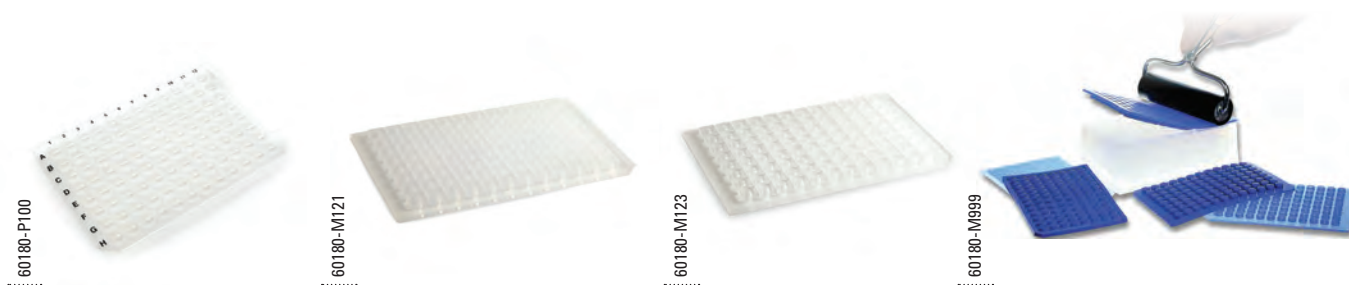


## WebSeal Mats and Sealing Tapes, Non-Sterile

- Mats manufactured of EVA (Ethylene-vinyl acetate) or pure silicone with or without PTFE coating
- The footprint permits plates to be securely stacked without robotic arm interference
- Eliminates cross contamination of samples
- Dry heat autoclavable (only Silicone mats) with excellent chemical compatibility, withstand low temperature to -80°C
- Resists coring and tearing
- Superior resealability after multiple injections
- Available pre-slit for easy penetration and reduced vacuum formation

Sealing tapes minimize evaporation and protect samples from contamination and spilling.

- Adhesive seals effectively seal all microplate formats
- Wide range of adhesive seals for every assay
- Thin, lightweight tapes seal onto the plate with a convenient, handheld applicator (available separately, Cat. No. 60180-M950)



### WebSeal Mats and Sealing Tapes, Non-Sterile

Description	Color	Material	Well Design	Pre-slit	Cat. No.	Pack of
WebSeal Mats (Solvent Resistant)	Clear	Silicone	96 Round Well, 8mm Diameter	Yes	<b>60180-M100</b>	10
WebSeal Mats (Alcohol Resistant)	Clear	EVA	96 Round Well, 8mm Diameter	No	<b>60180-M101</b>	5
	Clear	EVA	96 Round Well, 8mm Diameter	No	<b>60180-M171</b>	50
WebSeal CLR Silicone Mat	Clear	Silicone	96 Round Well – Flat Base, 8mm Diameter, Large Penetration Area	No	<b>60180-M134</b>	5
	Clear	Silicone	96 Round Well – Flat Base, 8mm Diameter, Large Penetration Area	Yes	<b>60180-M183</b>	5
WebSeal Mats (Solvent Resistant)	Blue	Silicone/PTFE	96 Round Well – Flat Base, 8mm Diameter, Large Penetration Area	No	<b>60180-M102</b>	5
	Blue	Silicone/PTFE	96 Round Well – Flat Base, 8mm Diameter, Large Penetration Area	Yes	<b>60180-M103</b>	5
WebSeal CLR Silicone Mat	Clear	Silicone	96 Square Well – Flat Base, 8mm Diameter, Large Penetration Area	No	<b>60180-M121</b>	5
	Clear	Silicone	96 Square Well – Flat Base, 8mm Diameter, Large Penetration Area	Yes	<b>60180-M123</b>	5
WebSeal CLR Silicone Mat	Clear	Silicone	384 Square Well	No	<b>60180-M126</b>	5
	Clear	Silicone	384 Square Well	Yes	<b>60180-M150</b>	5
Sealing Tape, -40°C - 90°C	Clear	PE/Silicone	N/A	No	<b>60180-M142</b>	100
Sealing Tape, -70°C - 100°C	Clear	PES/Silicone	N/A	No	<b>60180-M143</b>	100
Sealing Tape, -80°C - 120°C	Silver	Aluminum/Silicone	N/A	No	<b>60180-M144</b>	100
Sealing Tape with SRA (Synthetic Rubber Adhesive)	Clear	Polyolefin/Rubber	N/A	No	<b>60180-M145</b>	100

Well plates for these mats and sealing tapes can be found on the previous page

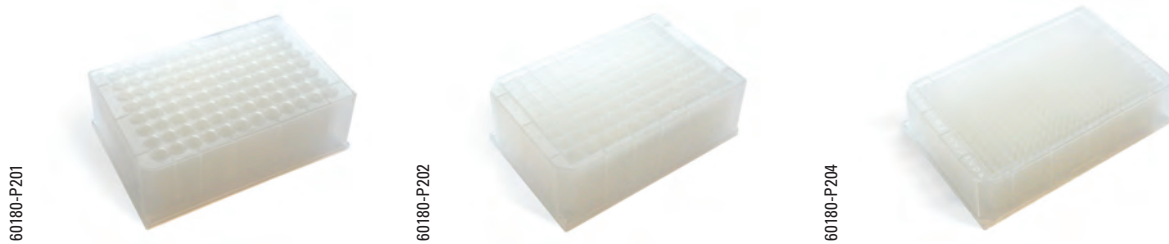
## WebSeal Mats and Sealing Tapes, Non-Sterile (Continued)

Description	Color	Material	Well Design	Pre-slit	Cat. No.	Quantity
Re-sealing Tape with 3 Layer No Adhesive at Cavity Area	Clear	PET/Silicone/PET	N/A	Yes	<b>60180-M146</b>	100 Pack
	Clear	PET/Silicone/PET	N/A	Yes	<b>60180-M176</b>	25 Pack
WebSeal Mats (Alcohol Resistant)	Clear	EVA	96 Square Well - Flat Base	No	<b>60180-M177</b>	5 Pack
	Clear	EVA	96 Square Well - Flat Base	No	<b>60180-M178</b>	50 Pack
Hand held Sealing Tape Applicator	Gold	N/A	N/A	N/A	<b>60180-M950</b>	2 Pack
Hand Held Mat Applicator	Black	N/A	N/A	N/A	<b>60180-M999</b>	1 Each
WebSeal Cutter for Vial Removal	Silver	N/A	N/A	N/A	<b>60180-M975</b>	1 Each

Well plates for these mats and sealing tapes can be found 2 pages prior to this

## WebSeal Well Plates, Plastic, Non-Coated, Non-Sterile, Certified

- Polypropylene microplates are manufactured from ultra low bleed high purity basis resin
- Plates are fully LOT tested by GC-MS for organic extractables
- Microplates are chemically and thermally resistant and will tolerate temperatures from -80°C to +121°C
- SBS and ANSI standard footprint design for broad instrument compatibility
- Microplates are ideal for pharmaceutical applications, sample collection and storage, combinatorial chemistry and HTS applications
- U- and V- bottom wells for optimal sample recovery



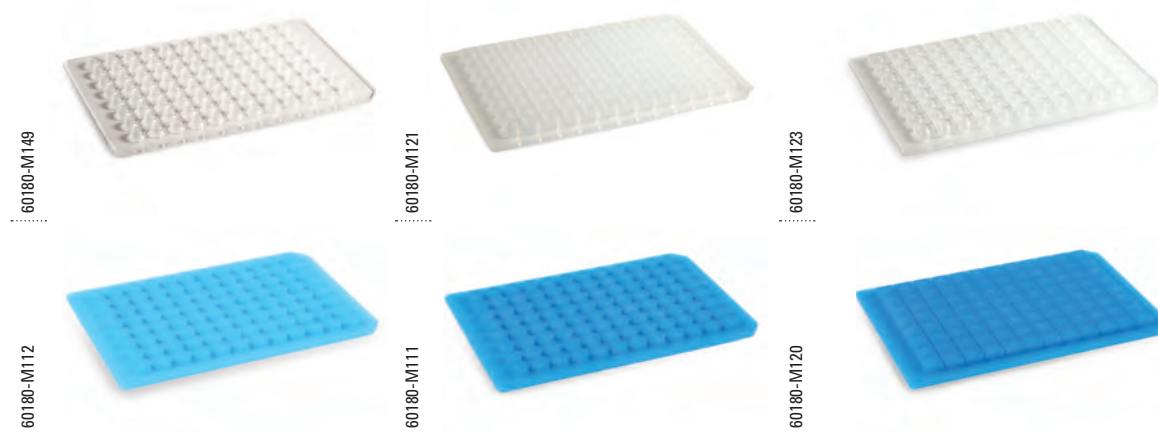
## WebSeal Well Plates, Plastic, Non-Coated, Non-Sterile, Certified

Description	Material	Total Height	Well Format	Total Volume (µL)	Working Volume range µL/well	Cat. No.	Pack of
96-Well Microplate, round well	PP	14.7	Flat bottom, 7mm dia	350	10-300	<b>60180-P215</b>	10
	PP	14.7	Flat bottom, 7mm dia	350	10-300	<b>60180-P205</b>	100
	PP	14.7	U-Shape, 7mm dia	270	10-250	<b>60180-P216</b>	10
	PP	14.7	U-Shape, 7mm dia	270	10-250	<b>60180-P206</b>	100
	PP	14.7	V-Shape, 7mm dia	220	10-190	<b>60180-P217</b>	10
	PP	14.7	V-Shape, 7mm dia	220	10-190	<b>60180-P207</b>	100
96 Well Plates, round well	PP	41.6	U-Shape, 7mm dia	1000	50-900	<b>60180-P211</b>	5
	PP	41.6	U-Shape, 7mm dia	1000	50-900	<b>60180-P201</b>	50
96-Well Square Well Plate	PP	44.4	V-Shape, 8mm dia	2000	50-1900	<b>60180-P212</b>	5
	PP	44.4	V-Shape, 8mm dia	2000	50-1900	<b>60180-P202</b>	50
384-Well Microplate	PP	14.4	U-Shape, square	58	2-35	<b>60180-P213</b>	10
	PP	14.4	U-Shape, square	58	2-35	<b>60180-P203</b>	60
	PP	30.2	V-Shape, square	300	5-240	<b>60180-P214</b>	6
	PP	30.2	V-Shape, square	300	5-240	<b>60180-P204</b>	48

Mats and sealing tapes for these well plates can be found on the next page

## WebSeal Mats, Non-Sterile

- Manufactured of pure silicone with or without PTFE coating
- The footprint permits plates to be securely stacked without robotic arm interference
- Eliminates cross contamination of samples
- Dry heat autoclavable with excellent chemical compatibility, withstand low temperature to -80°C
- Resists coring and tearing
- Superior resealability after multiple injections
- Available pre-slit for easy penetration and reduced vacuum formation



### WebSeal Mats, Non-Sterile

Description	Color	Material	Well Design	Pre-slit	Cat. No.	Pack of
WebSeal Mats (alcohol resistant)	Clear	EVA	96 Round Well, 7mm Diameter	No	<b>60180-M179</b>	100
WebSeal CLR Silicone Mat	Clear	Silicone	96 Round Well – Flat Base, 7mm Diameter, Large Penetration Area	No	<b>60180-M105</b>	5
	Clear	Silicone	96 Round Well – Flat Base, 7mm Diameter, Large Penetration Area	Yes	<b>60180-M116</b>	5
	Clear	Silicone	96 Round Well – 7mm, Step, Small Penetration Area	No	<b>60180-M149</b>	5
	Clear	Silicone	96 Round Well – 7mm, Step, Small Penetration Area	Yes	<b>60180-M113</b>	5
	Clear	Silicone	96 Square Well – Flat Base - 8mm, Large Penetration Area	No	<b>60180-M121</b>	5
	Clear	Silicone	96 Square well – Flat Base - 8mm, Large Penetration Area	Yes	<b>60180-M123</b>	5
	Clear	Silicone	384 Square Well	No	<b>60180-M126</b>	5
	Clear	Silicone	384 Square Well	Yes	<b>60180-M150</b>	5
WebSeal Mat	Blue	Silicone/PTFE	96 Round Well – Flat Base, Step, 7mm Diameter	No	<b>60180-M111</b>	5
	Blue	Silicone/PTFE	96 Round Well – Flat Base, Step, 7mm Diameter	Yes	<b>60180-M112</b>	5
	Blue	Silicone/PTFE	96 Square Well – Flat Base - 8mm, Large Penetration Area	No	<b>60180-M120</b>	5
	Blue	Silicone/PTFE	96 Square Well – Flat Base - 8mm, Large Penetration Area	Yes	<b>60180-M122</b>	5
	Blue	Silicone/PTFE	384 Square Well	No	<b>60180-M125</b>	5
	Blue	Silicone/PTFE	384 Square Well	Yes	<b>60180-M131</b>	5
WebSeal Mat for Plate+	Blue	Silicone/PTFE	96 Round well – Dome Base, 7.2mm Diameter	No	<b>60180-M108</b>	5
	Blue	Silicone/PTFE	96 Round well – Dome Base, 7.2mm Diameter	Yes	<b>60180-M115</b>	5

Well plates for these mats can be found on the previous page (except for Plate+ which are on the next page)

## WebSeal Plate+ Glass Coated Microplates

- High quality polypropylene microplates coated with 200nm thick layer of silicone dioxide
- Plate+ provides microplates with a chemical resistance similar to glass while retaining the advantages of polypropylene
- Eliminates the need to use glass limited volume inserts
- Excellent for applications where plastic microplates are not applicable
- Plate+ is chemically and thermally resistant and will tolerate temperatures from -80°C to +80°C
- Lightweight, precision molded, cost-effective alternative to solid glass plates



### WebSeal Plate+ Glass Coated Microplates

Description	Material	Total Height	Well Format	Total Volume	Working Volume	Cat. No.	Pack of
96 Well Microplate, round well	Glass coated PP	14.6	U-Shape, 7mm dia	300µL	250µL	<b>60180-P300</b>	10
	Glass coated PP	14.6	V-Shape, 7mm dia	220µL	190µL	<b>60180-P302</b>	10
	Glass coated PP	14.6	Flat Bottom, 7mm dia	370µL	300µL	<b>60180-P304</b>	10
96 Deep Well Plate, round well	Glass coated PP	41.5	U-Shape, 7mm dia	1.2mL	1.0mL	<b>60180-P306</b>	10
96-Well Square Well Plate	Glass coated PP	44	V-Shape, 8mm dia	2.4mL	2.0mL	<b>60180-P308</b>	10
384 Well Microplate	Glass coated PP	14.4	Square-Rounded, flat	120µL	90µL	<b>60180-P310</b>	10
	Glass coated PP	22	Square-Rounded, U-Shape	240µL	180µL	<b>60180-P312</b>	6

For sealing mats, please refer to the previous page.

## WebSeal Glass Inserted Plate Kits with 96-Position Mats

- Convenient wellplate kits with pre-assembled glass or PTFE vials
- Replacement parts for kits available separately
- Unique cutting tool allows removal of individual samples with the seal in place, eliminating cross contamination
- Mats with solid plugs are used for sample storage



### WebSeal Glass Inserted Plate Kits with 96-Position Mats

Kit Type	Vial Material	Total Volume (µL)	Vial Dimension (mm)	Profile	Mat material	Total Height (mm)	Vial Cat. No.	Mat Cat. No.	Kit Cat. No.	Pack of
96 Well Small Volume Microplate with Sealing Mat	Clear glass	500	6.5 x 31	taper	Silicone/PTFE	32	60180-V100	60180-M151	<b>60180-K100</b>	5
96 Well Small Volume Microplate with Sealing Mat and Cutting Tool	Clear glass	700	6.5 x 41.4	taper	Silicone/PTFE	44	60180-V101	60180-M151	<b>60180-K101</b>	5
96 Well Small Volume Microplate with Sealing Mat and Cutting Tool	PTFE	700	6.5 x 41.4	round	Silicone/PTFE	44	60180-V103	60180-M151	<b>60180-K103</b>	1
96 Well Microplate with Sealing Mat and Cutting Tool	Clear glass	1100	7.45 x 38.5	round	Silicone/PTFE	41.5	60180-V104	60180-M153	<b>60180-K104</b>	5
96 Well Microplate with Crimp Top Vials, pre-inserted	Clear glass	1100	7.45 x 45	round	N/A	47	60180-V105	N/A	<b>60180-K105</b>	5
96 Deep Well Plate with Sealing Mat	Clear glass	1500	7.25 x 60.5	round	Silicone/PTFE	64.5	60180-V106	60180-M153	<b>60180-K106</b>	5
96 Square Well Plate with Sealing Mat	Clear glass	1000	7.6 x 45	constricted	Silicone/PTFE	47.3	60180-V107	60180-M155	<b>60180-K107</b>	1
96 Square Well Plate with Sealing Mat - Precut	Clear glass	1000	7.6 x 45	constricted	Silicone/PTFE	47.3	60180-V107	60180-M156	<b>60180-K108</b>	1
96 Square Well Plate with Sealing Mat - solid plug	Clear glass	1000	7.6 x 45	constricted	Silicone/PTFE	47.3	60180-V107	60180-M157	<b>60180-K109</b>	1

## WebSeal Kit Accessories

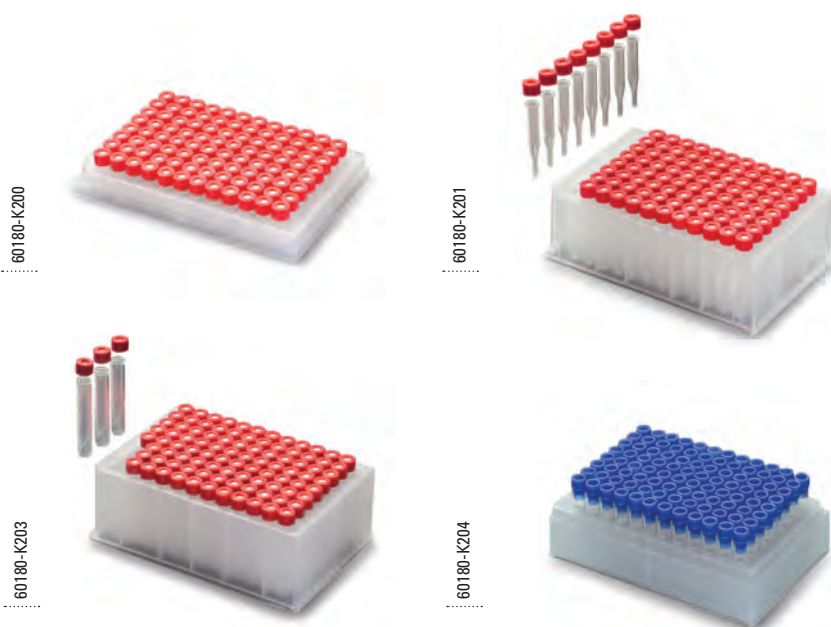


### WebSeal Kit Accessories

Kit Type	Vial Material	Total Volume (µL)	Vial Dimension (mm)	Profile	Mat material	Total Height (mm)	Pre-slit	Cat. No.	Pack of
Micro Titer Plate Vial for 96 Wells	Clear glass	500	6.5x31	taper	N/A	N/A	N/A	<b>60180-V100</b>	500
	Clear glass	700	6.5x41.4	taper	N/A	N/A	N/A	<b>60180-V101</b>	500
	PTFE	700	6.5x41.4	round	N/A	N/A	N/A	<b>60180-V103</b>	100
	Clear glass	1100	7.45x38.5	round	N/A	N/A	N/A	<b>60180-V104</b>	500
Square/Deep Well Plate Crimp Top Vial for 96 Wells	Clear glass	1100	7.45x45	round	N/A	N/A	N/A	<b>60180-V105</b>	500
Deep Well Plate Vial for 96 Wells	Clear glass	1500	7.25x60.5	round	N/A	N/A	N/A	<b>60180-V106</b>	500
Square Well Plate Vial for 96 Wells	Clear glass	1000	7.6x45	constricted	N/A	N/A	N/A	<b>60180-V107</b>	960
96 Well WebSeal Mat (60180-K100, 101, 103)	N/A	N/A	N/A	N/A	Silicone/PTFE	N/A	No	<b>60180-M151</b>	5
96 Well WebSeal Mat (60180-K100, 101, 103)	N/A	N/A	N/A	N/A	Silicone/PTFE	N/A	Yes	<b>60180-M152</b>	5
96 Well WebSeal Mat (60180-K104, 106)	N/A	N/A	N/A	N/A	Silicone/PTFE	N/A	No	<b>60180-M153</b>	5
96 Well WebSeal Mat (60180-K104, 106)	N/A	N/A	N/A	N/A	Silicone/PTFE	N/A	Yes	<b>60180-M154</b>	5
96 Well WebSeal Mat, welled plugs (60180-K107)	N/A	N/A	N/A	N/A	Silicone/PTFE	N/A	No	<b>60180-M155</b>	1
96 Well WebSeal Mat, welled plugs (60180-K108)	N/A	N/A	N/A	N/A	Silicone/PTFE	N/A	Yes	<b>60180-M156</b>	1
96 Well WebSeal Mat, solid plugs for sample storage (60180-K109)	N/A	N/A	N/A	N/A	Silicone/PTFE	N/A	No	<b>60180-M157</b>	1
Plastic 96 Round Well Micro Titer Plate (60180-K100)	N/A	800	N/A	V-Shape, 7mm dia	N/A	31.5	N/A	<b>60180-P400</b>	5
PP 96 Round Well Micro Rack (60180-K101, K102)	N/A	N/A	N/A	U-Shape, 7mm dia	N/A	41.6	N/A	<b>60180-P211</b>	5
Plastic 96 Well Micro Titer Rack (60180-K104)	N/A	N/A	N/A	Rack	N/A	31.2	N/A	<b>60180-P401</b>	5
PP 96 Well Micro Titer Plate (60180-K105)	N/A	2200	N/A	U-Shape	N/A	42.5	N/A	<b>60180-P402</b>	5
PP 96 Well Square Well Plate (60180-K107/108/109)	N/A	2000	N/A	U-shape, square	N/A	44.0	N/A	<b>60180-P403</b>	1
PP 96 Well Square Well Plate (60180-K106)	PP	2000	N/A	V-shape, Square	N/A	44	N/A	<b>60180-P212</b>	5
WebSeal Cutter for Vial Removal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<b>60180-M975</b>	1

## WebSeal Glass Inserted Plate Kits with Individual Closures

- 96 Position Block Systems with Glass Inserts are used when the pure PP Block is not inert enough
- Inserts manufactured from clear, Type 1 Class A or amber, Type 1 Class B borosilicate glass
- Inserts are sealed individually with a PE Cap Seal and can be easily removed and used externally without risk of losing sample
- The products can be obtained as individual components or as completely assembled, ready-to-use convenience blocks
- Assembled kits include 96 vials with pre-attached caps and septa
- Pre-assembled kits reduce the risk of vial contamination before use
- Snap Caps offer the same functionality as for screw or crimp caps: PTFE layered Silicone septa for excellent solvent stability
- Polyethylene caps are chemically inert and suitable for most chromatography applications



### WebSeal Glass Inserted Plate Kits with Individual Closures

Kit Type	Vial Material	Total Volume (µL)	Vial Dimension (mm)	Profile	Septum	Vial Cat. No.	Cap Cat. No.	Kit Cat. No.	Pack of
96 Well Microplate	Clear glass	100	5.7x15.5	flat bottom	Silicone/PTFE, Pre-slit, 45°	60180-V108	60180-C100	<b>60180-K200</b>	1
96 Deep Well Plate	Clear glass	350	6x42.5	taper	Silicone/PTFE, Pre-slit, 45°	60180-V109	60180-C100	<b>60180-K201</b>	1
96 Square Well Plate	Clear glass	1000	7.6x45.9	round	Silicone/PTFE, 45°	60180-V110	60180-C102	<b>60180-K202</b>	1
	Clear glass	1000	7.6x45.9	round	Silicone/PTFE, Pre-slit, 45°	60180-V110	60180-C100	<b>60180-K203</b>	1
96 Micro-Tube-Rack-System	Clear glass	800	7.6x40	round	PE Plug	60180-V111	60180-C101	<b>60180-K204</b>	1

## WebSeal Kit Accessories



### WebSeal Kit Accessories

Kit Type	Vial Material	Total Volume (μL)	Vial Dimension (mm)	Profile	Septum	Total Height (mm)	Cat. No.	Pack of
Micro Titer Plate Vial for 96 Wells	Clear glass	100	5.7x15.5	flat bottom	N/A	N/A	<b>60180-V108</b>	960
Deep Well Plate Vial for 96 Wells	Clear glass	350	6x42.5	taper	N/A	N/A	<b>60180-V109</b>	960
Square Well Vial for 96 Wells	Clear glass	1000	7.6x45.9	round	N/A	N/A	<b>60180-V110</b>	960
MTRS Vial for 96 Wells	Clear glass	800	7.6x40	round	N/A	N/A	<b>60180-V111</b>	960
PE Cap, red, center hole, for 96 Well Plate Inserts	N/A	N/A	N/A	N/A	Silicone/PTFE, Pre-slit, 45°	N/A	<b>60180-C100</b>	96
8mm PE Plug, blue, for 60180-K204	N/A	N/A	N/A	N/A	PE Plug	N/A	<b>60180-C101</b>	96
MT-Plate, PP, 96 Positions	N/A	350	N/A	Flat Bottom, 7mm dia	N/A	14.3	<b>60180-P404</b>	10
DW-Block, PP, 96 Positions	N/A	1200	N/A	U-Shape	N/A	40.0	<b>60180-P405</b>	10
SQW-Block, PP, 96 Positions	N/A	2000	N/A	U-Shape	N/A	44.3	<b>60180-P406</b>	10
Micro-Tube-Rack-System, PP, 96 Positions	N/A	N/A	N/A	N/A	N/A		<b>60180-P407</b>	10



# BioLC Columns and Accessories

The analysis of proteins, peptides, oligonucleotides and other biomolecules demands a range of sample separation modes, column chemistries, column configurations and detection techniques. The range of Thermo Scientific™ polymeric and silica columns in analytical and nano-scale formats are designed to handle these challenging separations.

## Featured Products



### MAbPac SEC-1

A size exclusion chromatography (SEC) column specifically designed for the high-resolution separation and characterization of monoclonal antibodies (mAbs) and their aggregates.

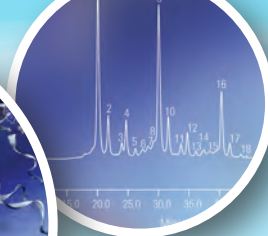
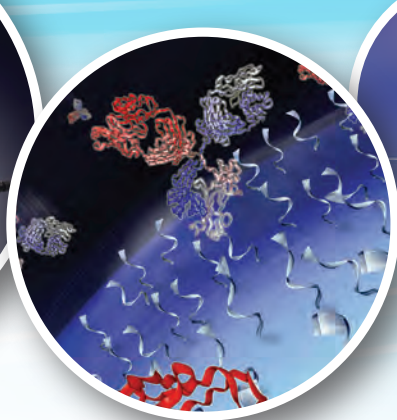
**PAGE 3-007**



### MAbPac SCX

Strong cation exchange columns designed specifically for the high-resolution, high efficiency charged variant analysis of monoclonal antibodies and associated variants.

**PAGE 3-008**



## Section Contents

BioLC Columns Line . . . . .	<b>3-004</b>	ProPac HPLC Columns . . . . .	<b>3-018</b>
MABPac HPLC and UHPLC Columns . . . . .	<b>3-006</b>	DNAPac HPLC and UHPLC Columns . . . . .	<b>3-033</b>
pH Gradient Buffers . . . . .	<b>3-010</b>	Nano, Capillary and Micro LC Columns . . . . .	<b>3-038</b>
GlycanPac HPLC and UHPLC Columns . . . . .	<b>3-016</b>		



### MABPac RP

Columns designed for high-resolution accurate mass analysis of monoclonal antibodies (mAbs), antibody drug conjugates (ADCs) and other proteins using reversed-phase HPLC and LC-MS for high-resolution separations.

**PAGE 3-014**



### EASY-Spray

EASY-Spray columns offer outstanding peak capacity for comprehensive proteome characterization and temperature control for maximum reliability and performance.

**PAGE 3-040**

# BioLC Columns

## Technical Resources



visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert) to access the following information:

- BioLC Columns Selection Guide
- HPLC Phases for Biomolecules
- Columns for Protein Separations
- Columns for Monoclonal Antibody Separations
- Columns for Carbohydrate Separations
- Columns for Oligonucleotide Separations



# Columns for Biomolecules

## BioLC Column Lines



### Monoclonal Antibodies

#### MABPac

MABPac Protein A

MABPac SEC-1

MABPac SCX-10

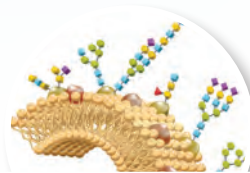
MABPac HIC

MABPac HIC-10

MABPac HIC-20

MABPac HIC-Butyl

MABPac RP



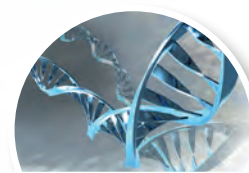
### Glycans

#### GlycanPac

Accucore Amide-HILIC

GlycanPac AXH-1

GlycanPac AXR-1



### Nucleic Acids

#### DNAPac

DNAPac PA100

DNAPac PA200

DNAPac RP

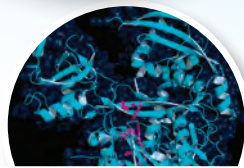
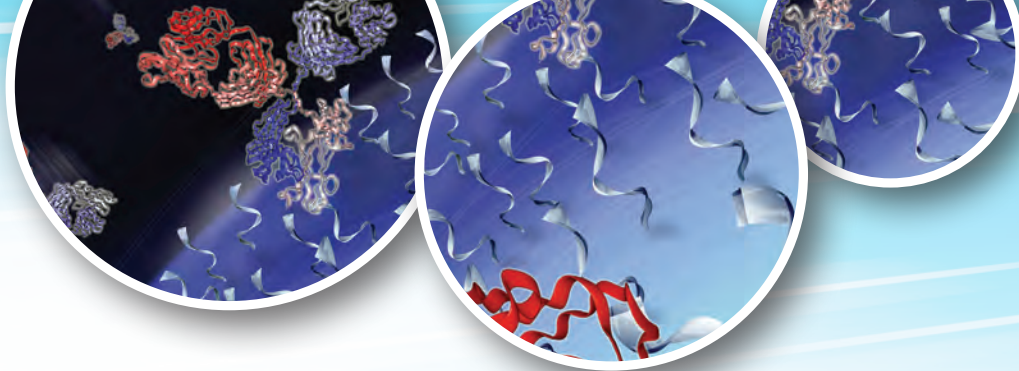
#### Associated products



pH Gradient Buffers



WebSeal Well Plates and Mats



**Proteins / Peptides**

**ProPac**

- ProPac Ion Exchange
- ProPac HIC Hydrophobic Interaction
- ProPac IMAC

**ProSwift/  
PepSwift**

- ProSwift Ion Exchange
- ProSwift Rev Phase
- PepSwift Rev Phase
- ProSwift Con A

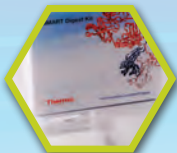
**Others**

- Accucore 150
- BioBasic
- Acclaim 300

**Associated products**



SOLA $\mu$  SPE Plates



SMART Digest Kit



Viper Fingertight Fittings

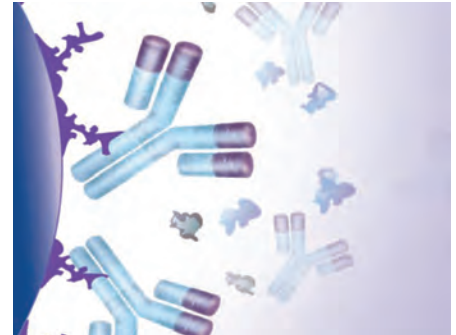
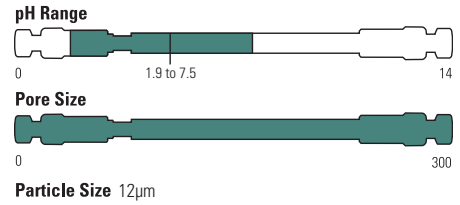
# MABPac HPLC and UHPLC Columns

## MABPac Protein A

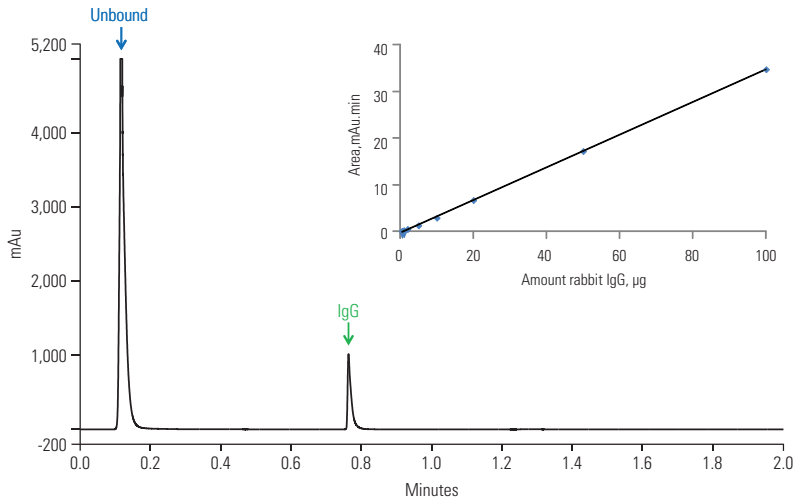
Fast mAb titer analysis

- High efficiency column
- Rugged, long column lifetime
- Excellent sample recovery
- Designed for ease of use and automation

Thermo Scientific™ MABPac™ Protein A is an affinity column designed to provide fast monoclonal antibody (mAb) titer analysis of samples such as harvest cell cultures (HCC). This HPLC column offers high throughput and accurate analysis through a combination of low back pressure and high efficiency. The MABPac Protein A column format allows rapid automation of loading, binding, elution and collection using Thermo Scientific biocompatible systems. The column is based on a novel non-porous polymeric resin consisting of a divinylbenzene core and a hydrophilic surface, optimized for affinity separation.



### Harvest cell culture titer analysis



### MABPac Protein A, 12µm, 35 x 4.0mm

Flow Rate:	2 mL/min
Mobile Phase A:	50mM Sodium Phosphate, 150mM NaCl, 5% acetonitrile, pH 7.5
Mobile Phase B:	50mM Sodium Phosphate, 150mM NaCl, 5% acetonitrile, pH 2.5
Gradient:	0% B for 0.2 mins, 100% B for 0.60 mins, 0% B for 1.20 mins
Temperature:	30°C
Injection Volume:	10µL
Detection:	280nm
Sample:	MAB B, 5mg/mL Harvest Cell Culture

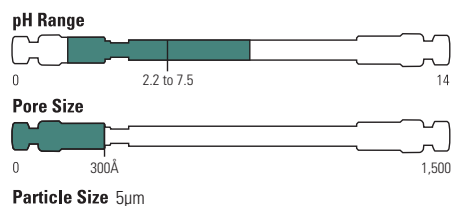
### MABPac Protein A

Particle Size (µm)	Format	Length (mm)	4.0mm ID
12	HPLC Column	35	<b>082539</b>



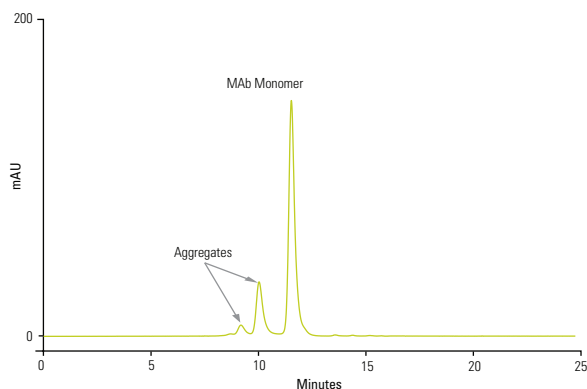
## MABPac SEC-1

A size exclusion chromatography (SEC) column specifically designed for the high-resolution separation and characterization of monoclonal antibodies (mAbs) and their aggregates



- Analysis of monoclonal antibodies (mAbs) and their aggregates
- Analysis of mAb Fab and Fc fragments, even using high and low salt concentrations
- Hydrophilic bonded layer for minimal undesired interactions between the biomolecules and the stationary phase
- Stable surface bonding leads to low column bleed and compatibility with MS, ELSD and Corona Charged Aerosol Detection (CAD)
- Separation range for globular proteins 10,000–1,000,000; exclusion limit for globular proteins >1,000,000

### Monoclonal antibody aggregate separation



#### MABPac SEC-1, 5µm, 300 x 4.0mm (PEEK)

Mobile Phase:	0.3 M NaCl in 50mM phosphate buffer pH 6.8
Temperature:	30°C
Flow Rate:	0.20mL/min
Injection Volume:	2µL
Detection:	UV, 280nm
Sample:	MAB (10mg/mL)

### MABPac SEC-1

Particle Size (µm)	Format	Length (mm)	2.1mm ID	4.0mm ID	7.8mm ID
5	Guard Column	50	—	<b>074697</b>	—
	HPLC Column	150	<b>088790</b>	<b>075592</b>	—
		300	<b>088789</b>	<b>074696</b>	<b>088460</b>

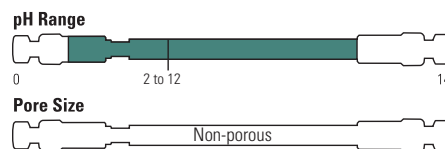




## MABPac SCX-10

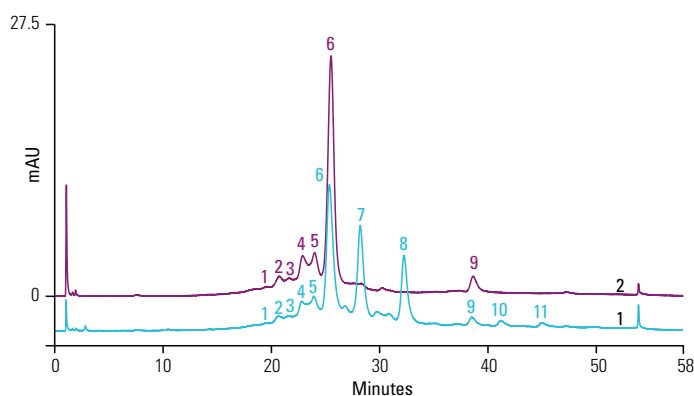
Strong cation exchange column designed specifically for the high-resolution, high efficiency charged variant analysis of monoclonal antibodies and associated variants

- Exceptionally high-resolution for monoclonal antibody charged variants separation
- Ideal for characterization and quality control assessment of monoclonal antibodies
- Unmatched column-to-column and lot-to-lot reproducibility
- Hydrophobic interactions greatly minimized
- Ideal for stability studies
- Meets the regulatory requirements for biopharmaceutical characterization



**Particle Size** 3µm, 5µm, 10µm

### Baseline resolution of C-terminal lysine variants of a monoclonal antibody



#### MABPac SCX-10, 5µm, 250 x 4.0mm

Mobile Phase A:	20mM MES (pH 5.6) + 60mM NaCl
Mobile Phase B:	20mM MES (pH 5.6) + 300mM NaCl
Gradient:	15–36% B in 50 min
Temperature:	30°C
Flow Rate:	1mL/min
Injection Volume:	5µL
Detection:	UV at 280nm
Samples:	1. MAb B, 900µg in 100µL (no carboxypeptidase) 2. MAb B, 900µg in 100µL + carboxypeptidase, 50µg, incubation at 37°C for 3 h
Both Chromatograms:	Peaks 1–5: Acidic variants
Sample 1:	Peaks 6-8: C-Terminal lysine truncation variants of main peak Peaks 9–11: C-Terminal lysine truncation variants of minor variant peak
Sample 2:	Peak 6 results from peaks 6, 7, and 8 after CBP treatment. Peak 9 results from peaks 9, 10, and 11 after CBP treatment

### MABPac SCX-10

Particle Size (µm)	Format	Length (mm)	2.0mm ID	4.0mm ID	9.0mm ID
3	HPLC Column	50	–	<b>077907</b>	–
		150	–	<b>085198</b>	–
		250	–	<b>078655</b>	–
10	Guard Column	50	<b>075749</b>	<b>074631</b>	–
	HPLC Column	50	–	<b>075603</b>	–
		150	–	<b>075602</b>	–
		250	<b>075604</b>	<b>074625</b>	<b>088784</b>

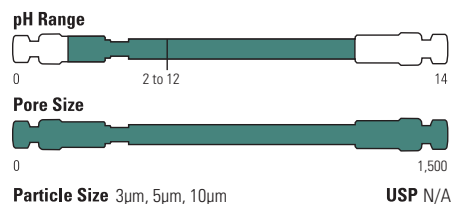


## MABPac SCX-10 RS

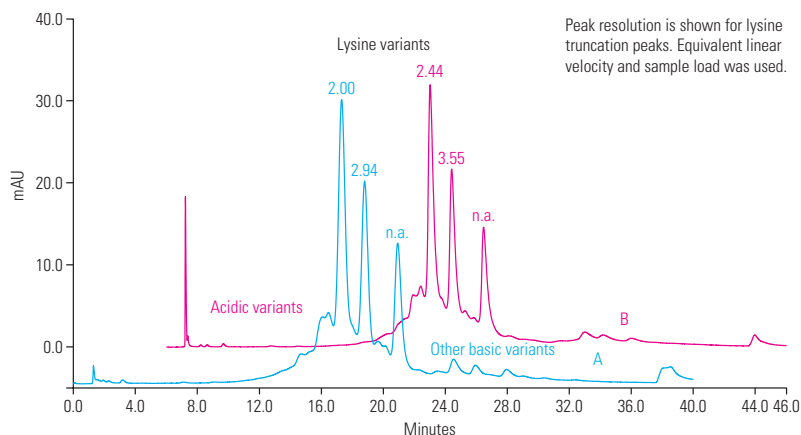
BioRS (Rapid Separation), strong cation exchange column designed for monoclonal antibodies and associated charged variants

- UHPLC, high throughput analysis
- Specially developed bio-inert PEEK lined stainless steel column hardware
- High pressure compatibility
- Suitable for operation up to 7,000 psi

Higher resolution and throughput of mAb charge variant UHPLC separations can be achieved using the MABPac SCX-10 RS strong cation-exchange phase with specially developed bio-inert PEEK lined stainless steel column hardware. These columns are designed to be used at higher UHPLC conditions to maximize the resolution of mAb variant separation. Higher pressure compatibility of the column hardware allows use of high flow rates for faster separation.



### Improved mAb resolution



#### MABPac SCX, 5µm, 250 x 4.6mm

Mobile Phase A:	20 mM MES pH 5.6 + 60 mM
Mobile Phase B:	20 mM MES pH 5.6 + 300 mM NaCl
Flow Rate:	1.5 mL/min
Injection Volume:	15µL
Sample:	MAB 5mg/mL
Chromatogram A:	Gradient: 33-53% B in 30 min
Chromatogram B:	Gradient: 33-53% in 20 min

### MABPac SCX-10 RS

Particle Size (µm)	Format	Length (mm)	2.1mm ID	4.6mm ID
5	UHPLC Column	50	<b>082675</b>	<b>082674</b>
		150	<b>088242</b>	<b>085209</b>
		250	<b>082515</b>	<b>082673</b>



## pH Gradient Buffers

Ready-to-use buffers for simple method development during charge variant characterization

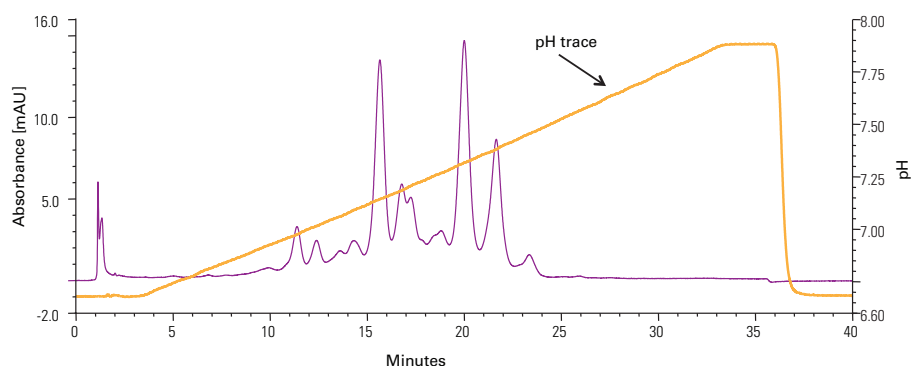


The Thermo Scientific pH gradient platform accelerates method development and facilitates method transfer to QA/QC for a wide range of protein and mAb charge variants through a generic LC-based approach to charge variant characterization.

- Patented buffer formulations enable fast, robust and reproducible pH gradients that are simple to optimize and easily automated
- Ready to use with existing LC columns and systems, without the need for time consuming mobile phase adjustments
- Applicable to the majority of mAbs

Thermo Scientific pH buffer concentrates can be purchased individually or as a pair, in quantities of 125mL or 250mL. For added convenience, the 125mL buffers can also be bundled with columns in a number of specifically preconfigured kits.

### Optimization of mAb charge variant separation using a linear pH gradient: 25% B (pH 6.75) to 50% B (pH 7.9)



### pH Gradient Buffers

Description		Buffer Bottle size	
Buffer		125mL	250mL
CX-1 pH Gradient Buffer A (pH 5.6)		<b>083273</b>	<b>085346</b>
CX-1 pH Gradient Buffer B (pH 10.2)		<b>083275</b>	<b>085348</b>
Kits		Buffer Bottle size	
Buffer	MABPac SCX-10 Column format	125mL	250mL
Gradient Buffer Kit: Includes both Buffer A & Buffer B (available in either 125mL or 250mL size – one bottle each/ kit)		<b>083274</b>	<b>085349</b>
Gradient Starter Kit: Includes both Buffer A & Buffer B + MABPac SCX-10		10µm, 4 × 250mm column	<b>083381</b> -
Gradient High Throughput Kit: Includes both Buffer A & Buffer B + MABPac SCX-10		5µm, 4 × 50mm column	<b>083378</b> -
Gradient High Resolution Kit: Includes both Buffer A & Buffer B + MABPac SCX-10		5µm, 4 × 250mm column	<b>083272</b> -

## Monoclonal Antibody Characterization and Analysis Kits

### MAb Charge Variant Analysis IEX Column Kit

MAb Charge Variant Analysis IEX Column Kit includes two ion-exchange (IEX) specialty columns for mAb charge variants analysis. This kit is a convenient starter kit for researchers at the beginning of a mAb analysis projects, and facilitates the screening of two columns for determination of the best column for their specific monoclonal antibody sample.

Included in the Kit:

- ProPac WCX-10 Analytical column, 4 × 250mm (P/N 054993)
- MAbPac SCX-10 Analytical column, 4 × 250mm (P/N 074625)

#### MAb Charge Variants Kit

Description	Cat. No.
MAb Charge Variant Analysis IEX Column Kit	<b>076196</b>

### MAb Analysis IEX and SEC Column Kit

The MAb Analysis IEX and SEC Column Kit includes two columns: an ion-exchange (IEX) column and a size-exclusion (SEC) column. This kit is a convenient starter and column replacement kit for mAb analysis projects. It is useful for researchers at the beginning of mAb analysis projects, and facilitates the screening of aggregates and variants in two columns.

Included in the kit:

- MAbPac SCX-10 Analytical column, 4 × 250mm (P/N 074625)
- MAbPac SEC-1 Analytical column, 4 × 300mm (P/N 074696)

#### MAb Analysis Kit

Description	Cat. No.
MAb Analysis IEX and SEC Column Kit	<b>076197</b>



## MABPac HIC Family

The MABPac HIC column family is designed for separations of monoclonal antibodies (mAbs) and related biologics by hydrophobic interaction chromatography (HIC). These columns are designed to address the separation challenges as the result of heterogeneity, complexity and diversity of mAbs and related biologics.

- Advanced column chemistry designed for separating mAbs and related biologics
- Broad selectivity coverage for most challenging separations of mAbs
- Excellent bio-compatibility
- High column efficiency
- Rugged column packing

### Applications

The MABPac HIC-10 is the column of choice for intact mAbs/proteins and mAb aggregates while the MABPac HIC-20 is suited to resolve mAb fragments, oxidized mAbs and bispecific mAbs. When it comes to ADCs, MABPac HIC-Butyl is ideal for cystein-conjugated ADC while MABPac HIC-10 and MABPac HIC-20 have proven useful for several cysteine proprietary ADC molecules, as shown below.

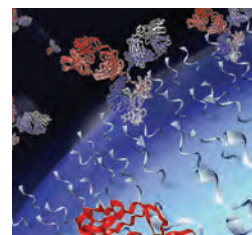
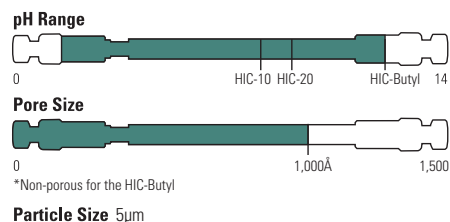
### MABPac HIC Selection Guide

Column	MABPac HIC-10	MABPac HIC-20	MABPac HIC-Butyl
Intact mAbs/proteins	++++	+++	++
mAb aggregates	++++	+++	++
mAb fragments (F <sub>ab</sub> and F <sub>c</sub> )	+++	++++	+++
Oxidized mAbs	+++	++++	+++
Antibody Drug Conjugates (ADCs)	+++	+++	++++
Bispecific mAbs	+++	++++	++

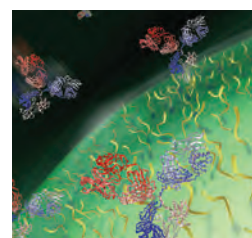
Greater number of ++++ denotes greater suitability

### MABPac HIC Family

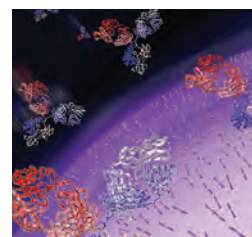
Description	Particle Size (µm)	Format	Length (mm)	4.6mm ID
MABPac HIC-10	5	Guard Cartridges (2/pk)	10	<b>088482</b>
		HPLC Column	100	<b>088480</b>
			250	<b>088481</b>
MABPac HIC-20	5	Guard Cartridges (2/pk)	10	<b>088555</b>
		HPLC Column	100	<b>088553</b>
			250	<b>088554</b>
MABPac HIC-Butyl	5	Guard Cartridges (2/pk)	10	<b>088559</b>
		HPLC Column	100	<b>088558</b>
Guard Cartridge Holder				<b>069580</b>



MABPac HIC-10

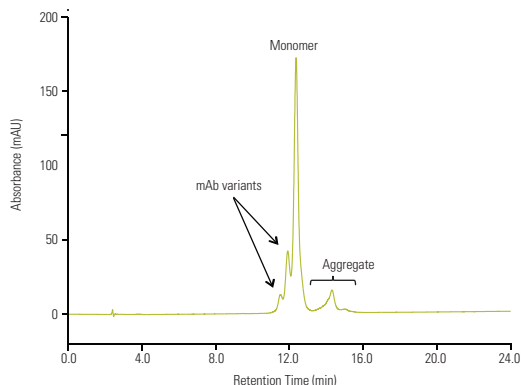


MABPac HIC-20



MABPac HIC-Butyl

### Separation of mAb Aggregates



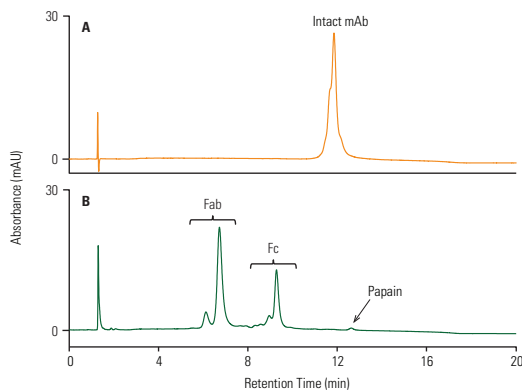
#### MABPac HIC-10, 5µm, 100 x 4.6mm

Mobile Phase A: 2 M ammonium sulfate, 100mM sodium phosphate, pH 7.0  
 Mobile Phase B: 100mM sodium phosphate, pH 7.0

Gradient:	Time (min)	%A	%B
	-5.0	60	40
	0.0	60	40
	1.0	60	40
	29.0	0	100
	34.0	0	100

Temperature: 20°C  
 Flow Rate: 0.5mL/min  
 Injection Volume: 10µL  
 Detection: UV, 280nm  
 Sample: Monoclonal antibody (4mg/mL)

### Separation of mAb Fragments



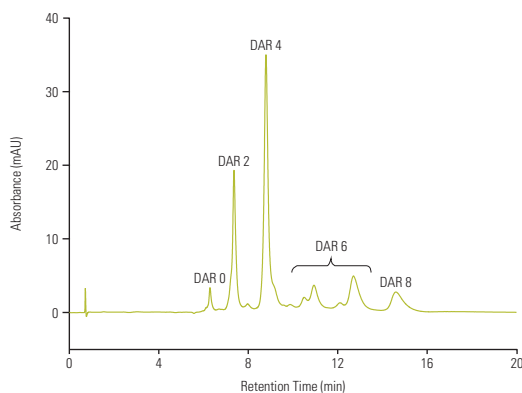
#### MABPac HIC-20, 5µm, 100 x 4.6mm

Mobile Phase A: 2 M ammonium sulfate, 100mM sodium phosphate, pH 7.0  
 Mobile Phase B: 100mM sodium phosphate, pH 7.0

Gradient:	Time (min)	%A	%B
	-5.0	60	40
	0.0	60	40
	1.0	60	40
	15.0	0	100
	20.0	0	100

Temperature: 30°C  
 Flow Rate: 1.0mL/min  
 Injection Volume: Intact mAb: 5µL  
 Papain digest: 12µL  
 Detection: UV, 280nm  
 Sample: a. Intact mAb (2.5mg/mL)  
 b. Papain digest (1mg/mL)

### Separation of Antibody Drug Conjugates (ADCs)



#### MABPac HIC-Butyl, 5µm, 100 x 4.6mm

Mobile Phase A: 1.5 M ammonium sulfate, 50mM sodium phosphate, pH 7.0/ isopropanol (95:5 v/v)  
 Mobile Phase B: 50mM sodium phosphate, pH 7.0/ isopropanol (80:20 v/v)

Gradient:	Time (min)	%A	%B
	-5.0	100	0
	0.0	100	0
	1.0	100	0
	15.0	0	100
	20.0	0	100

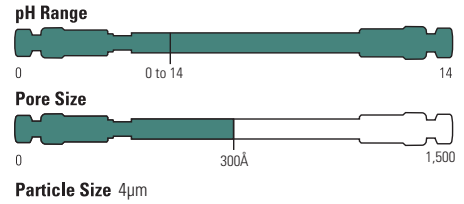
Temperature: 25°C  
 Flow Rate: 1.0mL/min  
 Injection Volume: 5µL  
 Detection: UV, 280nm  
 Sample: Cys-conjugated ADC mimic (5mg/mL)

# MABPac RP

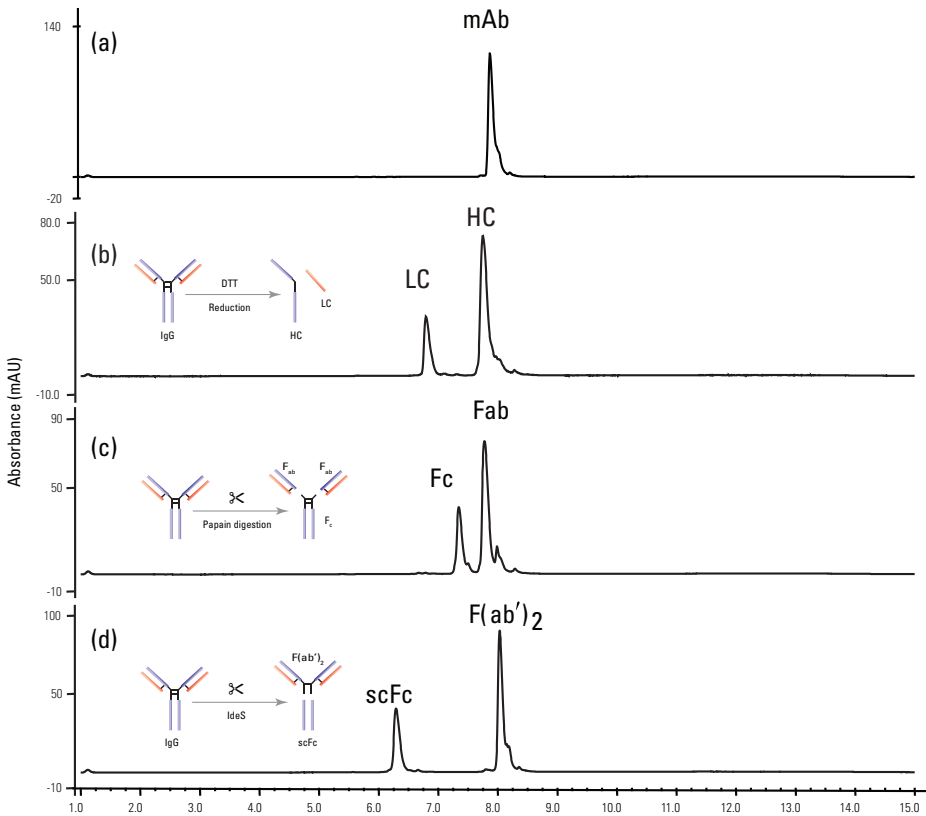
High resolution accurate mass determination of monoclonal antibody variants, antibody drug conjugates (ADC) and proteins

- Superior resolution power for monoclonal antibodies and related substances
- High efficiency with low carry-over
- Excellent MS compatibility
- Wide operating pH range: 0 – 14
- High temperature stability: up to 110°C
- High throughput

The Thermo Scientific™ MABPac™ RP is a reverse phase (RP) liquid chromatography column designed for mAb characterization. Highly efficient separations can be achieved for mAbs and their variants, light chain (LC) and heavy chain (HC), Fc and Fab fragments, scFc and F(ab')<sub>2</sub> fragments. The unique column chemistry provides stability under wide pH range, high temperature, and organic mobile phases and is fully compatible with both UV and MS detection.



## mAb and mAb Fragments Analysis



### MABPac RP, 4µm, 50 x 3.0mm

Mobile Phase A: H<sub>2</sub>O/FA/TFA (99.88 : 0.1:0.02 v/v/v)  
 Mobile Phase B: MeCN/H<sub>2</sub>O/FA/TFA (90: 9.88 :0.1:0.02 v/v/v/v/v)

Gradient:	Time (min)	%A	%B
	0.0	80	20
	1.0	80	20
	11.0	55	45
	12.0	55	45
	14.0	80	20
	12.0	80	20

Temperature: 80°C  
 Flow Rate: 0.5mL/min  
 Injection Volume: 5µL  
 Detection: UV, 280nm  
 Sample: (a) trastuzumab (5mg/mL)  
 (b) trastuzumab + DTT (4mg/mL)  
 (c) trastuzumab + Papain (2mg/mL)  
 (d) trastuzumab + IdeS (2mg/mL)

## MABPac RP

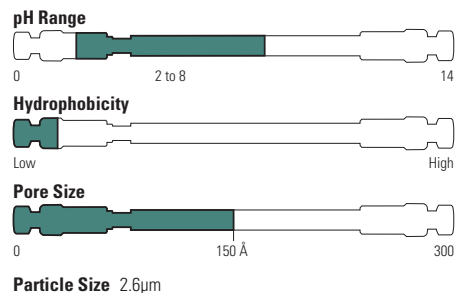
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID
4	Guard Cartridges (2/pk)	10	<b>088649</b>	<b>088646</b>
	HPLC Column	50	<b>088648</b>	<b>088645</b>
		100	<b>088647</b>	<b>088644</b>
	Guard Cartridge Holder		<b>069580</b>	<b>069580</b>

## Accucore 150-Amide-HILIC

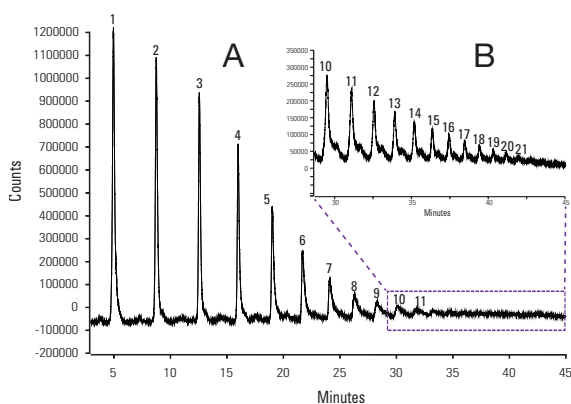
HPLC column for neutral glycan analysis

- Amide phase bonded onto 150 Å pore diameter solid core particles
- High retention of a broad range of hydrophilic analytes in HILIC mode
- Recommended for hydrophilic biomolecules such as glycans

The amide bonded phases provide strong hydrogen bonding interaction between the stationary phase and the analytes, resulting in unique selectivity compared to other HILIC phases. Combined with larger pore size of the solid core particles, Accucore 150-Amide-HILIC is well suited for separating a variety of hydrophilic molecules, including carbohydrates and peptides. As a result, the Accucore 150-Amide-HILIC is an excellent choice for glycan separations.



### 2-AB labeled dextran ladder



(A) 2µL injection of sample, where 11 glycans were separated.

(B) 5µL injection of sample, zoomed-in to the later part of the gradient rise. A further 10 glycans were detected.

#### Accucore 150-Amide-HILIC, 2.6µm, 100 x 2.1mm

Mobile Phase A:	Acetonitrile
Mobile Phase B:	50mM Ammonium formate, pH 4.5
Gradient:	20–50 % B in 40.0 minutes 50 % B for 5.0 minutes 50–20 % B in 0.5 minutes 50 % B for 4.5 minutes
Temperature:	60°C
Flow Rate:	500µL/min
Backpressure at Starting Conditions:	110 bar
Injection Volume:	2µL to 5µL of sample.
Injection Wash Solvent:	80:20 (v/v) acetonitrile:water.
Detector:	Fluorescence, 330nm excitation wavelength; 420nm emission wavelength; acquisition start after 3 min from gradient start.
Run Time:	50 minutes

### Accucore 150 Amide-HILIC

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk) HPLC Column	10	<b>16726-012105</b>	<b>16726-013005</b>	<b>16726-014005</b>
		50	<b>16726-052130</b>	<b>16726-053030</b>	<b>16726-054630</b>
		100	<b>16726-102130</b>	<b>16726-103030</b>	<b>16726-104630</b>
		150	<b>16726-152130</b>	<b>16726-153030</b>	<b>16726-154630</b>
		250	<b>16726-252130</b>	-	-
Guard Cartridge Holder			<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

For our range of nanoLC columns refer to page **3-043**



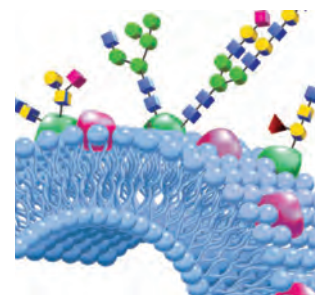
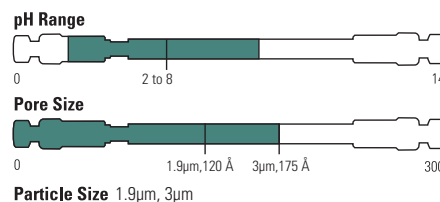
# GlycanPac HPLC and UHPLC Columns

## GlycanPac AXH-1

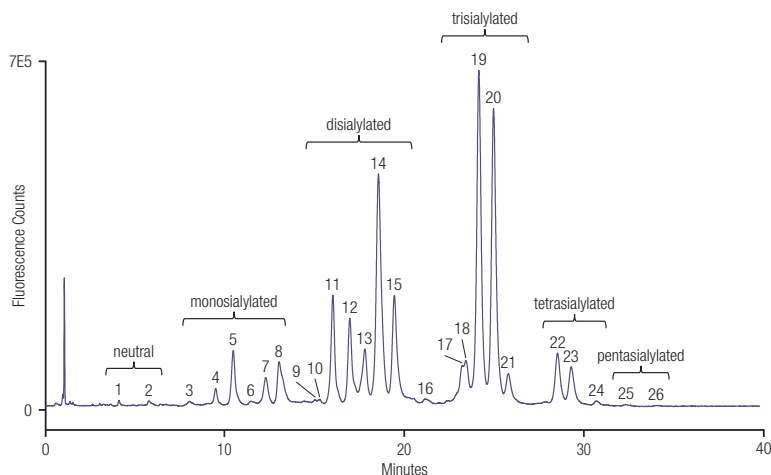
High-resolution columns for neutral and charged glycan analysis

- Unique glycan selectivity based on charge, size and polarity
- Excellent resolution for both native and labeled glycans
- Useful for both high-resolution glycan profile characterization and easy quantification of glycans based on charge, size and polarity
- Compatible with fluorescence and MS detection methods
- High chromatographic efficiency and excellent column stability

Thermo Scientific™ GlycanPac™ AXH-1 is a high-performance, silica-based HPLC column for simultaneous separation of glycans by charge, size and polarity. It is designed for high-resolution and high-throughput analysis of biologically important glycans, either labeled or native, by LC-fluorescence and LC-MS methods.



### Separation of 2AB labeled N-glycans from bovine fetuin by charge, size and polarity



#### GlycanPac AXH-1, 1.9µm, 150 x 2.1mm

Mobile Phase A:	Acetonitrile (100%)
Mobile Phase B:	Water
Mobile Phase C:	Ammonium formate (100mM, pH = 4.4)
Temperature:	30°C
Flow Rate:	0.4mL/min
Injection Volume:	50pmoles
Detection:	Fluorescence, 320/420nm
Sample:	2AB labeled N-glycan from bovine fetuin

Time (min)	% A	% B	% C	Flow (mL/min)	Curve
-10	78	20	2	0.4	5
0	78	20	2	0.4	5
30	70	20	10	0.4	5
35	60	20	20	0.4	5
40	50	20	30	0.4	5

### GlycanPac AXH-1

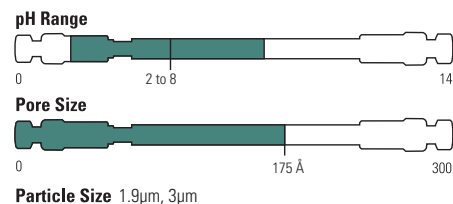
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
1.9	UHPLC Column	100	<b>082473</b>	—	—
		150	<b>082472</b>	—	—
		250	<b>082521</b>	—	—
3	Guard Cartridges (2/pk)	10	<b>082476</b>	<b>082475</b>	<b>082474</b>
	HPLC Column	150	<b>082470</b>	<b>082469</b>	<b>082468</b>
	Guard Cartridge Holder		<b>069580</b>	<b>069580</b>	<b>069580</b>

## GlycanPac AXR-1

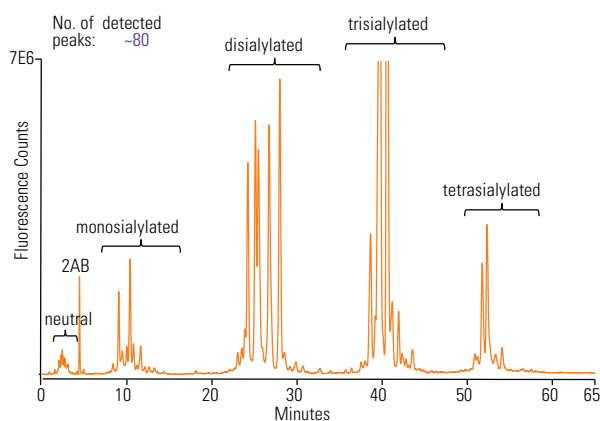
Ultra-high resolution columns for neutral, charged and glycan isomer analysis

- Excellent glycan selectivity based on hydrophobicity, charge, size and isomerization
- High resolution for isomeric glycans
- Compatibility with fluorescence and MS detection methods
- High column efficiency and stability
- Ideal tool for qualitative, quantitative and structural analysis of glycans

The GlycanPac AXR-1 column, based on high-purity and spherical silica substrates, combines both weak anion-exchange (WAX) and reversed-phase (RP) retention mechanisms for optimal selectivity and ultra-high resolution for glycan separation. The WAX functionality separates glycans based on charge, and RP property facilitates high resolution for glycans of the same charge according to their hydrophobicity, branching and isomerization. As the result, the GlycanPac AXR-1 column provides unparalleled resolutions for complex charged glycans.



### Separation of 2AB labeled N-glycans from bovine fetuin



#### GlycanPac AXR-1, 1.9µm, 150 x 2.1mm

Mobile Phase A:	Acetonitrile
Mobile Phase B:	D.I. water
Mobile Phase C:	Ammonium formate (100mM, pH=4.4)
Flow Rate:	0.4mL/min
Temperature:	40°C
Injection Volume:	100pmoles
Detection:	Fluorescence, 320/420nm
Sample:	2AB labeled N-glycan from bovine fetuin

Time (min)	% A	% B	% C	Curve
-10	0	95	5	5
0	0	95	5	5
1	0	95	5	5
30	1	74	25	5
65	20	50	30	5

### GlycanPac AXR-1

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
1.9	UHPLC Column	150	<b>088136</b>	-	-
		250	<b>088135</b>	-	-
3	Guard Cartridges (2/pk)	10	<b>088258</b>	<b>088259</b>	<b>088260</b>
	HPLC Column	150	<b>088251</b>	<b>088252</b>	<b>088255</b>
	Guard Cartridge Holder		<b>069580</b>	<b>069580</b>	<b>069580</b>

# ProPac HPLC Columns

## ProPac WCX-10 and SCX-10

Weak and strong cation exchange columns with exceptionally high resolution and efficiency for separations of protein variants

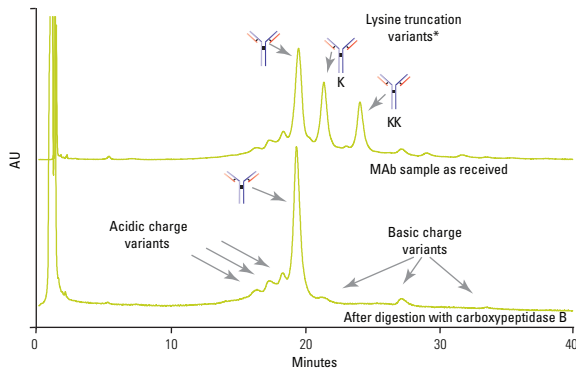
- Characterization and quality control assessment of monoclonal antibodies and other proteins
- Exceptionally high-resolution and high-efficiency separations
- Useful for characterization of related protein variants including deamidation and mAb lysine truncation variants
- ProPac WCX-10 contains carboxylate functional groups and ProPac SCX-10 contains sulfonate functional groups

ProPac WCX-10 and SCX-10 columns are non-porous particles that can resolve isoforms that differ by a single charged residue. A hydrophilic layer prevents unwanted secondary interactions, and a grafted cation exchange surface provides pH-based selectivity control and fast mass transfer for high-efficiency separation and moderate capacity.



**Particle Size** 10µm

### MAb lysine truncation variants



#### ProPac WCX-10, 10µm, 250 x 4.0mm

Mobile Phase A: 20mM MES+ 115mM NaCl + 1mM EDTA, pH 5.5

Mobile Phase B: 20mM MES+ 145mM NaCl + 1mM EDTA, pH 5.5

Gradient:	t (min)	%E1	%E2
	0	100	0
	2	100	0
	40	0	100
	60	0	100

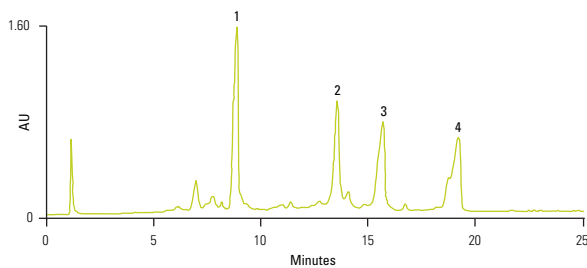
Flow Rate: 1.0mL/min

Detection: UV, 280nm

Sample: MAb

\* Peak assignment supported by data from R. J. Harris, et.al, *J.Chromatogr. A* 1995, 705, 129-134, and Carboxypeptidase B digest.

### Hemoglobin variants



#### ProPac SCX-10, 10µm, 250 x 4.0mm

Mobile Phase A: 20mM Sodium phosphate, 4mM Potassium cyanide, pH 6

Mobile Phase B: 1 M Sodium chloride in water

Mobile Phase C: Water

Gradient:	Time	%A	%B	%C
	Init	50	0	50
	30 min	50	50	0

Flow Rate: 1mL/min

Injection Volume: 10µL

Detection: UV, 220nm

Sample: 1. Fetal hemoglobin  
2. Hemoglobin  
3. Sickle cell hemoglobin  
4. Hemoglobin C

## ProPac WCX-10 and SCX-10 *continued*

### ProPac WCX-10

Particle Size (µm)	Format	Length (mm)	2.0mm ID	4.0mm ID	9.0mm ID	22.0mm ID
10	Guard Column	50	<b>063480</b>	<b>054994</b>	–	–
	HPLC Column	50	–	<b>074600</b>	–	–
		100	–	<b>088778</b>	–	–
		150	–	<b>088778</b>	–	–
		250	<b>063472</b>	<b>054993</b>	<b>063474</b>	<b>088766</b>

### ProPac SCX-10

Particle Size (µm)	Format	Length (mm)	2.0mm ID	4.0mm ID	9.0mm ID	22.0mm ID
10	Guard Column	50	<b>063462</b>	<b>079930</b>	–	–
	HPLC Column	250	<b>063456</b>	<b>054995</b>	<b>063700</b>	<b>088769</b>

### ProPac Kits

Part Number	Phase Description	Set Contents	Column Dimensions
<b>088776</b>	ProPac WAX-10 Lot Select Column Set	3 columns from 1 lot of resin	250 x 4.0mm
<b>088777</b>	ProPac WAX-10 Lot Select Column Set	3 lots of resin, 1 column from each lot	250 x 4.0mm
<b>088774</b>	ProPac SAX-10 Lot Select Column Set	3 columns from 1 lot of resin	250 x 4.0mm
<b>088775</b>	ProPac SAX-10 Lot Select Column Set	3 lots of resin, 1 column from each lot	250 x 4.0mm
<b>088767</b>	ProPac WCX-10 Lot Select Column Set	3 columns from 1 lot of resin	250 x 4.0mm
<b>088768</b>	ProPac WCX-10 Lot Select Column Set	3 lots of resin, 1 column from each lot	250 x 4.0mm
<b>088772</b>	ProPac SCX-10 Lot Select Column Set	3 columns from 1 lot of resin	250 x 4.0mm
<b>088773</b>	ProPac SCX-10 Lot Select Column Set	3 lots of resin, 1 column from each lot	250 x 4.0mm

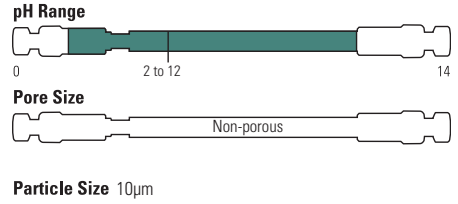


# ProPac SCX-20

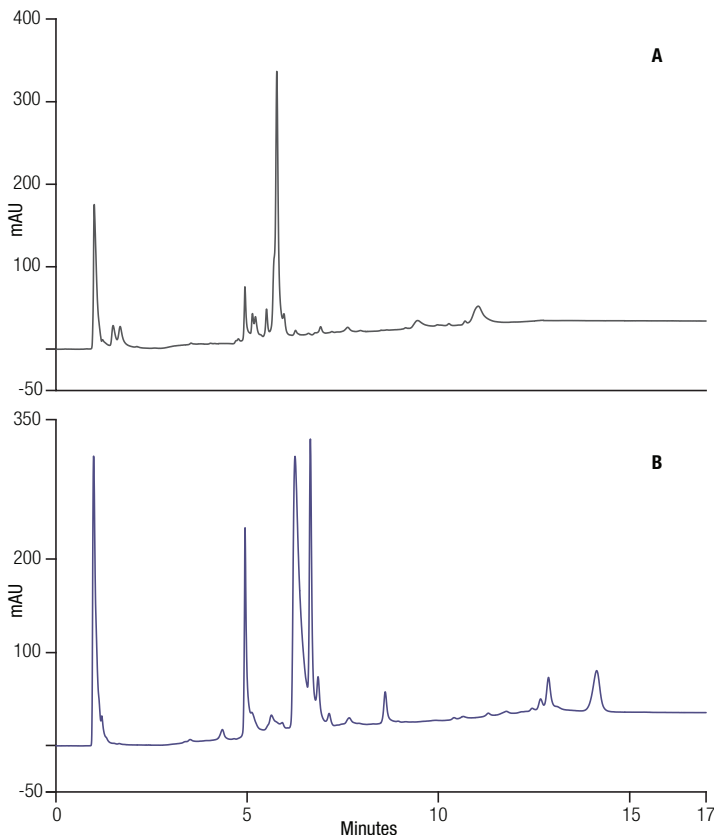
Strong cation-exchange column for high-resolution protein separations

- Grafted cation-exchange surface provides pH-based selectivity control
- Fast mass transfer for high-efficiency separation

The ProPac SCX-20 column is designed specifically to provide high-resolution UHPLC separations of proteins. The stationary phase is composed of 10µm, non-porous, solvent compatible resin beads that are uniformly coated with a highly hydrophilic layer to reduce non-specific interactions between the bead surface and the biopolymer.



## Snake venoms from Naja naja and Russell's viper



### ProPac SCX-20, 5µm, 250 x 4.0mm

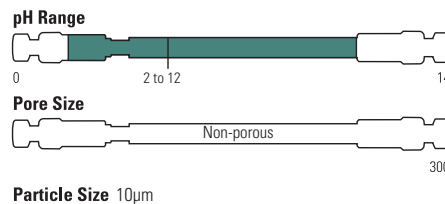
Mobile Phase A:	20mM Tris pH 7.3
Mobile Phase B:	0.5M NaCl in Eluent A
Gradient:	1–100% B in 10 min
Temperature:	30°C
Injection Volume:	10µL
Detection:	UV, 214nm
Samples:	A. Snake Venom (Naja naja) 1mg/mL
	B. Snake Venom (Russell's viper) 1mg/mL

### ProPac SCX-20

Particle Size (µm)	Description	Length (mm)	4.0mm ID
10	Guard Column	50	<b>074643</b>
	HPLC Column	250	<b>074628</b>

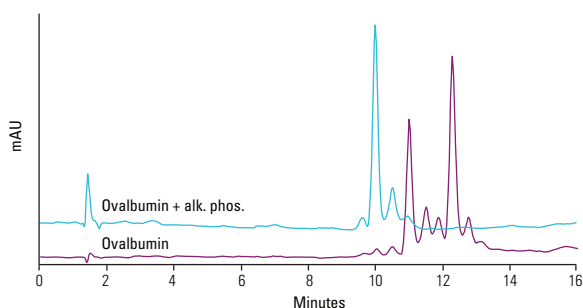
## ProPac WAX-10 and SAX-10

Weak and strong anion anion-exchange providing unequalled high resolution and efficiency in the separations of protein variants



- High-efficiency, high-resolution separations
- Useful for characterization and quality control assessment of closely-related protein variants
- Supports separation of proteins that differ by as little as one amino acid residue
- Neutral hydrophilic coat that eliminates protein-resin hydrophobic interactions
- Superior lot-to-lot and column-to-column reproducibility
- ProPac WAX-10 column contains a tertiary amine functional group and ProPac SAX-10 contains a quaternary amine functional group

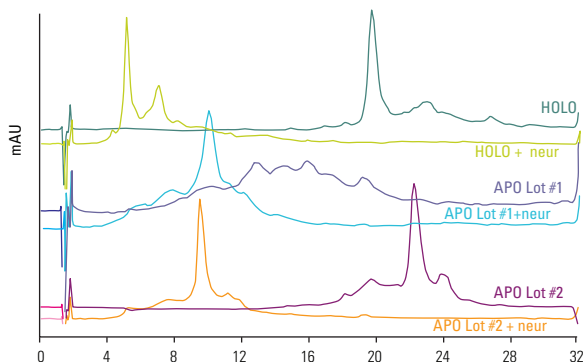
### Resolution of phosphorylation variants of ovalbumin



#### ProPac SAX-10, 10µm, 250 x 4.0mm

Mobile Phase A:	Water		
Mobile Phase B:	2.0 M NaCl		
Mobile Phase C:	0.1 M Tris/HCl (pH 8.5)		
Gradient:	Time	%A	%B %C
	0 min	80	0 20
	15 min	67.5	12.5 20
Flow Rate:	1.0mL/min		
Injection Volume:	30µL		
Detection:	UV, 214nm		
Sample:	Ovalbumin before and after alkaline phosphatase treatment		

### Effect of sialylation on transferrin chromatography



#### ProPac SAX-10, 10µm, 250 x 4.0mm

Mobile Phase A:	Water		
Mobile Phase B:	2.0 M NaCl		
Mobile Phase C:	0.2 M Tris/HCl (pH 9)		
Gradient:	Time	%A	%B %C
	0 min	87	3 10
	30 min	83	7 10
Flow Rate:	1.0mL/min		
Injection Volume:	50µL		
Detection:	UV, 214nm		
Samples:	HOLO (iron rich) and APO (iron poor) human transferrin samples before and after neuraminidase treatment. Digestions were carried out overnight at 37°C in sodium acetate buffer at pH 5.		

### ProPac WAX-10

Particle Size (µm)	Format	Length (mm)	2.0mm ID	4.0mm ID	9.0mm ID	22.0mm ID
10	Guard Column	50	<b>063470</b>	<b>055150</b>	—	—
	HPLC Column	250	<b>063464</b>	<b>054999</b>	<b>063707</b>	<b>088771</b>

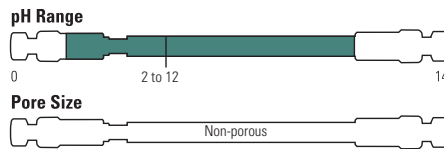
### ProPac SAX-10

Particle Size (µm)	Format	Length (mm)	2.0mm ID	4.0mm ID	9.0mm ID	22.0mm ID	4 x 50mm
10	Guard Column	50	<b>063454</b>	<b>054998</b>	—	—	—
	HPLC Column	250	<b>063448</b>	<b>054997</b>	<b>063703</b>	<b>088770</b>	<b>078990</b>

# ProPac PA1

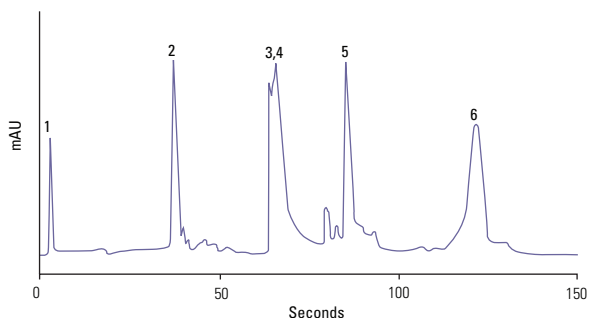
For hydrophilic anionic protein separations

- Good for hydrophilic proteins and peptides
- Ideal for high-resolution separations of proteins with pI values from 3 to 11
- Available in semipreparative format
- Pellicular packing ensures high-efficiency and fast mass transport



Particle Size 10µm

## Gradient separation of protein standards



Column: ProPac PA1, 10µm, 50 x 4.0mm

Mobile Phase:	10 to 350mM NaCl in 1.0mM Tris, pH 8.2
Flow Rate:	5mL/min
Detection:	UV, 280nm
Analytes:	1. Horseheart Myoglobin 33µg 2. Contaminant - 3,4. Conalbumin 66 5. Ovalbumin 66 6. Soybean Trysin Inhibitor 66



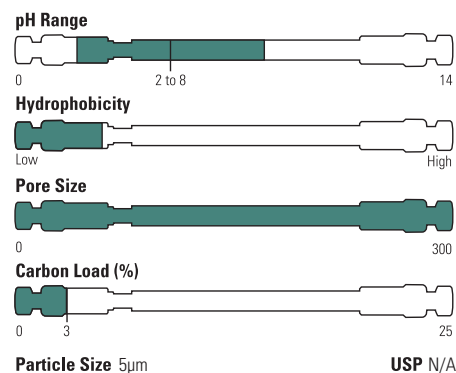
## ProPac PA1

Particle Size (µm)	Format	Length (mm)	4.0mm ID	9.0mm ID
10	Guard Column	50	<b>039657</b>	—
	HPLC Column	250	<b>039658</b>	<b>040137</b>

## BioBasic AX

Optimized for the separation of proteins, peptides, other anionic species and polar molecules

- Weak anion exchange phase for multiple charged species
- 300Å pore size for enhanced protein and peptide separations
- Suitable for HILIC retention and separation of highly polar molecules
- Superb stability under demanding pH conditions



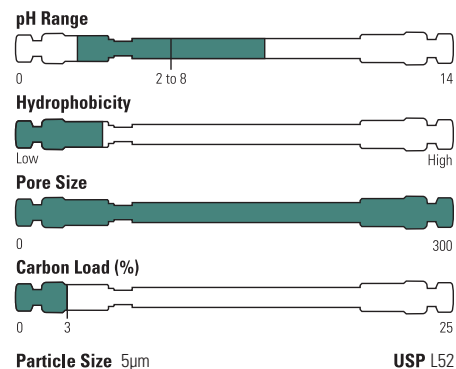
### BioBasic AX

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.6mm ID
5	Drop-in Guard (4/pk) HPLC Column	10	<b>73105-011001</b>	<b>73105-012101</b>	<b>73105-013001</b>	<b>73105-014001</b>
		50	<b>73105-051030</b>	<b>73105-052130</b>	<b>73105-053030</b>	<b>73105-054630</b>
		100	<b>73105-101030</b>	<b>73105-102130</b>	<b>73105-103030</b>	<b>73105-104630</b>
		150	<b>73105-151030</b>	<b>73105-152130</b>	<b>73105-153030</b>	<b>73105-154630</b>
		250	<b>73105-251030</b>	<b>73105-252130</b>	-	<b>73105-254630</b>
	UNIGUARD Guard Cartridge Holder		<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

## BioBasic SCX

For the separation of proteins, peptides, and other cationic species

- Strong cation exchange phase based on sulfonic acid chemistry
- Separation and retention of basic and other cationic species
- 300Å pore size for enhanced protein and peptide separations
- Outstanding stability under demanding pH conditions



### BioBasic SCX

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.6mm ID
5	Drop-in Guard (4/pk) HPLC Column	10	<b>73205-011001</b>	<b>73205-012101</b>	<b>73205-013001</b>	<b>73205-014001</b>
		50	<b>73205-051030</b>	<b>73205-052130</b>	<b>73205-053030</b>	<b>73205-054630</b>
		100	<b>73205-101030</b>	<b>73205-102130</b>	<b>73205-103030</b>	<b>73205-104630</b>
		150	<b>73205-151030</b>	<b>73205-152130</b>	<b>73205-153030</b>	<b>73205-154630</b>
		250	<b>73205-251030</b>	<b>73205-252130</b>	-	<b>73205-254630</b>
	UNIGUARD Guard Cartridge Holder		<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

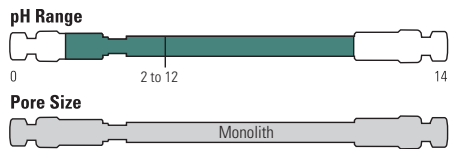


# ProSwift IEX

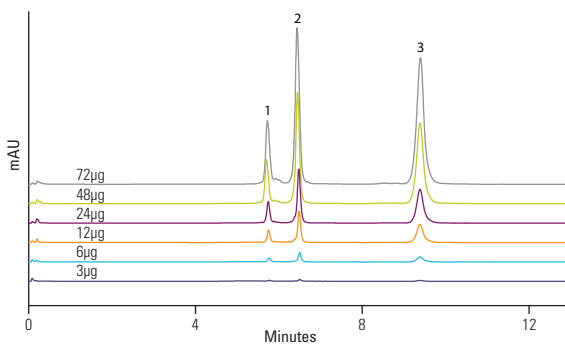
Monolith IEX columns for high-resolution and fast protein analysis

- High resolution
- High loading capacity
- Fast analysis
- Wide range of operational flow rates
- Excellent stability over a wide pH range
- Outstanding reproducibility and ruggedness

ProSwift polymer monolith (poly(Meth)acrylate) media are uniquely suited for separation of proteins. Each monolith is a single cylindrical, sponge-like polymer rod containing an uninterrupted, interconnected network of flow-through channels of a specific pore size. These large channels combined with the monolith's nonporous surfaces result in fast mass-transfer, high-resolution, and fast protein separations. The unique globular morphology of the polymer medium provides its high capacity.



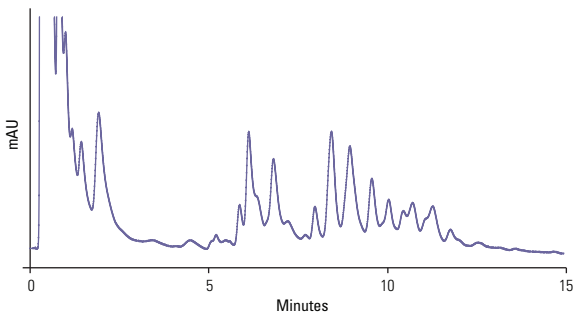
## Dynamic protein loading capacity of ProSwift WCX-1S 50 x 1.0mm



### ProSwift WCX-1S, 50 x 1.0mm

Mobile Phase A:	10mM Sodium phosphate (pH 7.6)
Mobile Phase B:	1 M NaCl in eluent A
Gradient:	0% B for 2 min, 0–85% B in 7.5 min, 85% B for 3 min
Temperature:	30°C
Flow Rate:	0.2mL/min
Injection Volume:	1–24µL
Detection:	UV, 280nm
Sample:	Protein mix, 1mg/mL each
Analytes:	1. Ribonuclease A 2. Cytochrome C 3. Lysozyme

## Protein separation



### ProSwift WAX-1S, 50 x 1.0mm

Mobile Phase A:	10mM Tris, pH 7.6
Mobile Phase B:	1 M NaCl in 10mM Tris, pH 7.6
Gradient:	5 to 55% of B in 13 min, hold for 2 min
Temperature:	30°C
Flow Rate:	0.2mL/min
Injection Volume:	1.3µL
Detection:	UV, 280nm
Sample:	1.25mg/mL <i>E. coli</i> protein

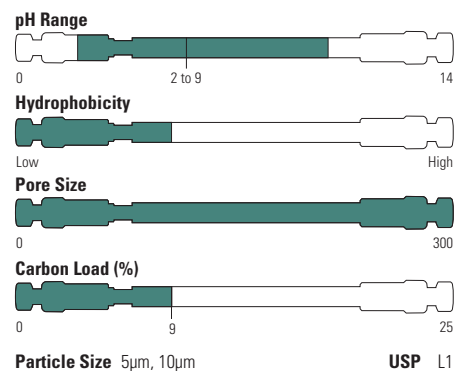
## ProSwift IEX

Functional Group	Length (mm)	1.0mm ID	4.6mm ID
WAX-1S	50	<b>066642</b>	<b>064294</b>
WCX-1S	50	<b>066643</b>	<b>064295</b>
SAX-1S	50	<b>068459</b>	<b>064293</b>
SCX-1S	50	<b>071977</b>	<b>066765</b>

## BioBasic 18

Outstanding separation of small to medium peptides

- C18 with 300Å pore size for maximum performance with biomolecules
- High peak capacity stationary phase
- Outstanding reproducibility, efficiency and column lifetime
- Excellent for LC-MS separations



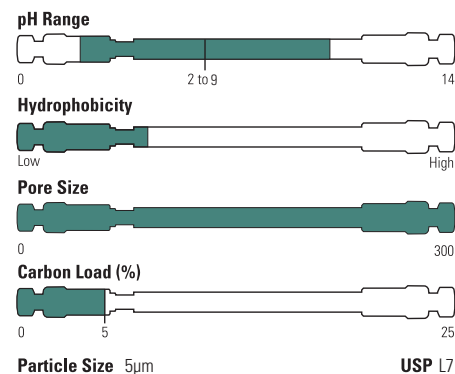
### BioBasic 18

Particle Size (μm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.6mm ID
5	Drop-in Guard (4/pk) HPLC Column	10	<b>72105-011001</b>	<b>72105-012101</b>	<b>72105-013001</b>	<b>72105-014001</b>
		50	<b>72105-051030</b>	<b>72105-052130</b>	-	-
		100	<b>72105-101030</b>	<b>72105-102130</b>	<b>72105-103030</b>	<b>72105-104630</b>
		150	<b>72105-151030</b>	<b>72105-152130</b>	-	<b>72105-154630</b>
		250	<b>72105-251030</b>	<b>72105-252130</b>	-	<b>72105-254630</b>
	UNIGUARD Guard Cartridge Holder		<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

## BioBasic 8

Optimized for the separation of a wide range of peptides

- C8 with 300Å pore size for improved biomolecule analysis
- An excellent starting column for protein and peptide analysis
- Outstanding reproducibility, efficiency and column lifetime
- Excellent for LC-MS separations

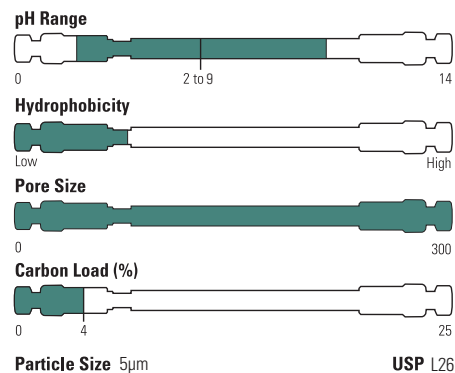


### BioBasic 8

Particle Size (μm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.6mm ID
5	Drop-in Guard (4/pk) HPLC Column	10	<b>72205-011001</b>	<b>72205-012101</b>	<b>72205-013001</b>	<b>72205-014001</b>
		50	<b>72205-051030</b>	<b>72205-052130</b>	-	-
		100	<b>72205-101030</b>	<b>72205-102130</b>	<b>72205-103030</b>	<b>72205-104630</b>
		150	<b>72205-151030</b>	<b>72205-152130</b>	-	<b>72205-154630</b>
		250	<b>72205-251030</b>	<b>72205-252130</b>	-	<b>72205-254630</b>
	UNIGUARD Guard Cartridge Holder		<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

## BioBasic 4

- Based on 300Å silica for outstanding biomolecule performance
- C4 with lower carbon load for optimal retention of larger peptides and proteins
- Outstanding reproducibility, efficiency and column lifetime
- Excellent for LC-MS separations



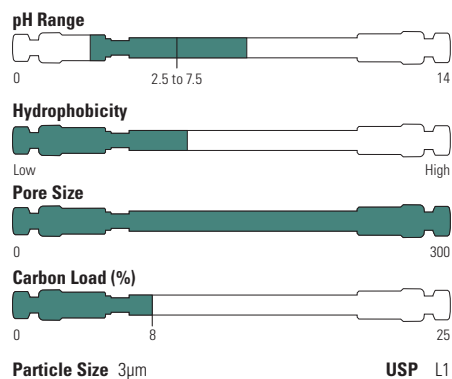
### BioBasic 4

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.6mm ID
5	Drop-in Guard (4/pk)	10	<b>72305-011001</b>	<b>72305-012101</b>	<b>72305-013001</b>	<b>72305-014001</b>
	HPLC Column	50	<b>72305-051030</b>	<b>72305-052130</b>	-	-
		100	<b>72305-101030</b>	<b>72305-102130</b>	<b>72305-103030</b>	<b>72305-104630</b>
		150	<b>72305-151030</b>	<b>72305-152130</b>	-	<b>72305-154630</b>
		250	<b>72305-251030</b>	<b>72305-252130</b>	-	<b>72305-254630</b>
	UNIGUARD Guard Cartridge Holder		<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

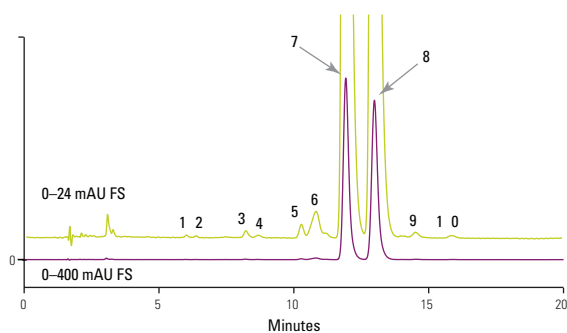
## Acclaim 300 C18

High-resolution reversed-phase separation of proteins and peptides

- Designed for high-resolution peptide mapping and protein separations
- Application tested for suitability in peptide mapping
- Reproducible for dependable results
- LC-MS compatible
- Ultrapure silica with low metal content and exhaustive bonding and endcapping



### Budesonide and related substances



#### Acclaim 300 C18, 3µm, 150 x 4.6mm

Mobile Phase A: Acetonitrile:ethanol 15:1  
Mobile Phase B: 0.1% phosphoric acid  
Isocratic 66% B

Temperature: 30°C

Flow Rate: 1.0mL/min

Injection Volume: 15µL

Detection: UV, 240nm

Sample: Budesonide, 500µg/mL  
after three days

Analytes: 7, 8. Budesonide epimers, 99%

Reference: Hou S, Hindle M, Byron PR;  
*J. Pharm. Biomed. Anal.* 2001 24:371-80.

### Acclaim 300 C18

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
3	HPLC Column	50	<b>060263</b>	—	<b>060265</b>
		150	<b>060264</b>	<b>063684</b>	<b>060266</b>
5	Guard Cartridges (2/pk)	10	<b>069690</b>	<b>075721</b>	<b>069697</b>

### Acclaim Guard Holder

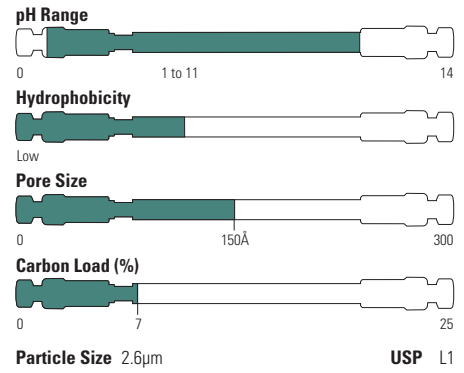
Description	Cat. No.
Acclaim SST Guard Cartridge Holder V-2	<b>069580</b>
Acclaim Guard Kit (Holder and Coupler) V-2	<b>069707</b>
Guard to Analytical Column Coupler V-2	<b>074188</b>

## Accucore 150-C18

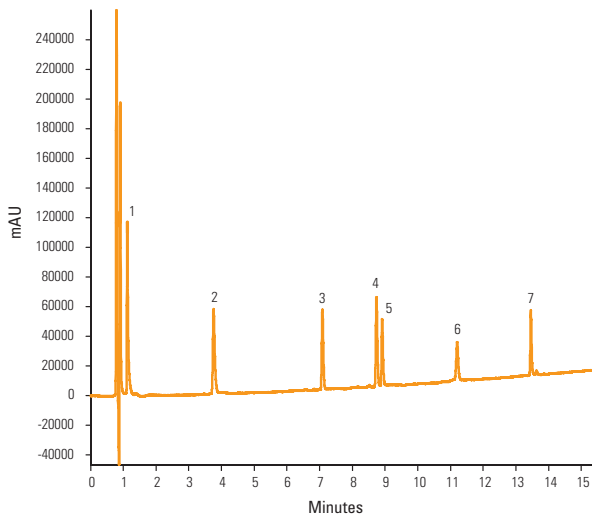
- Designed for the separation of peptides
- Outstanding resolution
- 150Å pore diameter material

Higher peak capacities facilitate increased peptide identifications. Accucore 150-C18 provides much narrower peak widths, therefore significantly higher peak capacity than a column packed with <math><2\mu\text{m}</math> wide pore fully porous C18.

Precision of retention times is critical for reliable analysis. The Accucore 150-C18 column exhibits excellent retention time reproducibility.



### Peptide separations



#### Accucore 150-C18, 2.6 $\mu\text{m}$ , 100 x 2.1mm

Mobile Phase A:	0.1% TFA in 10:90 acetonitrile:water
Mobile Phase B:	0.1% TFA in 70:30 acetonitrile:water
Gradient:	0-50% B over 15 min; hold for 2 min; drop to 0% in 0.1 min; hold at 0% B for 5 min
Temperature:	35°C
Flow Rate:	300 $\mu\text{L}/\text{min}$
Injection Volume:	5 $\mu\text{L}$
Detection:	UV, 220nm
Analytes:	1. Glycine-Tyrosine 2. Valine-Tyrosine-Valine 3. Met-Enkephalin 4. Angiotensin III 5. Leu-Enkephalin 6. Ribonuclease A 7. Insulin

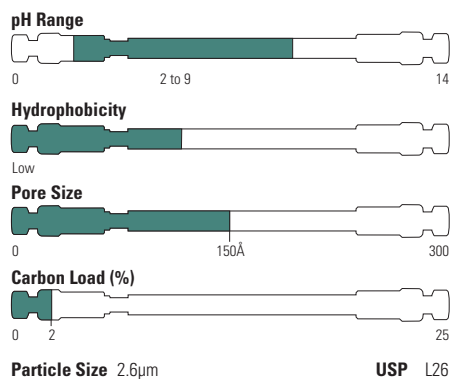
### Accucore 150-C18

Particle Size ( $\mu\text{m}$ )	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Drop-in Guard (4/pk) HPLC Column	10	<b>16126-012105</b>	<b>16126-013005</b>	<b>16126-014005</b>
		30	<b>16126-032130</b>	<b>16126-033030</b>	<b>16126-034630</b>
		50	<b>16126-052130</b>	<b>16126-053030</b>	<b>16126-054630</b>
		100	<b>16126-102130</b>	<b>16126-103030</b>	<b>16126-104630</b>
		150	<b>16126-152130</b>	<b>16126-153030</b>	<b>16126-154630</b>
	UNIGUARD Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

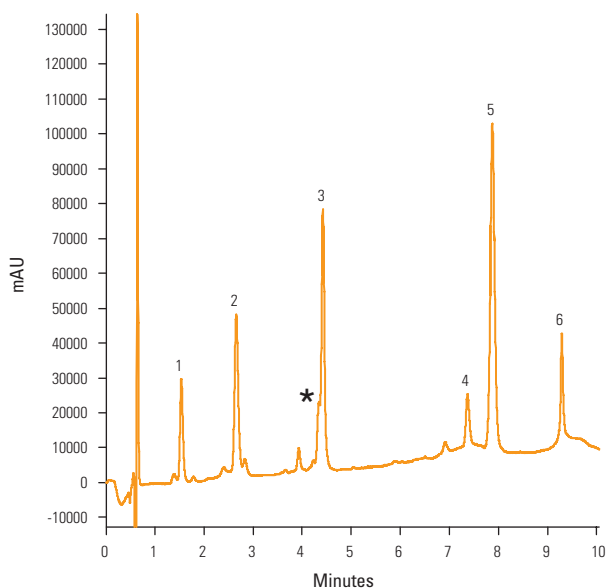
## Accucore 150-C4

- Significantly lower hydrophobic retention than C18
- Ideal for retention of proteins and larger peptides

Accucore 150-C4 provides significantly sharper and higher peaks than a column packed with 5µm wide pore fully porous C4, thus offering better resolution and sensitivity. The Accucore 150-C4 also performs better than a column packed with <2µm wide pore fully porous C4 and generates only a fraction of the backpressure.



### Intact proteins



#### Accucore 150-C4, 2.6µm, 100 x 2.1mm

Mobile Phase A: 0.1% TFA in 30:70 acetonitrile:water

Mobile Phase B: 0.1% TFA in 98:2 acetonitrile:water

Gradient: 0-30% B over 8 mins  
 30-95% B over 2 mins  
 95% B hold for 1 min  
 0% B hold for 4 mins

Temperature: 40°C

Flow Rate: 400µL/min

Injection Volume: 2µL 10pmol/µL solution

Detection: UV, 214 and 280nm

Analytes: 1. Insulin  
 2. Cytochrome C  
 3. Lysozyme  
 4. Myoglobin  
 5. Carbonic anhydrase  
 6. Ovalbumin  
 \* Carbonic anhydrase impurity

### Accucore 150-C4

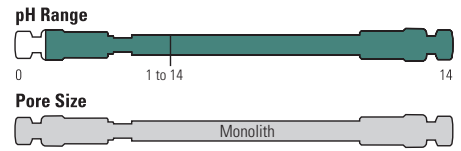
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Drop-in Guard (4/pk) HPLC Column	10	<b>16526-012105</b>	<b>16526-013005</b>	<b>16526-014005</b>
		30	<b>16526-032130</b>	<b>16526-033030</b>	<b>16526-034630</b>
		50	<b>16526-052130</b>	<b>16526-053030</b>	<b>16526-054630</b>
		100	<b>16526-102130</b>	<b>16526-103030</b>	<b>16526-104630</b>
		150	<b>16526-152130</b>	<b>16526-153030</b>	<b>16526-154630</b>
	UNIGUARD Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

# ProSwift RP

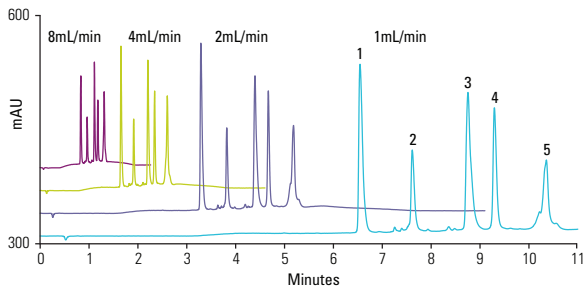
Reversed-phase monolith columns that uniquely provide the advantages of high resolution at exceptionally high flow rates for fast protein separations and analysis

- High resolution at high speed
- Highest operational flow rates available
- High throughput and improved productivity
- Excellent stability over a wide pH range of 1 to 14
- Outstanding reproducibility and ruggedness
- High stringent wash compatible, for example, 1 M NaOH
- High loading capacity

ProSwift polymer reversed-phase monolith media are (polystyrene-co-DVB) uniquely suited for the separation of proteins. Each monolith is a single cylindrical polymer rod containing an uninterrupted, interconnected network of flow-through channels of a specific pore size; ranging from small channel (1S), medium size channels (2H & 4H) to very large channel (3U) sizes. These channels and the monolith's nonporous surfaces result in fast mass transfer for high-resolution and fast protein separations. The channels also produce low backpressure, allowing the use of higher linear velocities with minimal loss of resolution.



## Proteins

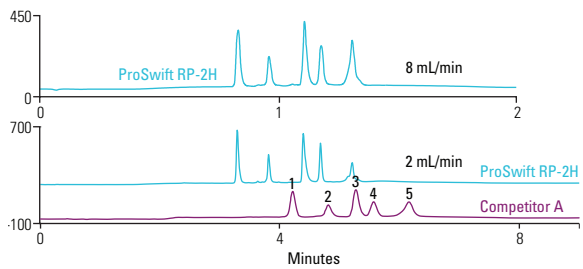


### ProSwift RP-2H, 50 x 4.6mm

Mobile Phase A: DI H<sub>2</sub>O/CH<sub>3</sub>CN (95:5; V/V) + 0.1% TFA  
 Mobile Phase B: DI H<sub>2</sub>O/CH<sub>3</sub>CN (5:95; V/V) + 0.1% TFA  
 Gradient:  
 1mL/min: 1-75% B in 12 min  
 2mL/min: 1-75% B in 6 min  
 4mL/min: 1-75% B in 3 min  
 8mL/min: 1-75% B in 1.5 min

Flow Rate: 1, 2, 4, or 8mL/min  
 Injection Volume: 5µL  
 Detection: UV, 214nm  
 Sample: Mixture of five proteins  
 Analytes:  
 1. Ribonuclease A 1.5mg/mL  
 2. Cytochrome C 0.5mg/mL  
 3. BSA 1.5mg/mL  
 4. Carbonic anhydrase 0.9mg/mL  
 5. Ovalbumin 1.5mg/mL

## Competitive comparison



### ProSwift RP-2H, 50 x 4.6mm Competitor A, 15µm, 100 x 4.6mm

Mobile Phase A: DI H<sub>2</sub>O/CH<sub>3</sub>CN (95:5; V/V) + 0.1% TFA  
 Mobile Phase B: DI H<sub>2</sub>O/CH<sub>3</sub>CN (5:95; V/V) + 0.1% TFA  
 Gradient:  
 2mL/min: 1-75% B in 6 min  
 8mL/min: 1-75% B in 1. min

Temperature: 30°C  
 Flow Rate: 2 or 8mL/min  
 Injection Volume: 5µL  
 Detection: UV, 214nm  
 Sample: Mixture of five proteins  
 Analytes:  
 1. Ribonuclease A 1.5mg/mL  
 2. Cytochrome C 0.5mg/mL  
 3. BSA 1.5mg/mL  
 4. Carbonic anhydrase 0.9mg/mL  
 5. Ovalbumin 1.5mg/mL

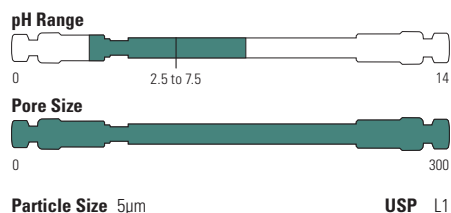
## ProSwift RP

Functional Group	Length (mm)	1.0mm ID	4.6mm ID
RP-1S	50	—	<b>064297</b>
RP-2H	50	—	<b>064296</b>
RP-3U	50	—	<b>064298</b>
RP-4H	50	<b>069477</b>	—
RP-10R	50	<b>164586</b>	—
RP-4H	250	<b>066640</b>	—

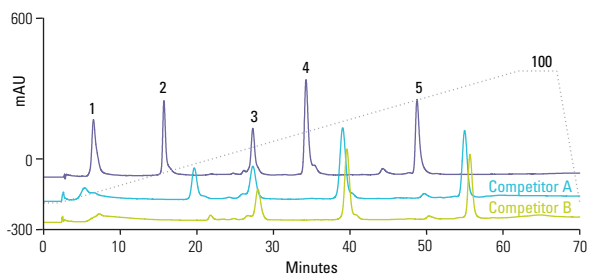
## ProPac HIC-10

Hydrophobic Interaction Chromatography columns for the high-resolution separation of proteins and peptides

- High-resolution HPLC separation of proteins, protein variants and peptides
- Proteins are separated under non-denaturing conditions
- High protein loading capacity for protein purification applications
- Wide range of applications
- Based on 5µm ultra high purity spherical silica gel particles with 300Å pores



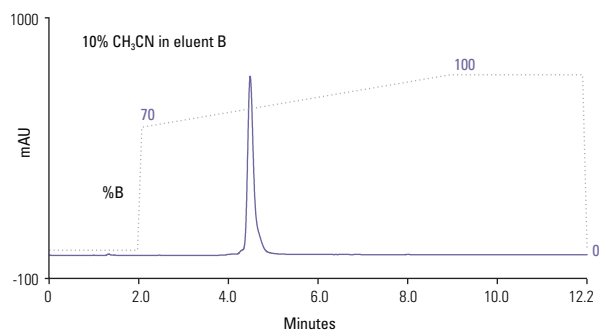
### Protein mixture



#### ProPac HIC-10, 5µm, 75 x 7.8mm Competitors A and B, 75 x 7.5mm

Mobile Phase A:	2 M (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> in 0.1 M NaH <sub>2</sub> PO <sub>4</sub> (pH 7.0)
Mobile Phase B:	0.1 M NaH <sub>2</sub> PO <sub>4</sub> (pH 7.0)
Flow Rate:	1.0mL/min
Injection Volume:	20µL
Detection:	UV, 214nm
Sample:	Mixture of proteins (1mg/mL each final after 1:1 dilution with mobile phase A)
Analytes:	1. Cytochrome c 2. Myoglobin 3. Ribonuclease A 4. Lysozyme 5. Chymotrypsinogen

### Monoclonal antibody



#### ProPac® HIC-10, 5µm 100 x 4.6mm

Mobile Phase A:	0.5 M (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> in 0.1 M NaH <sub>2</sub> PO <sub>4</sub> (pH 7.0)
Mobile Phase B:	0.1 M NaH <sub>2</sub> PO <sub>4</sub> (pH 7.0)
Gradient:	70–100% B in 15 min
Flow Rate:	1mL/min
Injection Volume:	5µL (25µg)
Detection:	UV, 214nm
Sample:	MAB 50µL (50mg/mL) + 450µL Eluent B

### ProPac HIC-10

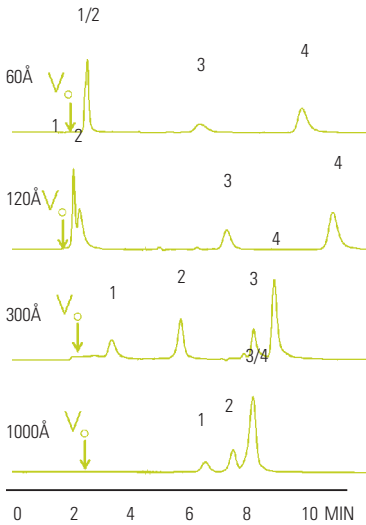
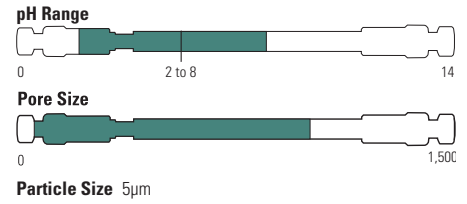
Particle Size (µm)	Format	Length (mm)	2.1mm ID	4.6mm ID	7.8mm ID
5	HPLC Column	75	–	–	<b>063665</b>
		100	<b>063653</b>	<b>063655</b>	–
		250	–	<b>074197</b>	–



# BioBasic SEC

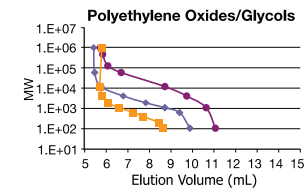
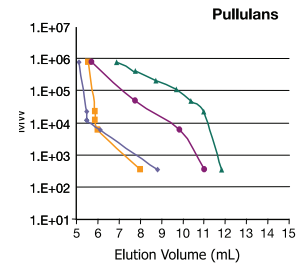
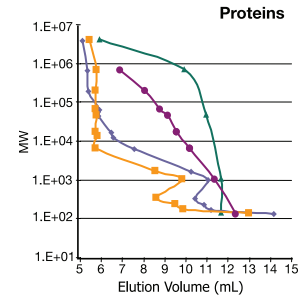
Superior separation of water soluble compounds

- Covers separation of analytes over a wide molecular weight range
- Long column life and high column efficiencies
- Simple mechanism of interaction based on molecular size and shape
- Ideal for sample clean-up
- Straightforward method development, simple mobile phases



**BioBasic SEC, 5μm, 300 x 7.8mm**  
 Mobile Phase: 0.1M KH<sub>2</sub>PO<sub>4</sub> pH 7  
 Flow Rate: 1.0mL/min  
 Injection Volume: 20μL  
 Detection: UV, 254nm  
 Analytes: 1. Thyroglobulin (MW669,00)  
 2. Ovalbumin (MW 45,000)  
 3. Angiotensin II (MW 1,046)  
 4. PABA (V<sub>0</sub>) (MW 137)

Effect of pore size on SEC resolution



**BioBasic SEC,**  
 — 60Å — 300Å  
 — 120Å — 1000Å

Molecular weight calibration curves

## BioBasic SEC

Pore Size (Å)	Description	ID (mm)	Length (mm)	Cat. No.
<b>BioBasic SEC 60</b>				
60	Guard Column	7.8	30	73305-037821
	HPLC Column	7.8	150	73305-157846
	HPLC Column	7.8	300	73305-307846
<b>BioBasic SEC 120</b>				
120	Guard Column	7.8	30	73405-037821
	HPLC Column	7.8	150	73405-157846
	HPLC Column	7.8	300	73405-307846
<b>BioBasic SEC 300</b>				
300	Guard Column	7.8	30	73505-037821
	HPLC Column	7.8	150	73505-157846
	HPLC Column	7.8	300	73505-307846
<b>BioBasic SEC 1000</b>				
1000	Guard Column	7.8	30	73605-037821
	HPLC Column	7.8	150	73605-157846
	HPLC Column	7.8	300	73605-307846

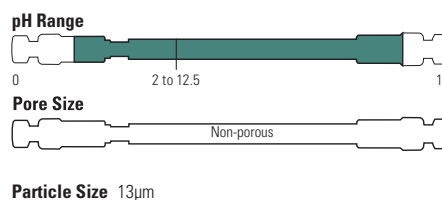
# DNAPac HPLC and UHPLC Columns

## DNAPac PA100

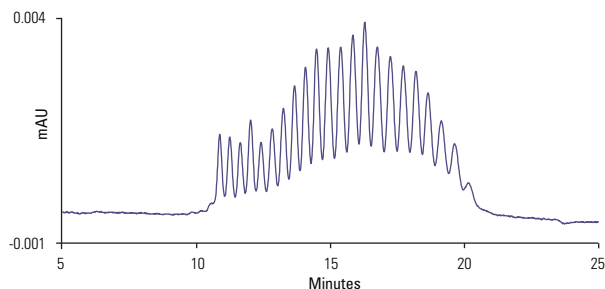
A strong anion exchange column developed to provide high-resolution analysis and purification of synthetic oligonucleotides

- High-resolution oligonucleotide separations
- Achieve n, n-1 resolution for oligonucleotides
- Resolves oligonucleotides with secondary structures
- Suitable for the analysis of phosphorothioate-based clinical samples
- Easy scale-up from 2.0mm to 22mm ID column (>100x)

The DNAPac PA100 is a high-resolution anion-exchange column that provides single-base resolution. It is stable under denaturing conditions, rugged, reliable, and can be readily scaled up. The DNAPac PA100 is a 13µm pellicular, nonporous polymeric resin with bound quaternary amine-functionalized Thermo Scientific™ Dionex™ MicroBeads™. The rapid mass-transport characteristics of this resin result in very high-resolution oligonucleotide separations. DNAPac PA100 can resolve full length from n-1, n+1, and other failure sequences.



### Oligonucleotides



#### DNAPac PA100, 13µm, 250 x 4.0mm

Mobile Phase:	410-510mM NaCl in 25mM Tris-Cl, pH 8.0
Flow Rate:	1.5mL/min
Detection:	UV, 260nm
Sample:	pd(A) <sub>40-60</sub>

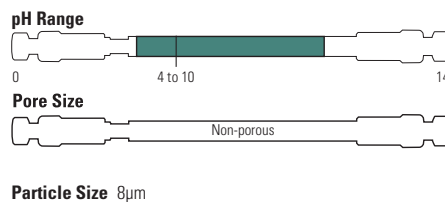
### DNAPac PA100

Particle Size (µm)	Format	Length (mm)	2.0mm ID	4.0mm ID	9.0mm ID	22.0mm ID
13	Guard Column	50	<b>088761</b>	<b>043018</b>	<b>088764</b>	<b>088765</b>
	HPLC Column	250	<b>088760</b>	<b>043010</b>	<b>043011</b>	<b>088759</b>

# DNAPac PA200

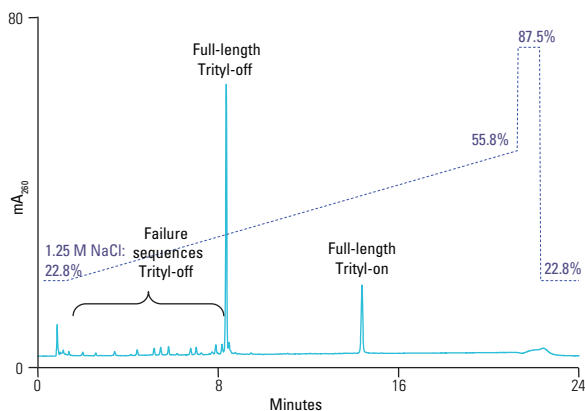
A strong anion exchange column developed to provide the best resolution for analysis and purification of synthetic oligonucleotides

- Achieve n, n-1 resolution for oligonucleotides
- Resolve oligonucleotides with secondary structures
- Assay phosphorothioate purity
- Selectivity control with eluent pH, salt, and solvent
- Resolve RNA with aberrant (2', 5') links from normal ssRNA
- Separate individual phosphorothioate diastereoisomers
- HR/AM AXLC/MS via automated desalting

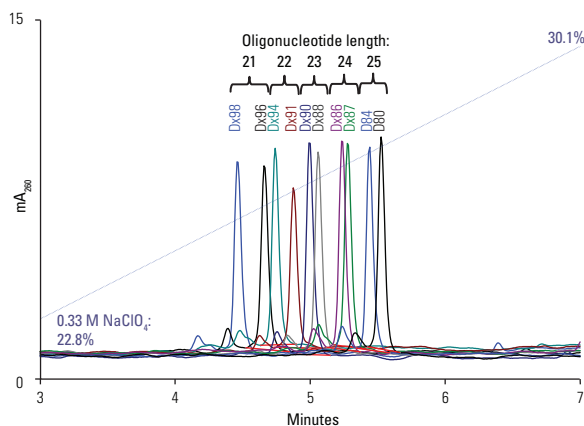


The DNAPac PA200 is packed with a pellicular anion-exchange resin composed of an 8µm diameter nonporous polymeric substrate to which quaternary amine-functionalized Dionex MicroBeads are bound. The rapid mass transport characteristics of this resin result in high-resolution oligonucleotide separations. DNAPac PA200 can resolve full length from n-1, n+1, and other failure sequences not possible with other columns.

## Target, failure and trityl-on oligonucleotides



## Separation of oligonucleotides by length



### DNAPac® PA200, 8µm, 250 x 4.0mm

Mobile Phase: NaClO<sub>4</sub>, pH 6.5 with 20% CH<sub>3</sub>CN

Flow Rate: 1.2mL/min

Injection Volume: 8µL

Detection: UV, 260nm

### DNAPac PA200

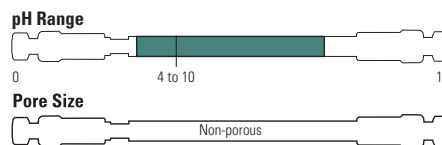
Particle Size (µm)	Format	Length (mm)	2.0mm ID	4.0mm ID	9.0mm ID	22.0mm ID
8	Guard Column	50	<b>063423</b>	<b>062998</b>	<b>063419</b>	<b>088780</b>
	HPLC Column	250	<b>063425</b>	<b>063000</b>	<b>063421</b>	<b>088781</b>

# DNAPac PA200 RS

UHPLC Solutions for nucleic acid analysis

- Provide single base resolution of oligonucleotides
- Higher efficiency to improve resolution
- Improved throughput
- Ruggedness consistent with the DNAPac PA200 column line
- Stable to 10,000 psi

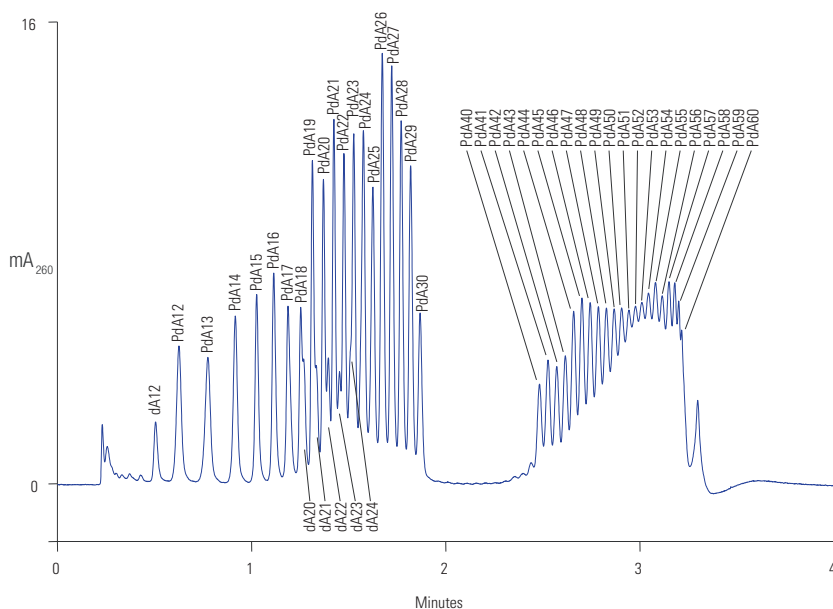
DNAPac PA200 RS columns are packed with smaller, 4µm particles, for improved resolution and better performance. The smaller particles also allow shorter columns to provide significantly higher throughput. These columns are packed in bio-inert PEEK-lined stainless steel (SST) bodies, designed to protect from unwanted interactions of eluents and analytes with metals, while maintaining 10,000 psi stability. These columns offer exceptional resolution of oligonucleotides, including isomer separations; and are able to resolve full length oligonucleotides from n-1 and n+1 oligonucleotides and other failure sequences.



Particle Size 4µm



## Partial resolution of 46 oligonucleotides



### DNAPac PA200 RS, 4µm, 50 x 4.6mm

Mobile Phase A:	20 mM Tris pH 8
Mobile Phase B:	A + 1.25 M NaCl
Gradient:	28–43% B in 4 CV* (2.56 min) curve 3**
Temperature:	30°C
Flow Rate:	1.30mL/min
Injection Volume:	2.5µL
Sample:	PdA12–30, 40–60

\*CV = column volumes

\*\*Curve 3 indicates continuously changing gradient, asymptotically approaching a maximum salt concentration. Programmed in Chromeleon 6.8.

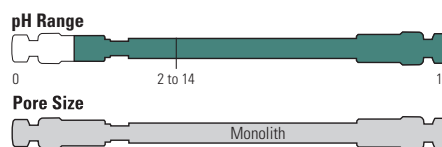
## DNAPac PA200 RS

Particle Size (µm)	Format	Length (mm)	4.6mm ID
4	BioRS column	50	<b>082508</b>
		150	<b>082509</b>
		250	<b>082510</b>

## DNASwift SAX-1S

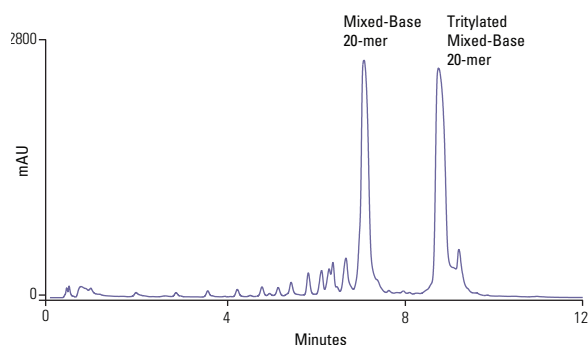
A strong anion exchange monolith column that provides improved capacity and industry-leading oligonucleotide yield-purity performance.

- Micromole purifications in a 5mm ID column body
- Substantial capacity in a small format
- Tunable selectivity control, like the DNAPac columns, for high resolution
- Compatible with high pH mobile phases, solvents, or high temperatures
- Ideal for therapeutic and diagnostic oligonucleotide research
- Purify difficult oligonucleotide products



The DNASwift column is a unique porous polymer monolith coated with functionalized latex nanobeads, optimized for oligonucleotide separations. The monolith, a polymer cylinder with interconnected flow through channels, provides fast mass transfer, low back pressure (for increased flow rates), very high capacity, and refined selectivity control.

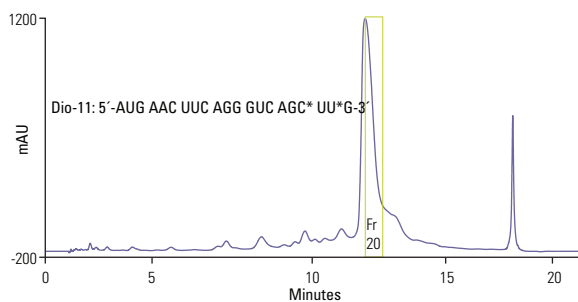
### Tritylated oligonucleotide



#### DNASwift SAX-1S, 150 x 5.0mm

Mobile Phases A:	15mM Tris, pH 8
Mobile Phases B:	15mM Tris, pH 8, 1.25 M NaCl
Gradient:	8–64% B in 10 min
Flow Rate:	1.5mL/min
Injection Volume:	20µL
Detection:	UV, 260nm
Sample:	Derivatized mixed-base 20mer, 20mg/mL

### Purification of a 21-base RNA Sample with aberrant 2'-5' linkages at the 1 and 3 positions from the 3' end



#### DNASwift SAX-1S, 150 x 5.0mm

Mobile Phase A:	40mM Tris, pH 7
Mobile Phase B:	40mM Tris, pH 7 + 1.25 M NaCl
Gradient:	26–42% B in 10 column volumes
Temperature:	30°C
Flow Rate:	1.5mL/min
Injection Volume:	125µg
Detection:	UV, 260nm

### DNASwift SAX-1S

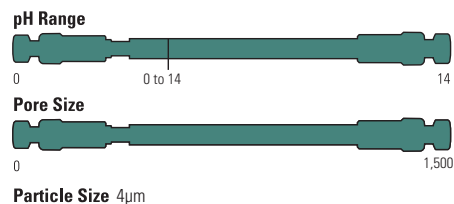
Length (mm)	5.0mm ID
150	066766

## DNAPac RP

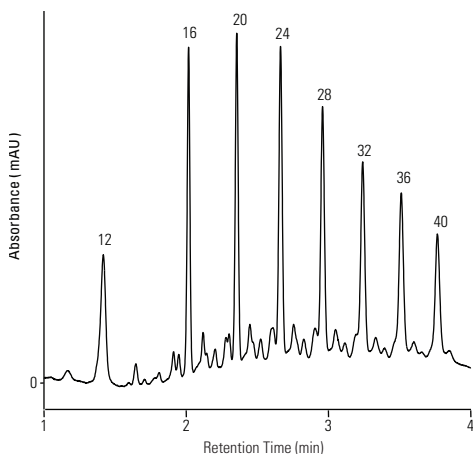
Reverse phase (RP) column specifically for analysis of oligonucleotides and double stranded (ds) DNA and RNA fragments.

- Excellent MS compatibility
- Wide operating pH range: 0–14
- High temperature stability: up to 110°C
- High throughput

The DNAPac RP is based on wide-pore, 4µm polymer particles. The unique column chemistry provides excellent performance under a broad range of pH (0-14), high temperature (up to 110°C) and mobile phase composition. The large pore size of the resin enables efficient separation of small to large oligonucleotides.



### Fast analysis of mixed base DNA



#### DNAPac RP, 4µm, 50 x 2.1mm

Mobile Phase A: 25 mM HAA, pH 8.5

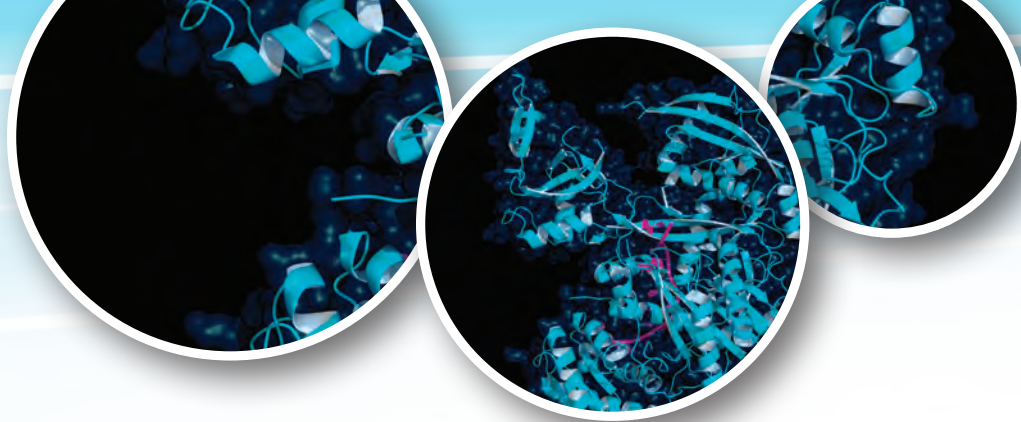
Mobile Phase B: 25 mM HAA, pH 8.5 / Acetonitrile (50:50 v/v)

Gradient:	Time (min)	%A	%B
	-0.1	67	33
	0.0	67	33
	3.0	41	59
	3.1	5	95
	4.9	5	95
	5.0	67	33
	8.5	67	33

Gradient Curve:	3
Temperature:	65°C
Flow Rate:	0.8mL/min
Injection Volume:	4µL
Detection:	UV, 260 nm
Sample:	8-Combo DNA
Peak Label:	Length of DNA

### DNAPac RP

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID
4	Guard Cartridges (2/pk)	10	<b>088925</b>	<b>088921</b>
	HPLC Column	50	<b>088924</b>	<b>088920</b>
		100	<b>088923</b>	<b>088919</b>
	Guard Cartridge Holder		<b>069580</b>	<b>069580</b>



## Nano, Capillary and Micro LC Columns

### Delivering high performance separations to -omics research

Our columns have been specifically designed to combine high performance with ease of use. From the “plug and spray” EASY-Spray columns to the innovative nanoViper fitted Acclaim PepMap range and the Monolithic PepSwift and ProSwift columns.

- **LC-MS Compatible Formats**  
Offering the highest sensitivity
- **1200 bar Compatible Nano Columns**  
With increased length to increase peak capacity
- **Monolithic Polymer Phases**  
For high throughput peptide and protein analysis



The Bio LC web page contains the latest news, applications and downloads for the nano, capillary and microbore range. Visit [www.thermoscientific.com/columns](http://www.thermoscientific.com/columns)

# NanoLC

## Technical Resources



visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)  
to access the following information:

- Application Areas by Column Format
- Chemistries





## EASY-Spray Columns

“Plug and Spray” nano LC columns for routine and robust performance.

- Simple to use format
- Routine research methodology
- Excellent performance for peptide separations
- Available with wide pore phases and monoliths for the separation of intact proteins

### Acclaim PepMap C18 100Å

Particle size (µm)	Length (mm)	50µm ID	75µm ID
2	150	<b>ES801</b>	<b>ES804</b>
	250	–	<b>ES802</b>
	500	–	<b>ES803</b>
	750	–	<b>ES805</b>
3	150	–	<b>ES800</b>

### Acclaim PepMap C18 300Å

Particle size (µm)	Length (mm)	50µm ID	75µm ID
5	150	–	<b>ES812</b>

### PepSwift

Length (mm)	200µm ID
250	<b>ES810</b>



## EASY-Spray Emitters

Integrated sprayer coupled with a transfer line.

- Pre-made connections
- Easy installation in the MS Ion Source
- No chromatography required

### EASY-Spray Emitters

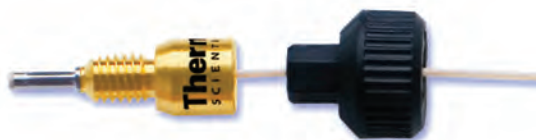
Description	Cat. No.
EASY-Spray Emitter, nanoflow (Emitter ID 7µm, Transfer line ID 20µm, Transfer line length 500mm)	<b>ES791</b>
EASY-Spray Emitter, microflow (Emitter ID 20µm, Transfer line ID 75µm, Transfer line length 500mm)	<b>ES792</b>



## nanoViper Fingertight Fittings

Designed to be a virtually dead volume-free fingertight UHPLC fitting system.

- Provides virtually zero-dead-volume connections
- Compatible with backpressures up to 1000 bar (14,500 psi)
- Suitable for temperatures up to 80°C
- Easy to use 1/32" PEEK sheathed fused silica and fingertight design
- Works with virtually any valve and any column from any manufacturer



The nanoViper connections come preassembled and high pressure tested. The fittings do not “grab” the tubing at a single point. It seals at the tip and not with a ferrule. Nor does it “grab” the tubing at a single point. It is this feature that gives nanoViper fittings their UHPLC, virtually dead-volume-free capabilities.

### nanoViper Fingertight Fittings

Length (mm)	Green 10µm ID	Orange 20µm ID	Brown 50µm ID	Black 75µm ID	Red 100µm ID	Purple 150µm ID
70	-	<b>6041.5120</b>	<b>6041.5123</b>	<b>6041.5126</b>	<b>6041.5810</b>	<b>6041.5817</b>
150	<b>6041.5118*</b>	<b>6041.5121</b>	<b>6041.5124</b>	<b>6041.5127</b>	<b>6041.5811</b>	<b>6041.5818</b>
250	-	-	-	<b>6041.5730</b>	<b>6041.5812</b>	<b>6041.5819</b>
350	-	<b>6041.5240</b>	<b>6041.5540</b>	<b>6041.5735</b>	<b>6041.5813</b>	<b>6041.5820</b>
450	-	-	-	-	<b>6041.5814</b>	<b>6041.5821</b>
550	-	<b>6041.5260</b>	<b>6041.5560</b>	<b>6041.5760</b>	<b>6041.5815</b>	<b>6041.5822</b>
650	-	<b>6041.5275</b>	<b>6041.5575</b>	<b>6041.5775</b>	<b>6041.5824</b>	-
750	-	<b>6041.5280</b>	<b>6041.5580</b>	<b>6041.5780</b>	<b>6041.5816</b>	<b>6041.5823</b>
850	-	-	-	<b>6041.5785</b>	-	-
950	-	<b>6041.5122</b>	<b>6041.5125</b>	<b>6041.5128</b>	-	-
1100	-	-	-	<b>6041.5711</b>	-	-

\*180mm Length

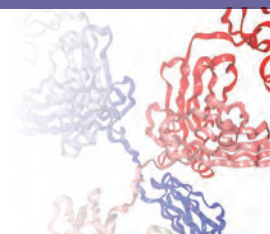
### Trap Column Cartridges Holders with nanoViper Fittings

Description	Cartridge Length (mm)	Fitting ID (µm)	Cat. No.
µ-Precolumn holder for trap cartridges with 2 x 100mm length nanoViper fittings	5	30	<b>164649</b>
	15	75	<b>164650</b>

### Sample Loops with nanoViper Fittings

Volume (µL)	Cat. No.	Quantity
1	<b>6826.2401</b>	1 Each
5	<b>6826.2405</b>	1 Each
10	<b>6826.2410</b>	1 Each
20	<b>6826.2420</b>	1 Each
50	<b>6826.2450</b>	1 Each
125	<b>6826.2412</b>	1 Each

Find out more about how SMART Digest Kits can benefit your workflow at:  
[www.thermoscientific.com/SMARTdigest](http://www.thermoscientific.com/SMARTdigest)



## nanoViper Application Kits

nanoViper fittings are also included in tubing and application kits designed for use with the UltiMate 3000 RSLCnano systems.

### nanoViper Fitting Kits for UltiMate 3000 RSLCnano Systems

Description	Tubing	Samples	Trap Column	Separation Column	RSLCnano Systems
Direct Injection nano LC Kit	Y	Y	–	Y	<b>6720.0300</b>
Direct Injection capillary LC Kit	Y	Y	–	Y	<b>6720.0305</b>
Preconcentration nano LC kit	Y	Y	Y	Y	<b>6720.0310</b>
Preconcentration capillary LC kit	Y	Y	Y	Y	<b>6720.0315</b>
Preconcentration monolithic LC kit	Y	Y	Y	Y	<b>6720.0320</b>
2D salt plugs kit	Y	Y	Y	Y	<b>6720.0325</b>
Automated off line SCX-RP peptides kit	Y	Y	Y	Y	<b>6720.0330</b>
Automated off line RP-RP peptides kit	Y	Y	Y	Y	<b>6720.0340</b>
Tandem nano LC kit	Y	Y	Y	Y	<b>6720.0335</b>
FLM nanoViper tubing kit (All tubing for nano LC preconcentration)	Y	–	–	–	<b>6041.5100</b>
MS connection kit	Y	–	–	–	<b>6720.0345</b>
EASY-Spray connection kit (Supports direct injection as well as preconcentration)	Y	Y	Y	–	<b>6720.0395</b>



## Acclaim PepMap NanoLC columns

The standard for peptide separations in proteomics

- High-resolution protein identification
- Highest sensitivity in LC-MS
- Fitted with nanoViper fittings as standard



### Acclaim PepMap C18 100Å

Particle size (µm)	Length (mm)	nanoViper Column				nanoViper FS
		50µm ID	75µm ID	300µm ID	1000µm ID	75µm ID
2	50	<b>164561</b>	<b>164563</b>	<b>164560</b>	<b>164454</b>	–
	150	<b>164562</b>	<b>164534</b>	<b>164537</b>	<b>164711</b>	<b>164769</b>
	250	<b>164709</b>	<b>164536</b>	–	–	<b>164734</b>
	500	<b>164710</b>	<b>164540</b>	–	–	<b>164738</b>
3	50	<b>164712</b>	<b>164567</b>	<b>164716</b>	<b>164717</b>	–
	150	<b>164713</b>	<b>164568</b>	<b>164571</b>	<b>164572</b>	<b>164738</b>
	250	<b>164714</b>	<b>164569</b>	–	–	–
	500	<b>164715</b>	<b>164570</b>	–	–	<b>164739</b>
	750	–	–	–	–	<b>164939</b>
5	50	–	–	<b>164901</b>	<b>164899</b>	–
	150	–	–	<b>164902</b>	<b>164900</b>	–

Note: nanoViper FS Columns have 45mm of Fused Silica for use with PEEK sleeves and Microtight unions

### Acclaim PepMap C8 100Å

Particle size (µm)	Length (mm)	nanoViper Column			
		50µm ID	75µm ID	300µm ID	1000µm ID
3	150	–	<b>164706</b>	<b>164722</b>	<b>164723</b>

### Acclaim PepMap C4 300Å

Particle size (µm)	Length (mm)	nanoViper Column			
		50µm ID	75µm ID	300µm ID	1000µm ID
5	150	–	<b>164707</b>	<b>164720</b>	<b>164721</b>

### Acclaim PepMap C18 300 Å

Particle size (µm)	Length (mm)	nanoViper Column			
		50µm ID	75µm ID	300µm ID	1000µm ID
5	150	–	<b>164708</b>	<b>164718</b>	<b>164719</b>

## Accucore NanoLC Columns

### Accucore 150-C18

		nanoViper Column
Particle size (µm)	Length (mm)	75µm ID
2.6	150	<b>16126-157569</b>
	500	<b>16126-507569</b>

### Accucore 150-C4

		nanoViper Column
Particle size (µm)	Length (mm)	75µm ID
2.6	150	<b>16526-157569</b>
	500	<b>16526-507569</b>

### Accucore 150-Amide-HILIC

		nanoViper Column
Particle size (µm)	Length (mm)	75µm ID
2.6	150	<b>16726-157569</b>



## MSPac™ DS-10 MS Desalter Cartridge

Built for LC-MS compatibility

- High confidence with low peak carryover
- Antibody and protein desalting with a high load capacity
- High pH stability: 0 - 14
- IEX, pH-gradient, SEC fraction use
- MS sensitivity improvement



### MSPac DS-10 MS Desalter Cartridge

Item	Cat. No.
Desalter Cartridge - 2 Pack	<b>089170</b>
Cartridge Holder	<b>069580</b>

## Monolithic Capillary and Micro HPLC Columns

High-speed peptide and protein separations

- High-resolution for protein identification, biomarker discovery, and systems biology
- High column-to-column reproducibility
- nanoViper fittings for easy column installation

The monolithic structure offers a high-quality alternative to traditional microparticulate sorbents, providing important advantages to the chromatographic separation. High-sensitivity proteomics and biotech applications are easily performed using these columns.



### PepSwift

Length (mm)	PepSwift		
	100µm ID	200µm ID	500µm ID
5	–	<b>164558</b>	–
50	<b>164584</b>	<b>164557</b>	<b>164585</b>
250	<b>164543</b>	<b>164542</b>	–

### ProSwift RP-4H

Length (mm)	ProSwift		
	100µm ID	200µm ID	500µm ID
100	–	–	<b>164925</b>
250	<b>164922</b>	<b>164923</b>	–
500	<b>164921</b>	–	–

### ProSwift C4 RP-5H

Length (mm)	ProSwift		
	100µm ID	200µm ID	500µm ID
100	–	–	<b>164931</b>
250	<b>164929</b>	<b>164930</b>	<b>164932</b>
500	<b>164928</b>	–	–



## Trap columns – nano trap design

### Acclaim PepMap C18 100Å

Type	Part number	Particle Size	ID	Bed Length (mm)	Total Length	Quantity
nanoViper Column	<b>164535</b>	3	75	20	150	2 Pack
	<b>164705</b>	3	75	20	70	2 Pack
	<b>164564</b>	5	100	20	150	2 Pack
Classic Column	<b>164197</b>	5	100	10	150	2 Pack
	<b>164199</b>	5	100	20	150	2 Pack
	<b>164213</b>	5	200	20	150	2 Pack

Note: 164705 is a shorter total length used for vented column set up for example with EASY nLC 1000

## Trap Columns – Cartridge (Set of 5)



### Acclaim PepMap C18 100Å

Length (mm)	300µm ID	1000µm ID
5	<b>160454</b>	<b>160434</b>
15	–	<b>160438</b>

### Acclaim PepMap C8 100Å

Length (mm)	300µm ID
5	<b>161194</b>

### Acclaim PepMap C4 300Å

Length (mm)	300µm ID
5	<b>163591</b>

### Acclaim PepMap C18 300Å

Length (mm)	300µm ID
5	<b>163589</b>

### Accucore 150-C18

Length (mm)	300µm ID
5	<b>16126-900379</b>

### Accucore 150-C4

Length (mm)	300µm ID
5	<b>16526-900379</b>

### Accucore 150-Amide-HILIC

Length (mm)	300µm ID
5	<b>16726-900379</b>

### µ-Precolumn™ holder, 5mm, with 30µm ID connecting tubing, nanoViper fittings

Length (mm)	300µm ID
5	<b>164649</b>



## 1<sup>st</sup> dimension columns for 2D separations

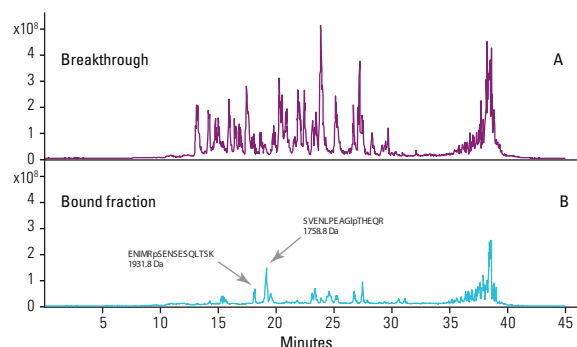
Improving separation efficiency with multidimensional analysis.

There are dedicated application kits which utilize either SCX or RP as the first dimension  
 A TiO<sub>2</sub> trapping column can be added to the application for phosphopeptide analysis

### 1<sup>st</sup> dimension columns

Chemistry	Part Number	Description	Application
SCX	<b>164565</b>	300µm ID x 10cm, packed with Poros 10 S, nanoViper column	2D Salt plugs
	<b>164566</b>	1.0mm ID x 15cm, packed with Polysulfoethyl ASP, 5µm, 300Å, nanoViper column	Automated off-line 2D LC of Peptides, micro SCX x nano RP
RP	<b>164592</b>	300µm ID x 15cm, packed with Acclaim PA2, nanoViper column	Automated off-line 2D LC, Cap RP (basic) x Nan RP (acidic)
TiO <sub>2</sub>	<b>164205</b>	100µm ID x 1cm packed with TiO <sub>2</sub>	Phosphopeptide analysis
	<b>164215</b>	200µm ID x 1cm packed with TiO <sub>2</sub>	Phosphopeptide analysis

### Isolation of two synthetic phosphopeptides from a BSA tryptic digest



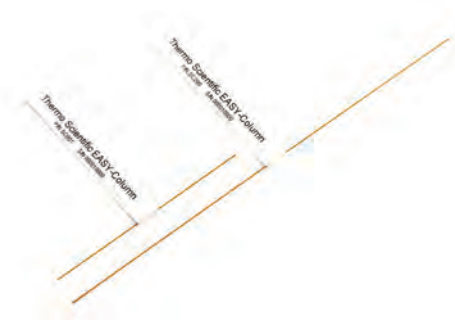
<b>Trap Column: 200µm ID x 1cm, packed with TiO<sub>2</sub>, 5µm</b>
<b>100µm ID x 1cm, packed with Acclaim PepMap C18, 5µm</b>
Separation Column: Acclaim PepMap C18, 3µm, 75µm x 15cm
Loading Solvent: 0.05% HFBA in DI H <sub>2</sub> O
Wash Solvent: 0.01% HFBA in DI H <sub>2</sub> O
Mobile Phase A: 0.05% TFA in DI H <sub>2</sub> O
Mobile Phase B: 0.04% TFA in acetonitrile/ DI H <sub>2</sub> O (80:20 v/v)
TiO <sub>2</sub> Trap
Mobile Phase: 250mM NH <sub>4</sub> HCO <sub>3</sub> in DI H <sub>2</sub> O, pH 9.0
Gradient: 3–40% acetonitrile in 30 min
Flow Rate: 300nL/min
Loading Flow: 8µL/min
Injection Volume: 5µL
Detection: MS

## EASY-Columns

Excellence in nanoscale separations

- Compatible with any nanoscale HPLC system
- Simple, flexible design

EASY-Column capillary LC columns are produced with a focus on design simplicity using metal-free fused capillaries and can be used on any nano LC system



### EASY-Columns

Description	Cat. No.	Quantity
EASY-Column, 2cm, ID 100µm, 5µm, C18-A1 (Trap column)	<b>SC001</b>	3 Pack
EASY-Column, 10cm, ID 75µm, 3µm, C18-A2 (Analytical column)	<b>SC200</b>	1 Each
EASY-Column, 10cm, ID 75µm, 3µm, C18-A2 (Analytical column)	<b>SC2003</b>	3 Pack
HPLC-to-Column Connector kit Zero-dead-volume union (1/32in OD tubing), 10x SC603	<b>SC600</b>	1 Each
A/B Mixing Tee & Venting Tee for two-column setup Nanoliter-dead-volume tee (1/32in OD tubing), 10 sleeves for 360µm OD fused silica (10xSC603).	<b>SC601</b>	1 Each
Connector Kit for two-column setup Zero-dead-volume union (1/32in OD tubing), Nanoliter-dead-volume tee (1/32 inch OD tubing), 10x SC603	<b>SC602</b>	1 Each
Sleeves (2cm, 1/32in OD) for 360µm OD fused silica	<b>SC603</b>	30 Pack



## Nano Instruments

Thermo Scientific nanoLC systems offer market leading performance and integrate seamlessly with all Thermo Scientific nanoESI sources and MS families



### EASY-nLC1200

Operational simplicity and excellent performance

- Increased robustness
- Improved performance at 1200 bar
- Improved throughput
- Intelligent maintenance

### EASY-nLC1200

Operational simplicity and excellent performance

- Easily configured for routine nano LC
- Wide range of flows available from 20nL/min to 50 $\mu$ L/min
- Customized application set up easily established



For more product information visit our website:  
[www.thermoscientific.com/en/products/nano-capillary-systems.html](http://www.thermoscientific.com/en/products/nano-capillary-systems.html)



# LC Columns and Accessories

As a leader in LC column technology including silica, polymer and porous graphitic carbon manufacturing, bonded phase production and column packing for 40 years, you can rely on the quality of Thermo Scientific HPLC products. Here, we showcase our latest and most comprehensive range of innovative columns, accessories and equipment for fast LC, analytical HPLC and UHPLC.

## Featured Products



### Accucore

Solid core particles enabling high speed, high resolution separations with back pressures significantly lower than those associated with UHPLC.

**PAGE 4-005**



### Hypersil GOLD

Thermo Scientific™ Hypersil GOLD™ columns offers chromatographers outstanding peak shape for reversed phase, ion exchange, HILIC or normal phase chromatography.

**PAGE 4-020**



## Section Contents

Accucore HPLC and UHPLC Columns . . . . .	<b>4-005</b>	Synchronis HPLC and UHPLC Columns . . . . .	<b>4-062</b>
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Acclaim HPLC and UHPLC Columns . . . . .	<b>4-034</b>	LC Accessories . . . . .	<b>4-078</b>
Application Specific HPLC Columns . . . . .	<b>4-048</b>	LC Reagents . . . . .	<b>4-098</b>
Hypercarb HPLC Columns . . . . .	<b>4-059</b>	LC and LC-MS Instruments . . . . .	<b>4-108</b>



### Acclaim

Acclaim columns are based on high-purity, porous silica particles with advanced and innovative column bonding technologies. This provides complementary selectivity, high column efficiencies and symmetrical peaks.

**PAGE 4-034**



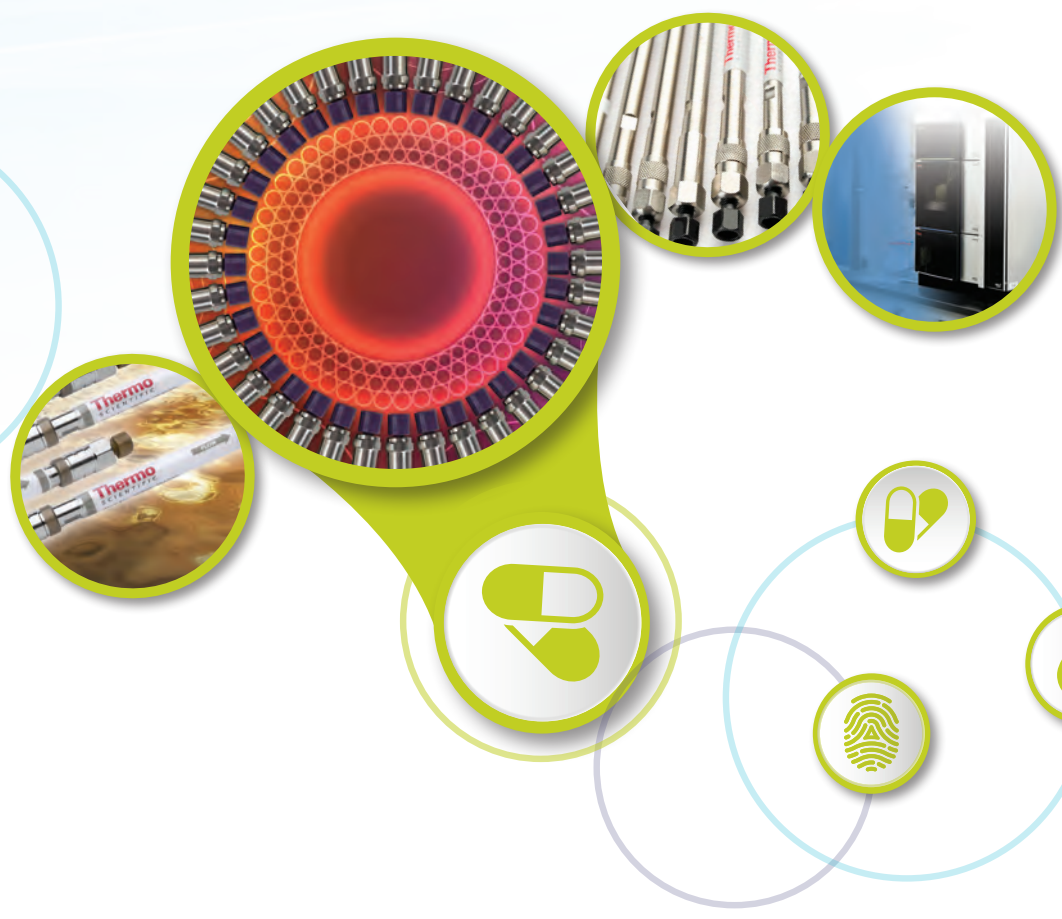
### Viper

Maximize liquid chromatography (LC) performance and get zero-dead-volume connections to ensure optimal separations.

**PAGE 4-078**

# LC Columns

## Technical Resources



visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert) to access the following information:






- HPLC Column Selection
- HPLC Column Selection by US Pharmacopeia Specifications
- Thermo Scientific HPLC Phases
- HPLC Column Selection by Manufacturer
- Method Transfer
- Scaling a Method Up or Down
- HPLC Troubleshooting
- HPLC Definitions and Equations
- Selecting the Correct Buffer
- Preparation of Mobile Phases
- Solvent Properties
- Chromophore Detection Wavelengths
- Column Cleaning and Regeneration



# Columns for Fast and Analytical HPLC

The Thermo Scientific LC column portfolio offers a comprehensive range of high quality options for fast and analytical HPLC and UHPLC.

The table below shows our leading column families with details of relative hydrophobicity, key attributes and how the attributes are achieved. Use this table and the information in the subsequent catalogue pages to find the best Thermo Scientific LC columns for your separation needs.

Hydrophobicity		Key Attribute	Achieved through
Low	<b>Accucore Columns</b> Page 4-005 	Ultimate Performance	<ul style="list-style-type: none"> <li>1.5, 2.6 and 4µm solid core silica particles</li> <li>Core Enhanced Technology</li> </ul>
	<b>Hypersil GOLD Columns</b> Page 4-020 	Selectivity & Peak Shape	<ul style="list-style-type: none"> <li>1.9, 3, 5 and 12µm ultra-high purity silica particles</li> <li>Wide range of conventional phases</li> </ul>
Medium/High	<b>Acclaim Columns</b> Page 4-034 	Traditional, Speciality & Application Specific Phases	<ul style="list-style-type: none"> <li>2.2, 3 and 5µm ultra-pure silica particles</li> <li>Innovative and unique bonded phases</li> </ul>
High	<b>Synchronis Columns</b> Page 4-062 	Ruggedness & Reproducibility	<ul style="list-style-type: none"> <li>1.7, 3 and 5µm high surface area silica particles</li> <li>Dense bonding, double endcapping, rigorous testing</li> </ul>
Very High	<b>Hypercarb Columns</b> Page 4-059 	Extended Separation Capabilities	<ul style="list-style-type: none"> <li>3 and 5µm 100% porous graphitic carbon particles</li> <li>Polar retention effect on graphite (PREG)</li> </ul>



# Accucore HPLC and UHPLC Columns

## Ultimate Core Performance – Speed and Selectivity Combined

Thermo Scientific™ Accucore™ HPLC and UHPLC columns are a family of high speed, high resolution columns based on Core Enhanced Technology™.

- **Next-Generation Accucore Vanquish UHPLC Columns**  
Combines the benefits of a solid core material and the increased chromatographic efficiency of a sub-2 $\mu$ m particle
- **Solid Core Particles**  
With a solid central core and porous outer layer, these particles generate high speed, high resolution separations without excessive backpressure
- **Tight Control of Particle Diameter**  
Enhanced selection process keeps particle size distribution to a minimum and produces high efficiency columns



The Accucore web page contains the latest news, applications and downloads for the Accucore HPLC and UHPLC column range. Visit [www.thermoscientific.com/accucore](http://www.thermoscientific.com/accucore)



## Accucore Vanquish

Powerful separations are our core performance

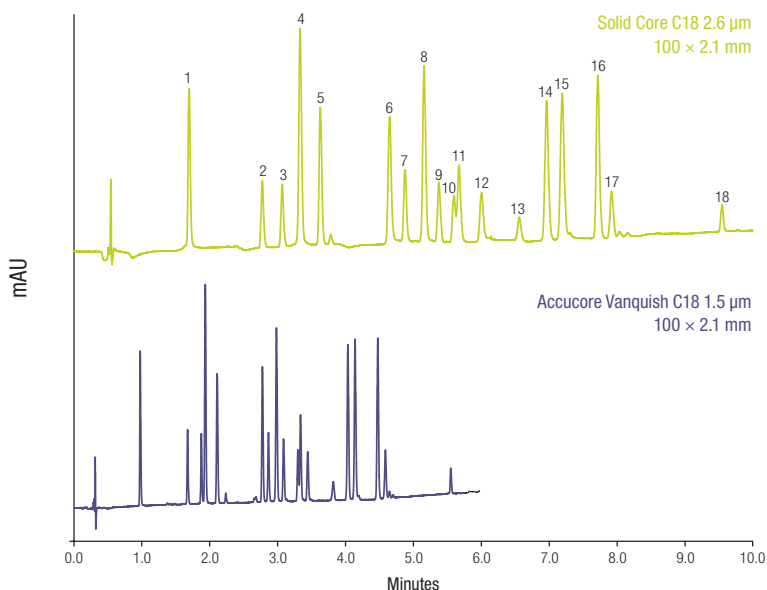
Thermo Scientific™ Accucore™ Vanquish™ UHPLC columns provide a robust chromatography solution to enhance laboratory workflows and productivity. These columns, in combination with Vanquish UHPLC systems, deliver powerful separations to solve your analytical challenges faster and more effectively.

These next-generation UHPLC columns feature 1.5µm solid core particles and combine the benefits of a solid core material and the increased chromatographic efficiency of a sub-2µm particle.

Modern analytical laboratories continue to be driven towards higher throughput workflows which require better separations, more results and easier interaction at a reduced cost. Accucore Vanquish UHPLC columns enable you to achieve this by delivering:

### Better separations

The high efficiency offered by Accucore Vanquish UHPLC columns enables the resolution of very complex mixtures.

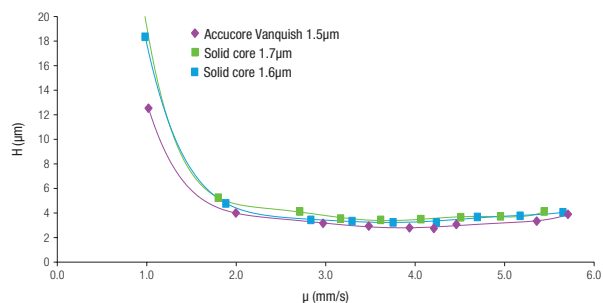


Comparison of separation of 18 pesticides using Accucore Vanquish 1.5µm column to a larger particle size solid core column

Mobile Phase A:	Water
Mobile Phase B:	Acetonitrile
Gradient:	Solid core C18 2.6µm 100 × 2.1mm
	Time (min) %B
	0 20
	6.9 40
	12.1 80
	Accucore Vanquish C18 1.5µm 100 × 2.1mm
	Time (min) %B
	0 20
	4 40
	7 80
Temperature:	43°C
Flow Rate:	Solid Core C18 2.6µm 100 × 2.1mm = 380µL/min
	Accucore Vanquish C18 1.5µm 100 × 2.1mm = 650µL/min
Injection Volume:	0.5µL
Detection:	UV, 230nm (0.1s rise time, 50Hz)
Analytes:	1. Desethylatrazine 10. Diuron 2. Metoxuron 11. Isoproturon 3. Hexazinone 12. Metobromuron 4. Simazine 13. Metazachlor 5. Cyanazine 14. Sebutylazin 6. Methabenzthiazuron 15. Propazine 7. Chlorotoluron 16. Terbutylazine 8. Atrazine 17. Linuron 9. Monolinuron 18. Metolachlor

## More results

High efficiency is maintained even at high flow rates enabling fast reproducible separations.

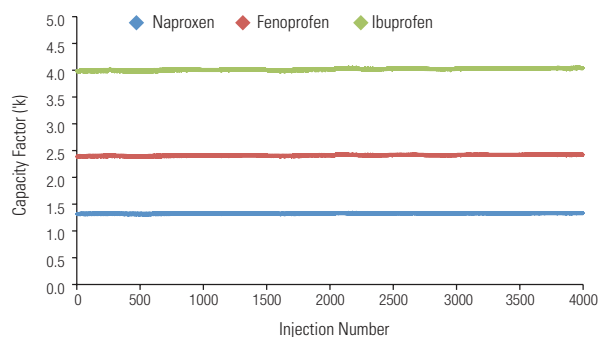


### Accucore Vanquish C18, 1.5µm Solid Core C18 1.7µm Solid Core C18 1.6µm

Mobile Phase:	Water:acetonitrile (50:50)
Temperature:	30°C
Flow Rate:	0.1 to 0.6mL/min

## Reproducibility

The advanced bonding and automated packing technology used in the manufacture of Accucore Vanquish UHPLC columns results in exceptionally reproducible chromatography.



### Accucore Vanquish C18 1.5µm

Mobile Phase:	Acetonitrile:20 mM ammonium formate pH 3.0 (50:50)
Temperature:	30°C
Flow Rate:	0.4mL/min

%RSD for 4000 injections	Naproxen	Fenoprofen	Ibuprofen
Retention time	0.19	0.25	0.29
Capacity factor	0.41	0.42	0.41
Efficiency	2.94	2.74	2.80
Asymmetry	0.92	0.87	1.09
Peak area	0.53	0.50	0.55
Peak height	1.13	1.02	0.91
Pressure	0.53		

- RSD for retention time less than 0.3%
- RSD for peak area less than 0.6%
- RSD for peak height less than 1.2%
- Column pressure stable over 4000 injections (RSD 0.53%)
- Pressure 500 bar

## Easier interaction

Accucore Vanquish UHPLC columns, the Vanquish UHPLC System and the Thermo Scientific™ Dionex™ Chromleon™ Chromatography Data System are combined into a seamless workflow solution, which allows for simple and easy to implement separations.

### Accucore Vanquish

Particle Size (µm)	Format	Length (mm)	ID (mm)	C18+
1.5	UHPLC Column	50	2.1	<b>27101-052130</b>
		100	2.1	<b>27101-102130</b>
		150	2.1	<b>27101-152130</b>

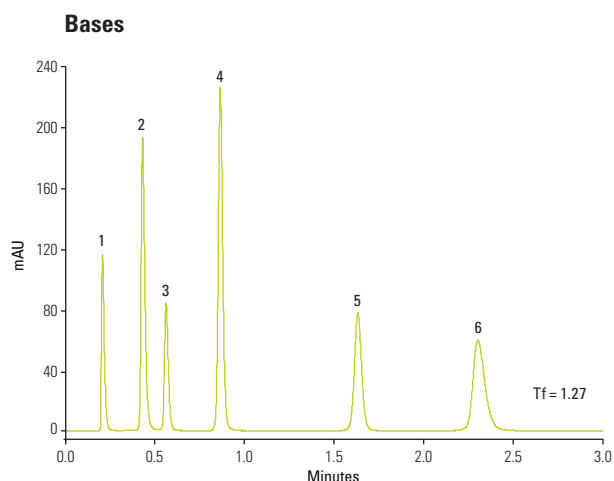
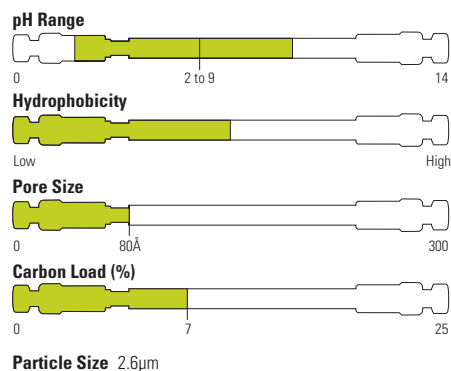
## Accucore RP-MS

- Optimized for MS detection
- Excellent peak shapes
- Excellent combination of speed and efficiency

Accucore RP-MS uses an optimized alkyl chain length for more effective coverage of the silica surface. This coverage results in a significant reduction in non-hydrophobic interactions and thus highly efficient peaks with very low tailing.

RP-MS offers slightly lower retention than C18 and this combined with high efficiencies and low peak tailing make this the phase of choice for use with MS detection.

The selectivity offered by Accucore RP-MS matches that of C18 columns.



### Accucore RP-MS 2.6μm, 50mm x 2.1mm

Mobile Phase:	65% Methanol / 35% 25mM Potassium Phosphate pH7.0
Temperature:	30°C
Flow Rate:	500μL/min
Injection Volume:	1μL
Backpressure:	232 bar
Detection:	UV, 215nm
Analytes:	1. Uracil 2. Propranolol 3. Butylparaben 4. Naphthalene 5. Acenaphthene 6. Amitriptyline

### Accucore RP-MS

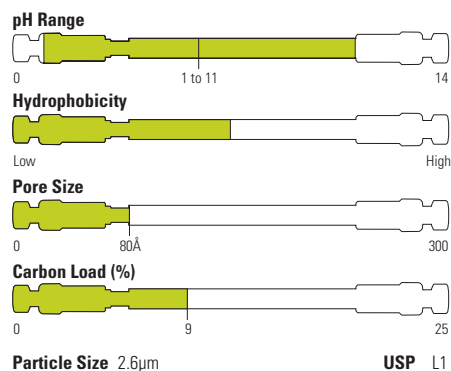
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	<b>17626-012105</b>	<b>17626-013005</b>	<b>17626-014005</b>
	HPLC Column	30	<b>17626-032130</b>	-	-
		50	<b>17626-052130</b>	<b>17626-053030</b>	<b>17626-054630</b>
		100	<b>17626-102130</b>	<b>17626-103030</b>	<b>17626-104630</b>
		150	<b>17626-152130</b>	<b>17626-153030</b>	<b>17626-154630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

## Accucore C18

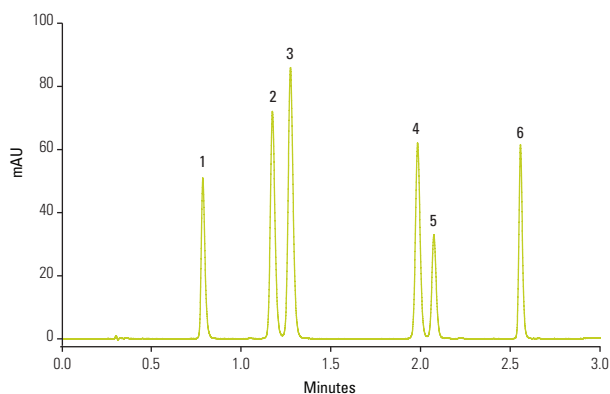
- Optimum retention of non-polar compounds
- Hydrophobic interaction mechanism
- Separates a broad range of analytes

The carbon loading of Accucore C18 phase provides high retention of non-polar analytes via a predominantly hydrophobic interaction mechanism.

The highly retentive nature of Accucore C18 phase means that it can be used to separate a broad range of analytes.



### Triazines



#### Accucore C18 2.6μm, 50mm x 2.1mm

Mobile Phase A:	Water
Mobile Phase B:	Acetonitrile
Gradient:	Time (min) %B
	1.0 35
	2.5 70
Temperature:	25°C
Flow Rate:	600μL/min
Injection Volume:	2μL
Backpressure:	298 bar
Detection:	UV, 280nm
Analytes:	1. Simazine 2. Simetryn 3. Atrazine 4. Ametryn 5. Propazine 6. Prometryn

### Accucore C18

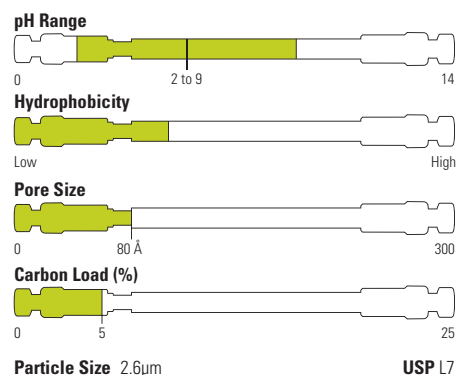
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	<b>17126-012105</b>	<b>17126-013005</b>	<b>17126-014005</b>
	HPLC Column	30	<b>17126-032130</b>	-	-
		50	<b>17126-052130</b>	<b>17126-053030</b>	<b>17126-054630</b>
		100	<b>17126-102130</b>	<b>17126-103030</b>	<b>17126-104630</b>
		150	<b>17126-152130</b>	<b>17126-153030</b>	<b>17126-154630</b>
4	Drop-in Guard (4/pk)	10	<b>74104-012101</b>	<b>74104-013001</b>	<b>74104-014001</b>
	HPLC Column	50	<b>74104-052130</b>	<b>74104-053030</b>	<b>74104-054630</b>
		100	<b>74104-102130</b>	<b>74104-103030</b>	<b>74104-104630</b>
		150	<b>74104-152130</b>	<b>74104-153030</b>	<b>74104-154630</b>
		250	<b>74104-252130</b>	<b>74104-253030</b>	<b>74104-254630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

## Accucore C8

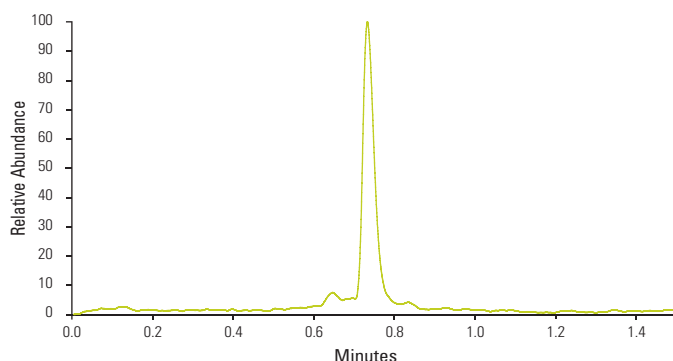
- Lower hydrophobic retention
- Complementary steric selectivity to C18
- Low levels of secondary interactions
- Recommended for moderately polar analytes

Accucore C8 HPLC columns offer lower hydrophobic retention than columns packed with longer alkyl chain length material, such as C18, and are therefore recommended for analytes with medium hydrophobicity or when a less hydrophobic phase provides optimum retention.

The low levels of secondary interactions demonstrated in the phase characterization are the result of excellent bonded phase coverage and allow users of Accucore C8 HPLC columns to benefit from excellent peak shapes.



### Testosterone



#### Accucore C8 2.6µm, 50 x 2.1mm

Mobile Phase A:	Water + 0.1% formic acid
Mobile Phase B:	Acetonitrile + 0.1% formic acid
Gradient:	5–95 % B in 0.8 minutes
Temperature:	60°C
Flow Rate:	1500µL/min
Injection Volume:	5µL
Detection:	ESI-MS/MS

Retention time (tR/min)	0.73
%RSD tR	0.22
%RSD Area	3.01

Data from six injections.

### Accucore C8

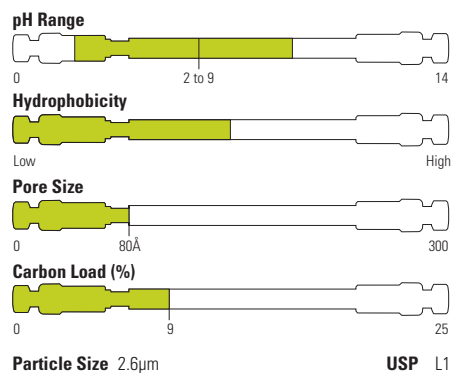
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	<b>17226-012105</b>	<b>17226-013005</b>	<b>17226-014005</b>
	HPLC Column	30	<b>17226-032130</b>	-	-
		50	<b>17226-052130</b>	<b>17226-053030</b>	<b>17226-054630</b>
		100	<b>17226-102130</b>	<b>17226-103030</b>	<b>17226-104630</b>
		150	<b>17226-152130</b>	<b>17226-153030</b>	<b>17226-154630</b>
4	Drop-in Guard (4/pk)	10	<b>74204-012101</b>	<b>74204-013001</b>	<b>74204-014001</b>
	HPLC Column	50	<b>74204-052130</b>	<b>74204-053030</b>	<b>74204-054630</b>
		100	<b>74204-102130</b>	<b>74204-103030</b>	<b>74204-104630</b>
		150	<b>74204-152130</b>	<b>74204-153030</b>	<b>74204-154630</b>
		250	<b>74204-252130</b>	<b>74204-253030</b>	<b>74204-254630</b>
		UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>

## Accucore aQ

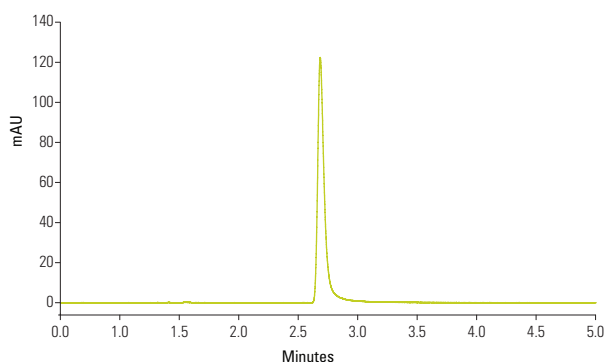
- Retention and resolution of polar analytes
- Polar endcapped C18 stationary phase for alternative selectivity
- Ideal for highly aqueous mobile phases

The polar functional group used to endcap Accucore aQ phase provides an additional controlled interaction mechanism by which polar compounds can be retained and resolved, making the Accucore aQ phase ideal for the quantitative analysis of trace levels of polar analytes.

The wettability of reversed phase media can be increased by the introduction of polar functional groups. The polar endcapping of Accucore aQ media also makes it usable in 100% aqueous mobile phases without the risk of loss of performance or poor stability.



### Lamivudine (USP)



#### Accucore aQ 2.6μm, 50mm x 2.1mm

Mobile Phase: 95:5 (v/v) Ammonium Acetate,  
pH 3.80 / Methanol

Temperature: 35°C

Flow Rate: 200μL/min

Injection Volume: 1μL

Detection: UV, 277nm

Analytes: Lamivudine

Asymmetry 1.36

%RSD t<sub>r</sub> 0.00

%RSD Peak area 1.72

(%RSD calculated from 6 replicate injections)

USP acceptance criteria: % RSD (t<sub>r</sub>, Peak Area) <2.0

### Accucore aQ

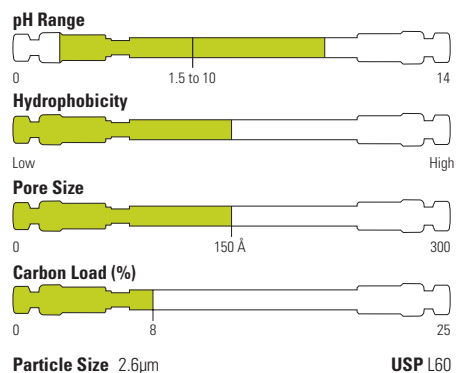
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	<b>17326-012105</b>	<b>17326-013005</b>	<b>17326-014005</b>
	HPLC Column	30	<b>17326-032130</b>	-	-
		50	<b>17326-052130</b>	<b>17326-053030</b>	<b>17326-054630</b>
		100	<b>17326-102130</b>	<b>17326-103030</b>	<b>17326-104630</b>
		150	<b>17326-152130</b>	<b>17326-153030</b>	<b>17326-154630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

## Accucore Polar Premium

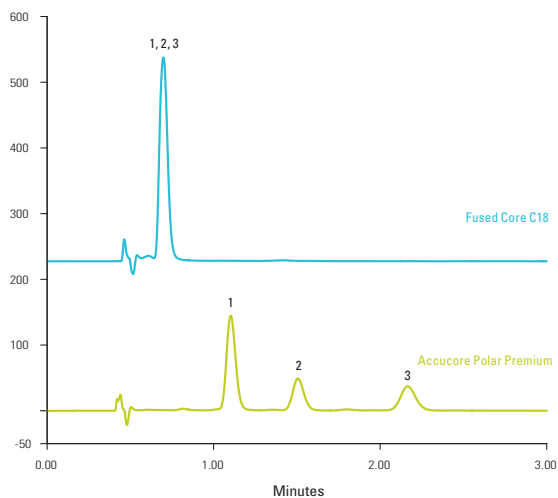
- Rugged amide-embedded C18 phase
- Selectivity complementary to conventional C18 phases
- Stable over a wide pH range and compatible with 100% aqueous mobile phase

Accucore Polar Premium is an exceptionally rugged polar embedded reverse phase material that offers high efficiency, wider operating pH range and unique selectivity complementary to standard C18 phases.

The specially designed bonded phase is stable from pH 1.5 to 10.5 and will not undergo phase collapse in 100% aqueous mobile phase.



### Curcuminoids (Turmeric)



#### Accucore Polar Premium 2.6µm, 100 x 3.0mm Fused Core C18, 100 x 3.0mm

Mobile Phase:	Methanol : 10mM Phosphoric Acid, 80 : 20
Temperature:	40°C
Flow Rate:	800µL/min
Injection Volume:	6µL
Detection:	UV, 428nm
Analytes:	1. Curcumin 2. Desmethoxycurcumin 3. Bis-desmethoxycurcumin

The Accucore Polar Premium HPLC column provides desirable selectivity that resolves the major and minor component under simple isocratic conditions in less than three minutes, while the C18 columns fail to separate these components.

### Accucore Polar Premium

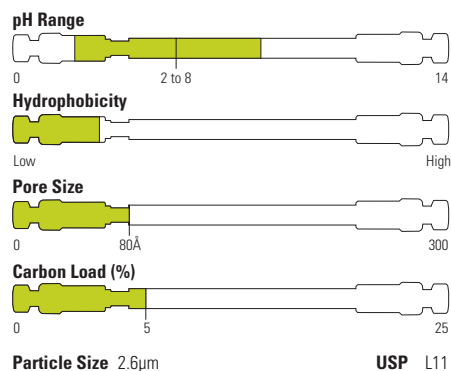
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	<b>28026-012105</b>	-	-
	HPLC Column	50	<b>28026-052130</b>	<b>28026-053030</b>	<b>28026-054630</b>
		100	<b>28026-102130</b>	<b>28026-103030</b>	<b>28026-104630</b>
		150	<b>28026-152130</b>	<b>28026-153030</b>	<b>28026-154630</b>
		250	<b>28026-252130</b>	-	-
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

## Accucore Phenyl-Hexyl

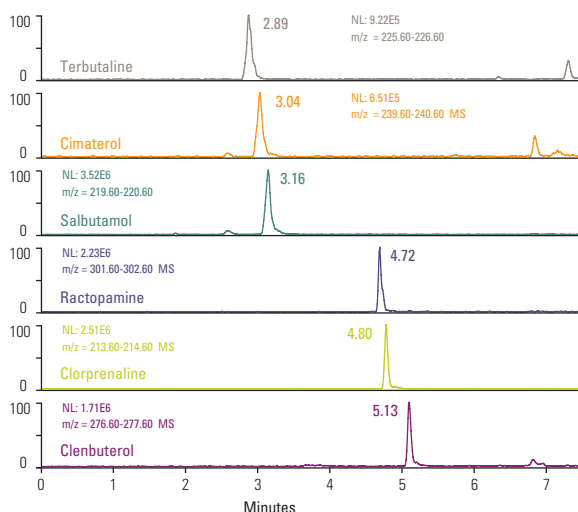
- Mixed-mode selectivity for aromatic and moderately polar analytes
- Enhanced pi-pi interactions with aromatics
- Moderate hydrophobicity

The C6 chain in Accucore Phenyl-Hexyl phase exhibits classical RP retention and selectivity, while the phenyl ring can add special selectivity by interacting with polar groups within the solutes. This results in a mixed-mode separation mechanism. The reduced hydrophobicity of this phase makes it ideal for the separation of very non-polar compounds.

The Phenyl-Hexyl phase should be selected for complex samples where some peaks are well resolved on a conventional alkyl phases, but are not well resolved on a conventional phenyl phase, or when other peaks are well resolved on a phenyl phase, but not well resolved on a conventional alkyl phase.



### Beta-agonists



### Accucore Phenyl-Hexyl 2.6µm, 100mm x 2.1mm

Mobile Phase A:	Ammonium Acetate 5mM, pH 4
Mobile Phase B:	Acetonitrile
Gradient:	Time (min) %B
	0 5
	1 5
	10 100
Temperature:	40°C
Flow Rate:	0.25mL/min
Injection Volume:	1µL
Backpressure:	120 bar (at t0)
Detection:	+ESI-MS (45°C, 4.5kV, 60V, scan 150 – 350)

### Accucore Phenyl-Hexyl

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	<b>17926-012105</b>	<b>17926-013005</b>	<b>17926-014005</b>
		HPLC Column	30	<b>17926-032130</b>	-
		50	<b>17926-052130</b>	<b>17926-053030</b>	<b>17926-054630</b>
		100	<b>17926-102130</b>	<b>17926-103030</b>	<b>17926-104630</b>
		150	<b>17926-152130</b>	<b>17926-153030</b>	<b>17926-154630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>



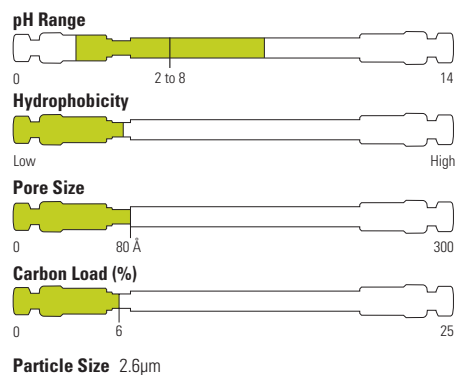
## Accucore Phenyl-X

- Unique reversed-phase shape selectivity
- Enhanced selectivity for aromatic compounds
- Compatible with highly aqueous mobile phases
- Robust, high-efficiency, low column bleed

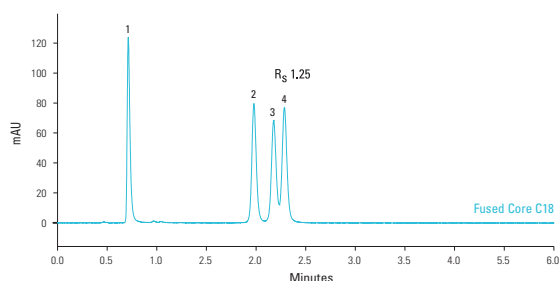
The proprietary Accucore Phenyl-X alkyl aromatic bonded phase provides a unique selectivity when compared to other reversed phase materials such as C18 or Phenyl.

The advanced design of the bonded phase makes it compatible with highly aqueous mobile phases and robust, demonstrating very low bleed.

Phenyl-X exhibits particularly high aromatic selectivity.

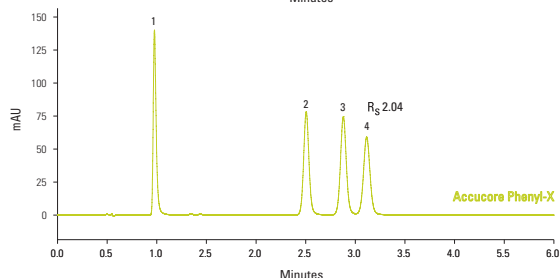


### Estrogens

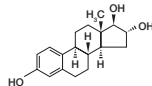


#### Accucore Phenyl-X 2.6µm, 100 x 2.1mm Fused Core C18, 100 x 2.1mm

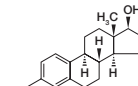
Mobile Phase: 15:40:45 (v/v) Acetonitrile:Methanol:Water  
 Temperature: 40°C  
 Flow Rate: 400µL/min  
 Injection Volume: 1µL  
 Detection: UV, 220nm



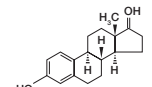
1. Estriol (E3)



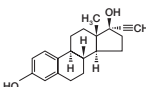
2. Estradiol (E2)



3. Estrone (E1)



4. Ethynylestradiol



### Accucore Phenyl-X

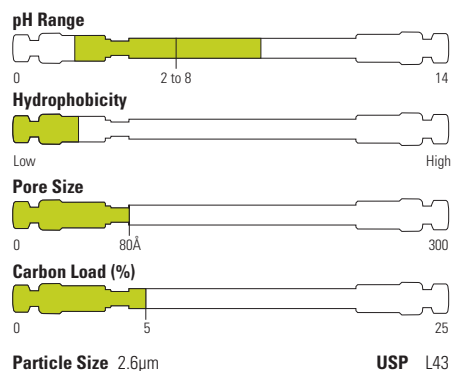
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	<b>27926-012105</b>	-	-
	HPLC Column	50	<b>27926-052130</b>	<b>27926-053030</b>	<b>27926-054630</b>
		100	<b>27926-102130</b>	<b>27926-103030</b>	<b>27926-104630</b>
		150	<b>27926-152130</b>	<b>27926-153030</b>	<b>27926-154630</b>
		250	<b>27926-252130</b>	-	-
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

## Accucore PFP

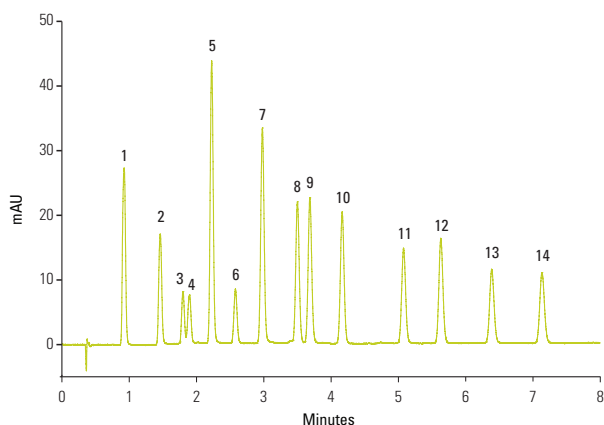
- Alternative selectivity to C18
- Extra retention for halogenated species
- Unique selectivity for non-halogenated polar compounds

The introduction of fluorine groups into the Accucore PFP (pentafluorophenyl) stationary phase causes significant changes in solute-stationary phase interactions. This can lead to extra retention and selectivity for positional isomers of halogenated compounds.

PFP Columns are also well suited to the selective analysis of non-halogenated compounds, in particular polar compounds containing hydroxyl, carboxyl, nitro, or other polar groups. High selectivity is often most apparent when the functional groups are located on an aromatic or other rigid ring system.



### Positional isomers



#### Accucore PFP 2.6µm, 50mm x 2.1mm

Mobile Phase A:	0.1% Formic Acid in Water
Mobile Phase B:	0.1% Formic Acid in Acetonitrile
Gradient:	15-30%B in 7 minutes
Temperature:	50°C
Flow Rate:	600µL/min
Injection Volume:	2µL
Detection:	UV, 270nm
Analytes:	1. 3,4 – Dimethoxyphenol 2. 2,6 – Dimethoxyphenol 3. 2,6 – Difluorophenol 4. 3,5 – Dimethoxyphenol 5. 2,4 – Difluorophenol 6. 2,3 – Difluorophenol 7. 3,4 – Difluorophenol 8. 3,5 – Dimethylphenol 9. 2,6 – Dimethylphenol 10. 2,6 – Dichlorophenol 11. 4 – Chloro-3-Methylphenol 12. 4 – Chloro-2-Methylphenol 13. 3,4 – Dichlorophenol 14. 3,5 – Dichlorophenol

### Accucore PFP

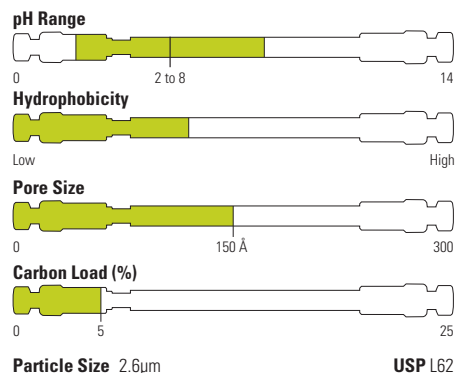
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	<b>17426-012105</b>	<b>17426-013005</b>	<b>17426-014005</b>
	HPLC Column	30	<b>17426-032130</b>	-	-
		50	<b>17426-052130</b>	<b>17426-053030</b>	<b>17426-054630</b>
		100	<b>17426-102130</b>	<b>17426-103030</b>	<b>17426-104630</b>
		150	<b>17426-152130</b>	<b>17426-153030</b>	<b>17426-154630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

## Accucore C30

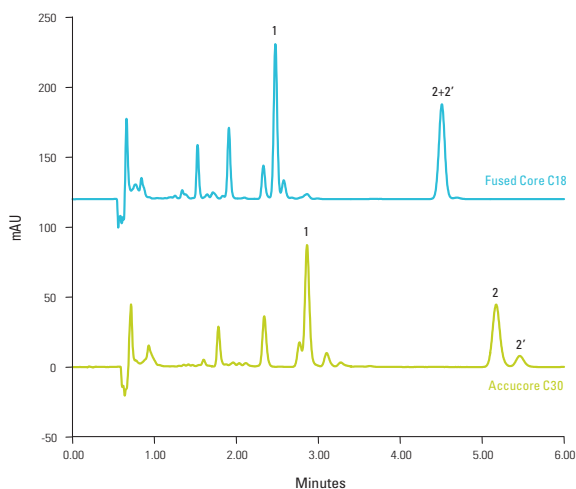
- Ideal for separation of hydrophobic, long alkyl chain compounds
- High shape selectivity for structurally related isomers
- Excellent aqueous-compatibility

Accucore C30 offers high shape selectivity for hydrophobic, long chain, structurally related isomers, for example carotenoids and steroids. This is a different form of shape selectivity from that measured in the steric selectivity phase characterisation test.

It is also an excellent alternative to normal-phase columns for lipid analysis. The optimized bonding density of the long alkyl chains facilitated by a wider pore diameter particle result in a phase that is stable even in highly aqueous mobile phases.



### Vitamin K isomers



#### Accucore C30 2.6µm, 100 x 3.0mm Fused Core C18, 100 x 3.0mm

Mobile Phase: Methanol: 2mM Ammonium Acetate, 98:2  
 Temperature: 20°C  
 Flow Rate: 650µL/min  
 Injection Volume: 5µL  
 Detection: UV, 250nm  
 Accucore C30 shows better separation for vitamin K1 isomers than the C18 column.

Chromatogram showing the separation of Vitamin K compounds  
 Minutes 1-Vitamin K2, 2-Vitamin K1 (trans isomer), 2'-Vitamin K1 (cis isomer)

### Accucore C30

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	<b>27826-012105</b>	-	-
	HPLC Column	50	<b>27826-052130</b>	<b>27826-053030</b>	<b>27826-054630</b>
		100	<b>27826-102130</b>	<b>27826-103030</b>	<b>27826-104630</b>
		150	<b>27826-152130</b>	<b>27826-153030</b>	<b>27826-154630</b>
		250	<b>27826-252130</b>	-	-
UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	

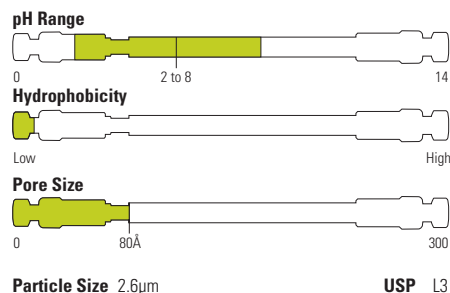
## Accucore HILIC

- Enhanced retention of polar and hydrophilic analytes
- Alternative selectivity to C18 without ion-pair or derivatization

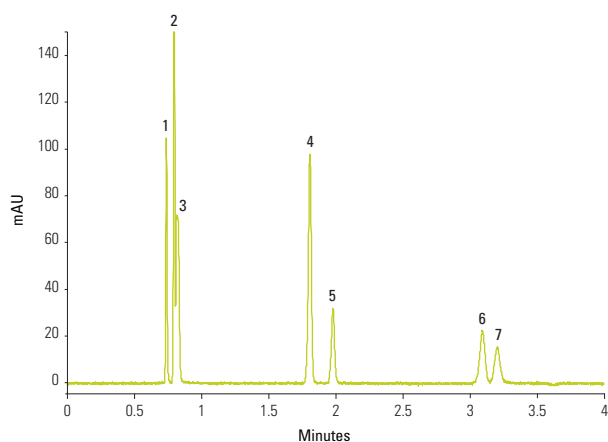
In HILIC mode the separation occurs through two mechanisms. The primary mechanism is a partitioning effect due to the enriched water layer around the polar or charged substrate material. The secondary mechanism involves interaction between the analyte and the active surface moiety.

Analyte properties that govern retention with HILIC phases are acidity/basicity, which determines hydrogen bonding, and polarizability which determines dipole-dipole interactions.

The highly organic mobile phases used with Accucore HILIC phase ensure efficient desolvation in ESI MS detection, which in turn leads to improved sensitivity.



### Catecholamines



#### Accucore HILIC 2.6µm, 50mm x 2.1mm

Mobile Phase:	85:15 Acetonitrile:100mM Ammonium Formate, pH 3.2
Temperature:	40°C
Flow Rate:	2mL/min
Injection Volume:	5µL
Backpressure:	157 bar
Detection:	UV, 280nm
Analytes:	1. Catechol 2. 5-HIAA 3. DOPAC 4. Serotonin 5. L-tyrosine 6. Dopamine 7. L-DOPA

### Accucore HILIC

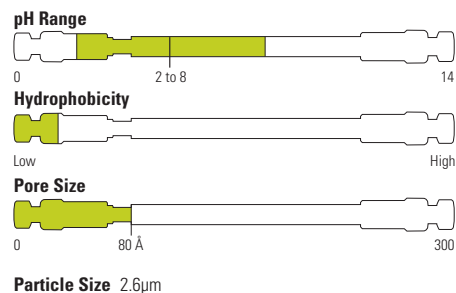
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	<b>17526-012105</b>	<b>17526-013005</b>	<b>17526-014005</b>
		30	<b>17526-032130</b>	-	-
	HPLC Column	50	<b>17526-052130</b>	<b>17526-053030</b>	<b>17526-054630</b>
		100	<b>17526-102130</b>	<b>17526-103030</b>	<b>17526-104630</b>
		150	<b>17526-152130</b>	<b>17526-153030</b>	<b>17526-154630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

## Accucore Urea-HILIC

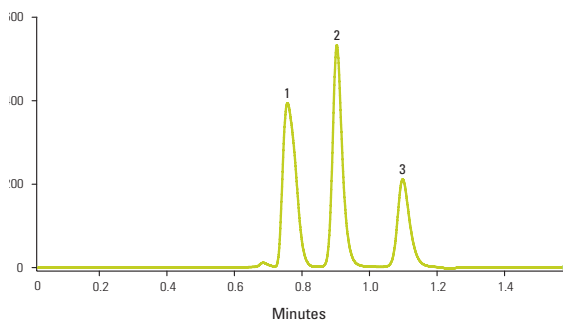
- Bonded hydrophilic stationary phase
- Unique selectivity compared to other HILIC phases
- Low ion exchange activity

Accucore Urea-HILIC has an alternative selectivity and lower ion exchange activity than other HILIC phases.

The bonded hydrophilic stationary phase provides retention of a broad range of polar analytes using up to 20% aqueous mobile phase.



### Analgesic compounds



#### Accucore Urea-HILIC 2.6µm, 100 x 2.1mm

Mobile Phase:	Composition 10:80:10, A : B : C
	A: Water
	B: Acetonitrile
	C: 100 mM Ammonium Acetate adjusted to pH 4.9
Temperature:	35°C
Flow Rate:	300µL/min
Injection Volume:	2µL into 10µL partial loop mode.
Backpressure:	71 bar
Detection:	UV, 230nm

	1. Acetaminophen			2. Salicylic acid			3. Aspirin		
	$t_R$	$A_s$	$R_s$	$t_R$	$A_s$	$R_s$	$t_R$	$A_s$	$R_s$
Mean	0.760	1.474	0.908	1.303	2.359	1.100	1.318	3.264	
CV %	0.00	1.17	0.48	0.92	0.49	0.00	0.63	0.48	

Data from eight replicate analyses of a mixture of acetaminophen, salicylic acid and aspirin

Retention time ( $t_R$ ), peak asymmetry ( $A_s$ ), peak resolution ( $R_s$ )

### Accucore Urea-HILIC

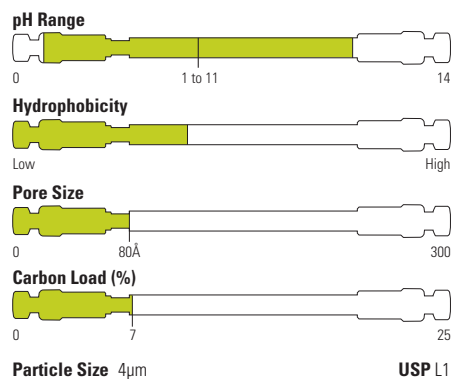
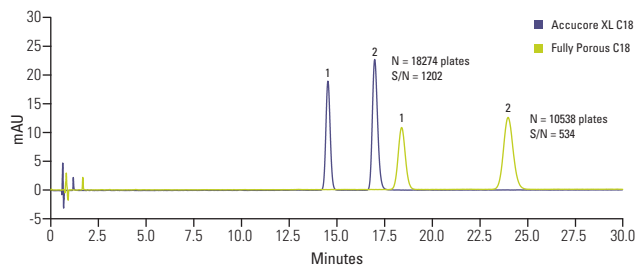
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	<b>27726-012105</b>	-	-
	HPLC Column	50	<b>27726-052130</b>	<b>27726-053030</b>	<b>27726-054630</b>
		100	<b>27726-102130</b>	<b>27726-103030</b>	<b>27726-104630</b>
		150	<b>27726-152130</b>	<b>27726-153030</b>	<b>27726-154630</b>
		250	<b>27726-252130</b>	-	-
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

## Accucore XL C18

- Optimum retention of non-polar compounds
- Hydrophobic interaction mechanism
- Separates a broad range of analytes

The carbon loading of Accucore XL C18 provides high retention of non-polar analytes via a predominantly hydrophobic interaction mechanism.

### Ibuprofen and Valerophenone (USP)



#### Accucore XL C18 4µm, 150 x 4.6mm Fully porous C18 5µm, 150 x 4.6mm

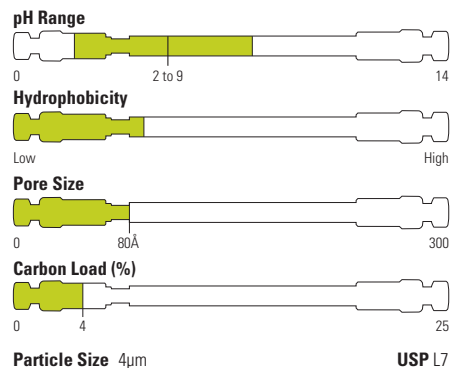
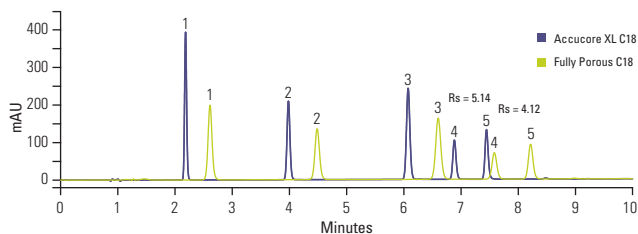
Mobile Phase:	66.3:33.7 (v/v) Water with Phosphoric Acid, pH 2.5:Methanol
Temperature:	30°C
Flow Rate:	2mL/min
Injection Volume:	5µL
Detection:	UV, 214nm
Analytes:	1. Valerophenone 2. Ibuprofen

## Accucore XL C8

- Similar selectivity to C18 with lower retention
- Recommended for analytes with moderate hydrophobicity

Accucore XL C8 is recommended for analytes with moderate hydrophobicity, or when a less hydrophobic phase provides optimum retention.

### Endocrine Disruptors



#### Accucore XL C8 4µm, 150 x 4.6mm Fully porous C8 5µm, 150 x 4.6mm

Mobile Phase A:	Water
Mobile Phase B:	Acetonitrile
Gradient:	Time (min) % B
	0.0 25
	20.0 70
	20.1 75
	25.0 25
Flow rate:	1.5mL/min
Temperature:	25°C
Detection:	UV at 220nm
Injection volume:	5µL
Analytes	1. Desethyl Atrazine 3. Atrazine 2. Simazine 4. Diuron 5. Bisphenol A

### Accucore XL

Particle Size (µm)	Format	Chemistry	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
4	Drop-in Guard (4/pk)	C18	10	<b>74104-012101</b>	<b>74104-013001</b>	<b>74104-014001</b>
			50	<b>74104-052130</b>	<b>74104-053030</b>	<b>74104-054630</b>
	100		<b>74104-102130</b>	<b>74104-103030</b>	<b>74104-104630</b>	
	150		<b>74104-152130</b>	<b>74104-153030</b>	<b>74104-154630</b>	
	250		<b>74104-252130</b>	<b>74104-253030</b>	<b>74104-254630</b>	
4	Drop-in Guard (4/pk)	C8	10	<b>74204-012101</b>	<b>74204-013001</b>	<b>74204-014001</b>
			50	<b>74204-052130</b>	<b>74204-053030</b>	<b>74204-054630</b>
	100		<b>74204-102130</b>	<b>74204-103030</b>	<b>74204-104630</b>	
	150		<b>74204-152130</b>	<b>74204-153030</b>	<b>74204-154630</b>	
	250		<b>74204-252130</b>	<b>74204-253030</b>	<b>74204-254630</b>	

# Hypersil GOLD HPLC and UHPLC Columns

## Outstanding peak shape for your separations

Thermo Scientific™ Hypersil GOLD™ columns are an ideal choice for new method development, delivering outstanding peak shape and increased sensitivity for your separations.

- **Solutions for all Separation Needs**  
Particle sizes and column designs optimized for all analyses
- **Improved Sensitivity**  
Excellent peak symmetry
- **Enhanced Resolution**  
Separation of complex samples
- **pH Stability**  
Robust assays at extended pH

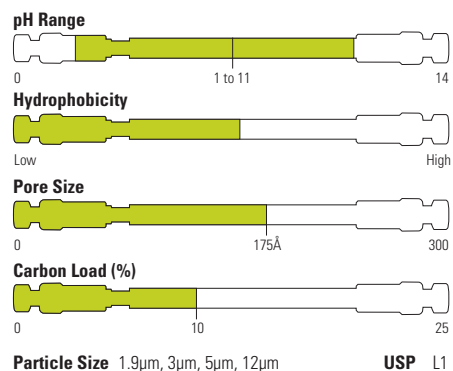


The Hypersil GOLD web page contains the latest news, applications and downloads for the Hypersil GOLD HPLC column range. Visit [www.thermoscientific.com/hypersilgold](http://www.thermoscientific.com/hypersilgold)

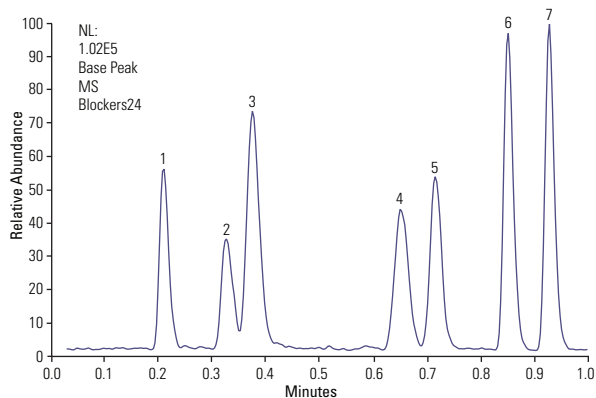
## Hypersil GOLD

Endcapped, ultra-pure, silica-based columns with exceptional peak shape and resolution for HPLC and LC-MS

- Significant reduction in peak tailing while retaining C18 selectivity
- Excellent resolution, efficiency and sensitivity
- Confidence in the accuracy and quality of analytical data



### Seven β-blockers in 1 minute



#### Hypersil GOLD, 1.9µm, 20 x 2.1mm

Mobile Phase A:	H <sub>2</sub> O+0.1%formic acid
Mobile Phase B:	MeCN+0.1%formic acid
Gradient:	15 to 100% B in 1min
Temperature:	30°C
Flow Rate:	0.5mL/min
Detection:	+ESI
Analytes:	1. Atenolol 2. Nadolol 3. Pindolol 4. Timolol 5. Metoprolol 6. Oxprenolol 7. Propranolol

### Hypersil GOLD

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.9	UHPLC Column	20	-	<b>25002-022130</b>	-	-	-
		30	<b>25002-031030</b>	<b>25002-032130</b>	-	-	-
		50	<b>25002-051030</b>	<b>25002-052130</b>	<b>25002-053030</b>	-	<b>25002-054630</b>
		100	<b>25002-101030</b>	<b>25002-102130</b>	<b>25002-103030</b>	-	-
		150	-	<b>25002-152130</b>	-	-	-
		200	-	<b>25002-202130</b>	-	-	-
3	Drop-in Guard (4/pk)	10	<b>25003-011001</b>	<b>25003-012101</b>	<b>25003-013001</b>	<b>25003-014001</b>	<b>25003-014001</b>
		30	-	<b>25003-032130</b>	-	-	<b>25003-034630</b>
	HPLC Column	50	-	<b>25003-052130</b>	<b>25003-053030</b>	<b>25003-054030</b>	<b>25003-054630</b>
		100	<b>25003-101030</b>	<b>25003-102130</b>	<b>25003-103030</b>	<b>25003-104030</b>	<b>25003-104630</b>
		150	<b>25003-151030</b>	<b>25003-152130</b>	<b>25003-153030</b>	<b>25003-154030</b>	<b>25003-154630</b>
		200	-	-	-	-	-
5	Drop-in Guard (4/pk)	10	-	<b>25005-012101</b>	<b>25005-013001</b>	<b>25005-014001</b>	<b>25005-014001</b>
		30	-	<b>25005-032130</b>	<b>25005-033030</b>	-	<b>25005-034630</b>
	HPLC Column	50	-	<b>25005-052130</b>	<b>25005-053030</b>	-	<b>25005-054630</b>
		100	-	<b>25005-102130</b>	<b>25005-103030</b>	-	<b>25005-104630</b>
		150	-	<b>25005-152130</b>	<b>25005-153030</b>	<b>25005-154030</b>	<b>25005-154630</b>
		250	-	<b>25005-252130</b>	<b>25005-253030</b>	<b>25005-254030</b>	<b>25005-254630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	<b>850-00</b>



**Hypersil GOLD Preparative**

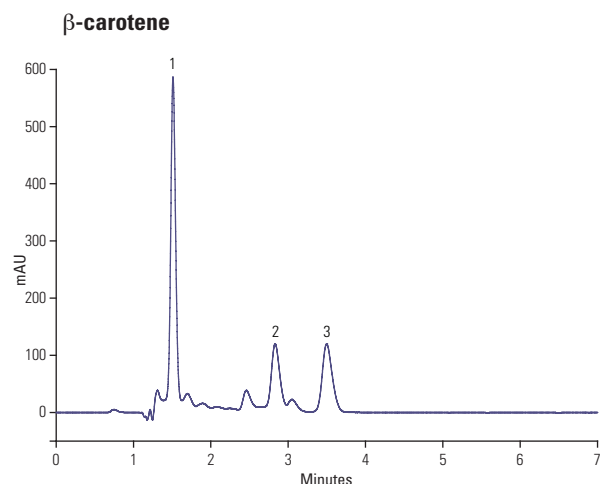
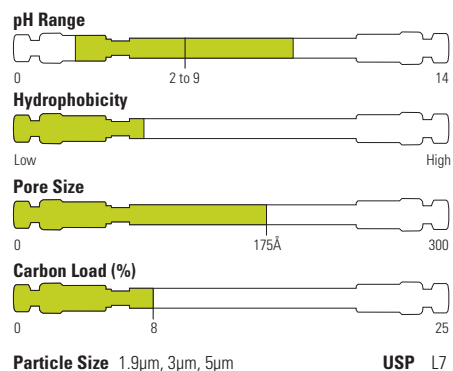
Particle Size (µm)	Format	Length (mm)	10mm ID	20mm ID	21mm ID	30mm ID	50mm ID
5	Preparative Guard Cartridge (3/pk)	10	<b>25005-019023</b>	<b>25005-019223</b>	-	-	-
	Preparative HPLC Column	50	<b>25005-059070</b>	-	-	<b>25005-059370</b>	<b>25005-059570</b>
		100	<b>25005-109070</b>	-	<b>25005-109270</b>	<b>25005-109370</b>	<b>25005-109570</b>
		150	<b>25005-159070</b>	-	<b>25005-159270</b>	<b>25005-159370</b>	<b>25005-159570</b>
		250	<b>25005-259070</b>	-	<b>25005-259270</b>	<b>25005-259370</b>	<b>25005-259570</b>
12	Preparative Guard Cartridge (3/pk)	10	<b>25012-019023</b>	<b>25012-019223</b>	-	-	-
	Preparative HPLC Column	50	<b>25012-059070</b>	-	<b>25012-059270</b>	<b>25012-059370</b>	<b>25012-059570</b>
		100	<b>25012-109070</b>	-	<b>25012-109270</b>	<b>25012-109370</b>	<b>25012-109570</b>
		150	-	-	<b>25012-159270</b>	<b>25012-159370</b>	<b>25012-159570</b>
		250	<b>25012-259070</b>	-	<b>25012-259270</b>	<b>25012-259370</b>	<b>25012-259570</b>
	Preparative Guard Cartridge Holder	10	<b>C-1000</b>	<b>854-00</b>	-	-	-



## Hypersil GOLD C8

Recommended for analytes with medium hydrophobicity or when a less hydrophobic phase is required to obtain optimum retention

- Similar selectivity to C18 columns but with reduced retention
- Lower hydrophobicity, allowing compounds to elute quicker
- Faster separations
- Excellent peak shape
- High efficiency
- Outstanding sensitivity



### Hypersil GOLD C8 5µm, 150 x 4.6mm

Mobile Phase:	MeOH
Temperature:	25°C
Flow Rate:	1.5mL/min
Detection:	UV, 450nm
Analytes:	1. Lutein 2. Lycopene 3. β-Carotene

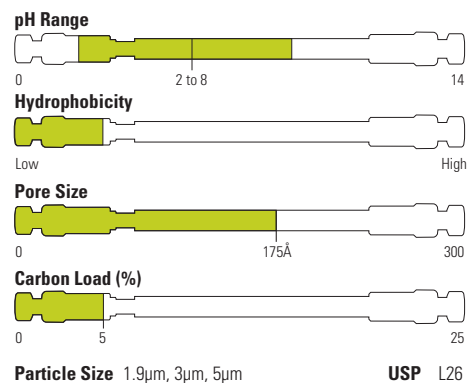
### Hypersil GOLD C8

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.9	UHPLC Column	20	-	<b>25202-022130</b>	-	-	-
		30	-	<b>25202-032130</b>	-	-	-
		50	-	<b>25202-052130</b>	<b>25202-053030</b>	-	<b>25202-054630</b>
		100	<b>25202-101030</b>	<b>25202-102130</b>	<b>25202-103030</b>	-	-
		150	-	<b>25202-152130</b>	-	-	-
3	Drop-in Guard (4/pk)	10	<b>25203-011001</b>	<b>25203-012101</b>	<b>25203-013001</b>	<b>25203-014001</b>	<b>25203-014001</b>
	HPLC Column	50	-	<b>25203-052130</b>	<b>25203-053030</b>	<b>25203-054030</b>	<b>25203-054630</b>
		100	<b>25203-101030</b>	<b>25203-102130</b>	<b>25203-103030</b>	<b>25203-104030</b>	<b>25203-104630</b>
		150	-	<b>25203-152130</b>	<b>25203-153030</b>	<b>25203-154030</b>	<b>25203-154630</b>
5	Drop-in Guard (4/pk)	10	-	<b>25205-012101</b>	<b>25205-013001</b>	<b>25205-014001</b>	<b>25205-014001</b>
	HPLC Column	50	-	<b>25205-052130</b>	<b>25205-053030</b>	-	<b>25205-054630</b>
		100	-	<b>25205-102130</b>	<b>25205-103030</b>	-	<b>25205-104630</b>
		150	-	<b>25205-152130</b>	<b>25205-153030</b>	<b>25205-154030</b>	<b>25205-154630</b>
		250	-	<b>25205-252130</b>	<b>25205-253030</b>	<b>25205-254030</b>	<b>25205-254630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	<b>850-00</b>

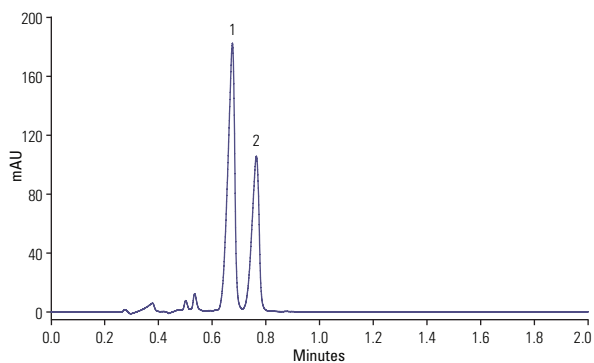
## Hypersil GOLD C4

Lower hydrophobicity than C18 or C8 recommended for very hydrophobic analytes

- Lower hydrophobicity
- Faster separations
- Excellent peak shape
- High efficiency
- Outstanding sensitivity



### Fatty acids



#### Hypersil GOLD C4 1.9µm, 100 x 2.1mm

Mobile Phase:	H <sub>2</sub> O / MeCN (20:80)
Temperature:	30°C
Flow Rate:	0.55mL/min
Injection Volume:	1µL
Detection:	200 nm
Analytes:	1. Linolenic acid 2. Linoleic acid

### Hypersil GOLD C4

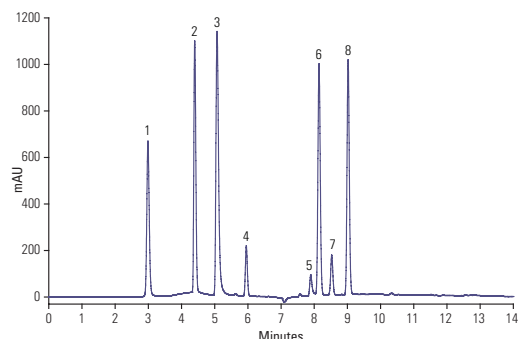
Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.6mm ID
1.9	UHPLC Column	50	-	<b>25502-052130</b>	-	-
		100	-	<b>25502-102130</b>	-	-
		150	-	<b>25502-152130</b>	-	-
3	Drop-in Guard (4/pk)	10	<b>25503-011001</b>	<b>25503-012101</b>	<b>25503-013001</b>	<b>25503-014001</b>
	HPLC Column	50	-	<b>25503-052130</b>	-	-
		100	-	<b>25503-102130</b>	<b>25503-103030</b>	<b>25503-104630</b>
		150	<b>25503-151030</b>	<b>25503-152130</b>	<b>25503-153030</b>	<b>25503-154630</b>
5	Drop-in Guard (4/pk)	10	-	<b>25505-012101</b>	<b>25505-013001</b>	<b>25505-014001</b>
	HPLC Column	50	-	<b>25505-052130</b>	-	<b>25505-054630</b>
		100	-	<b>25505-102130</b>	<b>25505-103030</b>	<b>25505-104630</b>
		150	-	<b>25505-152130</b>	-	<b>25505-154630</b>
		250	-	<b>25505-252130</b>	<b>25505-253030</b>	<b>25505-254630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

## Hypersil GOLD aQ

Controlled interaction mechanism by which polar analytes can be retained and resolved

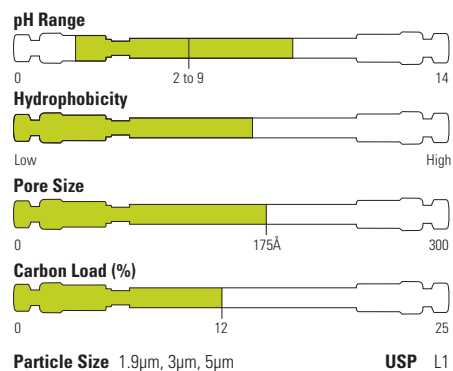
- Polar endcapped C18 phase for alternative selectivity
- Retention and resolution of polar analytes
- Stable in 100% aqueous mobile phases

### Water soluble vitamins



#### Hypersil GOLD aQ 5µm, 150 x 4.6mm

Mobile Phase A:	50 mM KH <sub>2</sub> PO <sub>4</sub> , pH 3.5
Mobile Phase B:	MeOH
Gradient:	0 – 100% B in 15 min
Flow Rate:	1mL/min
Detection:	UV, 205nm
Analytes:	1. Vitamin B1 (thiamine) 2. Vitamin B6 (pyridoxine) 3. Vitamin B3 (nicotinamide) 4. Vitamin B5 (pantothenic acid) 5. Folic Acid 6. Vitamin B12 (cyanocobalamin) 7. Vitamin H (biotin) 8. Vitamin B2 (riboflavin)



### Hypersil GOLD aQ

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID	
1.9	UHPLC Column	20	-	<b>25302-022130</b>	-	-	-	
		30	-	<b>25302-032130</b>	-	-	-	
		50	<b>25302-051030</b>	<b>25302-052130</b>	<b>25302-053030</b>	-	<b>25302-054630</b>	
		100	<b>25302-101030</b>	<b>25302-102130</b>	<b>25302-103030</b>	-	-	
		150	-	<b>25302-152130</b>	-	-	-	
		200	-	<b>25302-202130</b>	-	-	-	
3	Drop-in Guard (4/pk)	10	<b>25303-011001</b>	<b>25303-012101</b>	<b>25303-013001</b>	<b>25303-014001</b>	<b>25303-014001</b>	
		30	-	<b>25303-032130</b>	<b>25303-033030</b>	-	-	
	HPLC Column	50	-	<b>25303-052130</b>	<b>25303-053030</b>	<b>25303-054030</b>	<b>25303-054630</b>	
		100	<b>25303-101030</b>	<b>25303-102130</b>	<b>25303-103030</b>	<b>25303-104030</b>	<b>25303-104630</b>	
		150	<b>25303-151030</b>	<b>25303-152130</b>	<b>25303-153030</b>	<b>25303-154030</b>	<b>25303-154630</b>	
		250	-	<b>25303-252130</b>	-	<b>25303-254030</b>	<b>25303-254630</b>	
5	Drop-in Guard (4/pk)	10	-	<b>25305-012101</b>	<b>25305-013001</b>	<b>25305-014001</b>	<b>25305-014001</b>	
		30	-	<b>25305-032130</b>	<b>25305-033030</b>	-	-	
5	HPLC Column	50	-	<b>25305-052130</b>	<b>25305-053030</b>	-	<b>25305-054630</b>	
		100	-	<b>25305-102130</b>	<b>25305-103030</b>	-	<b>25305-104630</b>	
		150	-	<b>25305-152130</b>	<b>25305-153030</b>	-	<b>25305-154630</b>	
		250	-	<b>25305-252130</b>	-	<b>25305-254030</b>	<b>25305-254630</b>	
		UNIGUARD Drop-in Guard Cartridge Holder	10	<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	<b>850-00</b>

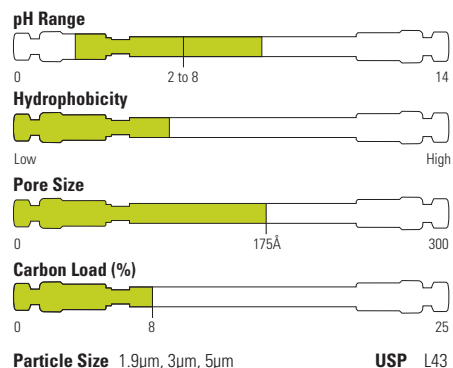
### Hypersil GOLD aQ Preparative

Particle Size (µm)	Format	Length (mm)	10mm ID	20mm ID	21mm ID	30mm ID	50mm ID
5	Preparative Guard Cartridge (3/pk)	10	<b>25305-019023</b>	<b>25305-019223</b>	-	-	-
		50	<b>25305-059070</b>	-	<b>25305-059270</b>	<b>25305-059370</b>	<b>25305-059570</b>
	Preparative HPLC Column	100	<b>25305-109070</b>	-	<b>25305-109270</b>	<b>25305-109370</b>	<b>25305-109570</b>
		150	<b>25305-159070</b>	-	<b>25305-159270</b>	<b>25305-159370</b>	<b>25305-159570</b>
		250	<b>25305-259070</b>	-	<b>25305-259270</b>	<b>25305-259370</b>	<b>25305-259570</b>

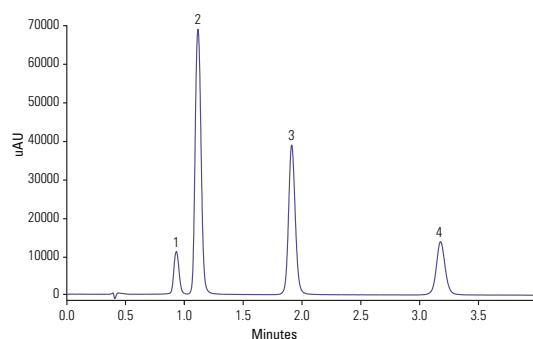
## Hypersil GOLD PFP

Introduction of a fluorine group into the stationary phase causes significant changes in solute-stationary phase interaction

- Fluorine atoms around the phenyl ring enhance pi-pi interactions with aromatic molecules
- Extra retention for halogenated species
- Selectivity for non-halogenated polar compounds



### Polyphenols



#### Hypersil GOLD PFP 1.9μm, 50 x 2.1mm

Mobile Phase:	0.1% Acetic Acid
Temperature:	25°C
Flow Rate:	0.5mL/min
Injection Volume:	0.5μL
Detection:	UV, 280nm
Analytes:	1. Pyrogallol 2. Hydroquinone 3. Resorcinol 4. Phenol

### Hypersil GOLD PFP

Particle Size (μm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.9	UHPLC Column	20	-	<b>25402-022130</b>	-	-	-
		30	-	<b>25402-032130</b>	-	-	-
		50	<b>25402-051030</b>	<b>25402-052130</b>	<b>25402-053030</b>	-	<b>25402-054630</b>
		100	<b>25402-101030</b>	<b>25402-102130</b>	<b>25402-103030</b>	-	-
		150	-	<b>25402-152130</b>	-	-	-
		200	-	<b>25402-202130</b>	-	-	-
3	Drop-in Guard (4/pk)	10	<b>25403-011001</b>	<b>25403-012101</b>	<b>25403-013001</b>	<b>25403-014001</b>	<b>25403-014001</b>
	HPLC Column	30	-	<b>25403-032130</b>	<b>25403-033030</b>	-	<b>25403-034630</b>
		50	-	<b>25403-052130</b>	<b>25403-053030</b>	<b>25403-054030</b>	<b>25403-054630</b>
		100	<b>25403-101030</b>	<b>25403-102130</b>	<b>25403-103030</b>	<b>25403-104030</b>	<b>25403-104630</b>
		150	<b>25403-151030</b>	<b>25403-152130</b>	<b>25403-153030</b>	-	<b>25403-154630</b>
		200	-	<b>25403-202130</b>	-	-	-
5	Drop-in Guard (4/pk)	10	-	<b>25405-012101</b>	<b>25405-013001</b>	<b>25405-014001</b>	<b>25405-014001</b>
	HPLC Column	50	-	<b>25405-052130</b>	<b>25405-053030</b>	-	-
		100	-	<b>25405-102130</b>	<b>25405-103030</b>	-	<b>25405-104630</b>
		150	-	<b>25405-152130</b>	<b>25405-153030</b>	<b>25405-154030</b>	<b>25405-154630</b>
		250	-	<b>25405-252130</b>	-	<b>25405-254030</b>	<b>25405-254630</b>
		UNIGUARD Drop-in Guard Cartridge Holder	10	<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

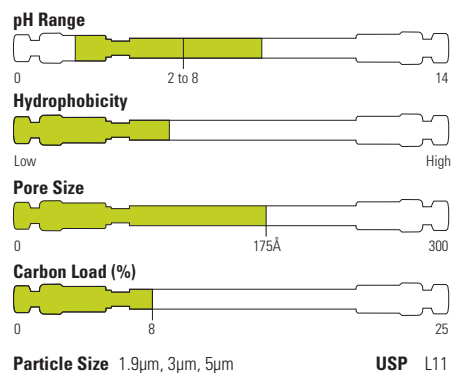
### Hypersil GOLD PFP Preparative

Particle Size (μm)	Format	Length (mm)	10mm ID	20mm ID	21mm ID	30mm ID	50mm ID
5	Preparative Guard Cartridge (3/pk)	10	<b>25405-019023</b>	<b>25405-019223</b>	-	-	-
	Preparative HPLC Column	50	<b>25405-059070</b>	-	<b>25405-059270</b>	<b>25405-059370</b>	<b>25405-059570</b>
		100	<b>25405-109070</b>	-	<b>25405-109270</b>	<b>25405-109370</b>	<b>25405-109570</b>
		150	<b>25405-159070</b>	-	<b>25405-159270</b>	<b>25405-159370</b>	<b>25405-159570</b>
		250	<b>25405-259070</b>	-	<b>25405-259270</b>	<b>25405-259370</b>	<b>25405-259570</b>

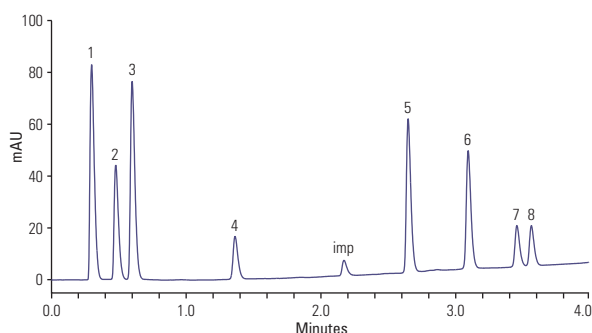
## Hypersil GOLD Phenyl

Contains a C4 linker which allows for superior alignment of the phenyl ring with aromatic molecules

- Enhanced pi-pi interactions with aromatics
- Moderate hydrophobicity
- Outstanding peak shape and sensitivity



### Antidepressants



#### Hypersil GOLD Phenyl 1.9µm, 50 x 2.1mm

Mobile Phase A:	0.1% Formic acid
Mobile Phase B:	0.1% Formic acid in MeCN
Gradient:	10 – 60% B in 3.4mins, 60 – 90% B in 0.24 min
Temperature:	60°C
Flow Rate:	0.5mL/min
Injection Volume:	0.7µL
Detection:	UV, 225 and 254nm
Analytes:	1. Uracil 2. Acetaminophen 3. p-Hydroxybenzoic acid 4. o-Hydroxybenzoic acid 5. Oxazepam 6. Diazepam 7. Di-isopropyl phthalate 8. Di-n-propyl phthalate

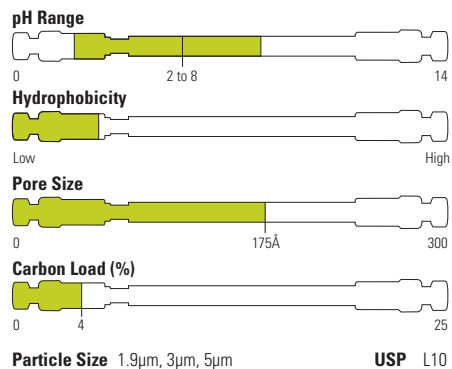
### Hypersil GOLD Phenyl

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.9	UHPLC Column	50	-	<b>25902-052130</b>	-	-	-
		100	-	<b>25902-102130</b>	-	-	-
		150	-	<b>25902-152130</b>	-	-	-
		200	-	<b>25902-202130</b>	-	-	-
3	Drop-in Guard (4/pk)	10	<b>25903-011001</b>	<b>25903-012101</b>	<b>25903-013001</b>	<b>25903-014001</b>	<b>25903-014001</b>
	HPLC Column	50	-	<b>25903-052130</b>	-	-	-
		100	-	<b>25903-102130</b>	<b>25903-103030</b>	-	<b>25903-104630</b>
5	HPLC Column	150	<b>25903-151030</b>	-	<b>25903-153030</b>	-	<b>25903-154630</b>
		10	-	<b>25905-012101</b>	<b>25905-013001</b>	<b>25905-014001</b>	<b>25905-014001</b>
		50	-	<b>25905-052130</b>	-	-	<b>25905-054630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	100	-	<b>25905-102130</b>	<b>25905-103030</b>	-	-
		150	-	-	-	-	<b>25905-154630</b>
		250	-	-	<b>25905-253030</b>	<b>25905-254030</b>	<b>25905-254630</b>
10	<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	<b>850-00</b>		

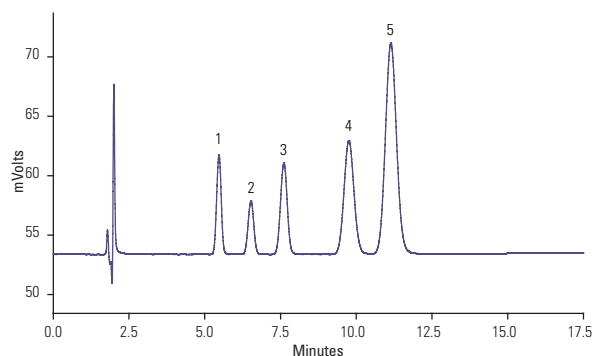
# Hypersil GOLD CN

For both normal phase and reversed-phase separations

- Provide alternative selectivity with lower hydrophobicity
- Excellent peak shape
- Outstanding sensitivity
- Less retention for faster analysis



## Organic acids



### Hypersil GOLD CN 5µm, 150 x 4.6mm

Mobile Phase A:	25 mM KH <sub>2</sub> PO <sub>4</sub> , pH2
Mobile Phase B:	MeOH
Temperature:	25°C
Flow Rate:	1.5mL/min
Detection:	UV, 230nm
Analytes:	1. 4-Fluorobenzoic 2. o-Toluic Acid 3. p-Toluic Acid 4. 2,4,6-Trimethylbenzoic Acid 5. 2,5-Dimethylbenzoic Acid

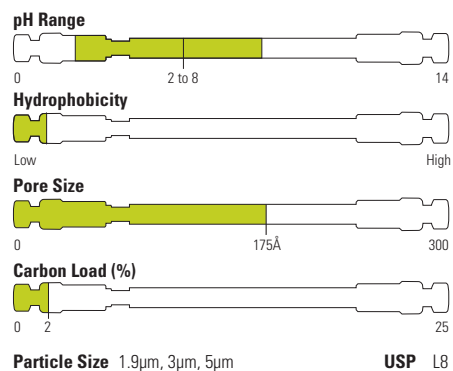
## Hypersil GOLD CN

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.9	UHPLC Column	50	-	<b>25802-052130</b>	-	-	-
		100	-	<b>25802-102130</b>	-	-	-
		200	-	<b>25802-202130</b>	-	-	-
3	Drop-in Guard (4/pk)	10	<b>25803-011001</b>	<b>25803-012101</b>	<b>25803-013001</b>	<b>25803-014001</b>	<b>25803-014001</b>
	HPLC Column	30	-	<b>25803-032130</b>	-	-	-
		50	-	<b>25803-052130</b>	-	-	-
		100	-	<b>25803-102130</b>	<b>25803-103030</b>	-	<b>25803-104630</b>
		150	<b>25803-151030</b>	<b>25803-152130</b>	<b>25803-153030</b>	-	<b>25803-154630</b>
5	Drop-in Guard (4/pk)	10	-	<b>25805-012101</b>	<b>25805-013001</b>	<b>25805-014001</b>	<b>25805-014001</b>
	HPLC Column	50	-	<b>25805-052130</b>	-	-	<b>25805-054630</b>
		100	-	<b>25805-102130</b>	<b>25805-103030</b>	-	-
		150	-	<b>25805-152130</b>	-	-	<b>25805-154630</b>
		250	-	<b>25805-252130</b>	<b>25805-253030</b>	<b>25805-254030</b>	<b>25805-254630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	<b>850-00</b>

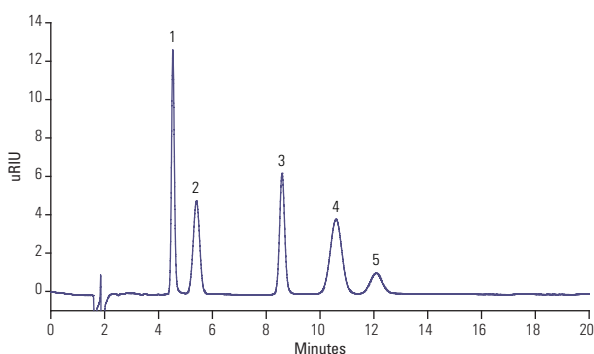
## Hypersil GOLD Amino

A high performance aminopropyl phase that gives excellent chromatographic properties in three modes: weak anion exchange, reversed-phase and normal phase

- Retains anions and organic acids in weak anion exchange
- Excellent for carbohydrate analysis in reversed-phase
- Alternative selectivity to silica columns in normal phase chromatography
- Outstanding peak shape and sensitivity



### Sugars



#### Hypersil GOLD Amino 5µm, 150 x 4.6mm

Mobile Phase:	MeCN/Water (80:20)
Temperature:	35°C
Flow Rate:	1.2mL/min
Injection Volume:	20µL
Detection:	RI
Analytes:	1. Fructose 2. Glucose 3. Sucrose 4. Maltose 5. Lactose

### Hypersil GOLD Amino

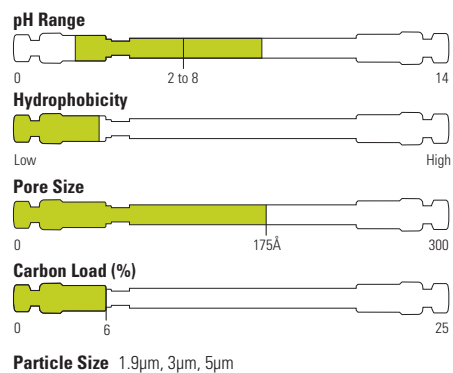
Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.9	UHPLC Column	50	-	<b>25702-052130</b>	-	-	-
		100	-	<b>25702-102130</b>	-	-	-
		150	-	<b>25702-152130</b>	-	-	-
		200	-	<b>25702-202130</b>	-	-	-
3	Drop-in Guard (4/pk)	10	<b>25703-011001</b>	<b>25703-012101</b>	<b>25703-013001</b>	<b>25703-014001</b>	<b>25703-014001</b>
	HPLC Column	30	-	<b>25703-032130</b>	-	-	-
		50	-	<b>25703-052130</b>	-	-	-
		100	-	<b>25703-102130</b>	<b>25703-103030</b>	-	<b>25703-104630</b>
		150	<b>25703-151030</b>	<b>25703-152130</b>	<b>25703-153030</b>	-	<b>25703-154630</b>
5	Drop-in Guard (4/pk)	10	-	<b>25705-012101</b>	<b>25705-013001</b>	<b>25705-014001</b>	<b>25705-014001</b>
		50	-	<b>25705-052130</b>	-	-	<b>25705-054630</b>
	HPLC Column	100	-	<b>25705-102130</b>	<b>25705-103030</b>	-	-
		150	-	-	-	-	<b>25705-154630</b>
		250	-	<b>25705-252130</b>	<b>25705-253030</b>	<b>25705-254030</b>	<b>25705-254630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	<b>850-00</b>



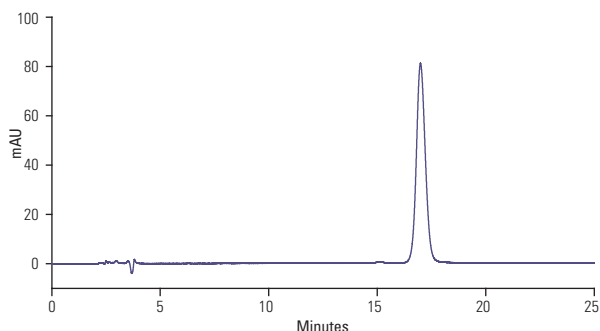
## Hypersil GOLD AX

A novel polymeric amine ligand bonded to highly pure base deactivated silica

- Weak anion exchange phase for multiple charged species
- Suitable for HILIC retention and separation of highly polar molecules
- Higher efficiency than polymer based ion exchange columns
- Outstanding peak shape and selectivity



### Vitamin C



#### Hypersil GOLD AX 5µm, 100 x 4.6mm

Mobile Phase:	100 mM Ammonium Acetate pH 6.8/ MeCN (30:70)
Temperature:	30°C
Flow Rate:	0.5mL/min
Injection Volume:	50µL
Detection:	UV, 240nm

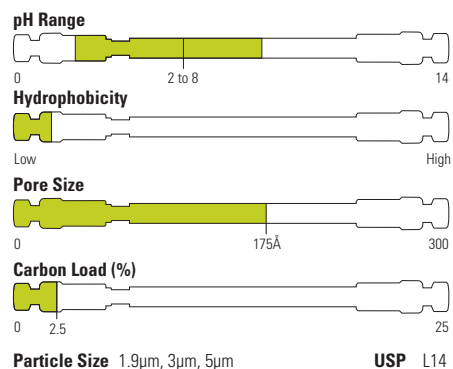
### Hypersil GOLD AX

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.9	UHPLC Column	50	-	<b>26102-052130</b>	-	-	-
		100	-	<b>26102-102130</b>	-	-	-
		150	-	<b>26102-152130</b>	-	-	-
		200	-	<b>26102-202130</b>	-	-	-
3	Drop-in Guard (4/pk)	10	<b>26103-011001</b>	<b>26103-012101</b>	<b>26103-013001</b>	<b>26103-014001</b>	<b>26103-014001</b>
	HPLC Column	30	-	<b>26103-032130</b>	-	-	-
		50	-	<b>26103-052130</b>	-	-	-
		100	-	<b>26103-102130</b>	-	-	<b>26103-104630</b>
		150	<b>26103-151030</b>	<b>26103-152130</b>	<b>26103-153030</b>	-	<b>26103-154630</b>
5	Drop-in Guard (4/pk)	10	-	<b>26105-012101</b>	<b>26105-013001</b>	<b>26105-014001</b>	<b>26105-014001</b>
	HPLC Column	50	-	-	-	-	<b>26105-054630</b>
		100	-	<b>26105-102130</b>	-	-	<b>26105-104630</b>
		150	-	<b>26105-152130</b>	-	-	<b>26105-154630</b>
		250	-	<b>26105-252130</b>	<b>26105-253030</b>	<b>26105-254030</b>	-
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	<b>850-00</b>

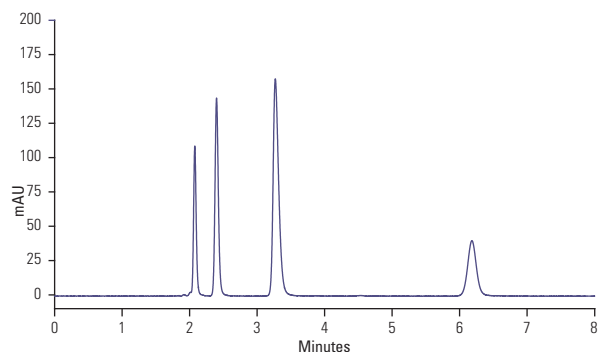
## Hypersil GOLD SAX

A highly stable quaternary amine strong anion exchange column for aqueous and low pH mobile phases

- High stability to aqueous and low pH mobile phases
- Ideally suited to the analysis of smaller organic molecules including nucleotides and organic acids
- Outstanding peak shape and sensitivity



### Monophosphates



#### Hypersil GOLD SAX 5µm, 150 x 4.6mm

Mobile Phase:	Aqueous $\text{KH}_2\text{PO}_4$ (50 mM, pH 3)
Temperature:	40°C
Flow Rate:	1.0 mL/min
Injection Volume:	10 µL
Detection:	UV, 254 nm

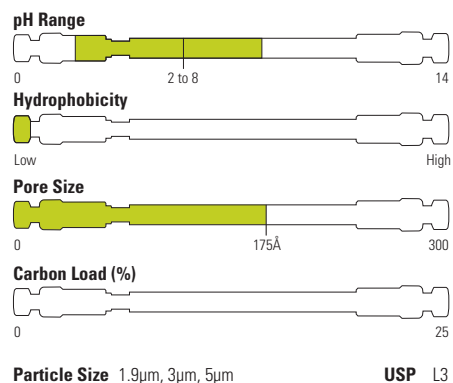
### Hypersil GOLD SAX

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.9	UHPLC Column	100	<b>26302-102130</b>	-	-	-
		150	<b>26302-152130</b>	-	-	-
3	Drop-in Guard (4/pk)	10	<b>26303-012101</b>	<b>26303-013001</b>	<b>26303-014001</b>	<b>26303-014001</b>
	HPLC Column	50	<b>26303-052130</b>	-	-	-
		100	<b>26303-102130</b>	<b>26303-103030</b>	-	<b>26303-104630</b>
		150	-	<b>26303-153030</b>	-	<b>26303-154630</b>
5	Drop-in Guard (4/pk)	10	<b>26305-012101</b>	<b>26305-013001</b>	<b>26305-014001</b>	<b>26305-014001</b>
	HPLC Column	50	<b>26305-052130</b>	-	-	-
		100	<b>26305-102130</b>	<b>26305-103030</b>	-	<b>26305-104630</b>
		150	<b>26305-152130</b>	-	-	<b>26305-154630</b>
		250	<b>26305-252130</b>	<b>26305-253030</b>	<b>26305-254030</b>	<b>26305-254630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	<b>850-00</b>

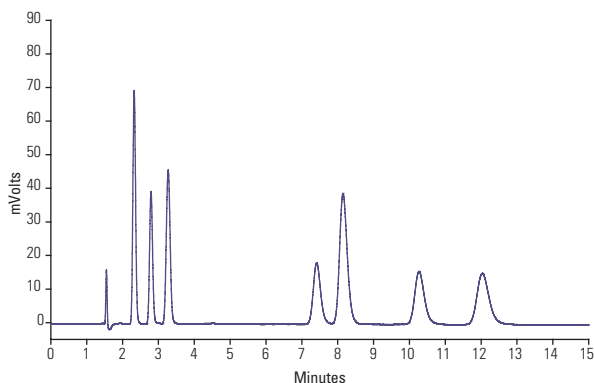
## Hypersil GOLD Silica

Unbonded, highly pure base deactivated silica media that is the backbone of the Hypersil GOLD range of columns

- Highly pure base deactivated silica media
- Outstanding peak shape and sensitivity



### Steroids



#### Hypersil GOLD Silica 5µm, 150 x 4.6mm

Mobile Phase:	19:1 (v/v) n-C6H14/EtOH
Temperature:	30°C
Flow Rate:	1.5mL/min
Injection volume:	5µL
Detection:	UV, 254nm
Analytes:	1. Progesterone 2. 21-Hydroxyprogesterone-21-acetate 3. 17- $\alpha$ -Hydroxyprogesterone 4. Cortisone 5. 11- $\alpha$ -Hydroxyprogesterone 6. Corticosterone 7. Hydrocortisone

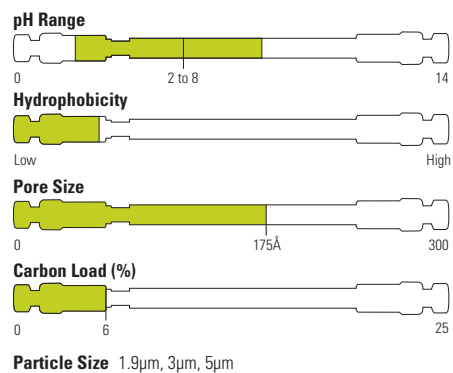
### Hypersil GOLD Silica

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.9	UHPLC Column	50	-	<b>25102-052130</b>	-	-	-
		100	-	<b>25102-102130</b>	-	-	-
		150	-	<b>25102-152130</b>	-	-	-
		200	-	<b>25102-202130</b>	-	-	-
3	Drop-in Guard (4/pk)	10	<b>25103-011001</b>	<b>25103-012101</b>	<b>25103-013001</b>	<b>25103-014001</b>	<b>25103-014001</b>
	HPLC Column	30	-	<b>25103-032130</b>	-	-	<b>25103-034630</b>
		50	-	<b>25103-052130</b>	-	-	-
		100	-	<b>25103-102130</b>	<b>25103-103030</b>	-	-
		150	<b>25103-151030</b>	<b>25103-152130</b>	<b>25103-153030</b>	-	<b>25103-154630</b>
5	Drop-in Guard (4/pk)	10	-	<b>25105-012101</b>	<b>25105-013001</b>	<b>25105-014001</b>	<b>25105-014001</b>
	HPLC Column	50	-	<b>25105-052130</b>	-	-	-
		100	-	<b>25105-102130</b>	<b>25105-103030</b>	-	<b>25105-104630</b>
		150	-	<b>25105-152130</b>	-	-	<b>25105-154630</b>
		250	-	<b>25105-252130</b>	-	<b>25105-254030</b>	<b>25105-254630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	<b>850-00</b>

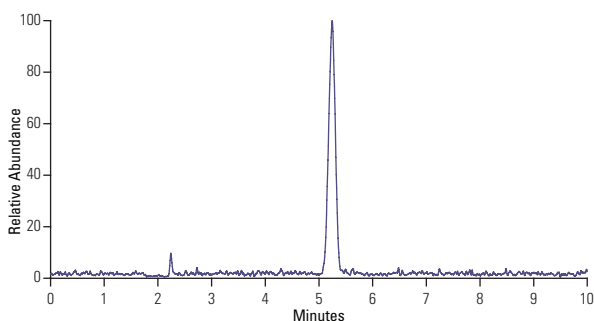
## Hypersil GOLD HILIC

Retains and separates polar analytes that are problematic using reversed-phase columns

- Alternative selectivity to C18
- Improved sensitivity for MS detection
- Alternative to ion-pair or derivatization
- Outstanding peak shape and selectivity



### Urea

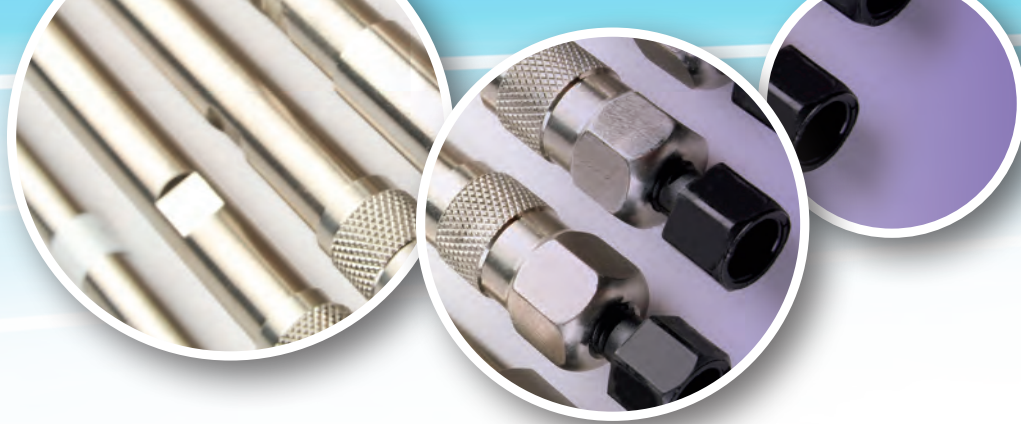


#### Hypersil GOLD HILIC 5µm, 150 x 4.6mm

Mobile Phase:	H <sub>2</sub> O/MeCN (10:90) + 0.1% formic acid
Temperature:	30°C
Flow Rate:	0.6mL/min
Injection Volume:	1µL
Detection:	+ESI
Analytes:	1. Urea

### Hypersil GOLD HILIC

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.9	UHPLC Column	50	-	<b>26502-052130</b>	-	-	-
		100	-	<b>26502-102130</b>	-	-	-
		150	-	<b>26502-152130</b>	-	-	-
3	Drop-in Guard (4/pk)	10	<b>26503-011001</b>	<b>26503-012101</b>	<b>26503-013001</b>	<b>26503-014001</b>	<b>26503-014001</b>
	HPLC Column	30	-	<b>26503-032130</b>	-	-	-
		50	-	<b>26503-052130</b>	-	-	-
		100	-	<b>26503-102130</b>	<b>26503-103030</b>	-	<b>26503-104630</b>
		150	<b>26503-151030</b>	<b>26503-152130</b>	<b>26503-153030</b>	-	<b>26503-154630</b>
5	Drop-in Guard (4/pk)	10	-	<b>26505-012101</b>	<b>26505-013001</b>	<b>26505-014001</b>	<b>26505-014001</b>
	HPLC Column	50	-	<b>26505-052130</b>	-	-	<b>26505-054630</b>
		100	-	<b>26505-102130</b>	<b>26505-103030</b>	-	-
		150	-	-	-	-	<b>26505-154630</b>
		250	-	<b>26505-252130</b>	<b>26505-253030</b>	<b>26505-254030</b>	<b>26505-254630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>851-00</b>	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	<b>850-00</b>

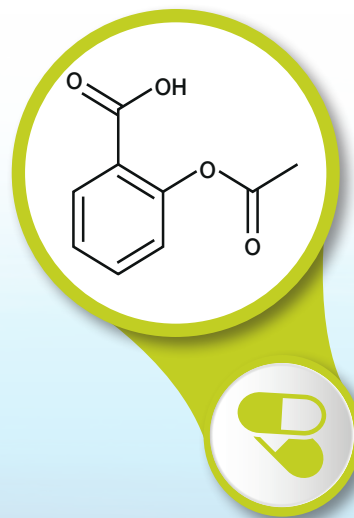


## Acclaim HPLC and UHPLC Columns

### Optimal selectivity through innovative chemistries

Designed for separating a variety of analytes, from small neutral and polar molecules to complex mixtures. Ideal for pharmaceutical, environmental, food and beverage and chemical applications.

- **Diversified Selectivities**  
Novel and proprietary surface chemistries
- **Reproducible and Reliable**  
Strict manufacturing and quality processes
- **High Efficiencies**  
For optimum resolution of complex mixtures
- **Ultra-pure, Porous, Spherical Silica**  
Providing consistent quality and performance



The Acclaim web page contains the latest news, applications and downloads for the Acclaim HPLC column range.

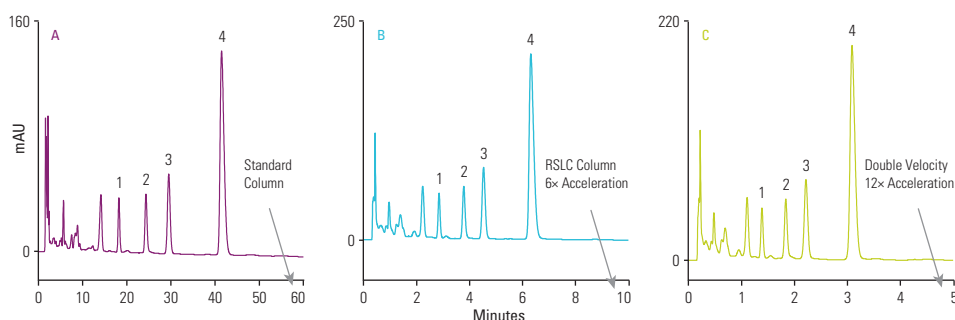
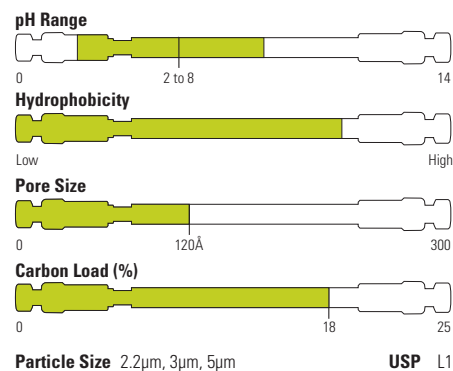
Visit [www.thermoscientific.com/acclaim](http://www.thermoscientific.com/acclaim)

## Acclaim 120 C18

High performance reversed-phase columns for reproducible results

- High hydrophobic retention
- Excellent efficiencies for maximum resolution
- Low silanol activity for excellent peak shapes for basic analytes
- Extremely low bleed, fully compatible with MS

The Acclaim 120 columns are designed for high resolution reversed-phase separations. The very high surface coverage and very low metal content together result in columns with excellent efficiencies. These columns provide exceptional performance for a variety of applications in the pharmaceutical, chemical, environmental and food separations areas.



**A: Acclaim 120 C18, 5µm, 150 x 4.6mm**  
**B, C: Acclaim RSLC C18, 2.2µm, 50 x 2.1mm**

Mobile Phase:	200mM HOAc in 10% (v/v) MeOH
Temperature:	20°C
Flow Rate:	A: 1.00mL/min B: 0.41mL/min C: 0.82mL/min
Injection Volume:	A: 10µL B: 1.2µL C: 1.2µL
Detection:	UV, 254 nm, A: 1 Hz data rate B: 5 Hz data rate C: 10 Hz data rate
Analytes:	1. p-Hydroxybenzoic acid 2. p-Hydroxybenzaldehyde 3. Vanillic acid 4. Vanillin
Sample:	Commercial vanilla extract in 40% ethanol, filtered
Reference:	AOAC Official Method 990.25

### Acclaim 120 C18

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.2	RSLC Column	30	<b>071402</b>	<b>071609</b>	-
		50	<b>068989</b>	<b>071608</b>	-
		75	-	<b>075699</b>	-
		100	<b>068990</b>	<b>071607</b>	-
		150	<b>071401</b>	-	-
		250	<b>074814</b>	-	-
3	HPLC Column	33	-	<b>066276</b>	-
		50	<b>077999</b>	<b>068973</b>	<b>063189</b>
		75	-	<b>066277</b>	-
		100	<b>077998</b>	<b>078000</b>	<b>078001</b>
		150	<b>063187</b>	<b>063705</b>	<b>063191</b>
		250	<b>077997</b>	<b>070080</b>	-
5	Guard Cartridge	10	<b>069692</b>	<b>071985</b>	<b>069699</b>
	HPLC Column	150	-	-	<b>063197</b>
		250	-	-	<b>063199</b>

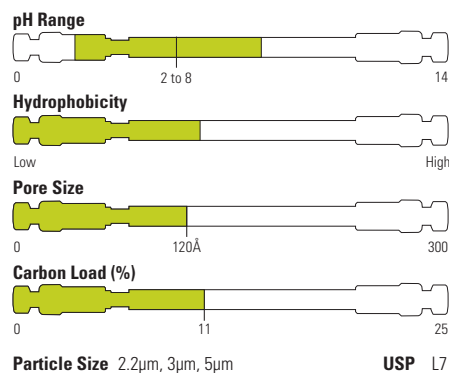
See page 4-037 for Acclaim Guard Holder Ordering Guide

## Acclaim 120 C8

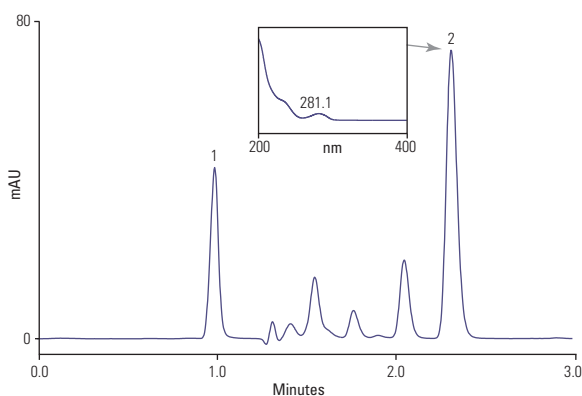
High performance reversed-phase columns with intermediate hydrophobic retention

- Low silanol activity for excellent peak shapes for basic analytes
- Excellent column efficiencies
- LC-MS compatible

Acclaim 120 C8 reversed-phase columns feature densely bonded monolayer C8 ligands on a high-purity, spherical porous silica substrate. The columns are a well-characterized line of LC-MS compatible C8 phases with very high surface coverage and extremely low silanol activity. These columns provide exceptional performance for a variety of applications in the pharmaceutical, environmental, food and many other industrial sectors.



### Triclosan in toothpaste



**Column: Acclaim RSLC C8, 2.2µm, 50 x 2.1mm**

Mobile Phase:	Isocratic, 15% buffer, (2mM Ammonium acetate pH5), 85% methanol (v/v)
Temperature:	50°C
Flow Rate:	0.2mL/min
Injection Volume:	1.0µL
Detection:	Diode array detector, 281nm, 10Hz, 0.1 s resp. time and spectra 200–400 nm
Analytes:	1. Saccharin 2. Triclosan
Sample:	Toothpaste containing 0.3% triclosan

### Acclaim 120 C8

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.2	RSLC Column	30	-	<b>072618</b>	-
		50	<b>072615</b>	<b>072619</b>	-
		100	<b>072616</b>	<b>072620</b>	-
		150	<b>072617</b>	-	-
		250	<b>074811</b>	-	-
3	HPLC Column	50	<b>059122</b>	-	<b>059125</b>
		100	<b>059123</b>	-	<b>059126</b>
		150	<b>059124</b>	<b>068970</b>	<b>059127</b>
		250	<b>076185</b>	-	-
5	Guard Cartridge	10	<b>069688</b>	<b>071979</b>	<b>069696</b>
	HPLC Column	50	<b>059134</b>	-	<b>059138</b>
		100	-	-	<b>059139</b>
		150	<b>059136</b>	-	<b>059140</b>
		250	-	-	<b>059141</b>

See page 4-037 for Acclaim Guard Holder Ordering Guide

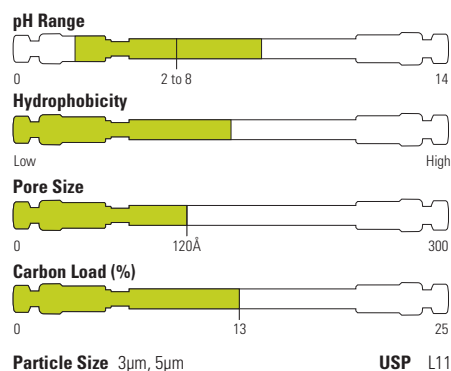
## Acclaim Phenyl-1

A unique reversed-phase column with high aromatic selectivity

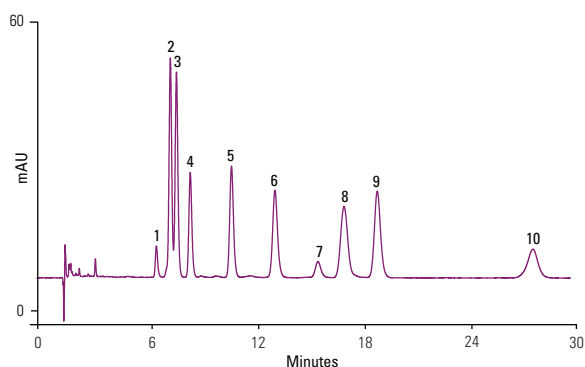
- High aromatic selectivity
- High hydrophobic retention
- Unique and complementary selectivity compared to any other phenyl type column
- Compatibility with highly aqueous mobile phase
- High efficiency and rugged packing

Acclaim Phenyl-1 has a higher pi-pi interaction than other phenyl phases and provides unique selectivity for aromatic compounds while maintaining sufficient hydrophobic interaction and aqueous compatibility for superior chromatographic performance.

The Acclaim Phenyl-1 column can be used in a wide range of applications in pharmaceutical, environmental, food testing and product-quality testing. This column is ideally suited for the analysis of aromatic analytes; some examples include glucocorticosteroids, estrogens, fat-soluble vitamins and phospholipids.



### Separation of fat-soluble vitamins



#### Acclaim Phenyl-1, 3µm, 150 x 3.0mm

Mobile Phase:	Methanol/water v/v 90/10
Temperature:	30°C
Flow Rate:	0.5mL/min
Injection Volume:	2µL
Detection:	UV, 220nm
Analytes:	(100 ppm each)
	1. Retinol acetate (vitamin A acetate)
	2. Vitamin D2
	3. Vitamin D3
	4. delta-Tocopherol
	5. gamma-Tocopherol
	6. alpha-Tocopherol (vitamin E)
	7. Impurity (unknown)
	8. Vitamin E acetate
	9. Vitamin K2
	10. Vitamin K1

### Acclaim Phenyl-1

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
3	Guard Cartridge	10	<b>079934</b>	<b>071974</b>	<b>071973</b>
	HPLC Column	150	<b>071971</b>	<b>071970</b>	<b>071969</b>
5	HPLC Column	150	-	-	<b>088016</b>
		250	-	-	<b>079697</b>

### Acclaim Guard Holder

Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	<b>069580</b>
Acclaim Guard Kit (Holder and Coupler) V-2	<b>069707</b>
Guard to Analytical Column Coupler V-2	<b>074188</b>

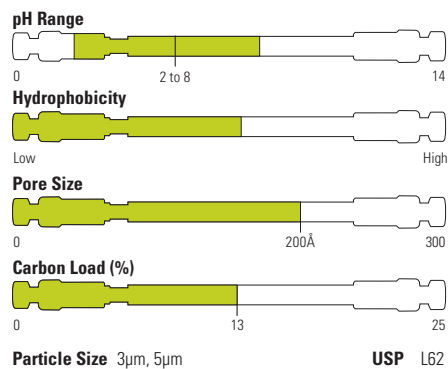


# Acclaim C30

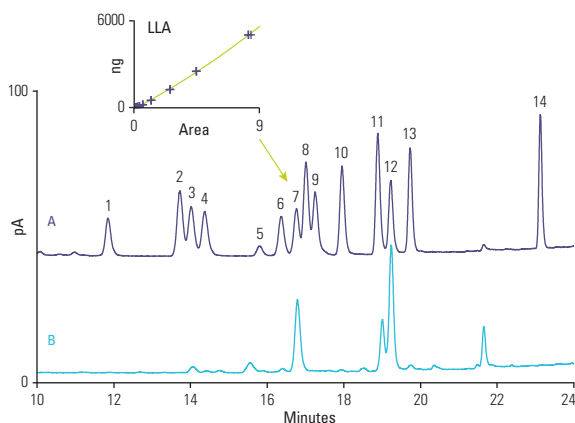
Columns for separating structurally related isomers

- High shape selectivity
- Unique selectivity complementary to other reversed-phase columns
- Compatibility with highly aqueous mobile phase
- High-quality: low column bleed, high efficiency and rugged packing

The Acclaim C30 is designed to provide high shape selectivity for separating hydrophobic structural related isomers and unique selectivity complementary to other reversed-phase columns (e.g. C18).



## Omega fatty acids



### Acclaim C30, 5µm, 150 x 4.6mm

Mobile Phase A: Water:formic acid:mobile phase B 900:3.6:100 (v/v/v)

Mobile Phase B: Acetone:acetonitrile:THF:formic acid 675:225:100:4(v/v/v)

Gradient:	Time (min)	%A	%B
	0	100	0
	1	40	60
	13	30	70
	22	5	95
	24	5	95
	29	100	0
	32	100	0

Temperature: 30°C  
 Flow Rate: 1.00mL/min  
 Injection Volume: 2µL  
 Detection: Corona ultra, nebulizer 15°C, filter high  
 Analytes: 1. SDA, 2. EPA, 3. ALA, 4. GLA, 5. DHA, 6. Arach., 7. LLA

Samples: A. Standards in isopropanol  
 B. Saponified chicken fat

## Acclaim C30

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
3	HPLC Column	50	<b>078666</b>	-	<b>078661</b>
		100	<b>078665</b>	-	-
		150	<b>075725</b>	<b>075724</b>	<b>075723</b>
		250	<b>078664</b>	<b>075726</b>	-
5	Guard Cartridge	10	<b>075722</b>	<b>075721</b>	<b>075720</b>
	HPLC Column	150	-	-	<b>075719</b>
		250	-	-	<b>075718</b>

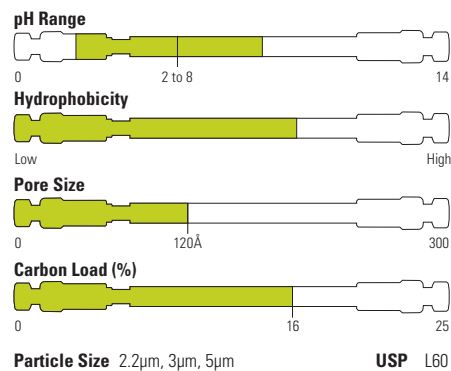
## Acclaim Guard Holder

Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	<b>069580</b>
Acclaim Guard Kit (Holder and Coupler) V-2	<b>069707</b>
Guard to Analytical Column Coupler V-2	<b>074188</b>

## Acclaim PolarAdvantage

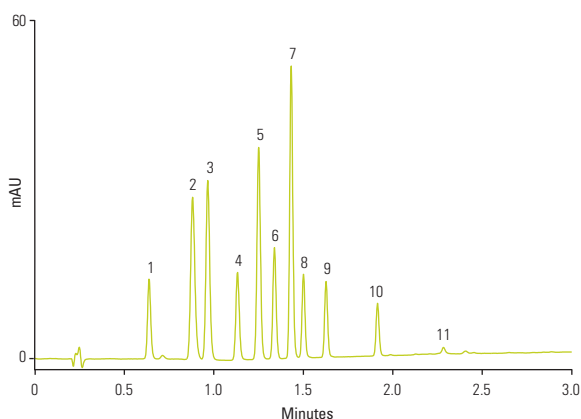
Novel polar-embedded reversed-phase columns with unique selectivity

- Selectivity complementary to the C18 column
- Low silanol activity for excellent peak shape with basic compounds
- Compatible with 100% aqueous mobile phase
- High selectivity for hydrophobic aromatic molecules
- Wide range of applications



Acclaim PolarAdvantage (PA) columns feature a patented bonding column chemistry that incorporates a polar sulfonamide group with an ether linkage near the silica surface. This unique chemistry provides low silanol activity, compatibility with 100% aqueous mobile phase. The Acclaim PA column offers great separation power to resolve a wide variety of polar and non-polar analytes and supports LC-MS analysis.

### EPA 604 phenols



#### Acclaim RSLC PolarAdvantage, 2.2µm, 50 x 3.0mm

Mobile Phase A: 10mM formic acid + 10mM ammonium formate, pH 3.75 ± 0.05

Mobile Phase B: Acetonitrile

Gradient: -1.5 0.0 0.3 2.6 3.0  
%A 70 70 70 10 10  
%B 30 30 30 90 90

Temperature: 30°C

Flow Rate: 1.25mL/min

Injection Volume: 0.5µL

Detection: UV, 280nm, 10Hz, 0.5s resp. time

Analytes: 1. Phenol  
2. 2,4-Dinitrophenol  
3. 4-Nitrophenol  
4. 2-Chlorophenol  
5. 2-Nitrophenol  
6. 2,4-Dimethylphenol  
7. 4,6-Dinitro-2-methylphenol  
8. 4-Chloro-3-methylphenol  
9. 2,4-Dichlorophenol  
10. 2,4,6-Trichlorophenol  
11. Pentachlorophenol

Sample: Calibration mix, 50µg/mL in water

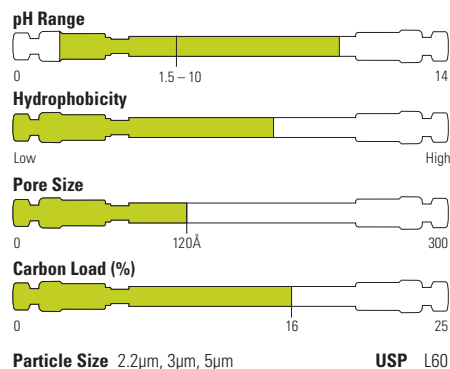
### Acclaim PolarAdvantage

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.2	RSLC Column	50	<b>072622</b>	-	-
		75	-	<b>075698</b>	-
		100	<b>072623</b>	<b>072627</b>	-
		150	<b>072624</b>	-	-
		250	<b>074813</b>	-	-
3	HPLC Column	50	<b>063174</b>	<b>068972</b>	-
		100	<b>061316</b>	<b>076214</b>	-
		150	<b>061317</b>	<b>063693</b>	<b>061318</b>
		250	-	<b>070079</b>	-
5	Guard Cartridge	10	<b>069691</b>	<b>071983</b>	<b>069698</b>
	HPLC Column	50	-	-	<b>061319</b>
		150	-	-	<b>061320</b>
		250	-	-	<b>061321</b>

## Acclaim PolarAdvantage II

Complementary selectivity and enhanced hydrolytic stability

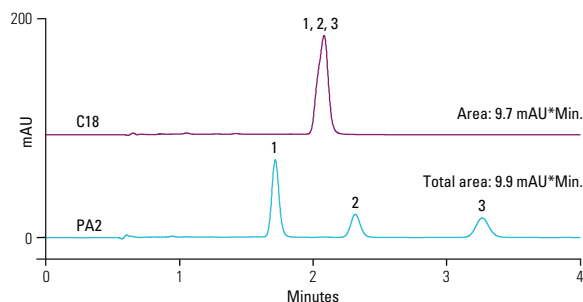
- Unique selectivity complementary to the C18 column
- Novel polar-embedded column chemistry for hydrolytic stability
- Compatible with 100% aqueous mobile phase
- Low bleed for MS compatibility
- Wide range of applications



Acclaim PolarAdvantage II (PA2) columns feature a patented surface chemistry that incorporates an amide-embedded polar group and multi-point attachment between the ligands and the silica surface. This unique chemistry provides enhanced hydrolytic stability from pH 1.5-10 with 100% aqueous mobile phases and exhibits high reversed-phase capacity, with selectivity complementary to conventional C18 columns.

The Acclaim PA2 column is specifically designed to withstand high pH conditions, making it a good choice for the separation of both basic and acidic analytes.

### Turmeric



#### Acclaim RSLC 120 C18 2.2µm, 100 x 2.1mm Acclaim RSLC PA2, 2.2µm, 100 x 2.1mm

Mobile Phase A:	15mM H <sub>3</sub> PO <sub>4</sub>
Mobile Phase B:	Methanol
Isocratic:	C18: 70% B (v/v) PA2: 80% B (v/v)
Temperature:	30°C
Flow Rate:	0.41mL/min
Detection:	UV, 428nm
Analytes:	1. Curcumin 2. Demethoxycurcumin 3. Bis-demethoxycurcumin
Sample:	Turmeric extract

### Acclaim PolarAdvantage II

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.2	RSLC Column	30	<b>071402</b>	<b>071609</b>	-
		50	<b>068989</b>	<b>071608</b>	-
		100	<b>068990</b>	<b>071607</b>	-
		150	<b>071401</b>	-	-
		250	<b>074814</b>	-	-
3	HPLC Column	33	-	<b>066276</b>	-
		50	<b>077999</b>	<b>068973</b>	<b>063189</b>
		75	-	<b>066277</b>	-
		100	<b>077998</b>	<b>078000</b>	<b>078001</b>
		150	<b>063187</b>	<b>063705</b>	<b>063191</b>
		250	<b>077997</b>	<b>070080</b>	-
5	Guard Cartridge	10	<b>069692</b>	<b>071985</b>	<b>069699</b>
	HPLC Column	150	-	-	<b>063197</b>
		250	-	-	<b>063199</b>

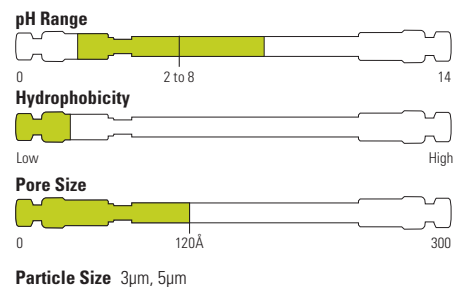
See page 4-037 for Acclaim Guard Holder Ordering Guide

## Acclaim HILIC-10

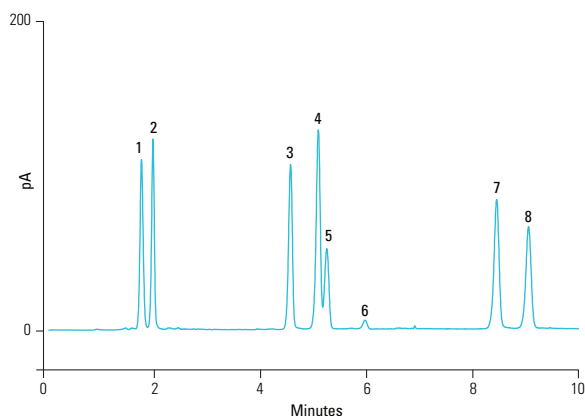
Designed with unique selectivity for hydrophilic molecules

- Retains highly polar molecules that are not retained by reversed-phase chromatography
- Unique selectivity, complementary to reversed-phase columns
- Hydrolytically stable
- Rugged column packing
- Broad application range

The Acclaim HILIC-10 column is designed for separating highly hydrophilic molecules by Hydrophilic Interaction Liquid Chromatography (HILIC). This column is based on high-purity spherical porous silica covalently modified with a proprietary hydrophilic layer.



### Glycerides



#### Acclaim HILIC-10, 3μm, 150 x 3.0mm

Mobile Phase A:	Heptane
Mobile Phase B:	2-Propanol/acetic acid 99.5:0.5
Temperature:	25°C
Flow Rate:	0.50mL/min
Injection Volume:	4μL
Detection:	Corona ultra, nebulizer 15°C
Analytes:	1. Tristearin 2. Trilaurin 3. Distearin isomer 1 4. Dilaurin isomer 1 5. Distearin isomer 2 6. Dilaurin isomer 2 7. Monostearin 8. Monolaurin

### Acclaim HILIC-10

Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
3	HPLC Column	150	<b>074259</b>	<b>074258</b>	<b>074257</b>
5	Guard Cartridge	10	<b>074263</b>	<b>074261</b>	<b>074262</b>

### Acclaim Guard Holder

Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	<b>069580</b>
Acclaim Guard Kit (Holder and Coupler) V-2	<b>069707</b>
Guard to Analytical Column Coupler V-2	<b>074188</b>

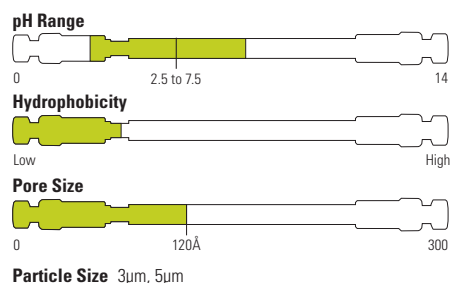
## Acclaim Mixed-Mode HILIC-1

Uniquely designed for both reversed-phase and HILIC operations

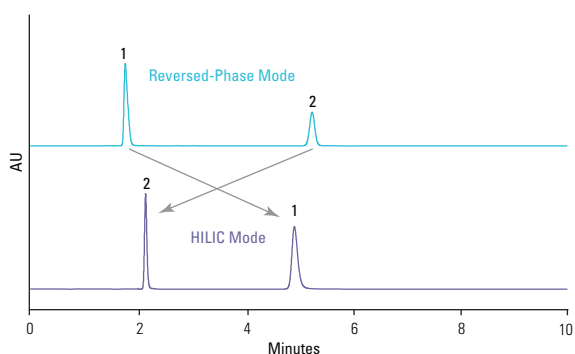
- Can operate in both RP and HILIC modes
- Retains highly polar molecules
- Unique selectivity complementary to RP columns
- Broader application range compared with conventional diol-based columns
- High-efficiency column for high-resolution separations

The Acclaim Mixed-Mode HILIC-1 column features a unique, high-efficiency, silica-based HPLC mixed-mode stationary phase that combines both reversed-phase (RP) and hydrophilic interaction liquid chromatography (HILIC) properties. This combination allows both hydrophobic and hydrophilic interactions to be utilized to optimize separations.

The functional group is of a hydrophobic alkyl chain with a diol group at the terminus. This unique combination results in the adjustable selectivity, making Acclaim Mixed-Mode HILIC-1 separate mixtures that would be impossible for a C18 column. This column is suitable for a broad range of applications, including non-ionic ethoxylated surfactants, drug metabolites, lipids, polyethylene glycols (PEGs), ethoxylated surfactants, and more.



### Cytosine and naphthalene



#### Acclaim Mixed-Mode HILIC-1, 5µm, 150 x 4.6mm

Mobile Phase:	CH <sub>3</sub> CN/0.1 M NH <sub>4</sub> OAc, pH 5.2 v/v 52/48 for RP mode v/v 92/8 for HILIC mode
Temperature:	30°C
Flow Rate:	1mL/min
Injection Volume:	10µL
Detection:	UV, 254nm
Analytes:	1. Cytosine (100 ppm) 2. Naphthalene (100 ppm)

### Acclaim Mixed-Mode HILIC-1

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
3	HPLC Column	50	-	<b>071912</b>	-
		150	<b>070091</b>	<b>070090</b>	-
5	Guard Cartridge	10	<b>069694</b>	<b>071913</b>	<b>069706</b>
	HPLC Column	150	<b>066847</b>	-	<b>066843</b>
		250	-	-	<b>066844</b>

### Acclaim Guard Holder

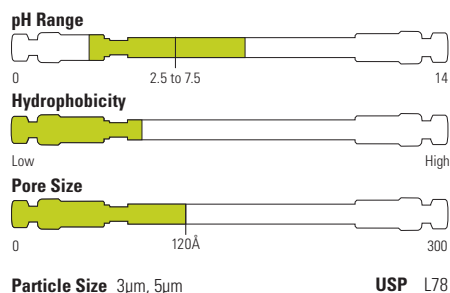
Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	<b>069580</b>
Acclaim Guard Kit (Holder and Coupler) V-2	<b>069707</b>
Guard to Analytical Column Coupler V-2	<b>074188</b>

## Acclaim Mixed-Mode WAX-1

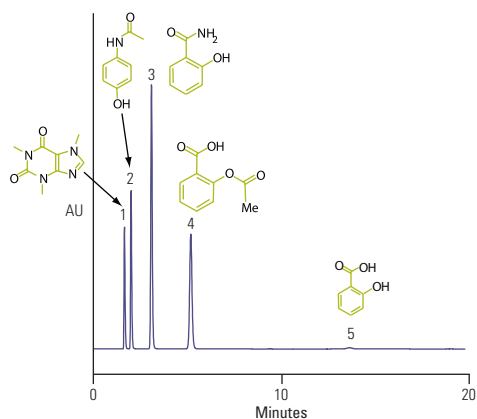
Designed for separating anionic molecules with powerful adjustable selectivity control

- Adjustable selectivity
- Selectivity orthogonal to reversed-phase (RP) columns
- Ideal selectivity for anionic molecules
- Excellent column efficiency and peak asymmetry
- Multimode retention mechanisms: reversed-phase, weak anion exchange, and HILIC modes

The Acclaim Mixed-Mode WAX-1 is a novel, high-efficiency silica HPLC column that combines hydrophobic and weak anion exchange characteristics. Its unique chemistry results in a multimode separation mechanism that includes reversed-phase, anion exchange, and HILIC interactions. Selectivity can be adjusted by changing ionic strength, pH or organic solvent content.



### Pain relief medicine



#### Acclaim Mixed-Mode WAX-1, 5µm, 150 x 4.6mm

Mobile Phase: 40/60 v/v Acetonitrile/buffer  
(6.8 g potassium monophosphate and  
0.5 g pyrophosphate in 1000 g D.I. H<sub>2</sub>O,  
pH is adjusted to 6.0 with NaOH)

Temperature: 30°C

Flow Rate: 1mL/min

Injection Volume: 1µL

Detection: UV, 220nm

Analytes: 1. Caffeine  
2. Acetaminophen  
3. Salicylamide  
4. Acetyl salicylic acid (Aspirin)  
5. Salicylic acid

### Acclaim Mixed-Mode WAX-1

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
3	HPLC Column	50	-	<b>071908</b>	-
		150	<b>070089</b>	<b>070088</b>	-
5	Guard Cartridge	10	<b>069686</b>	<b>071909</b>	<b>069704</b>
	HPLC Column	150	<b>067084</b>	-	<b>064984</b>
		250	-	-	<b>064985</b>

### Acclaim Guard Holder

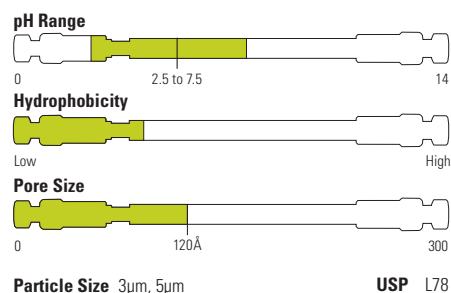
Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	<b>069580</b>
Acclaim Guard Kit (Holder and Coupler) V-2	<b>069707</b>
Guard to Analytical Column Coupler V-2	<b>074188</b>

## Acclaim Mixed-Mode WCX-1

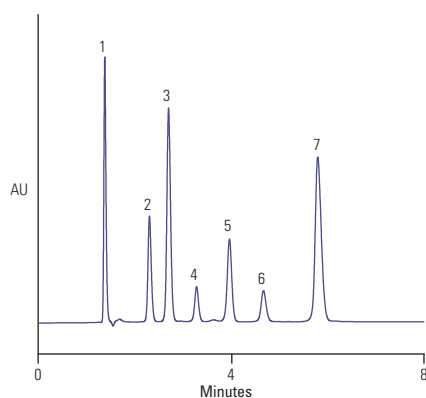
Designed for separating cationic molecules with adjustable selectivity control

- Adjustable selectivity
- Ideal selectivity for separating basic molecules
- Selectivity complementary to C18 RP columns
- Multimode separation mechanism: reversed-phase, weak cation exchange, anion-exclusion and HILIC

The Acclaim Mixed-Mode WCX-1 is a novel, high-efficiency, silica-based column, with a proprietary ligand with both hydrophobic and weak cation exchange properties. Selectivity of ionizable and neutral compounds can be controlled independently or simultaneously by tuning mobile phase ionic strength, pH or organic modifier. This column therefore can separate using multiple separation modes: reversed-phase, cation exchange, and normal-phase/ HILIC and is recommended for a variety of industrial applications, including pharmaceutical, chemical, consumer products, foods and beverages.



### Pharmaceutical counterions



#### Acclaim Mixed-Mode WCX-1, 5µm, 150 x 4.6mm

Mobile Phase:	40/60 v/v CH <sub>3</sub> CN/NH <sub>4</sub> OAc, pH 5.2 (20 mM total)
Temperature:	30°C
Flow Rate:	1mL/min
Injection Volume:	5µL
Detection:	UV (225 nm)
Analytes:	1. Maleate 50µg/mL 2. Ketoprofen 30µg/mL 3. Naproxen 30µg/mL 4. Hydrocortisone 60µg/mL 5. Dexamethasone 60µg/mL 6. Oxprenolol 300µg/mL 7. Timolol 250µg/mL

### Acclaim Mixed-Mode WCX-1

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
3	HPLC Column	50	-	<b>071910</b>	-
		150	<b>070093</b>	<b>070092</b>	-
5	Guard Cartridge	10	<b>085455</b>	<b>071911</b>	<b>069705</b>
	HPLC Column	150	<b>068371</b>	-	<b>068353</b>
		250	-	-	<b>068352</b>

### Acclaim Guard Holder

Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	<b>069580</b>
Acclaim Guard Kit (Holder and Coupler) V-2	<b>069707</b>
Guard to Analytical Column Coupler V-2	<b>074188</b>

## OmniPac

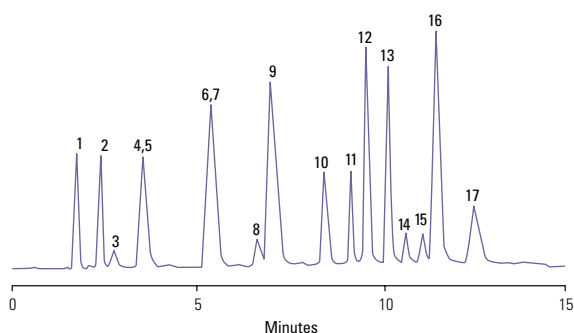
DVB polymer columns for combined ion exchange and reversed-phase separations

- Acid, base and solvent compatible, pH 0 to 14
- Ideal for the separation of high molecular weight organic acids
- Delivers optimal separation of very hydrophobic anions
- Delivers optimal separation of halogenated anions
- Provides simultaneous separation of neutral and ionic species
- Unique selectivity for polar and ionic organic analytes
- Delivers optimal separation of organic, hydrophobic, and halogenated cations

Thermo Scientific™ OmniPac™ is a range of latex-based columns. Both PAX columns have an ion exchange capacity of about 40µeq per column, and the PCX columns have a capacity of approximately 120µeq per column. The PAX-500 and PCX-500 columns separate analytes through both ion exchange and reversed-phase mechanisms, due to their higher reversed-phase capacity relative to the PAX-100 and PCX-100 columns.



### Gradient separation of nitrogen-containing compounds



#### OmniPac PCX-500, 250 x 4.0mm

Mobile Phase: Acetonitrile/Sodium Chloride/  
Hydrochloric Acid Gradient

Flow Rate: 1.0mL/min

Detection: UV, 254nm

Analytes:

1. Orotic Acid
2. 4-Hydroxybenzamide
3. Luminol Impurity
4. Luminol
5. Pyridine
6. PABA
7. 2,2'-Bipyridine
8. p-Phenylenediamine
9. Naphthylamine
10. Nitrobenzoic Acid
11. Tribenzylamine
12. p-Nitroaniline
13. 2,4-Dinitroaniline
14. Dibenzylamine
15. N-Methyl-N-nitrosoaniline
16. 4-Chloro-2-nitroaniline
17. 2,6-Dichloro-4-nitroaniline

### OmniPac Anion Exchange

Description	Porosity	Length (mm)	4.0mm ID
PAX-100	Microporous	50	<b>042151</b>
		250	<b>042150</b>
PAX-500	Microporous	50	<b>042153</b>
		250	<b>042152</b>

### OmniPac Cation Exchange

Description	Porosity	Length (mm)	4.0mm ID
PCX-100	Microporous	50	<b>042193</b>
		250	<b>042189</b>
PCX-500	Microporous	50	<b>042195</b>
		250	<b>042191</b>

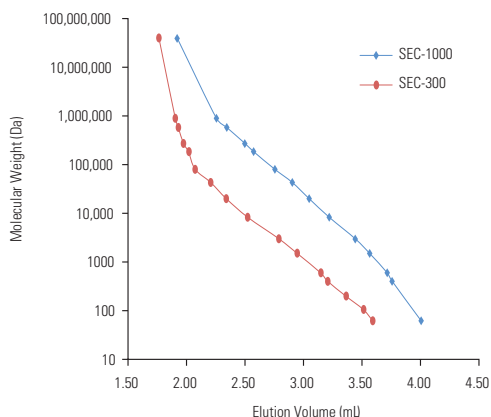
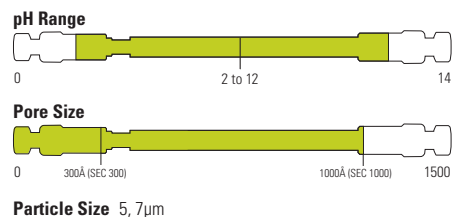


## Acclaim Size Exclusion Chromatography (SEC)

High performance SEC columns for analysis of water soluble polymers

- Proprietary mono-dispersed multi-pore hydrophilic resin: no inflection points in calibration curve
- SEC-300 calibrated from 100 to 50,000 Daltons
- SEC-1000 calibrated from 1,000 to 1,000,000 Daltons
- Availability of small particle sizes packed in 300 x 4.6mm dimension allows for high-resolution analysis at reduced solvent consumption
- Stable surface bonding with low column bleed and compatibility with UV, RI, MS, ELSD and Thermo Scientific™ Dionex™ Corona™ Charged Aerosol Detectors

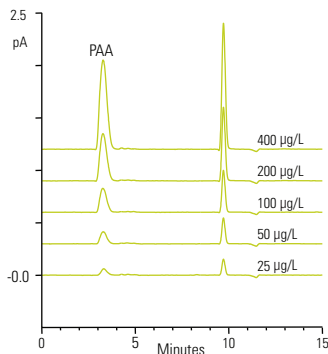
Thermo Scientific™ Acclaim™ SEC-300 and SEC-1000 are a family of resin based, high performance size exclusion chromatography columns specifically designed for the separation of water soluble polymers and oligomers.



### Acclaim SEC-300, 5µm, 300 x 4.6mm Acclaim SEC-1000, 7µm, 300 x 4.6mm

Mobile Phase:	10mM sodium perchlorate
Temperature:	25°C
Flow Rate:	0.35mL/min
Injection Volume:	50µL
Detection:	RI
Analytes:	(0.03% - 0.1% in mobile phase) dextran (MW 5,000,000-40,000,000), PEO (MW 895,000, 580,000, 272,000, 185,000, 80,000, 43,000, and 20,000), PEG (MW 8,300, 3,000, 1,500, 600, 400 and 200), diethylene glycol (MW 106 and ethylene glycol (MW 62)

## Polyacrylic acid using size-exclusion chromatography with charged-aerosol detection



### Acclaim SEC-300, 5µm, 300 x 4.6mm

Mobile Phase A:	Acetonitrile
Mobile Phase B:	Water
Temperature:	30°C
Flow Rate:	0.35mL/min
Injection Volume:	35µL
Detection:	Corona III; evaporator 55°C, Engine 40 °C, 2 Hz, filter 5, power function 1.20
Analytes:	1. PAA standards in water

## Acclaim Size Exclusion Chromatography (SEC)

Description	Particle Size (µm)	Format	Length (mm)	4.6mm ID	7.8mm ID
Acclaim SEC-300	5	Guard	33	<b>082740</b>	–
		HPLC Column	150	–	<b>079726</b>
			300	<b>079723</b>	<b>079725</b>
Acclaim SEC-1000	7	Guard	33	<b>082739</b>	–
		HPLC Column	150	–	<b>079722</b>
			300	<b>079724</b>	<b>079721</b>





## Application Specific HPLC and UHPLC Columns

### Innovative chemistries tailored for challenging and critically important applications

Application specific columns utilize novel and unique chemistries to provide superior resolution with ease of use for key pharmaceutical and environmental applications.

- **Acclaim AmG C18**  
Aminoglycoside antibiotics separation
- **Acclaim Trinity P1 and P2**  
API & counterion analysis
- **Acclaim Organic Acid**  
Fast organic acid analysis
- **Acclaim Surfactant and Surfactant Plus**  
Separation of surfactants
- **Acclaim Explosives**  
Separation of explosive residues
- **Acclaim Trinity Q1**  
Diquat and paraquat analysis
- **Acclaim Carbamate**  
The separation of carbamate pesticides
- **Acclaim Carbonyl C18**  
Separation of DNPH derivatives of aldehydes and ketones



The Application Specific column web page contains the latest news, applications and downloads for the Application Specific HPLC column range. Visit [www.thermoscientific.com/columns](http://www.thermoscientific.com/columns)

## Acclaim AmG C18

Designed to provide rugged and reproducible reversed-phase chromatography of aminoglycoside antibiotics.

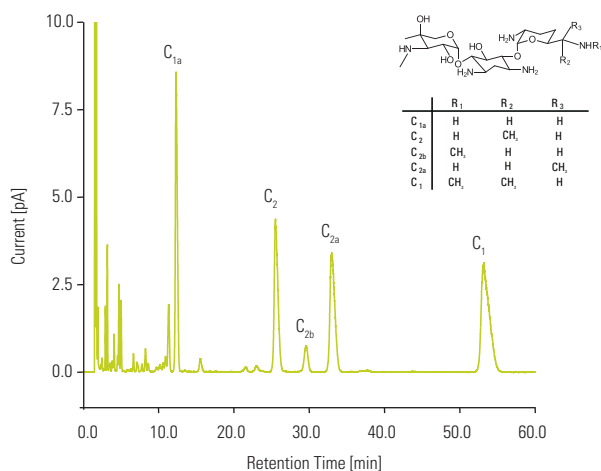
- Rugged and reproducible
- Excellent selectivity for the HPLC of aminoglycosides
- Superior resistance to acidic conditions for long column lifetime
- Easy to use with only aqueous mobile phase; TFA only, or TFA/HFBA or PFPA is needed
- Compatible with simple rugged methods; no solvents are required
- High efficiency and throughput



Aminoglycoside antibiotics are commonly used as clinical and veterinary medicines to treat bacterial infections. HPLC using ion-pairing reversed-phase separations is an effective technique for simultaneous qualitative and quantitative determination of aminoglycosides.

The Acclaim AmG C18 column is designed to provide excellent stability, selectivity and high resolution. It has a unique surface, a polymer encapsulated silica covalently bonded with a C18 ligand. This ensures ultra-stability when exposure to low pH (<1) and high temperature separation conditions.

### Isocratic separation of gentamicin sulfate using 100 mM TFA as the mobile phase



#### Acclaim AmG C18, 3µm, 150 x 3.0mm

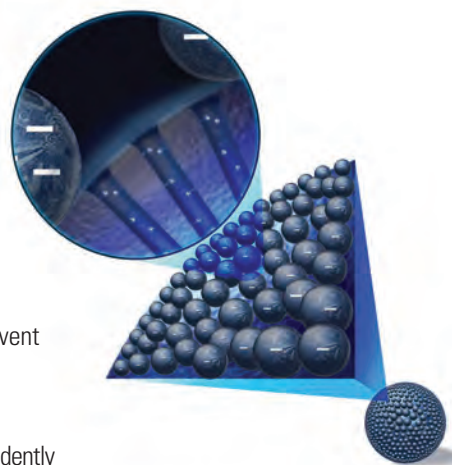
Mobile Phase:	100 mM TFA
Temperature:	30°C
Flow Rate:	0.425 mL/min
Injection Volume:	2µL
Detection:	Corona Veo RS (Filter = 5.0 s; Evaporation Temp = 35°C; Data Rate = 5 Hz; Power Function = 1.00)
Sample:	Gentamicin (1 mg/mL)

### Acclaim AmG C18

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
3	Guard Cartridges (2/pk)	10	<b>088754</b>	<b>088756</b>	<b>088758</b>
	HPLC Column	150	<b>088753</b>	<b>088755</b>	<b>088757</b>
Guard Cartridge Holder			<b>069580</b>	<b>069580</b>	<b>069580</b>

## Acclaim Trinity P1

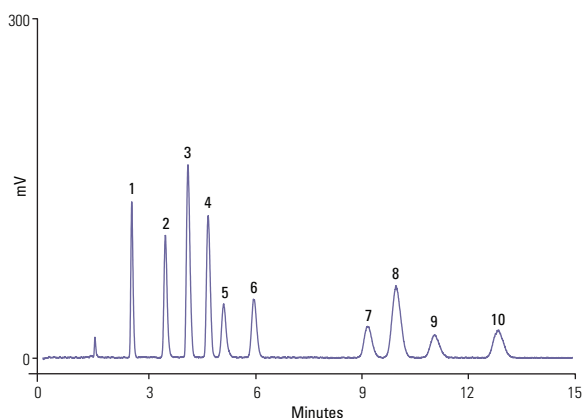
Mixed mode column technology combining reversed-phase, anion exchange and cation exchange functionality on a single support



- Ideal selectivity for simultaneous separation of API and counterion
- Adjustable selectivity by mobile phase ionic strength, electrolyte type, pH, and organic solvent
- Low bleed; compatible with MS, CAD and ELSD
- Retention of hydrophilic ionic and ionizable analytes without ion-pairing reagents
- Greater flexibility in method development: each retention mechanisms can be controlled independently

The Thermo Scientific™ Acclaim™ Trinity™ P1 HPLC column is designed with Nanopolymer Silica Hybrid (NSH) technology, which results in a multimode surface chemistry ideal for the simultaneous separation of drugs and their counterions. The surface chemistry concurrently provides reversed-phase, cation exchange, and anion exchange functionalities. The result is maximum flexibility in method development. Separations can be optimized easily by adjusting the chromatographic parameters (mobile phase pH, ionic strength, and organic strength).

### Simultaneous separation of pharmaceutical counterions



**Acclaim Trinity P1, 3µm, 100 x 3.0mm**

Mobile Phase:	60/40 v/v CH <sub>3</sub> CN/20mM (total) NH <sub>4</sub> OAc, pH 5
Temperature:	30°C
Flow Rate:	0.5mL/min
Injection Volume:	2µL
Detection:	Corona ultra (Gain = 100 pA; Filter = med; Neb Temp = 30°C)
Analytes: (50 to 100ppm)	1. Choline 2. Tromethamine 3. Sodium 4. Potassium 5. Meglumine 6. Mesylate 7. Nitrate 8. Chloride 9. Bromide 10. Iodide

### Acclaim Trinity P1

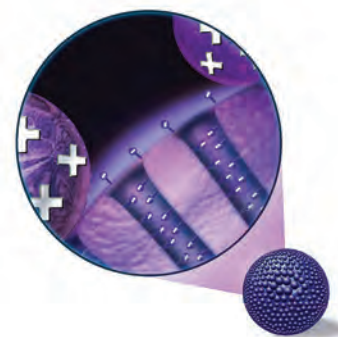
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID
3	Guard Cartridges (2/pk)	10	<b>071391</b>	<b>071390</b>
		HPLC Column	<b>075565</b>	<b>071388</b>
		100	<b>071389</b>	<b>071387</b>
		150	<b>075564</b>	<b>075563</b>

### Acclaim Guard Holder

Format	Cat. No.
Acclaim SST Guard Cartridge Holder V-2	<b>069580</b>
Acclaim Guard Kit (Holder and coupler) V-2	<b>069707</b>
Guard to Analytical Column Coupler V-2	<b>074188</b>

## Acclaim Trinity P2

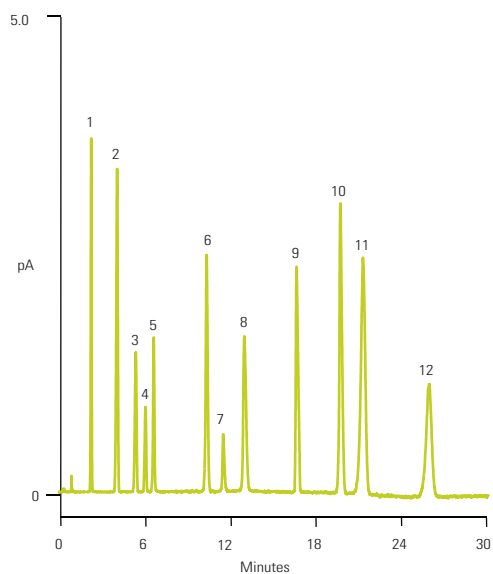
Mixed-mode column technology; hydrophilic interaction combining HILIC, anion exchange and cation exchange functionalities



- Ideal for separating pharmaceutical counterions, including monovalent and divalent cations or anions
- Selectivity complementary to the Trinity P1 column
- Low column bleed, compatible with CAD and MS
- Hydrolytically stable
- High efficiency

The Acclaim Trinity P2 is a unique, high-efficiency, silica-based column specifically designed for separation of pharmaceutical counterions, including monovalent and divalent cations or anions. This column is based on Nanopolymer Silica Hybrid (NSH) technology, which consists of high-purity porous spherical silica particles coated with charged nanopolymer particles. The inner-pore area of the silica bead is modified with a covalently bonded organic layer that provides cation-exchange retention, while the outer surface is modified with anion-exchange nano-polymer beads. Acclaim Trinity P2 column is aimed to complement Acclaim Trinity P1 to provide a total solution for pharmaceutical counter ion analysis by HPLC.

### Pharmaceutical-related anions and cations



#### Acclaim Trinity P2, 3µm, 100 x 3.0mm

Mobile Phase:	D.I. water and 100 mM NH <sub>4</sub> OFm, pH 3.65 gradient
Temperature:	30°C
Flow Rate:	0.60 mL/min
Injection Volume:	2µL
Detection:	Corona Veo Charged Aerosol Detector
Analytes:	1. Phosphate 2. Sodium 3. Potassium 4. Chloride 5. Malate 6. Bromide 7. Nitrate 8. Citrate 9. Fumarate 10. Sulfate 11. Magnesium 12. Calcium
Samples:	0.02 – 0.10 mg/mL each in D.I. water

Time (min)	H <sub>2</sub> O	0.1 M Ammonium formate, pH3.65
-10	0.760	1.474
0	80	20
2	80	20
22	0	100
30	0	100

### Acclaim Trinity P2

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID
3	Guard Cartridges (2/pk)	10	<b>085435</b>	<b>085436</b>
	HPLC Column	50	<b>085431</b>	<b>085433</b>
		100	<b>085432</b>	<b>085434</b>

### Acclaim Guard Holder

Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	<b>069580</b>
Acclaim Guard Kit (Holder and coupler) V-2	<b>069707</b>
Guard to Analytical Column Coupler V-2	<b>074188</b>

## Acclaim Organic Acid

Optimized and application-tested for the analysis of hydrophilic organic acids

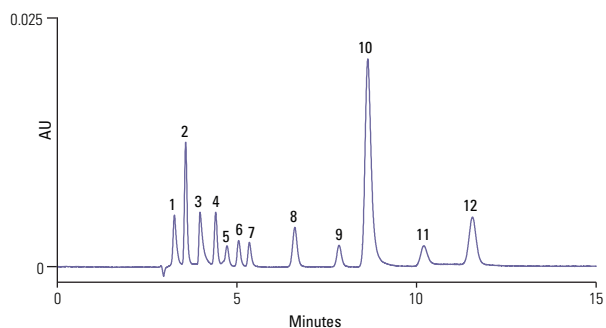
- Tested to guarantee consistent hydrophilic organic acid separations
- Compatible with 100% aqueous mobile phases
- Hydrolytic stability at low-pH conditions
- Ideal selectivity for separating a wide spectrum of organic acids
- Excellent column efficiency and peak shapes for organic acids



The Acclaim Organic Acid (OA) is a silica-based reversed-phase column designed for high-efficiency, high-throughput organic acids analysis. It offers unparalleled performance for separating hydroxyl aliphatic and aromatic organic acids.

The Acclaim OA is the recommended column for determining small hydrophilic organic acids, C1 to C7 aliphatic acids, and hydrophilic aromatic acid and is also valuable for the analysis and quality assurance of food and beverage products, pharmaceutical preparations, plating baths, and manufacturing chemicals, chemical intermediates, and environmental samples.

### Hydrophilic organic acids



#### Acclaim Organic Acid, 5µm, 4 × 250mm

Mobile Phase:	100mM Na <sub>2</sub> SO <sub>4</sub> , pH 2.65 (adjusted with methanesulfonic acid)
Temperature:	30°C
Flow Rate:	0.6mL/min
Injection Volume:	5µL
Detection:	UV, 210nm
Analytes:	<ol style="list-style-type: none"> <li>1. Oxalic acid 15mg/L (ppm)</li> <li>2. Tartaric acid 120</li> <li>3. Formic acid 180</li> <li>4. Malic acid 120</li> <li>5. iso-Citric acid 120</li> <li>6. Lactic acid 180</li> <li>7. Acetic acid 120</li> <li>8. Citric acid 120</li> <li>9. Succinic acid 120</li> <li>10. Fumaric acid 7</li> <li>11. cis-Aconitic acid *</li> <li>12. trans-Aconitic acid *</li> </ol>

\* 7ppm total for cis and trans isomers

### Acclaim Organic Acid

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.0mm ID
3	HPLC Column	150	<b>070087</b>	<b>070086</b>	—
5	Guard Cartridges (2/pkg)	10	—	<b>071987</b>	<b>069700</b>
	HPLC Column	150	—	—	<b>062903</b>
		250	—	—	<b>062902</b>

### Acclaim Guard Holder

Format	Cat. No.
Acclaim SST Guard Cartridge Holder V-2	<b>069580</b>
Acclaim Guard Kit (Holder and coupler) V-2	<b>069707</b>
Guard to Analytical Column Coupler V-2	<b>074188</b>

## Acclaim Surfactant

Excellent performance for separating a broad range of surfactants

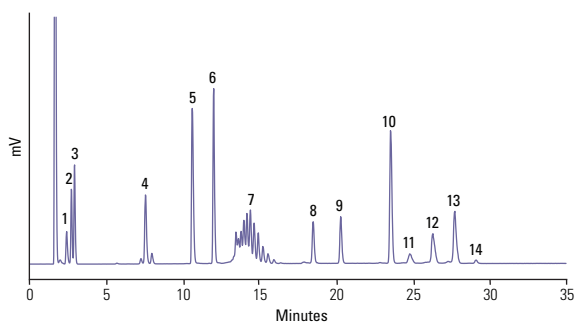
- Ideal selectivity for separation of anionic, nonionic, cationic and amphoteric surfactants
- Excellent peak shapes, especially for cationic surfactants
- Compatible with highly aqueous mobile phases
- Improved resolution for ethoxylated surfactants
- Rugged separations under a variety of conditions



The Acclaim Surfactant columns are the first generation high-efficiency, silica-based columns designed specifically for separating a wide variety of surfactants, including anionic, cationic, nonionic, ethoxylated and amphoteric surfactants using UV, ELSD or RI detection.

Surfactants are widely used in industrial, agricultural, and pharmaceutical markets, in products as diverse as pesticides, detergent powders, petroleum products, cosmetics, and pharmaceuticals. The Acclaim Surfactant column was designed specifically for HPLC separation of these surfactants.

### Inorganic anion, hydrotropes, cationic, nonionic, amphoteric, and anionic surfactants



#### Acclaim Surfactant, 5µm, 150 x 4.6mm

Mobile Phase A:	CH <sub>3</sub> CN
Mobile Phase B:	0.1 M NH <sub>4</sub> OAc, pH 5.4
Gradient:	25% to 85% A in 25min, then hold 85% A for 10min
Temperature:	30°C
Flow Rate:	1mL/min
Injection Volume:	25µL
Detection:	ELS detector
Analytes:	1. Chloride 2. Bromide 3. Nitrate 4. Xylene sulfonate 5. Laurylpyridinium chloride 6. Lauryldimethylbenzyl-ammonium chloride 7. Triton X-100 8. Cetyl betaine 9. Decyl sulfate 10. Dodecyl sulfate 11. C <sub>10</sub> -LAS 12. C <sub>11</sub> -LAS 13. C <sub>12</sub> -LAS 14. C <sub>13</sub> -LAS

### Acclaim Surfactant

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
3	HPLC Column	150	<b>070085</b>	<b>070084</b>	—
5	Guard Cartridges (2/pk)	10	<b>069693</b>	<b>071991</b>	<b>069701</b>
	HPLC Column	150	<b>068123</b>	—	<b>063201</b>
		250	—	—	<b>063203</b>

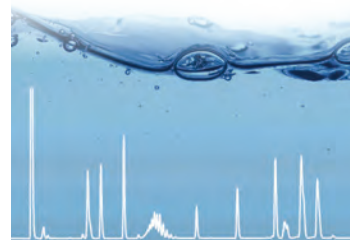
### Acclaim Guard Holder

Description	Cat. No.
Acclaim SST Guard Cartridge Holder V-2	<b>069580</b>
Acclaim Guard Kit (Holder and coupler) V-2	<b>069707</b>
Guard to Analytical Column Coupler V-2	<b>074188</b>



## Acclaim Surfactant Plus

Column of choice for surfactant analysis using higher sensitivity detection: performance, versatility, throughput

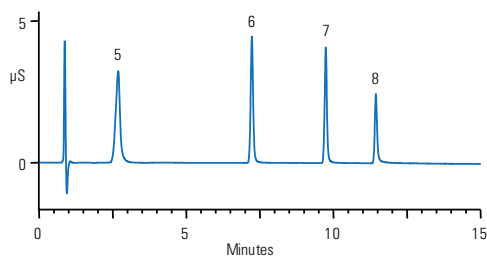
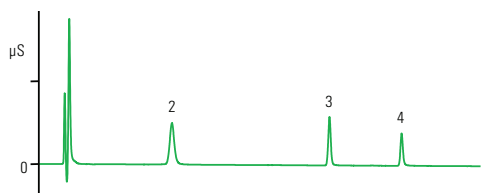


- Ideal selectivity for simultaneous separation of anionic, nonionic, cationic, and amphoteric surfactants
- Compatible with multiple detectors including MS, CAD, ELSD and UV
- Well suited for the determination of cationic surfactants
- High efficiency and fast analysis
- Rugged separations under a variety of conditions

Acclaim Surfactant Plus is a new generation of columns offering improved performance and higher throughput for analyzing surfactants. These columns exhibit exceptionally low bleed and are ideal for use with charged aerosol detectors (CAD) and mass spectrometers (MS). These columns can be used to separate a wide variety of surfactants including anionic, cationic, nonionic and amphoteric surfactants, as well as isomers of xylene sulfonate.

These columns can be used with evaporative light scattering detectors (ELSD), suppressed conductivity detectors (SCD), and UV-Vis detectors (UV). Non-metallic PEEK hardware is available for best compatibility with Dionex ion chromatography systems.

### Cationic surfactants



#### Acclaim Surfactant Plus, 3μm, 150 x 3.0mm

Mobile Phase A: Acetonitrile  
 Mobile Phase B: 100mM Formic acid  
 Mobile Phase C: Water

Gradient:

Time (min)	%A	%B	%C
-12	5	5	90
0	5	5	90
12	40	5	55
20	40	5	55

Temperature: 25°C

Flow Rate: 0.5mL/min

Injection Volume: 5μL

Detection: Conductivity with blank subtraction

Analytes:

1. Tetrabutylammonium
2. Tetrapentylammonium
3. Tetrahexylammonium
4. Tetraheptylammonium
5. Decyl-trimethylammonium
6. Dodecyl-trimethylammonium
7. Tetradecyl-trimethylammonium
8. Hexadecyl-trimethylammonium

### Acclaim Surfactant Plus

Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID	4.0mm ID PEEK
3	HPLC Column	100	<b>078955</b>	<b>078952</b>	—	—
		150	<b>078954</b>	<b>078951</b>	<b>078950</b>	—
		250	<b>078953</b>	—	—	—
5	Guard Cartridges (2/pk)	10	<b>078960</b>	<b>078959</b>	<b>082773</b>	—
		HPLC Column	250	—	—	<b>082767</b>
	HPLC Column	250	—	—	<b>082768</b>	—
		150	—	—	<b>082768</b>	<b>078956</b>

### Acclaim Guard Holder

Description	Cat. No.
Acclaim SST Guard Cartridge Holder V-2	<b>069580</b>
Acclaim Guard Kit (Holder and coupler) V-2	<b>069707</b>
Guard to Analytical Column Coupler V-2	<b>074188</b>

## Acclaim Explosives E2

The best solution for explosives analysis (EPA Method 8330)

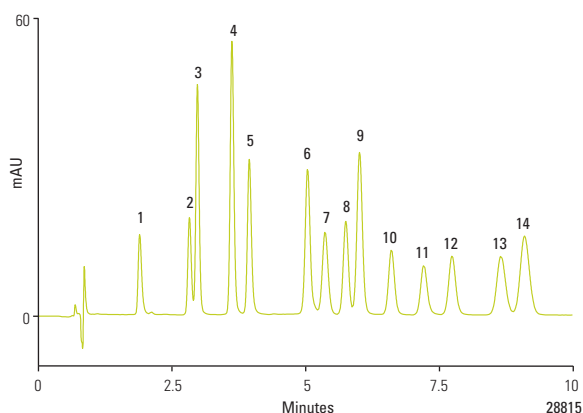
- Acclaim E2 columns provide baseline resolution of all 14 compounds targeted by EPA Method 8330
- Columns available in 2.2, 3 and 5µm particle size
- Simple isocratic elution conditions
- Rugged columns with good lot-to-lot reproducibility



Acclaim Explosives E2 columns are specifically designed to resolve all 14 explosives listed in EPA SW-846 Method 8330: Nitroaromatics and Nitramines by HPLC. The novel and unique chemistries of these columns provide superior resolution with complementary selectivities.

The Acclaim Explosives E2 may be used as either a primary or a confirmatory column. The unique selectivity and versatility of this column provides a wider application range, including the analysis of explosives beyond U.S. EPA Method 8330 (ISO22478).

### Rapid determination of EPA 8330A explosives



#### Acclaim RSLC Explosives E2, 2.2µm, 100 x 2.1mm

Mobile Phase:	Methanol:water 48:52 (v/v)														
Temperature:	31°C														
Flow Rate:	0.34mL/min (293 bar)														
Injection Volume:	1µL														
Detection:	UV, 254nm														
Analytes:	<table border="0"> <tr> <td>1. HMX</td> <td>8. 2,6-DNT</td> </tr> <tr> <td>2. RDX</td> <td>9. 2,4-DNT</td> </tr> <tr> <td>3. 1,3,5-TNB</td> <td>10. 2-NT</td> </tr> <tr> <td>4. 3,5-DNB</td> <td>11. 4-NT</td> </tr> <tr> <td>5. NB</td> <td>12. 3-NT</td> </tr> <tr> <td>6. 2,4,6-TNT</td> <td>13. 4-Am-2,6-DNT</td> </tr> <tr> <td>7. Tetryl</td> <td>14. 2-Am-4,6-DNT</td> </tr> </table>	1. HMX	8. 2,6-DNT	2. RDX	9. 2,4-DNT	3. 1,3,5-TNB	10. 2-NT	4. 3,5-DNB	11. 4-NT	5. NB	12. 3-NT	6. 2,4,6-TNT	13. 4-Am-2,6-DNT	7. Tetryl	14. 2-Am-4,6-DNT
1. HMX	8. 2,6-DNT														
2. RDX	9. 2,4-DNT														
3. 1,3,5-TNB	10. 2-NT														
4. 3,5-DNB	11. 4-NT														
5. NB	12. 3-NT														
6. 2,4,6-TNT	13. 4-Am-2,6-DNT														
7. Tetryl	14. 2-Am-4,6-DNT														
Sample:	Calibration mix, 25µg/mL in 50% acetonitrile														

### Acclaim Explosives E2

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.2	RSLC Column	100	<b>076225</b>	<b>076227</b>	—
		150	<b>076226</b>	—	—
3	HPLC Column	150	<b>070083</b>	<b>070082</b>	—
		250	—	<b>070081</b>	—
5	Guard Cartridges (2/pk)	10	—	<b>071989</b>	<b>069703</b>
	HPLC Column	250	—	—	<b>064309</b>

See page 4-054 for Acclaim Guard Holder Ordering Guide

## Acclaim Trinity Q1

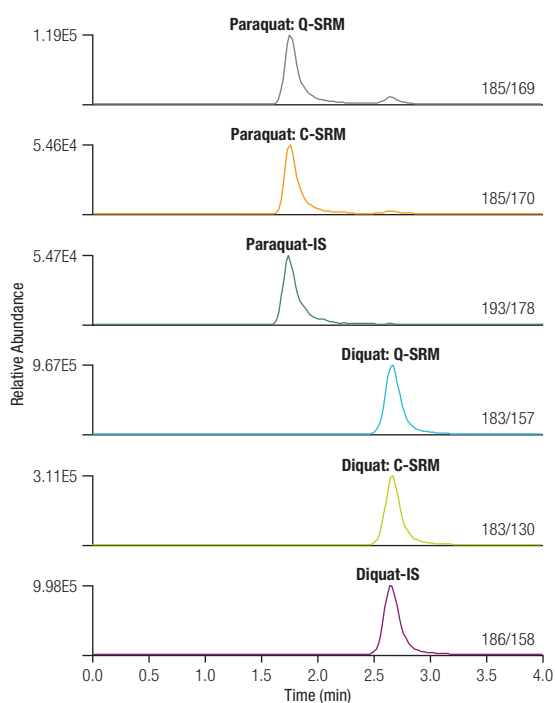
For trace analysis of diquat and paraquat

- Excellent resolution of diquat and paraquat
- Good peak shape
- Fast analysis
- LC-MS compatible
- No ion-pairing reagent needed



Acclaim Trinity Q1 columns are unique, high-efficiency, silica-based columns designed for the separation of the herbicides diquat and paraquat. These herbicides are toxic and residues are monitored in drinking water, wastewater and agricultural products. The Acclaim Trinity Q1 column is a tri-mode (WCX, WAX, RP), column based on Nano-polymer Silica Hybrid technology. It offers unmatched high-resolution and high-throughput trace analysis of the herbicides diquat and paraquat by LC-MS/MS and LC-UV methods.

### Diquat and paraquat



#### Acclaim Trinity Q1, 3µm, 50 x 3.0mm

Mobile Phase:	25% ammonium acetate (100mM, pH 5.0); 75% acetonitrile
Temperature:	Ambient
Flow Rate:	0.5mL/min
Injection Volume:	5µL
Detection:	Show Mass Spectrometric conditions and the scan events etc. table underneath are the peaks section
Mass Spectrometric Conditions	
System:	Thermo Scientific TSQ Quantiva Access MAX Quadrupole Mass Spectrometer
Interface:	Heated Electrospray Ionization with HESI II probe
Spray Voltage:	1500 V
Vaporizer Temp:	400 °C
Sheath Gas Pressure:	70
Aux Gas Pressure:	10
Capillary Temp:	350 °C
Quantitation Mode:	Selected Reaction Monitoring (SRM)

Scan Events	Precursor	Quantitative SRM (CID)	Confirmative SRM (CID)
Paraquat	185	169 (27)	170 (17)
Paraquat-d <sub>6</sub>	193	178 (17)	
Diquat	183	157 (22)	130 (31)
Diquat-d <sub>3</sub>	186	158 (22)	

### Acclaim Trinity Q1

Particle Size		Length (mm)	2.1mm ID	3.0mm ID
3	HPLC Column	50	<b>083242</b>	<b>083241</b>
		100	<b>079717</b>	<b>079715</b>
5	Guard Cartridges (2/pk)	10	<b>083244</b>	<b>079719</b>

## Acclaim Carbamate

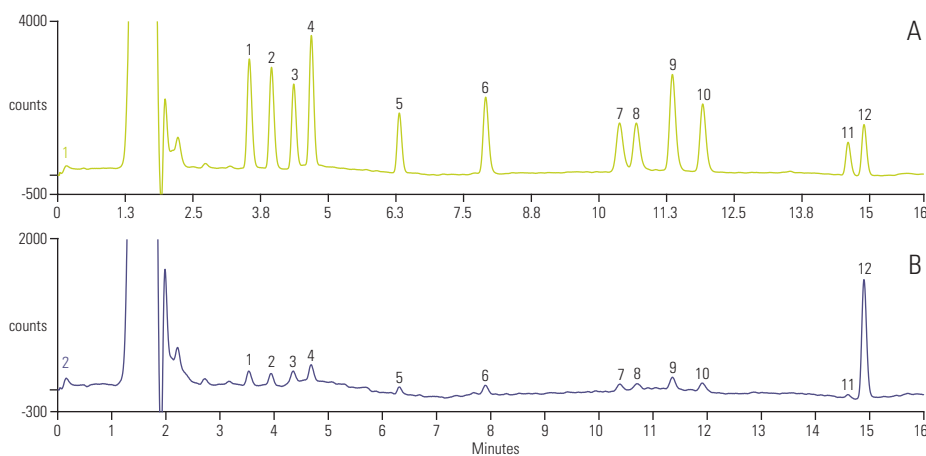
Designed for baseline separation of carbamate pesticides specified in US EPA Method 531.2

- Baseline separation of carbamate pesticides specified in US EPA Method 531.2
- Use with either LC/postcolumn derivatization/fluorescence or LC-MS detection
- Available in 2.2, 3 and 5µm particle size
- Compatible with both binary (methanol/water) and ternary (acetonitrile/methanol/water) mobile phase gradients
- High-efficiency, extremely low column bleed, and rugged column packing



Acclaim Carbamate columns are designed for baseline separation of carbamates (*N*-methylcarbamate and *N*-methylcarbamoyloxime pesticides) specified in US EPA Method 531.2. Carbamate pesticides are widely used throughout the world. Drinking water and raw surface water is monitored for the presence of carbamate pesticides and related compounds using an established EPA Method 531.2 that uses HPLC with postcolumn derivatization. LC-MS is the method of choice for the ultimate sensitivity.

### Carbamate standard - spiked rice samples



A: without dispersive SPE  
B: with dispersive SPE using PSA

#### Acclaim Carbamate, 3µm, 150 x 3.0mm

Mobile Phase:	Methanol-H <sub>2</sub> O
Gradient:	Methanol, -4.0-0.0 min, 14%; 2.0 min, 20%; 8.0 min, 40%; 13.6-16 min, 70%
Temperature:	50 °C
Flow Rate:	0.9mL/min
Injection Volume:	250µL
Detection:	Excitation/330nm and Emission/465nm
Analytes:	1. Aldicarb sulfoxide 2. Aldicarb sulfone 3. Oxamyl 4. Methomyl 5. 3-Hydroxy carbofuran 6. Aldicarb 7. Propoxur 8. Carbofuran 9. Carbaryl 10. 1-Naphthol 11. Methiocarb 12. BDMC (I.S.)

### Acclaim Carbamate

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.2	RSLC Column	100	<b>075597</b>	—	—
		150	<b>075596</b>	—	—
3	Guard Cartridges (2/pk)	10	<b>072930</b>	<b>072929</b>	<b>072928</b>
	HPLC Column	150	<b>072927</b>	<b>072926</b>	<b>072925</b>
5	HPLC Column	250	—	—	<b>072924</b>

### Acclaim Guard Holder

Description	Cat. No.
Acclaim SST Guard Cartridge Holder V-2	<b>069580</b>
Acclaim Guard Kit (Holder and coupler) V-2	<b>069707</b>
Guard to Analytical Column Coupler V-2	<b>074188</b>

## Acclaim Carbonyl C18

A silica-based, reversed-phase column designed specifically for separating DNPH derivatives of aldehydes and ketones

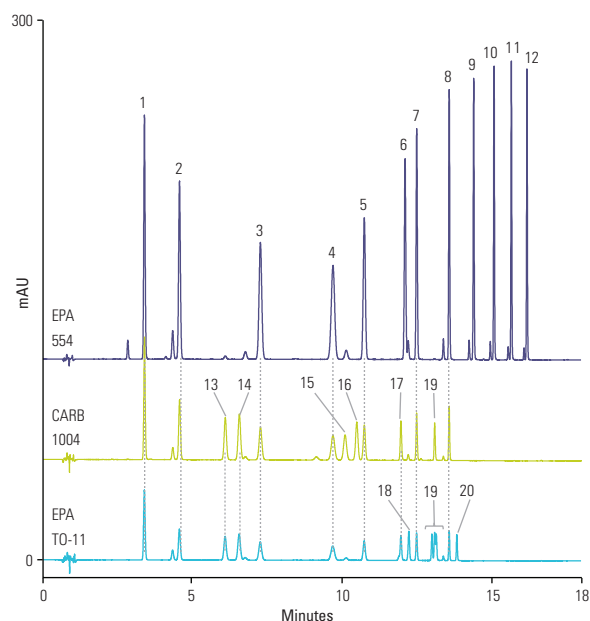
- Ideal selectivity for baseline resolution of DNPH derivatives of aldehydes and ketones regulated by various official methods, including EPA 554, EPA 8315, EPA 1667, EPA TO-11, and CARB 1004
- High efficiency for UHPLC performance
- Rugged columns with good lot-to-lot reproducibility
- Proven robust methods



Acclaim Carbonyl C18 columns are silica-based reversed phase columns designed specifically for separating DNPH derivatives of aldehydes and ketones. They exhibit superior resolution compared with other commercially available columns.

Aldehydes and ketones are common pollutants in air and water. Several standard methods have been developed to apply using dinitrophenylhydrazine (DNPH) to various environmental situations to measure these compounds. Some of the better known ones include CARB 1004 for vehicle exhaust, EPA 554 for drinking water, EPA 1667 for pharmaceutical wastewater, and EPA 8315 for general wastewater.

### DNPH aldehydes and ketones



#### Acclaim Carbonyl RSLC, 2.2µm, 150 x 2.1mm

Mobile Phase A:	D.I. water
Mobile Phase B:	Acetonitrile
Gradient (min):	-4.5 0.0 8.3 15.0 18.0
	%A 48 48 48 0 0
	%B 52 52 52 100 100
Flow Rate:	0.400mL/min
Injection Volume:	1µL
Temperature:	28°C
Detection:	UV, 360nm
Samples:	Calibration mixes diluted in methanol
Analytes:	1. Formaldehyde DNPH 2. Acetaldehyde DNPH 3. Propionaldehyde DNPH 4. Crotonaldehyde DNPH 5. Butyraldehyde DNPH 6. Cyclohexanone DNPH 7. Valeraldehyde DNPH 8. Hexanal DNPH 9. Heptanal DNPH 10. Octanal DNPH 11. Nonanal DNPH 12. Decanal DNPH 13. Acetone DNPH 14. Acrolein DNPH 15. Butanone DNPH 16. Methacrolein DNPH 17. Benzaldehyde DNPH 18. Isovaleraldehyde DNPH 19. Toluvaldehyde DNPH 20. Xylylaldehyde DNPH

### Acclaim Carbonyl C18

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.2	RSLC Column	100	<b>077972</b>	<b>077974</b>	—
		150	<b>077973</b>	—	—
3	HPLC Column	150	<b>079011</b>	<b>079010</b>	—
		250	—	<b>079009</b>	—
5	Guard Cartridge (2/pk)	10	<b>079012</b>	<b>079013</b>	<b>079014</b>
	HPLC Column	150	—	—	<b>079008</b>
		250	—	—	<b>083214</b>



## Hypercarb HPLC Columns

### 100% porous graphitic carbon for extended separation capabilities

Used for the retention and separation of highly polar species. Thermo Scientific™ Hypercarb™ columns are ideally suited to solve in both reversed phase and normal phase HPLC and LC-MS applications.

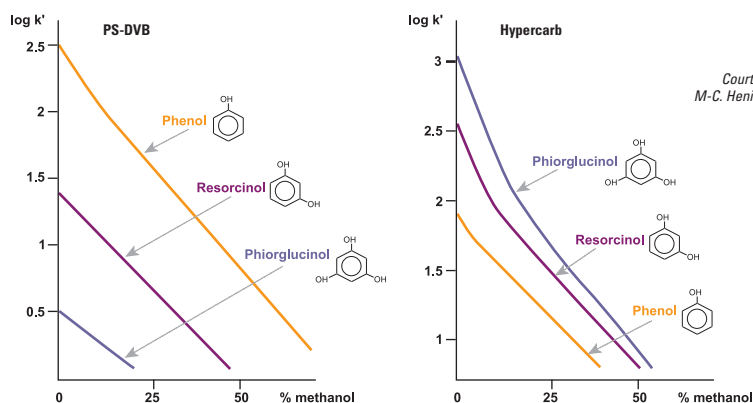
- **Exceptional Retention of Very Polar Analytes**  
Ideal for complex separations
- **Separates Structurally Related Substances**  
More effective than silica-based columns
- **pH Stable from 0 to 14**  
Extended temperature and pressure capabilities



The Hypercarb web page contains the latest news, applications and downloads for the Hypercarb HPLC column range. Visit [www.thermoscientific.com/hypercarb](http://www.thermoscientific.com/hypercarb)

### Increased Retention of Polar Analytes

In typical reversed phase chromatography, the retention of an analyte is directly related to its hydrophobicity: the more hydrophobic the analyte, the longer its retention. Conversely, as the polarity of the analyte increases, analyte-solvent interactions begin to dominate and retention is reduced. This observation holds true for the majority of reversed phase systems. An exception to this rule is Hypercarb columns, for which retention may in some cases increase as the polarity of the analyte increases, illustrated to the right. This phenomenon is referred to as the "polar retention effect on graphite" (PREG). This property makes Hypercarb columns particularly useful for the separation of highly polar compounds (with logP as low as -4) that are normally difficult to retain and resolve on silica-based alkyl chain phases. The retention of very polar solutes on Hypercarb columns can be achieved without ion pair reagents or complex mobile phase conditions, as illustrated in the chromatogram below.



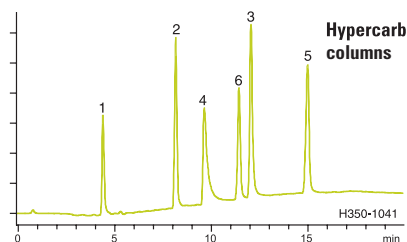
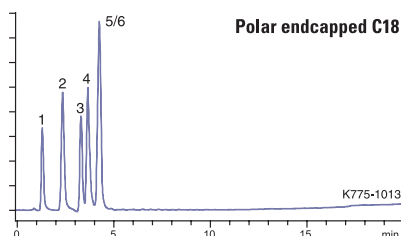
Courtesy V. Coquart and M.-C. Henion, J. Chrom., 1992

Retention on Hypercarb columns increases as polarity of the analyte increases, which is the opposite of typical reversed phase materials such as PS-DVB

### Extended pH Range

One of the other key benefits of Hypercarb columns is the extreme stability of the phase to chemical or physical attack. Due to the unique characteristics of the media, it can withstand chemical attack across the entire pH range of 0 to 14, allowing applications to be run at pH levels that are incompatible

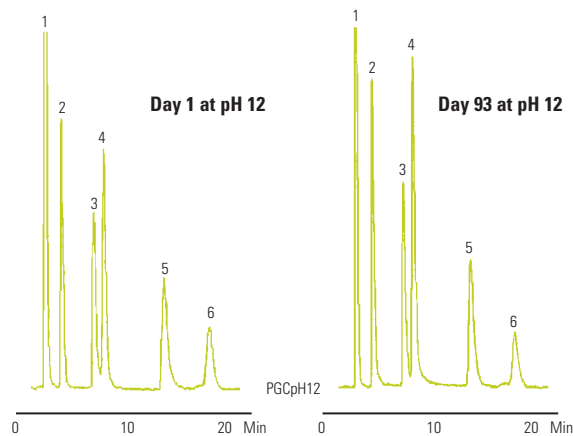
with typical silica-based columns. Hypercarb columns offer more choice in buffer selection while handling both high temperature and high pressure.



Additional retention is achieved for polar compounds using a Hypercarb column compared to a polar endcapped C18. Note also the change in elution order.

#### Hypercarb, 5µm, 100 x 0.32mm

Mobile Phase A:	H <sub>2</sub> O + 0.1% formic acid
Mobile Phase B:	ACN + 0.1% formic acid
Gradient:	0 to 25% B in 15 minutes
Temperature:	25°C
Flow Rate:	8µL/min
Detection:	UV, 254nm
Analytes:	1. Cytosine 2. Uracil 3. Guanine 4. Adenine 5. Xanthine 6. Thymine



#### Hypercarb, 5µm, 100 x 4.6mm

Mobile Phase:	MeOH:H <sub>2</sub> O
Gradient:	70:30
Flow Rate:	0.7mL/min
Detection:	UV, 254nm
Analytes:	1. Acetone 2. Phenol 3. p-Cresol 4. Anisol 5. Phenetole 6. 3,5-Xylenol

Hypercarb column stability at pH 12: retention and selectivity do not change even after 93 days of storage in 0.1M NaOH/MeOH

**Hypercarb**

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.	
3	Drop-in Guard (4/pk)	10	2.1	<b>35003-012101</b>	
			3.0	<b>35003-013001</b>	
			4.6	<b>35003-014001</b>	
	HPLC Column	30	30	1.0	<b>35003-032130</b>
				3.0	<b>35003-033030</b>
				2.1	<b>35003-052130</b>
				3.0	<b>35003-053030</b>
				4.6	<b>35003-054630</b>
				2.1	<b>35003-102130</b>
		100	30	3.0	<b>35003-103030</b>
				4.6	<b>35003-104630</b>
				2.1	<b>35003-152130</b>
				3.0	<b>35003-153030</b>
				4.6	<b>35003-154630</b>
				2.1	<b>35003-032146</b>
	High Temperature HPLC Column	30	2.1	<b>35003-032146</b>	
		50	2.1	<b>35003-052146</b>	
		100	4.6	<b>35003-054646</b>	
	5	Drop-in Guard (4/pk)	10	2.1	<b>35005-012101</b>
				3.0	<b>35005-013001</b>
				4.6	<b>35005-014001</b>
HPLC Column		30	30	2.1	<b>35005-032130</b>
				3.0	<b>35005-033030</b>
				4.6	<b>35005-034630</b>
				2.1	<b>35005-052130</b>
				3.0	<b>35005-053030</b>
				4.6	<b>35005-054630</b>
		100	30	2.1	<b>35005-102130</b>
				3.0	<b>35005-103030</b>
				4.6	<b>35005-104630</b>
				2.1	<b>35005-152130</b>
				3.0	<b>35005-153030</b>
				4.6	<b>35005-154630</b>
High Temperature HPLC Column		30	2.1	<b>35005-032146</b>	
		50	4.6	<b>35005-034646</b>	
		100	2.1	<b>35005-052146</b>	
Javelin HTS Column		20	2.1	4.6	<b>35005-054646</b>
				2.1	<b>35005-102146</b>
				4.6	<b>35005-104646</b>
Preparative HPLC Column	100	2.1	<b>35005-022135</b>		
		10	<b>35005-109070</b>		
		21.2	<b>35005-109270</b>		
		30	<b>35005-109370</b>		
		10	<b>35005-159070</b>		
		21.2	<b>35005-159270</b>		

Format	Length (mm)	ID (mm)	Cat. No.
UNIGUARD Guard Cartridge Holder	10	1.0	<b>851-00</b>
		2.1	<b>852-00</b>
		3.0	<b>852-00</b>
		4.6	<b>850-00</b>





## Synchronis HPLC and UHPLC Columns

### Remarkable separations guaranteed time after time

Thermo Scientific™ Synchronis™ HPLC columns are used to achieve consistent, reproducible separations. Chemistries available for a variety of applications.

- **Consistent Separations**

Highly pure, high surface area silica

- **Dense Bonding and Double Endcapping**

Reduction of residual silanols available to interact with basic analytes

- **Strong Quality Control**

Rigorously tested to ensure quality



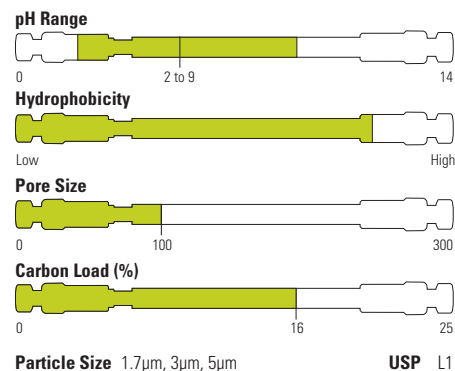
The Synchronis web page contains the latest news, applications and downloads for the Synchronis HPLC column range.

Visit [www.thermoscientific.com/synchronis](http://www.thermoscientific.com/synchronis)

## Synchronis C18

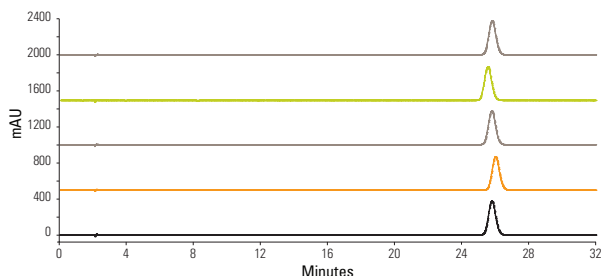
Synchronis C18 columns deliver remarkable separations, time after time

- Highly pure, high surface area silica
- High carbon load for increased retention
- Double endcapped for extra surface coverage
- Highly inert towards basic compounds
- Rigorously tested to ensure quality



Synchronis C18 columns show excellent column to column reproducibility, as illustrated here by the analysis of zidovudine using five separate columns. The reproducibility in terms of retention time and peak area is less than or equal to 0.5%, column to column.

### Zidovudine



#### Synchronis C18, 5µm, 150 x 4.6mm

Mobile Phase:	Water:Methanol (4:1)
Temperature:	25°C
Flow Rate:	1.0mL/min
Injection Volume:	10µL
Detection:	UV, 265nm
Analytes:	1. Zidovudine

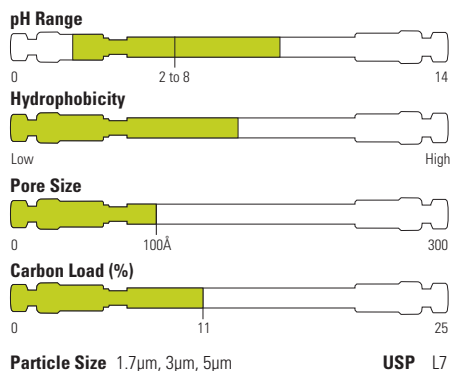
### Synchronis C18

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
1.7	UHPLC Column	30	<b>97102-032130</b>	-	-
		50	<b>97102-052130</b>	-	-
		100	<b>97102-102130</b>	-	-
3	HPLC Column	30	<b>97103-032130</b>	-	-
		50	<b>97103-052130</b>	-	<b>97103-054630</b>
		100	<b>97103-102130</b>	<b>97103-103030</b>	<b>97103-104630</b>
		150	<b>97103-152130</b>	-	<b>97103-154630</b>
5	Drop-in Guard (4/pk)	10	<b>97105-012101</b>	<b>97105-013001</b>	<b>97105-014001</b>
	HPLC Column	30	<b>97105-032130</b>	-	-
		50	<b>97105-052130</b>	<b>97105-053030</b>	<b>97105-054630</b>
		100	<b>97105-102130</b>	<b>97105-103030</b>	<b>97105-104630</b>
		150	<b>97105-152130</b>	<b>97105-153030</b>	<b>97105-154630</b>
		250	<b>97105-252130</b>	<b>97105-253030</b>	<b>97105-254630</b>
UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	

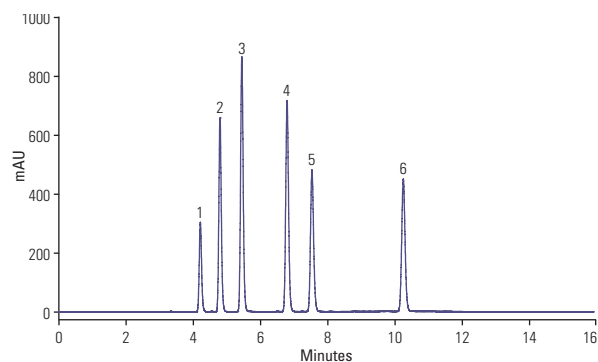
## Synchronis C8

Reduces hydrophobic interactions allowing compounds to elute quicker from the column. Recommended for analytes with medium hydrophobicity or when a less hydrophobic phase is required to obtain optimum retention.

- Highly pure, high surface area silica
- Less hydrophobic than Synchronis C18
- Double endcapped for extra surface coverage
- Rigorously tested to ensure quality



### Uron herbicides



#### Synchronis C8, 5µm, 150 x 4.6mm

Mobile Phase A:	Water
Mobile Phase B:	Acetonitrile
Gradient:	35 to 60% B in 10 minutes
Temperature:	30°C
Flow Rate:	1.0mL/min
Injection Volume:	20µL
Detection:	240nm
Analytes:	1. Tebuthiuron 2. Metoxuron 3. Monuron 4. Chlorotoluron 5. Diuron 6. Linuron

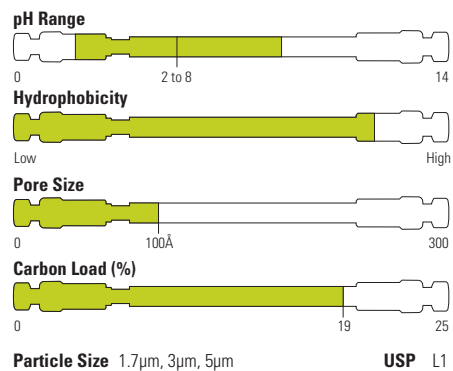
### Synchronis C8

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
1.7	UHPLC Column	50	<b>97202-052130</b>	-	-
		100	<b>97202-102130</b>	-	-
3	HPLC Column	50	<b>97203-052130</b>	-	-
		100	-	<b>97203-103030</b>	<b>97203-104630</b>
		150	-	-	<b>97203-154630</b>
5	Drop-in Guard (4/pk)	10	<b>97205-012101</b>	<b>97205-013001</b>	<b>97205-014001</b>
		30	<b>97205-032130</b>	-	-
	HPLC Column	50	<b>97205-052130</b>	<b>97205-053030</b>	<b>97205-054630</b>
		100	<b>97205-102130</b>	<b>97205-103030</b>	<b>97205-104630</b>
		150	<b>97205-152130</b>	<b>97205-153030</b>	<b>97205-154630</b>
		250	-	<b>97205-253030</b>	<b>97205-254630</b>
UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	

## Synchronis aQ

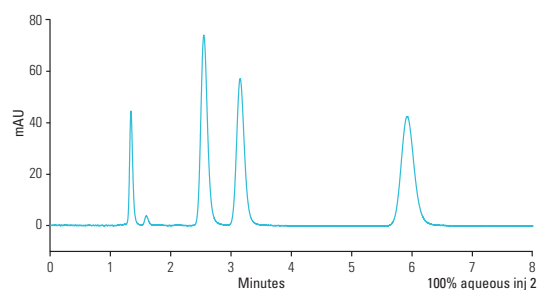
Polar endcapped Synchronis aQ columns provide a controlled interaction mechanism that retains and resolves polar analytes

- Stable in 100% aqueous mobile phase
- Enhanced retention of polar compounds
- Rigorously tested to ensure quality



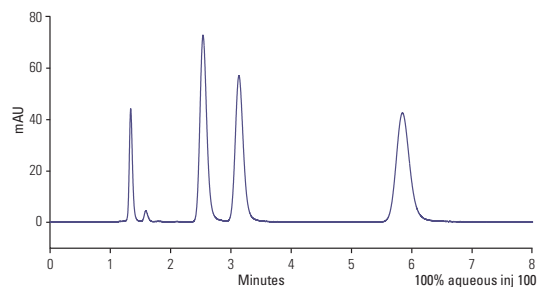
In comparison to a conventionally endcapped C18, the Synchronis aQ polar end-capped C18 stationary phase exhibits superior stability towards aqueous mobile phase. Synchronis aQ shows no degradation in performance after 100 injections in a buffered 100% aqueous eluent.

### Stability of Synchronis aQ in 100% aqueous mobile phase



#### Synchronis aQ, 5µm, 100 x 4.6mm

Mobile Phase:	50mM Aqueous $K_2HPO_4$ (pH 6)
Temperature:	30°C
Flow Rate:	0.7mL/min
Injection Volume:	2µL
Detection:	260nm
Analytes:	1. Cytidine-5'-diphosphate 2. Adenosine-5'-triphosphate 3. Adenosine-5'-diphosphate 4. Adenosine-5'-monophosphate



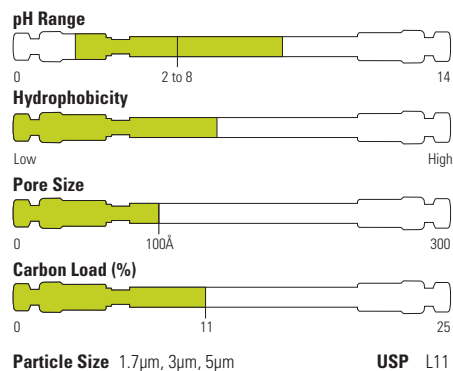
### Synchronis aQ

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.7	UHPLC Column	50	<b>97302-052130</b>	-	-	<b>97302-054630</b>
		100	<b>97302-102130</b>	<b>97302-103030</b>	-	-
3	HPLC Column	50	<b>97303-052130</b>	-	-	-
		100	-	<b>97303-103030</b>	-	<b>97303-104630</b>
		150	-	-	-	<b>97303-154630</b>
5	Drop-in Guard (4/pk)	10	<b>97305-012101</b>	<b>97305-013001</b>	<b>97305-014001</b>	<b>97305-014001</b>
		50	<b>97305-052130</b>	<b>97305-053030</b>	-	<b>97305-054630</b>
		100	<b>97305-102130</b>	-	-	<b>97305-104630</b>
		150	<b>97305-152130</b>	<b>97305-153030</b>	<b>97305-154030</b>	<b>97305-154630</b>
		250	-	<b>97305-253030</b>	<b>97305-254030</b>	<b>97305-254630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	<b>850-00</b>

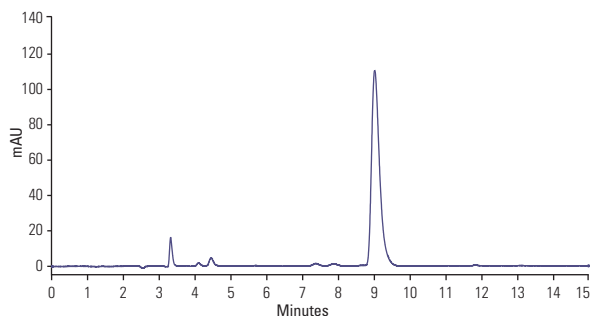
## Synchronis Phenyl

Provides an alternative to Synchronis C18 and is particularly useful for retention of aromatic compounds

- Alternative selectivity to Synchronis C18
- Double endcapped for extra surface coverage
- Highly inert towards basic compounds
- Rigorously tested to ensure quality



### Oxacillin sodium (USP)



#### Synchronis Phenyl, 5µm, 300 x 4.0mm

Mobile Phase:	Phosphate Buffer: MeCN:MeOH (70:30:10)
Temperature:	25°C
Flow Rate:	1.0mL/min (2mL/min in USP method)
Injection Volume:	10µL
Detection:	UV, 225nm
Analytes:	1. Oxacillin Sodium (0.11mg/mL)

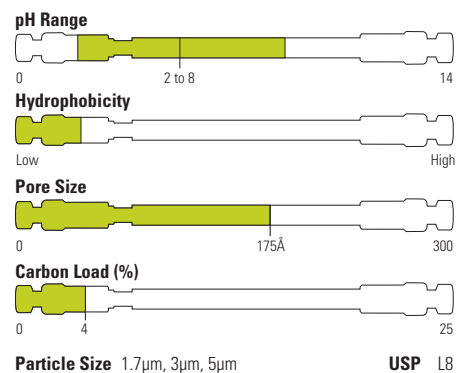
### Synchronis Phenyl

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
1.7	UHPLC Column	50	<b>97902-052130</b>	-	-
		100	<b>97902-102130</b>	-	-
3	HPLC Column	50	<b>97903-052130</b>	-	-
		100	-	-	<b>97903-104630</b>
		150	-	-	<b>97903-154630</b>
5	Drop-in Guard (4/pk)	10	<b>97905-012101</b>	<b>97905-013001</b>	<b>97905-014001</b>
	HPLC Column	50	-	<b>97905-053030</b>	<b>97905-054630</b>
		100	-	<b>97905-103030</b>	<b>97905-104630</b>
		150	<b>97905-152130</b>	-	<b>97905-154630</b>
		250	-	-	<b>97905-254630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>

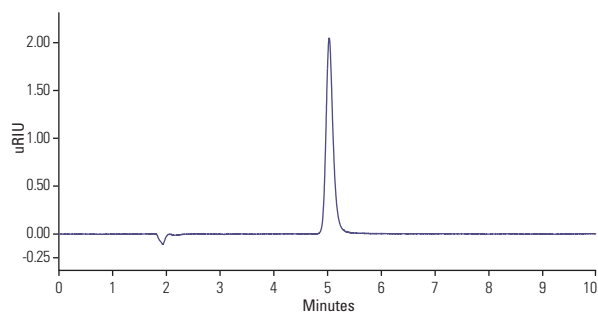
## Synchronis Amino

Provides a versatile aminopropyl phase that gives excellent chromatographic properties in four modes: weak anion exchange, reversed-phase, normal phase and HILIC

- Highly pure, high surface area silica
- Double endcapped for extra surface coverage
- Rigorously tested to ensure quality



### Lactulose



#### Synchronis Amino 5µm, 150 x 4.6mm

Mobile Phase:	Water: MeCN (30:70)
Temperature:	35°C
Flow Rate:	1.0mL/min
Detection:	RI
Injection Volume:	5µL
Analytes:	1. Lactulose

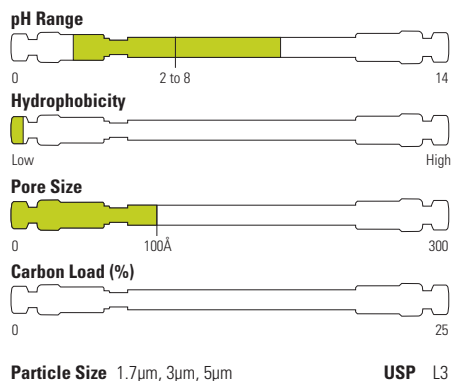
### Synchronis Amino

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.7	UHPLC Column	50	<b>97702-052130</b>	-	-	-
		100	<b>97702-102130</b>	-	-	-
3	HPLC Column	50	<b>97703-052130</b>	-	-	-
5	Drop-in Guard (4/pk)	10	<b>97705-012101</b>	<b>97705-013001</b>	<b>97705-014001</b>	<b>97705-014001</b>
	HPLC Column	30	<b>97705-032130</b>	-	-	-
		50	<b>97705-052130</b>	-	-	<b>97705-054630</b>
		150	<b>97705-152130</b>	<b>97705-153030</b>	<b>97705-154030</b>	<b>97705-154630</b>
		250	-	<b>97705-253030</b>	<b>97705-254030</b>	<b>97705-254630</b>
UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	<b>850-00</b>	

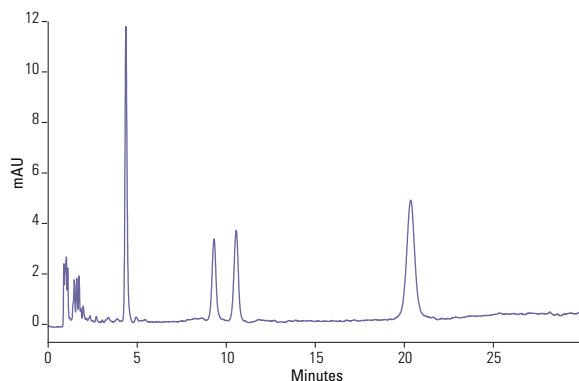
## Synchronis Silica

Serves as a powerful and efficient tool for the chromatography of moderately polar organic compounds by normal phase chromatography

- Highly pure, high surface area silica
- Excellent reproducibility for normal phase chromatography
- Rigorously tested to ensure quality



### Tocopherols



#### Synchronis Silica 5 μm, 150 x 4.6mm

Mobile Phase: Hexane +0.2% propan-2-ol (IPA)  
 Temperature: 40°C  
 Flow Rate: 2.0mL/min  
 Injection Volume: 10 μL  
 Detection: UV, 254nm  
 Analytes: α-tocopherol  
 β-tocopherol  
 γ-tocopherol  
 δ-tocopherol

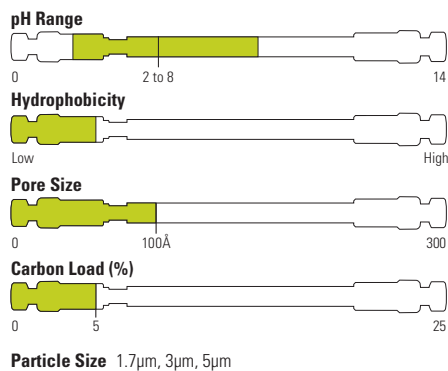
### Synchronis Silica

Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.7	UHPLC Column	50	<b>97002-052130</b>	-	-	-
		100	<b>97002-102130</b>	-	-	-
3	HPLC Column	50	<b>97003-052130</b>	-	-	-
5	Drop-in Guard (4/pk)	10	<b>97005-012101</b>	<b>97005-013001</b>	<b>97005-014001</b>	<b>97005-014001</b>
	HPLC Column	50	<b>97005-052130</b>	-	-	-
		100	<b>97005-102130</b>	-	-	-
		150	<b>97005-152130</b>	<b>97005-153030</b>	<b>97005-154030</b>	<b>97005-154630</b>
		250	-	<b>97005-253030</b>	<b>97005-254030</b>	<b>97005-254630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>	<b>850-00</b>

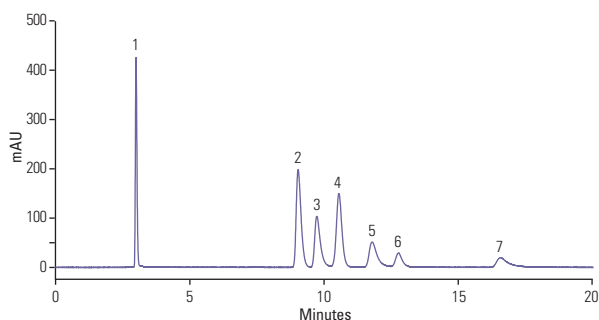
## Synchronis HILIC

Provides enhanced retention of polar and hydrophilic analytes

- Alternative selectivity to Synchronis C18
- Improved sensitivity with MS detection
- No need for ion-pair or derivatization
- Outstanding peak shape and sensitivity
- Highly pure, high surface area silica particles
- Neutral (uncharged), highly polar surface



### Catecholamines



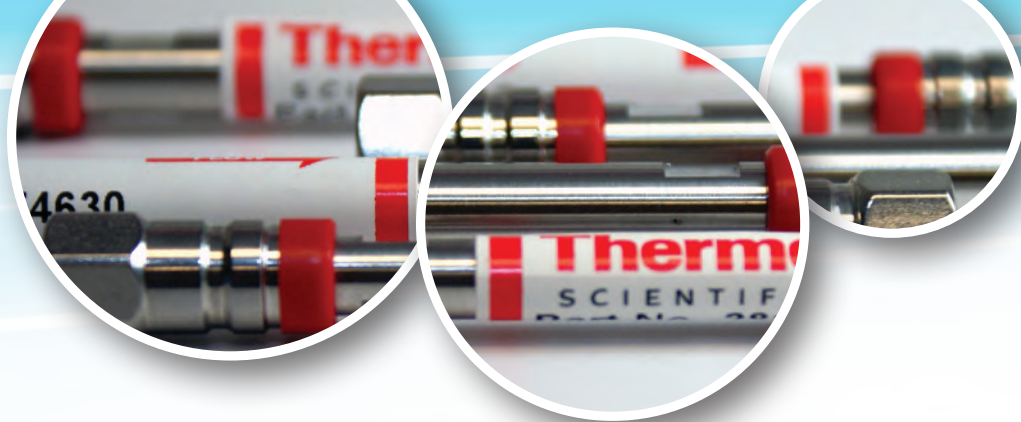
#### Synchronis HILIC, 5 μm, 250 x 4.6mm

Mobile Phase:	Water : acetonitrile : 200mM ammonium formate (10.5 : 84.5 : 5)
Temperature:	40°C
Flow Rate:	1.0mL/min
Injection Volume:	5 μL
Detection:	UV, 280nm
Analytes:	1. catechol 2. 5-HIAA 3. DOPAC 4. serotonin 5. tyrosine 6. dopamine 7. L-DOPA

### Synchronis HILIC

Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
1.7	UHPLC Column	50	<b>97502-052130</b>	-	<b>97502-054630</b>
		100	<b>97502-102130</b>	-	-
3	HPLC Column	50	<b>97503-052130</b>	-	-
		100	-	-	<b>97503-104630</b>
		150	-	-	<b>97503-154630</b>
5	Drop-in Guard (4/pk)	10	<b>97505-012101</b>	<b>97505-013001</b>	<b>97505-014001</b>
	HPLC Column	50	<b>97505-052130</b>	-	<b>97505-054630</b>
		100	<b>97505-102130</b>	-	<b>97505-104630</b>
		150	<b>97505-152130</b>	<b>97505-153030</b>	<b>97505-154630</b>
		250	-	-	<b>97505-254630</b>
	UNIGUARD Drop-in Guard Cartridge Holder	10	<b>852-00</b>	<b>852-00</b>	<b>850-00</b>





## Hypersil BDS and Hypersil Classical HPLC Columns

### Exceptionally reliable and reproducible general purpose columns

Exceptionally reliable robust columns that guarantee you have the same results time after time, even after changing your column. Chemistries available for a variety of applications.

- **Excellent Reproducibility**  
Manufactured to the highest standards
- **Very Robust and Rugged**  
Rigorous quality control under certified processes
- **Long Column Lifetimes**  
Ideal for QA/QC labs



The Hypersil BDS/Classical web page contains the latest news, applications and downloads for the Hypersil BDS/Classical HPLC column range. Visit [www.thermoscientific.com/columns](http://www.thermoscientific.com/columns)

# Hypersil BDS

A good choice for robust, general purpose columns

## Hypersil BDS

Particle Size (µm)	Format	Length (mm)	ID (mm)	C18	C8	Phenyl	CN		
2.4	Drop-in Guard (4/pk)	10	2.1	<b>28102-012101</b>	<b>28202-012101</b>	-	-		
			4.0/4.6	<b>28102-014001</b>	<b>28202-014001</b>	-	-		
		50	2.1	<b>28102-052130</b>	<b>28202-052130</b>	-	-		
			4.6	<b>28102-054630</b>	-	-	-		
	100	2.1	2.1	<b>28102-102130</b>	<b>28202-102130</b>	-	-		
			4.6	<b>28102-104630</b>	<b>28202-104630</b>	-	-		
		4.6	-	<b>28202-154630</b>	-	-	-		
			-	-	-	-	-		
	3	Drop-in Guard (4/pk)	10	2.1	<b>28103-012101</b>	<b>28203-012101</b>	-	-	
				3.0	<b>28103-013001</b>	<b>28203-013001</b>	-	-	
4.0/4.6				<b>28103-014001</b>	<b>28203-014001</b>	<b>28903-014001</b>	<b>28803-014001</b>		
HPLC Column			30	2.1	<b>28103-032130</b>	-	-	-	
		2.1		<b>28103-052130</b>	<b>28203-052130</b>	-	-		
		100	3.0	<b>28103-053030</b>	-	-	-		
			4.6	<b>28103-054630</b>	<b>28203-054630</b>	-	-		
			2.1	<b>28103-102130</b>	-	-	-		
			3.0	<b>28103-103030</b>	-	-	-		
		150	4.0	<b>28103-104030</b>	-	-	-		
			4.6	<b>28103-104630</b>	<b>28203-104630</b>	-	-		
2.1			<b>28103-152130</b>	-	-	-			
3.0			<b>28103-153030</b>	<b>28203-153030</b>	-	-			
4.0			<b>28103-154030</b>	-	-	-			
4.6			<b>28103-154630</b>	<b>28203-154630</b>	<b>28903-154630</b>	<b>28803-154630</b>			
5			Drop-in Guard (4/pk)	10	2.1	<b>28105-012101</b>	<b>28205-012101</b>	-	-
					3.0	<b>28105-013001</b>	<b>28205-013001</b>	-	-
		4.0/4.6			<b>28105-014001</b>	<b>28205-014001</b>	<b>28905-014001</b>	<b>28805-014001</b>	
		HPLC Column		50	2.1	<b>28105-052130</b>	<b>28205-052130</b>	-	-
			3.0		<b>28105-053030</b>	<b>28205-053030</b>	-	-	
	4.6		<b>28105-054630</b>		<b>28205-054630</b>	-	-		
	2.1		<b>28105-102130</b>		<b>28205-102130</b>	-	-		
	100		3.0	<b>28105-103030</b>	-	-	-		
			4.0	<b>28105-104030</b>	-	-	-		
			4.6	<b>28105-104630</b>	<b>28205-104630</b>	-	-		
3.0			<b>28105-123030</b>	-	-	-			
125	4.0	<b>28105-124030</b>	-	-	-				
	4.6	<b>28105-124630</b>	-	-	-				
	2.1	<b>28105-152130</b>	-	-	-				
	3.0	<b>28105-153030</b>	-	-	-				
150	4.0	<b>28105-154030</b>	<b>28205-154030</b>	-	-				
	4.6	<b>28105-154630</b>	<b>28205-154630</b>	<b>28905-154630</b>	<b>28805-154630</b>				
	2.1	<b>28105-252130</b>	-	-	-				
	3.0	<b>28105-253030</b>	-	-	-				
250	4.0	<b>28105-254030</b>	<b>28205-254030</b>	<b>28905-254030</b>	-				
	4.6	<b>28105-254630</b>	<b>28205-254630</b>	<b>28905-254630</b>	<b>28805-254630</b>				

Format	Length (mm)	ID (mm)	Cat. No.
UNIGUARD Guard Cartridge Holder	10	1.0	<b>851-00</b>
		2.1	<b>852-00</b>
		3.0	<b>852-00</b>
		4.0/4.6	<b>850-00</b>

# Hypersil Classical

A global standard for many existing methods

## Hypersil ODS

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.		
3	Drop-in Guard (4/pk)	10	2.1	<b>30103-012101</b>		
			3.0	<b>30103-013001</b>		
			4.0/4.6	<b>30103-014001</b>		
	HPLC Column	50	50	3.0	<b>30103-053030</b>	
				4.6	<b>30103-054630</b>	
				100	2.1	<b>30103-102130</b>
		100	100	3.0	<b>30103-103030</b>	
				4.0	<b>30103-104030</b>	
				4.6	<b>30103-104630</b>	
		125	125	4.0	<b>30103-124030</b>	
				4.6	<b>30103-124630</b>	
		150	150	2.1	<b>30103-152130</b>	
				3.0	<b>30103-153030</b>	
			250	250	4.0	<b>30103-154030</b>
					4.6	<b>30103-154630</b>
	5	Drop-in Guard (4/pk)	10	2.1	<b>30105-012101</b>	
				3.0	<b>30105-013001</b>	
				4.0/4.6	<b>30105-014001</b>	
		HPLC Column	50	50	3.0	<b>30105-053030</b>
					4.6	<b>30105-054630</b>
					100	2.1
100			100	3.0	<b>30105-103030</b>	
				4.0	<b>30105-104030</b>	
				4.6	<b>30105-104630</b>	
125	125		3.0	<b>30105-123030</b>		
			4.0	<b>30105-124030</b>		
			4.6	<b>30105-124630</b>		
150	150		2.1	<b>30105-152130</b>		
			3.0	<b>30105-153030</b>		
	200		200	4.0	<b>30105-154030</b>	
				4.6	<b>30105-154630</b>	
250	250		2.1	<b>30105-202130</b>		
			4.0	<b>30105-204030</b>		
			4.6	<b>30105-204630</b>		
	250		250	2.1	<b>30105-252130</b>	
				3.0	<b>30105-253030</b>	
			4.0	<b>30105-254030</b>		
			4.6	<b>30105-254630</b>		

**Hypersil ODS-2**

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
3	Drop-in Guard (4/pk)	10	4.0/4.6	<b>31603-014001</b>
	HPLC Column	50	4.6	<b>31603-054630</b>
		100	4.0	<b>31603-104030</b>
		4.6	<b>31603-104630</b>	
		150	4.6	<b>31603-154630</b>
5	Drop-in Guard (4/pk)	10	4.0/4.6	<b>31605-014001</b>
	HPLC Column	50	4.6	<b>31605-054630</b>
		100	4.6	<b>31605-104630</b>
		150	4.6	<b>31605-154630</b>
		250	4.0	<b>31605-254030</b>
4.6	<b>31605-254630</b>			

**Hypersil MOS (C8)**

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
5	Drop-in Guard (4/pk)	10	4.0/4.6	<b>30205-014001</b>
	HPLC Column	50	4.6	<b>30205-054630</b>
		100	4.6	<b>30205-104630</b>
		150	4.6	<b>30205-154630</b>
		250	4.0	<b>30205-254030</b>
4.6	<b>30205-254630</b>			

**Hypersil MOS-2 (C8)**

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
5	Drop-in Guard (4/pk)	10	4.0/4.6	<b>30305-014001</b>
	HPLC Column	150	4.6	<b>30305-154630</b>
		250	4.0	<b>30305-254030</b>
		4.6	<b>30305-254630</b>	

**Hypersil SAS (C1)**

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
5	Drop-in Guard (4/pk)	10	4.0/4.6	<b>30505-014001</b>
	HPLC Column	150	4.6	<b>30505-154630</b>
		250	4.6	<b>30505-254630</b>

**Hypersil Phenyl**

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
5	Drop-in Guard (4/pk)	10	4.0/4.6	<b>30905-014001</b>
	HPLC Column	50	4.6	<b>30905-054630</b>
		150	4.6	<b>30905-154630</b>
		250	4.0	<b>30905-254030</b>
4.6	<b>30905-254630</b>			

**Hypersil Phenyl-2**

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
5	Drop-in Guard (4/pk)	10	4.0/4.6	<b>31905-014001</b>
	HPLC Column	150	4.6	<b>31905-154630</b>
		250	4.6	<b>31905-254630</b>

### Hypersil CPS

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
3	Drop-in Guard (4/pk)	10	4.0/4.6	<b>30803-014001</b>
	HPLC Column	150	4.6	<b>30803-154630</b>
5	Drop-in Guard (4/pk)	10	4.0/4.6	<b>30805-014001</b>
	HPLC Column	150	4.6	<b>30805-154630</b>
		250	4.0	<b>30805-254030</b>
			4.6	<b>30805-254630</b>

### Hypersil CPS-2

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
5	Drop-in Guard (4/pk)	10	4.6	<b>31805-014001</b>
	HPLC Column	150	4.6	<b>31805-254630</b>
		250	4.6	<b>31805-254630</b>

### Hypersil APS-2

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.	
3	Drop-in Guard (4/pk)	10	2.1	<b>30703-012101</b>	
			4.6	<b>30703-014001</b>	
	HPLC Column	50	4.6	<b>30703-054630</b>	
			100	2.1	<b>30703-102130</b>
			150	2.1	<b>30703-152130</b>
5	Drop-in Guard (4/pk)	10	4.6	<b>30703-154630</b>	
			3.0	<b>30705-013001</b>	
	HPLC Column	100	4.0/4.6	<b>30705-014001</b>	
			3.0	<b>30705-103030</b>	
			4.6	<b>30705-104630</b>	
			4.6	<b>30705-154630</b>	
			4.0	<b>30705-254030</b>	
	4.6	<b>30705-254630</b>			

### Hypersil Silica

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.	
3	Drop-in Guard (4/pk)	10	2.1	<b>30003-012101</b>	
			3.0	<b>30003-013001</b>	
			4.0/4.6	<b>30003-014001</b>	
	HPLC Column	50	2.1	<b>30003-052130</b>	
			4.6	<b>30003-054630</b>	
			4.6	<b>30003-154630</b>	
5	Drop-in Guard (4/pk)	10	3.0	<b>30005-013001</b>	
			4.0/4.6	<b>30005-014001</b>	
	HPLC Column	50	4.6	<b>30005-054630</b>	
			100	4.6	<b>30005-104630</b>
			150	4.6	<b>30005-154630</b>
			250	4.0	<b>30005-254030</b>
		4.6	<b>30005-254630</b>		

## Hypersil Classical *continued*

### Hypersil SAX

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
5	Drop-in Guard (4/pk)	10	3.0	<b>34105-013001</b>
			4.6	<b>34105-014001</b>
	HPLC Column	250	3.0	<b>34105-253030</b>
			4.6	<b>34105-254630</b>

### Hypersil Green PAH

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
3	Guard Cartridge	10	2.1	<b>31103-012101</b>
			3.0	<b>31103-013001</b>
			4.6	<b>31103-014001</b>
	HPLC Column	100	2.1	<b>31103-102130</b>
			3.0	<b>31103-103030</b>
			4.6	<b>31103-104630</b>
	HPLC Column	150	2.1	<b>31103-152130</b>
			4.6	<b>31103-154630</b>
			5	Guard Cartridge
5	HPLC Column	100	4.6	<b>31105-104630</b>
		150	4.6	<b>31105-154630</b>
		250	4.6	<b>31105-254630</b>

## IonPac NS1 and NS2

Polymeric reversed-phase column ideal for the separation of hydrophobic, ionizable compounds

- Excellent resolution
- Good peak shape
- Ideal for separation of large molecules that carry localized charges, such as surfactants
- Compatible with acids, bases, and solvent from pH 0 to 14
- Can also be used for traditional polymeric reversed-phase applications
- Utilize ion-pair chromatography for difficult separations

Thermo Scientific™ IonPac™ NS1-10µm and NS1-5µm columns are packed with a neutral, macroporous, high-surface-area, ethylvinylbenzene polymer crosslinked with 55% divinylbenzene. This resin makes the NS1 resistant to solvents, acids, and bases, and permits the use of eluent from pH 0 to 14. The Dionex IonPac NS1 column is the column of choice for routine ion pair chromatography.

IonPac NS2 is a silica-based column for mobile-phase ion chromatography (MPIC) applications using eluents containing trifluoroacetic acid (TFA), heptafluorobutyric acid (HFBA), or tetrabutylammonium borate (TBAB). It provides high performance analysis for hydrophobic amines and hydrophobic acids using suppressed conductivity detection.

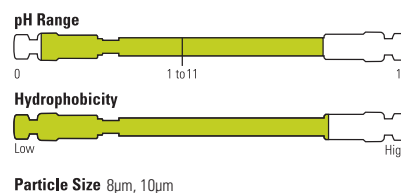
### IonPac NS1 and NS2

Description	Particle Size (µm)	Format	Length (mm)	2.0mm ID	4.0mm ID
IonPac NS1	5	HPLC Column	150	–	<b>039568</b>
	10	Guard Column	35	<b>088763</b>	<b>039567</b>
		HPLC Column	250	<b>088762</b>	<b>035321</b>
IonPac NS2	5	Guard Column	35	–	<b>088788</b>
		HPLC Column	150	–	<b>088787</b>
			250	–	<b>088786</b>

## HyperREZ XP

Polymer-based columns for carbohydrate analysis

- Designed for the determination of carbohydrates, saccharides, organic acids, and alcohols
- Efficient and reproducible monodisperse particles
- Stable for long column lifetimes even at low pH and high temperatures



### HyperREZ XP

	Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
HyperREZ XP Carbohydrate H+	8	Guard Cartridge (2/pk)	5	3.0	<b>69008-903027</b>
		Guard Column	50	7.7	<b>69008-057726</b>
		HPLC Column	300	7.7	<b>69008-307780</b>
HyperREZ XP Carbohydrate Ca <sup>2+</sup>	8	Guard Cartridge (2/pk)	5	3.0	<b>69208-903027</b>
		Guard Column	50	7.7	<b>69208-057726</b>
		HPLC Column	300	7.7	<b>69208-307780</b>
HyperREZ XP Carbohydrate Pb <sup>2+</sup>	8	Guard Cartridge (2/pk)	5	3.0	<b>69108-903027</b>
		Guard Column	50	7.7	<b>69108-057726</b>
		HPLC Column	300	7.7	<b>69108-307780</b>
HyperREZ XP Carbohydrate Na+	10	Guard Cartridge (2/pk)	5	3.0	<b>69310-903027</b>
		Guard Column	50	7.7	<b>69310-057726</b>
		HPLC Column	300	7.7	<b>69310-307780</b>
HyperREZ XP Organic Acids	8	Guard Cartridge (2/pk)	5	3.0	<b>69008-903027</b>
		HPLC Column	100	7.7	<b>69608-107780</b>
HyperREZ XP Sugar Alcohols	8	Guard Cartridge (2/pk)	5	3.0	<b>69208-903027</b>
		HPLC Column	250	4.0	<b>69708-254080</b>

Format	Length (mm)	ID (mm)	Cat. No.
HyperRez Guard Cartridge Holder	5	3	<b>60002-354</b>

### Retention Times of Common Saccharides (min)

Saccharide	H <sup>+</sup>	Ca <sup>2+</sup>	Pb <sup>2+</sup>
Adonitol	11.5	14.9	20.4
Arabinose	11.4	13.6	19.4
Erythritol	12.7	15.6	20.3
Fructose	10.6	13.5	19.3
Fucose	12.2	13.7	17.1
Galactose	1.07	12.2	15.6
Glucose	9.9	11.1	13.9
Glycerol	14.1	16.1	19.5
Lactose	8.6	9.7	12.8
Maltose	8.4	9.5	12.5
Maltotriose	7.7	8.7	11.9
Mannitol	11.0	17.3	28.9
Mannose	1.5	12.5	16.7
Raffinose	8.2	8.6	11.4
Sorbitol	11.1	20.7	N/A
Sucrose	9.8	9.4	11.9
Xylose	10.6	12.0	15.0

#### HyperREZ Carbohydrate H+ 300 x 7.7mm HyperREZ Carbohydrate Ca<sup>2+</sup> 300 x 7.7mm HyperREZ Carbohydrate Pb<sup>2+</sup> 300 x 7.7mm

Mobile Phase:	H <sub>2</sub> O
Flow Rate:	0.6mL/min
Detection:	RI
Temperature:	75°C (H <sup>+</sup> )
	85°C (Ca <sup>2+</sup> )
	80°C (Pb <sup>2+</sup> )

Note: partial hydrolysis may occur with some saccharides using H<sup>+</sup>.





## LC Accessories

### Excellence in LC accessories providing optimal performance

Thermo Scientific offers a wide range of accessories to suit your LC needs, ensuring confidence in your analysis and delivery of exceptionally reproducible data and reliable chromatography.

- **Viper Fingertight Fitting**  
Providing zero dead volume fingertight connections up to 1,250 bar
- **Rheodyne Sample Injectors**  
Biocompatible and stainless steel versions for highly accurate and precise injections
- **LC Syringes**  
Supporting manual and automated injections

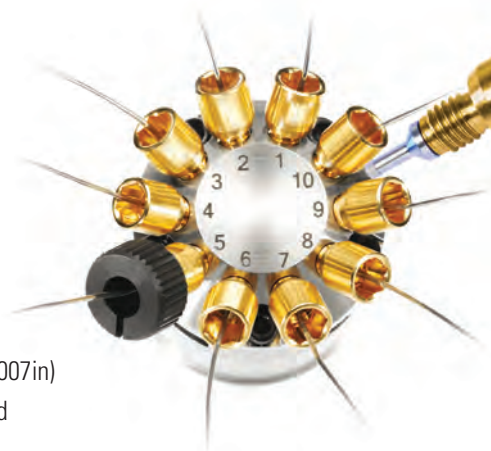


Learn more about LC Accessories.  
Visit [www.thermoscientific.com/columns](http://www.thermoscientific.com/columns)

## Viper Fingertight Fittings

Provides ease of use and dead-volume free plumbing of every conventional HPLC and UHPLC system

- Provides zero-dead volume fingertight connections
- Supports operating pressures up to 1,500 bar (22,000 psi)
- Available in different lengths: 65mm and from 150 to 950mm in 100mm steps
- Available in different inner diameters: 0.1mm (0.004in), 0.13mm (0.005in) or 0.18mm (0.007in)
- Easy to use due to stainless steel or biocompatible MP35N™ capillaries (1/32in OD) and fingertight design
- Works with virtually any valve and column from any manufacturer
- Fits narrow connections such as 10-port valves and enables mixed use with different designs



The Thermo Scientific™ Viper™ fingertight fitting system provides ease of use and dead-volume free plumbing of every conventional HPLC and modern UHPLC system. Together with flexible stainless steel (SST) or biocompatible MP35N® capillaries, it opens a new dimension in liquid chromatography. The Viper system improves chromatographic results, independent of various different connection geometries and system backpressures. Connecting LC modules,

valves, and columns quickly and easily without tools is simple with the Viper system.

Extra column volumes in HPLC have the most detrimental effects on the separation efficiency of an LC system and must be minimized. Conventional fittings tightened by hand or using tools have considerable drawbacks which can compromise efficiency. The Viper fitting system overcomes these drawbacks by design, working without ferrules

to reduce the dead volume of any fluidic connection to zero. The Viper system unifies robust performance, ease of use, acceptable lifetime, and universal compatibility with virtually all different valves and columns for HPLC system users. All Thermo Scientific™ Dionex™ UltiMate™ 3000 XRS, RS, BioRS and SD systems are equipped with Viper fingertight fitting system as a standard.

### Viper Fingertight Fitting Systems - SST

Length (mm)	0.1mm ID	0.13mm ID	0.18mm ID
65	<b>6040.2207</b>	<b>6040.2307</b>	<b>6040.2357</b>
150	<b>6040.2215</b>	<b>6040.2315</b>	<b>6040.2360</b>
250	<b>6040.2225</b>	<b>6040.2325</b>	<b>6040.2385</b>
350	<b>6040.2235</b>	<b>6040.2335</b>	<b>6040.2375</b>
450	<b>6040.2245</b>	<b>6040.2345</b>	<b>6040.2365</b>
550	<b>6040.2255</b>	<b>6040.2305</b>	<b>6040.2355</b>
650	<b>6040.2265</b>	<b>6040.2310</b>	<b>6040.2395</b>
750	-	<b>6040.2320</b>	<b>6040.2370</b>
850	-	<b>6040.2330</b>	<b>6040.2380</b>
950	-	<b>6040.2340</b>	<b>6040.2390</b>

**Viper Fingertight Fitting Systems - Biocompatible**

Length (mm)	0.065mm ID, PEEK	0.090mm ID, PEEK	0.1mm ID, MP35N	0.13mm ID, MP35N	0.13mm ID, PEEK	0.18mm ID, MP35N
65	-	<b>6041.9075*</b>	<b>6042.2306</b>	-	-	-
150	<b>6041.5615</b>	-	<b>6042.2320</b>	-	<b>6041.5616</b>	<b>6042.2315</b>
250	<b>6041.5625</b>	<b>6041.9025</b>	<b>6042.2330</b>	-	-	<b>6042.2327</b>
350	-	-	<b>6042.2340</b>	-	-	<b>6042.2337</b>
450	-	-	<b>6042.2350</b>	-	-	<b>6042.2365</b>
550	-	-	<b>6042.2360</b>	-	-	<b>6042.2355</b>
650	<b>6041.5665</b>	-	<b>6042.2370</b>	<b>6042.2363</b>	-	<b>6042.2380</b>
750	<b>6041.5675</b>	-	<b>6042.2390</b>	<b>6042.2373</b>	-	<b>6042.2375</b>
850	<b>6041.5685</b>	-	-	-	-	-
950	-	-	<b>6042.2395</b>	-	-	<b>6042.2385</b>

\* 75mm length

**Viper Accessories**

Description	Cat. No.	Quantity
Plug, Biocompatible	<b>6040.2303</b>	1 Each
Union, SST	<b>6040.2304</b>	1 Each
Calibration Tool	<b>6040.2312</b>	1 Each
Inline Filter	<b>6036.1045</b>	1 Each



## Viper Fingertight Fitting Kits for UltiMate 3000 Systems

### Viper Fingertight Fitting Kits for UltiMate 3000 Systems

Description	SD Systems	RS Systems
Viper Capillary Kit for ISO, LPG or DGP pumps	<b>6040.2302</b>	<b>6040.2301</b>
Viper Capillary Kit for HPG pumps	<b>6040.2309</b>	<b>6040.2308</b>
Viper Capillary Kit for biocompatible RSLC systems	–	<b>6841.2301</b>
Online SPE Solution Kit for x2 Dual Standard or RSLC systems	<b>6040.2802</b>	<b>6040.2801</b>
Tandem Operation Solution Kit for x2 Dual Standard or RSLC systems	<b>6040.2804</b>	<b>6040.2803</b>
Application Switching Solution Kit for x2 Dual Standard or RSLC systems	<b>6040.2806</b>	<b>6040.2805</b>
Parallel Setup Solution Kit for x2 Dual Standard or RSLC systems	<b>6040.2810</b>	<b>6040.2809</b>
Inverse Gradient Kit for x2 Dual Standard or RSLC systems	<b>6040.2819</b>	<b>6040.2820</b>
Automated Method Scouting Solution Kit for Standard or RSLC systems	<b>6040.2808</b>	<b>6040.2807</b>
MS Connection Kit for MS-frontends with WPS autosampler, excluding UV detection	<b>6720.0355</b>	<b>6720.0370</b>
MS Connection Kit for MS-frontends with WPS autosampler, including UV detection	<b>6720.0365</b>	<b>6720.0375</b>
MS Connection Kit for MS-frontends with HPG-RS pump and OAS autosampler excluding UV detection	–	<b>6720.0372</b>
MS Connection Kit for MS-frontends with HPG-RS pump and OAS autosampler including UV detection	–	<b>6720.0377</b>

Description	XRS Systems
Viper Capillary Kit for standalone system with with WPS autosampler	<b>6043.2301</b>
Viper Capillary Kit for standalone system with with OAS autosampler	<b>6845.2301A</b>
MS Connection Kit for MS-frontends with WPS autosampler excluding UV detection	<b>6720.0380</b>
MS Connection Kit for MS-frontends with WPS autosampler including UV detection	<b>6720.0385</b>
MS Connection Kit for MS-frontends with LPG-XRS pump and OAS autosampler excluding UV detection	<b>6720.0372</b>
MS Connection Kit for MS-frontends with LPG-XRS pump and OAS autosampler including UV detection	<b>6720.0377</b>

## Javelin Direct-Connection Column Filters

One-piece filter protects HPLC systems

- Direct-connection design for maximum efficiency
- Replace entire disposable filter unit for easy changes
- Recommended for use as dedicated filters for a column rather than the HPLC system
- 1/16in CPI tip attaches directly to HPLC column inlet without tubing or wrenches
- 0.5µm porosity



### Javelin Direct-Connection Column Filter

Description	2.1mm ID	3.0mm ID	4.0/4.6mm ID	Quantity
Javelin Column Filter	<b>88200</b>	<b>88700</b>	<b>88400</b>	4 Pack

## ColumnSaver Precolumn Filters

Filter mesh size 2µm

### ColumnSaver Precolumn Filters

Filter Mesh Size (µm)	Cat. No	Quantity
2	<b>60140-412</b>	10 Pack

## UNIFILTER Direct-Connection HPLC Filter Systems

Quickly replaced for minimal down time

- Replaceable 0.5µm drop-in filter enhances column lifetime and improved performance
- Holder attached directly to the inlet of your analytical system for maximum convenience



### UNIFILTER Direct-Connection HPLC Filter Systems

Description	2.1/3.0mm ID	4.0/4.6mm ID	Quantity
UNIFILTER Direct Connection Holder	<b>27002</b>	<b>27000</b>	1 Each
Replacement Filter, 0.5µm	<b>22017</b>	<b>22155</b>	5 Pack
Replacement Tip, CPI, Standard	<b>850-RT</b>	<b>850-RT</b>	1 Each
Replacement Tip, Waters End-fitting	<b>850-WT</b>	<b>850-WT</b>	1 Each

## UHPLC Filter

Column protection for Hypersil GOLD 1.9µm and Synchronis 1.7µm columns without compromising performance

- Low volume filter cartridge design
- Maintain peak shape
- Minimal efficiency loss through dispersion



### UHPLC Filter

Description	Cat. No.	Quantity
UHPLC Direct Connect Filter Holder	<b>27006</b>	1 Each
2.1mm ID Replacement Filter Cartridge, 0.2µm	<b>22180</b>	5 Pack
1.0mm ID Replacement Filter Cartridge, 0.2µm	<b>22185</b>	5 Pack

## PTFE One-Piece Column Connector

Excellent for high-throughput screening and quick connection

- Fingertight, leak-free connection of analytical and guard columns with 10-32 threads
- Minimizes dead volume
- Inert and biocompatible material



### PEEK One-Piece Column Connector




Description	Cat. No.	Quantity
One Piece Coupler	<b>60170-370</b>	1 Each



## Solvent Filters

- Efficient draw
- 100% PTFE polymer, including 2µm filters
- Built-in helium sparge port and frit

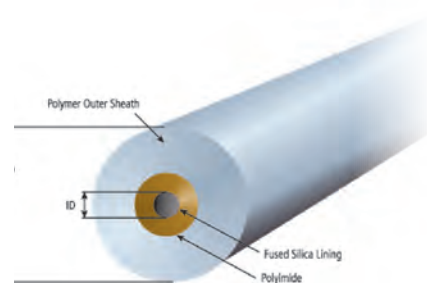
### Solvent Filters

	Type	For Use with	Cat. No.	Quantity
	Stainless Steel	Fit 1/16in OD tube to 1/8in OD plastic tubing	<b>A-302</b>	1 Each
	Stainless Steel	Fit to 1/8in OD plastic tubing using 1/8in PP nut	<b>A-302A</b>	1 Each
	Bottom-of-the-Bottle	3/16in OD plastic tubing	<b>A-436</b>	1 Each
	Bottom-of-the-Bottle	1/8in OD tubing	<b>A-437</b>	1 Each

## PEEKsil Capillary Tubing

Excellent chemical compatibility and very low carryover

- Precision-bore fused silica tubing coated with 1/16in OD PEEK covering
- Usable in most standard chromatography systems
- Withstands high pressures
- Smooth internal surface for excellent flow characteristics
- Tubing is stiff: not recommended for uses requiring tubing bends
- Precut lengths only: cutting in the lab may damage tubing



### PEEKsil Capillary Tubing

ID (in)	Length (cm)	Cat. No.	Quantity
0.002	10	<b>60182-500</b>	5 Pack
	20	<b>60182-501</b>	5 Pack
	50	<b>60182-502</b>	2 Pack
0.004	10	<b>60182-503</b>	5 Pack
	20	<b>60182-504</b>	5 Pack
	50	<b>60182-505</b>	2 Pack
0.007	10	<b>60182-506</b>	5 Pack
	20	<b>60182-507</b>	5 Pack
	50	<b>60182-508</b>	2 Pack

### Applications:

- HPLC
- LC-MS

## PEEK Sleeves for Fused Silica Capillary Tubing

Withstands high pressures

### 1/16in OD PEEK Sleeves for Fused Silica Capillary Tubing

ID (in)	Color	Cat. No.	Quantity
0.008	Yellow	<b>F-227</b>	1 Each
0.010	Blue	<b>F-228</b>	1 Each
0.012	Natural	<b>F-229</b>	1 Each
0.015	Orange	<b>F-230</b>	1 Each
0.021	Natural	<b>F-231</b>	1 Each
0.030	Natural	<b>F-232</b>	1 Each



## 316 Stainless Steel Capillary Tubing

Cleaned, polished, passivated and ready-to-use

- Suitable for ultra high pressure applications
- Wide chemical compatibility
- Prefinished, square, burr-free ends and interiors to minimize dead volume connections
- Not recommended for biological samples
- Rough internal surface may lead to sample carryover



### 316 Stainless Steel Capillary Tubing

ID (in)	Length (cm)	Color	Cat. No.	Quantity
<b>1/16in OD Precut Tubing</b>				
0.005	5	Red	<b>U-152</b>	1 Each
	10	Red	<b>U-153</b>	1 Each
	20	Red	<b>U-154</b>	1 Each
	30	Red	<b>U-155</b>	1 Each
	50	Red	<b>U-156</b>	1 Each
	100	Red	<b>U-157</b>	1 Each
0.007	5	Black	<b>U-126</b>	1 Each
	10	Black	<b>U-127</b>	1 Each
	20	Black	<b>U-128</b>	1 Each
	30	Black	<b>U-129</b>	1 Each
	50	Black	<b>U-130</b>	1 Each
	100	Black	<b>U-131</b>	1 Each
0.010	5	Blue	<b>U-111</b>	1 Each
	10	Blue	<b>U-112</b>	1 Each
	20	Blue	<b>U-113</b>	1 Each
	30	Blue	<b>U-114</b>	1 Each
	50	Blue	<b>U-132</b>	1 Each
	100	Blue	<b>U-133</b>	1 Each
<b>1/32in OD Precut Tubing with 1/16in Sleeves</b>				
0.005	10.5	Red	<b>30011-FLEX</b>	1 Each
	15	Red	<b>30015-FLEX</b>	1 Each
	28	Red	<b>30028-FLEX</b>	1 Each
	40	Red	<b>30040-FLEX</b>	1 Each
0.007	10.5	Yellow	<b>39011-FLEX</b>	1 Each
	15	Yellow	<b>39015-FLEX</b>	1 Each
	28	Yellow	<b>39028-FLEX</b>	1 Each
	40	Yellow	<b>39040-FLEX</b>	1 Each

### 1/16in 316 Stainless Steel Tubing, 5-Foot Coil

ID (in)	Cat. No.	Quantity
0.005	<b>U-158</b>	1 Each
0.007	<b>U-108</b>	1 Each
0.010	<b>U-106</b>	1 Each
0.020	<b>U-105</b>	1 Each
0.030	<b>U-107</b>	1 Each
0.040	<b>U-144</b>	1 Each

### Terry Tool Tubing Cutters

Description	Cat. No.	Quantity
1/16in stainless steel tubing	<b>60182-509</b>	1 Each
1/8in stainless steel tubing	<b>60182-510</b>	1 Each



## PEEK Capillary Tubing

Pre-cut and color-coded for easy identification and use



- Broad chemical compatibility
- Biocompatible
- Easily cut to desired length
- Appropriate for many HPLC applications
- Resistant to most organic solvents, except for nitric acid, sulfuric acid, dichloromethane, THF and DMSO

### 1/16in OD Precut PEEK Tubing

ID (in)	Length (cm)	Color	Cat. No.	Quantity
0.003	5	Natural	<b>37003-5</b>	1 Each
	10	Natural	<b>37003-10</b>	1 Each
	20	Natural	<b>37003-20</b>	1 Each
	30	Natural	<b>37003-30</b>	1 Each
	50	Natural	<b>37003-50</b>	1 Each
0.005	5	Red	<b>37005-5</b>	1 Each
	10	Red	<b>37005-10</b>	1 Each
	20	Red	<b>37005-20</b>	1 Each
	30	Red	<b>37005-30</b>	1 Each
	50	Red	<b>37005-50</b>	1 Each
0.007	5	Yellow	<b>37007-5</b>	1 Each
	10	Yellow	<b>37007-10</b>	1 Each
	20	Yellow	<b>37007-20</b>	1 Each
	30	Yellow	<b>37007-30</b>	1 Each
	50	Yellow	<b>37007-50</b>	1 Each
0.010	5	Blue	<b>37010-5</b>	1 Each
	10	Blue	<b>37010-10</b>	1 Each
	20	Blue	<b>37010-20</b>	1 Each
	30	Blue	<b>37010-30</b>	1 Each
	50	Blue	<b>37010-50</b>	1 Each
0.020	5	Orange	<b>37020-5</b>	1 Each
	10	Orange	<b>37020-10</b>	1 Each
	20	Orange	<b>37020-20</b>	1 Each
	30	Orange	<b>37020-30</b>	1 Each
	50	Orange	<b>37020-50</b>	1 Each

### 1/16in OD PEEK Tubing, 5-Foot Coil

ID (in)	Cat. No.	Quantity
0.003	<b>37003</b>	1 Each
0.005	<b>37005</b>	1 Each
0.007	<b>37007</b>	1 Each
0.010	<b>37010</b>	1 Each
0.020	<b>37020</b>	1 Each
0.030	<b>37030</b>	1 Each
0.040	<b>37040</b>	1 Each

### Polymer Tubing Cutter





Description	Cat. No.	Quantity
Polymeric Tubing Cutter	<b>A-327</b>	1 Each
Replacement blades	<b>A-328</b>	5 Pack

## High Pressure Stainless Steel Nuts and Ferrules

Accommodate a wide range of configurations

- Designed for 10-32 port configurations
- Burr and contaminant free

### High Pressure Stainless Steel Nuts and Ferrules

Type	Nut Cat. No.	Quantity	Description	Replacement Ferrule Cat. No.	Quantity
 10-32 thread nut with ferrule	<b>F-190</b>	1 Each	Replacement PEEK Ferrules	<b>F-192x</b>	10 Pack
 Male hex nut	<b>U-400x</b>	10 Pack	Universal Ferrules, 0.625in	<b>U-401x</b>	10 Pack
 Valco male hex nut, 10-32 thread	<b>U-320x</b>	10 Pack	Valco ferrules, 0.625in	<b>U-321x</b>	10 Pack
 Male hex nut, Waters compatible	<b>U-410x</b>	10 Pack	Universal Ferrules, 0.625in	<b>U-401x</b>	10 Pack

## Reducing Union for Preparative Columns

Connects 30 to 50mm ID preparative columns to 1/16in tubing

- Stainless steel construction
- 1.0mm bore
- Without frit

### Reducing Union for Preparative Column








Description	Cat. No.	Quantity
1/8in to 1/16in Reducing Union for Preparative Column	<b>60182-357</b>	1 Each

## PEEK Fingertight Fittings

Machined for reliability and ease of use

- Resist cracking, breaking, thread stripping and leaking in both low and high pressure applications
- Biocompatible for a broad range of applications

### PEEK Fingertight Fittings



Type	Cat. No.	Quantity
 One-Piece Fingertight Fitting, 1/16in, 0.37in head	<b>F-120x</b>	10 Pack
 One-Piece Long Fingertight Fitting, 1/16in, 0.37in head	<b>F-130x</b>	10 Pack
 One-Piece PEEK Fingertight Fitting, 1/32in, 0.25in head	<b>M-645</b>	1 Each
 Two-Piece Fingertight Wing Nut with Ferrule, 1/16in	<b>F-300x</b>	10 Pack
 Replacement PEEK Ferrules	<b>F-142x</b>	10 Pack
 Column End Plug, 1/16in, 10-32 coned, Delrin, Red	<b>U-467R</b>	1 Each
 Column End Plug, 1/16in, 10-32 coned, Delrin, Black	<b>U-467BLK</b>	1 Each

## Stainless Steel Unions, Tees and Crosses

Well-suited to high-pressure applications

- Absolute zero or low dead volume formats
- Includes two stainless steel nuts and ferrules

### Stainless Steel Unions, Tees and Crosses





	Description	Through Hole (in)	Swept Volume (μL)	Cat. No.	Quantity
	Union, stainless steel, Upchurch Scientific/Parker fittings compatible, includes 2 stainless steel nuts and ferrules	0.010	0.025	<b>U-435</b>	1 Each
	Union, stainless steel, Upchurch Scientific/Parker fittings compatible, includes 2 stainless steel nuts and ferrules	0.020	0.134	<b>U-402</b>	1 Each
	Union, stainless steel, Upchurch Scientific/Parker fittings compatible, includes 2 stainless steel nuts and ferrules	0.050	0.836	<b>U-437</b>	1 Each
	Union, stainless steel, Upchurch Scientific/Parker fittings compatible, includes 2 stainless steel nuts and ferrules	0.062	~0.0	<b>U-438</b>	1 Each
	Union, stainless steel, Waters fittings compatible, includes 2 stainless steel nuts and ferrules	0.020	0.129	<b>U-412</b>	1 Each
	Union, stainless steel, Valco fittings compatible, includes 2 stainless steel nuts and ferrules	0.020	0.103	<b>U-322</b>	1 Each
	Tee, stainless steel, 10-32 fittings for use with 1/16in OD tubing	0.020	0.57	<b>U-428</b>	1 Each
	Cross, stainless steel, 10-32 fittings for use with 1/16in OD tubing	0.020	0.72	<b>U-430</b>	1 Each

## PEEK Unions, Tees and Crosses

Well-suited to high pressure applications

- Absolute zero or low dead volume formats
- Biocompatible

### PEEK Unions, Tees and Crosses

	Description	Through Hole (in)	Swept Volume (μL)	Cat. No.	Quantity
	Union, PEEK polymer, includes two PEEK 2-piece fittings	0.010	0.070	<b>P-742</b>	1 Each
	Union, PEEK polymer, includes two PEEK 2-piece fittings	0.020	0.28	<b>P-704</b>	1 Each
	Tee, PEEK, 10-32 fittings for use with 1/16in OD tubing, includes three 10-32 PEEK double-winged nuts	0.020	0.57	<b>P-727</b>	1 Each
	PEEK, 10-32 fittings for use with 1/16in OD tubing, includes four 10-32 PEEK double-winged nuts	0.020	0.72	<b>P-729</b>	1 Each

## Rheodyne 7725 and 7725i Sample Injectors

Allow continuous flow between the load and inject positions to protect against pressure shock

- Stainless steel construction
- Make-Before-Break (MBB) design
- Can use partial filling for zero sample waste or complete filling for better reproducibility
- Inject 1 $\mu$ L to 5mL with high accuracy and precision
- 7725i features a position sensing switch for a reproducible start signal



### Rheodyne 7725 and 7725i Sample Injectors

Model	Mode	Features	Cat. No.	Quantity
7725	Dual	Continuous flow	<b>7725</b>	1 Each
7725i	Dual	Continuous flow, position sensing switch	<b>7725i</b>	1 Each

### Stainless Steel Sample Loops

Description	Volume	ID (mm / in)	Cat. No.	Quantity
Sample loops for 7725 and 7725i injectors	5 $\mu$ L	0.18 / 0.007	<b>7755-020</b>	1 Each
	10 $\mu$ L	0.30 / 0.012	<b>7755-021</b>	1 Each
	20 $\mu$ L	0.30 / 0.012	<b>7755-022</b>	1 Each
	50 $\mu$ L	0.51 / 0.020	<b>7755-023</b>	1 Each

### RheBuild Kits

For Use with Rheodyne Models	Cat. No.	Quantity
7725/7725i	<b>7725-999</b>	1 Each

### Rheodyne Stators

For Use with Rheodyne Models	Cat. No.	Quantity
7725	<b>7725-010</b>	1 Each

## Rheodyne 9725 and 9725i Sample Injectors

Allow continuous flow between the load and inject positions to protect against pressure shock

- Biocompatible PEEK construction
- Make-Before-Break (MBB) design
- Can use partial filling for zero sample waste or complete filling for better reproducibility
- Inject 1µL to 5mL with high accuracy and precision
- 9725i features a position sensing switch for a reproducible start signal

### Rheodyne 9725 and 9725i Sample Injectors

Model	Mode	Features	Cat. No.	Quantity
9725	Dual	Continuous flow	<b>9725</b>	1 Each
9725i	Dual	Continuous flow, position sensing switch	<b>9725i</b>	1 Each

### PEEK Sample Loops

Description	Volume	ID (mm / in)	Cat. No.	Quantity
Sample loops for 9725 and 9725i injectors	2µL	Internal	<b>7755-015</b>	1 Each
	5µL	0.18 / 0.007	<b>9055-020</b>	1 Each
	10µL	0.25 / 0.010	<b>9055-021</b>	1 Each
	20µL	0.25 / 0.010	<b>9055-022</b>	1 Each
	50µL	0.51 / 0.020	<b>9055-023</b>	1 Each
	100µL	0.51 / 0.020	<b>9055-024</b>	1 Each
	200µL	0.51 / 0.020	<b>9055-025</b>	1 Each
	500µL	0.76 / 0.030	<b>9055-026</b>	1 Each
	1mL	0.76 / 0.030	<b>9055-027</b>	1 Each
	5mL	0.76 / 0.030	<b>9055-029</b>	1 Each

### Rheodyne Suction Needle Adapter

For Use with	Cat. No.	Quantity
Rheodyne Injector Models 9725 and 9725i	<b>9125-076</b>	1 Each

## Rheodyne 8125 Low-Dispersion Microscale Injector

Designed for use with 1 and 2mm ID HPLC columns

- Can use partial filling for zero sample waste or complete filling for better reproducibility
- Position sensing switch provides reproducible start signal
- Suitable for use with 5 to 50µL sample loops



### Rheodyne 8125 Low-Dispersion Microscale Injector

Model	Mode	Features	Cat. No.	Quantity
8125	Dual	Continuous flow	<b>8125</b>	1 Each

### Stainless Steel Sample Loops

Description	Volume	ID (mm / in)	Cat. No.	Quantity
Sample loops for 8125 injectors	5µL	0.20 / 0.008	<b>8020</b>	1 Each
	10µL	0.20 / 0.008	<b>8021</b>	1 Each
	20µL	0.25 / 0.010	<b>8022</b>	1 Each
	50µL	0.30 / 0.012	<b>8023</b>	1 Each

### RheBuild Kits

For Use with Rheodyne Models	Cat. No.	Quantity
8125	<b>8125-999</b>	1 Each

### Rheodyne Replacement Rotor Seals for Injectors

For Use with Rheodyne Models	Cat. No.	Quantity
<b>Vespel Seals</b>		
8125/8126	<b>8125-038</b>	1 Each
<b>Tefzel Seals</b>		
8125	<b>8125-097</b>	1 Each

### Rheodyne Stators

For Use with Rheodyne Models	Cat. No.	Quantity
8125/8126	<b>8125-098</b>	1 Each

### Rheodyne Stator Face Assemblies

For Use with Rheodyne Models	Cat. No.	Quantity
8125	<b>8125-074</b>	1 Each

## Rheodyne 7010 Sample Injector

Single-mode sample injector designed for the complete filling method



### Compatible with:

Sample loop sizes 5µL to 20mL

### Rheodyne 7010 Sample Injector

Model	Mode	Features	Cat. No.	Quantity
7010	Single	Complete filling method	<b>7010</b>	1 Each

### Rheodyne Ports for Rheodyne Injectors

For Use with Rheodyne Model	Cat. No.	Quantity
7010 Filler Port, Stainless Steel	<b>7012</b>	1 Each

### Stainless Steel Sample Loops

Description	Volume	ID (mm / in)	Cat. No.	Quantity
Sample loops for 7010 and 7125 injectors	5µL	0.18 / 0.007	<b>7020</b>	1 Each
	10µL	0.30 / 0.012	<b>7021</b>	1 Each
	20µL	0.30 / 0.012	<b>7022</b>	1 Each
	50µL	0.51 / 0.020	<b>7023</b>	1 Each
	100µL	0.51 / 0.020	<b>7024</b>	1 Each
	200µL	0.76 / 0.030	<b>7025</b>	1 Each
	500µL	0.76 / 0.030	<b>7026</b>	1 Each
	1mL	0.76 / 0.030	<b>7027</b>	1 Each
	5mL	1.0 / 0.040	<b>7029</b>	1 Each

### RheBuild Kits

For Use with Rheodyne Models	Cat. No.	Quantity
7010/7000	<b>7010-999</b>	1 Each

### Rheodyne Replacement Rotor Seals for Injectors

For Use with Rheodyne Models	Cat. No.	Quantity
<b>Vespel Seals</b>		
7010	<b>7010-039</b>	1 Each
<b>Tefzel Seals</b>		
7010	<b>7010-071</b>	1 Each

## Rheodyne 9010 Sample Injector

Single-mode sample injector designed for the complete filling method

- Compatible with sample loop sizes 5 $\mu$ L to 10mL
- PEEK stator
- Position sensing switch provides a reproducible start signal

### Rheodyne 9010 Sample Injector

Model	Mode	Features	Cat. No.	Quantity
9010	Single	Continuous flow, position sensing switch	<b>9010</b>	1 Each

### Rheodyne Ports for Rheodyne Injectors

For Use with Rheodyne Model	Cat. No.	Quantity
9010 Filler Port, PEEK	<b>9012</b>	1 Each
9010 Needle Port, PEEK	<b>9013</b>	1 Each

### PEEK Sample Loops

Description	Volume	ID (mm / in)	Cat. No.	Quantity
Sample loops for 9010 injectors	2 $\mu$ L	Internal	<b>7755-015</b>	1 Each
	5 $\mu$ L	0.18 / 0.007	<b>9055-020</b>	1 Each
	10 $\mu$ L	0.25 / 0.010	<b>9055-021</b>	1 Each
	20 $\mu$ L	0.25 / 0.010	<b>9055-022</b>	1 Each
	50 $\mu$ L	0.51 / 0.020	<b>9055-023</b>	1 Each
	100 $\mu$ L	0.51 / 0.020	<b>9055-024</b>	1 Each
	200 $\mu$ L	0.51 / 0.020	<b>9055-025</b>	1 Each
	500 $\mu$ L	0.76 / 0.030	<b>9055-026</b>	1 Each
	1mL	0.76 / 0.030	<b>9055-027</b>	1 Each
	5mL	0.76 / 0.030	<b>9055-029</b>	1 Each

### Rheodyne Replacement Rotor Seals for Injectors

For Use with Rheodyne Models	Cat. No.	Quantity
<b>Tefzel Seals</b>		
9010	<b>9010-051</b>	1 Each

### Rheodyne Stators

For Use with Rheodyne Models	Cat. No.	Quantity
9010	<b>9125-043</b>	1 Each

### Rheodyne Stator Face Assemblies





For Use with Rheodyne Models	Cat. No.	Quantity
9125	<b>8125-094</b>	1 Each



## RheFlex High Pressure Fittings

Precision machined from 316 stainless steel

### RheFlex High Pressure Fittings

	Type	Cat. No.	Quantity
	Short Fittings Set	<b>6000-109</b>	5 Pack
	Short Fittings Set	<b>6000-209</b>	10 Pack
	Long Fittings Set	<b>6000-111</b>	5 Pack
	Long Fittings Set	<b>6000-211</b>	10 Pack
	Extra Long Fittings Set	<b>6000-162</b>	5 Pack
	Extra Long Fittings Set	<b>6000-262</b>	10 Pack
	1/16in Ferrule	<b>6000-110</b>	5 Pack
	1/16in Ferrule	<b>6000-210</b>	10 Pack



## RheFlex Two-Piece PEEK Fittings

Provide inert, metal-free connections

- Slotted backside of the ferrule is squeezed down onto the tube by the mating conical surface of the nut
- May be used on 1/16in metal or plastic tubing reliably up to 5000psi
- Reusable ferrule and nut

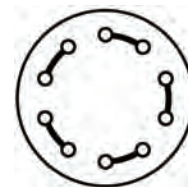


### RheFlex Two-Piece PEEK Fittings

Type	Cat. No.	Quantity
Fitting set, standard length	<b>6000-054</b>	5 Pack
Fitting set, short	<b>6000-055</b>	5 Pack
Fitting set, X-long	<b>6000-066</b>	1 Each
Replacement ferrules	<b>6000-051</b>	5 Pack

## Cheminert Model C2 Microbore Injector

Can be used as an injector or switching valve



- 1/16in fittings
- 0.010in ports
- Available in 6-port or 10-port configurations
- Available with manual or microelectric actuator

### Cheminert Model C2 Microbore Injector

Description	Sample Volume	Cat. No.	Quantity
Model C2 injector, N60 stainless stator, 5µL loop, manual	6 ports	<b>C2-1006</b>	1 Each
	10 ports	<b>C2-1000</b>	1 Each
Model C2 injector, N60 stainless stator, 5µL loop, microelectric actuator	6 ports	<b>C2-1006EH</b>	1 Each
	10 ports	<b>C2-1000EP</b>	1 Each
Sample injector loops, stainless steel	5µL	<b>CSL5</b>	1 Each
	10µL	<b>CSL10</b>	1 Each
	20µL	<b>CSL20</b>	1 Each
	50µL	<b>CSL50</b>	1 Each
	100µL	<b>CSL100</b>	1 Each
Model C4 injector, PAEK stator, 5µL loop, microelectric actuator	6 ports	<b>C2-1346EH</b>	1 Each
Sample injector loops, PAEK	5µL	<b>CZSL5PK</b>	1 Each
	10µL	<b>CZSL10PK</b>	1 Each
	50µL	<b>CZSL50PK</b>	1 Each

## Valco Injector Model C6W

Description	Volume	Cat. No.	Quantity
Model C6W injector, six 0.016in ports, manual	20µL loop	<b>C6W</b>	1 Each
Model EPC6W injector, six 0.016in ports, microelectric actuator	20µL loop	<b>EPC6W</b>	1 Each
Replacement rotor	—	<b>SSAC6W</b>	1 Each
Sample injector loop, stainless steel	2µL	<b>SL2CW</b>	1 Each
Sample injector loop, stainless steel	5µL	<b>SL5CW</b>	1 Each
Sample injector loop, stainless steel	10µL	<b>SL10CW</b>	1 Each
Sample injector loop, stainless steel	20µL	<b>SL20CW</b>	1 Each
Sample injector loop, stainless steel	50µL	<b>SL50CW</b>	1 Each
Sample injector loop, stainless steel	100µL	<b>SL100CW</b>	1 Each

## Valco Accessories

Description	Volume	Cat. No.	Quantity
Valco syringe ports	22 ga. needles; 1/16in fittings	<b>VISF-1</b>	1 Each
Valco syringe ports	22 ga. 2in needles	<b>VISF-2</b>	1 Each
Valco Nuts and Ferrules	1/16in standard nut	<b>ZN1-10</b>	10 Pack
Valco Nuts and Ferrules	1/16in long nut	<b>LZN1-10</b>	10 Pack
Valco Nuts and Ferrules	1/16in SS ferrule	<b>ZF1-10</b>	10 Pack

## LC Syringes for Manual Injection valves

Easy, accurate and reproducible manual injection

- Square tip to prevent damage to the injector
- Wide range of volumes
- Precision made from borosilicate glass and stainless steel
- Robust design and easy-to-read markings

### Removable Needle, Gas Tight Syringes for Rheodyne / Valco Injectors

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
10	50	22	90° Blunt End	<b>365DLG21</b>	1 Each	<b>365RNL15</b>	5 Pack
25	50	22	90° Blunt End	<b>365FLG31</b>	1 Each	<b>365RNL25</b>	5 Pack
50	50	22	90° Blunt End	<b>365GLG41</b>	1 Each	<b>365RNL25</b>	5 Pack
100	50	22	90° Blunt End	<b>365HLG51</b>	1 Each	<b>365RNL25</b>	5 Pack
500	50	22	90° Blunt End	<b>365JLG71</b>	1 Each	<b>365RNL25</b>	5 Pack

### Fixed Needle, Gas Tight Syringes for Rheodyne / Valco Injectors

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	50	22	90° Blunt End	<b>365DL263</b>	1 Each
25	50	22	90° Blunt End	<b>365F6315</b>	1 Each
50	50	22	90° Blunt End	<b>365G6316</b>	1 Each
100	50	22	90° Blunt End	<b>365H6317</b>	1 Each
500	50	22	90° Blunt End	<b>365J6319</b>	1 Each

### Fixed Needle Syringes for Rheodyne / Valco Injectors

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
5	50	22	90° Blunt End	<b>365CL221</b>	1 Each
10	50	22	90° Blunt End	<b>365DL231</b>	1 Each
25	50	22	90° Blunt End	<b>365FL241</b>	1 Each
50	50	22	90° Blunt End	<b>365GL251</b>	1 Each
100	50	22	90° Blunt End	<b>365HL261</b>	1 Each
250	50	22	90° Blunt End	<b>365IL271</b>	1 Each
500	50	22	90° Blunt End	<b>365JL281</b>	1 Each



## HPLC Syringes

- Instrument specific syringes
- Luer-Lok syringes ideal for priming
- Macro volume sampling syringes suitable for liquid or gas samples

### Removable Needle Syringes for Thermo Scientific Instruments

Volume (µL)	Length (mm)	Gauge	Instrument	Cat. No.	Quantity
250	50	22	LCQ	<b>365ILT21</b>	1 Each
500	50	22	LCQ	<b>365JLT41</b>	1 Each
250	–	–	AS1000, AS3000	<b>365ILT91</b>	1 Each
500	–	–	AS1000, AS3000	<b>365JLT61</b>	1 Each
2500	–	–	AS3000, AS3500	<b>365LLT81</b>	1 Each

### Mass Spectrometry Replacement ESI Probe Needles

Instrument	Cat. No.	Quantity
LCQ, XP, DECA, Advantage	<b>365RNL1</b>	1 Each
LCQ MS	<b>365RNL2</b>	1 Each
LCQ.XSQ	<b>365RNL3</b>	1 Each

### Fixed Needle Syringes for CTC Instruments

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	50	22	–	<b>365DL991</b>	1 Each
25	50	22	–	<b>365FL715</b>	1 Each
50	50	22	–	<b>365GL810</b>	1 Each
100	50	22	–	<b>365HL331</b>	1 Each

### PTFE Luer-Lok Syringes

Volume (mL)	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
1	<b>365KL531</b>	1 Each	<b>365RNL22</b>	2 Pack
2.5	<b>365LL541</b>	1 Each	<b>365RNL22</b>	2 Pack
5	<b>365ML551</b>	1 Each	<b>365RNL22</b>	2 Pack
10	<b>365NL561</b>	1 Each	<b>365RNL22</b>	2 Pack
25	<b>365PL571</b>	1 Each	<b>365RNL22</b>	2 Pack

### Syringes for Macro Volume Sampling

Volume (mL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
1	50	22s	Bevel	<b>365K3051</b>	1 Each
2.5	50	22s	Bevel	<b>365LL375</b>	1 Each
5	50	22s	Bevel	<b>365M5212</b>	1 Each
10	50	22s	Bevel	<b>365N5214</b>	1 Each

# HOT POCKET and COOL POCKET Column Temperature Controllers

Wrap-around column temperature control systems

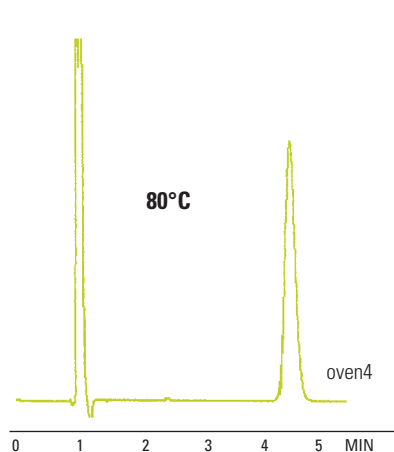
- Easy to install and use with a variety of column lengths
- Dual display of both actual and set point temperature
- HOT POCKET range from just above ambient to 85°C
- COOL POCKET range from 5°C to 55°C
- Explore sample selectivity and stability on both sides of ambient



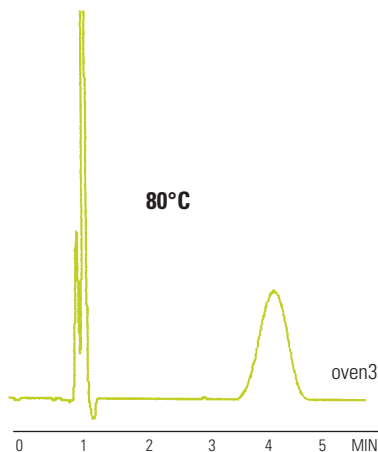
## Product Specifications

	HOT POCKET	COOL POCKET
Operating Range	5°C above ambient to 85°C	5°C to 55°C
Display	Dual LED displays of actual and set point temperatures in °C	
Temperature Accuracy	± 2°C over entire range	± 2°C over entire range
Temperature Repeatability	± 1°C	± 1°C
Temperature Stability	± 0.1°C	± 0.1°C
Time to Stabilization (from ambient)	85°C in less than 30 minutes	55°C in 25 minutes, 5°C in 20 minutes

With Eluent Pre-heater



Without Eluent Pre-heater

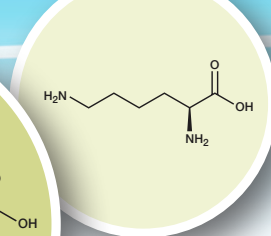
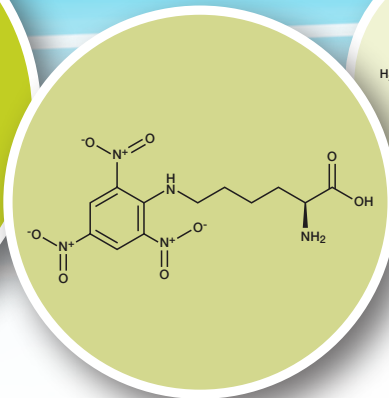
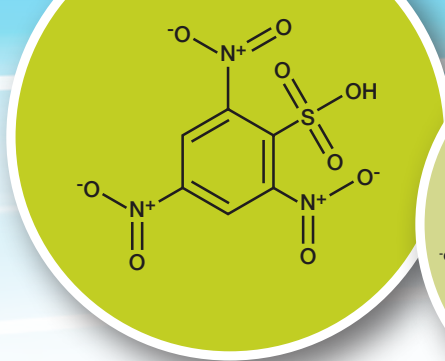


Effect of eluent pre-heater on efficiency

Data courtesy of Dr. Richard F. Myer, Quantitative Technologies, Inc., Whitehouse, NJ

## HOT POCKET Column Heaters, Eluent Preheater/Precooler and COOL POCKET Chiller

Description	Cat. No.	Quantity
HOT POCKET Column Heater	92016	1 Each
HOT POCKET Column Heater – short version	92016-150	1 Each
COOL POCKET Column Chiller	92017	1 Each
Eluent Preheater/Precooler	92018	1 Each



## LC Reagents

### Providing the selectivity needed for high-quality separation of charged compounds

Control selectivity, resolve complex ionic mixtures and improve peak symmetry with the use of our LC reagents.

#### By Using the Correct Reagent You Achieve:

- Increased or decreased retention, permitting controlled selectivity
- Resolution of complex ionic mixtures without using ion exchange columns
- Improved peak symmetry

#### Reagent Types:

- High purity pre-column derivatization reagents
- Hydrolysis reagents
- HPLC ion pair reagents
- Derivatization and visualization reagents
- Amino acid detection reagents
- Peptide standards

The LC Reagents web page contains the latest news, applications and downloads for the LC Reagents HPLC column range. Visit [www.thermoscientific.com/columns](http://www.thermoscientific.com/columns)



# LC Reagents

## Technical Resources



visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert) to access the following information:

- Derivatization and Visualization Reagents for HPLC
- Developments in Amino Acid Analysis
- Hydrolysis
- Methods for Fractionation of Peptide Mixtures



## HPLC Ion Pair Reagents

### Heptafluorobutyric Acid

Ion-pair reagent for the reversed-phase HPLC separation of proteins and peptides

- Typical purity is 99.7% by GC; <0.1% water
- Sequencing reagent for classical and automated Edman degradation of peptides and proteins
- Density: 1.645
- B.P. 120°C
- Packaged under nitrogen in amber glass ampules or bottles
- Clear, colorless liquid

#### Heptafluorobutyric Acid

Description	Quantity	Cat. No.	Quantity
Heptafluorobutyric Acid, Sequencing Grade	100mL	X <b>TS-25003</b>	1 Each
Heptafluorobutyric Acid, HPLC Grade	10 x 1mL ampules	<b>TS-53104</b>	1 Pack

X in the ordering table indicates that hazardous shipping charges apply.

### Triethylamine (TEA)

Ideal for HPLC separation and analysis of peptides

Triethylamine is an ion-pairing reagent that alters selectivity in reversed-phase HPLC separations. By pairing with peptides, it effectively sharpens peaks, resulting in improved peak resolution.

- 99.5% triethylamine purity, allowing sensitive peptide detection at low UV wavelengths in reverse-phase HPLC peptide separation systems
- Packaged in amber glass bottles with protective PTFE-lined fluorocarbon caps for reagent integrity
- Has a low UV absorbance to provide the most sensitive detection across all wavelengths

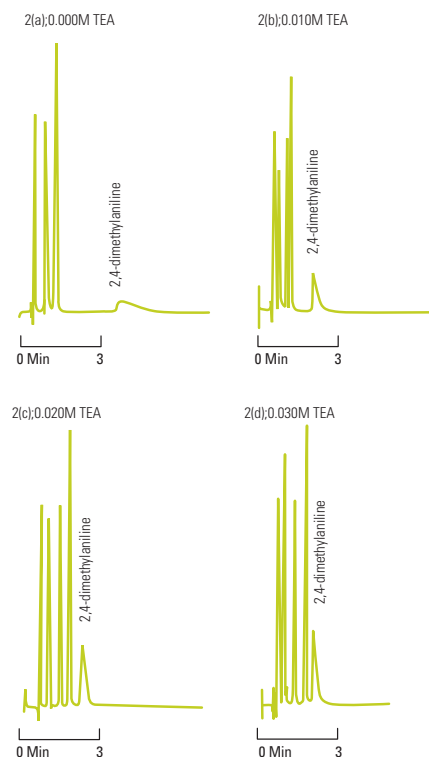
#### Properties of Triethylamine

- Alternate names TEA, Diethylethanamine
- Molecular formula  $C_6H_{15}N$
- Molecular weight 101.19
- Density 0.726g/mL

#### Triethylamine (TEA)

Description	Quantity	Cat. No.	Quantity
Triethylamine, Sequencing Grade	100g	X <b>TS-25108</b>	1 Each

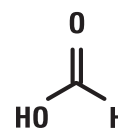
X in the ordering table indicates that hazardous shipping charges apply.





## Formic Acid Ampules

Well suited for HPLC and mass spectrometry applications



**Formic Acid**  
MW 46.03

Formic acid is a component found in reverse-phase mobile phases to provide protons for LC-MS analysis. The presence of a low concentration of formic acid in the mobile phase is also known to improve the peak shapes of the resulting separation. Unlike trifluoroacetic acid (TFA), formic acid is not an ion-pairing reagent, and it does not suppress MS ionization of polypeptides when used as a mobile phase component.

- Prescored, nitrogen-flushed, amber glass to protect formic acid from light and moisture
- 99% purity for consistent LC baselines and no interference introduced into LC and mass spectrometry applications
- Convenient format simplifies preparation of gradient and isocratic mobile phases containing 0.1% (v/v) formic acid in water or acetonitrile
- Contents of a single vial in a final volume of 1L solvent yields a mobile phase of the most common formic acid concentration

### Formic Acid Ampules

Description	Quantity	Cat. No.	Quantity
Formic Acid 99+%	10 x 1mL ampules	<b>TS-28905</b>	1 Each

For complex peptide separations, the key to success can be to vary selectivity. Varying mobile phase composition on the same column can change selectivity enough to resolve peptides that would otherwise overlap. The TFA concentration is usually specified as 0.1% for reverse-phase HPLC of peptides. For reproducible separations from run-to-run or from lab-to-lab, it is essential to make concentrations the same.



## Derivatization and Visualization Reagents for HPLC

### Trifluoroacetic Acid (TFA)

Routinely used ion-pairing agent in reversed-phase peptide separations

- Purity: >99.5% TFA and exceptional clarity allows sensitive, non-destructive peptide detection at low UV wavelengths
- High-performance packaging: Packaged under nitrogen in amber glass with protective TFE-lined fluorocarbon caps to ensure TFA integrity
- Choice of formats for convenience: 1mL ampules can prepare 1L of 0.1% v/v TFA solution for the mobile phase in reversed-phase chromatography in moments

#### Trifluoroacetic Acid (TFA)

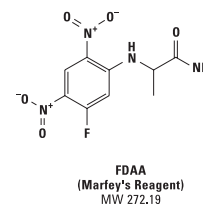
Description	Quantity	Cat. No.	Quantity
Trifluoroacetic Acid, Sequencing Grade	500mL	X <b>TS-28901</b>	1 Each
Trifluoroacetic Acid, Sequencing Grade	100g	X <b>TS-28903</b>	1 Each
Trifluoroacetic Acid, Sequencing Grade	10 × 1mL	X <b>TS-28904</b>	1 Pack
Trifluoroacetic Acid, Sequencing Grade	1g	X <b>TS-28902</b>	1 Each

X in the ordering table indicates that hazardous shipping charges apply.

### FDAA, Marfey's Reagent

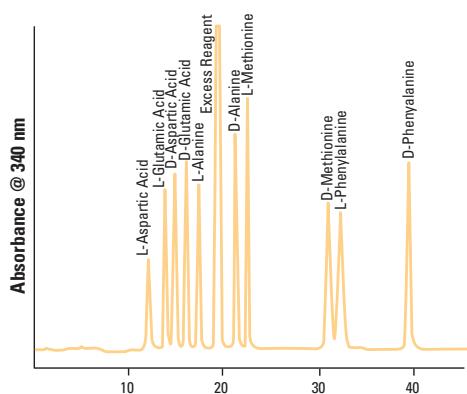
Makes separation and quantitation of optical isomers of amino acids by reversed-phase chromatography quick and easy

- Optical isomers of amino acids derivatization complete in just 90 minutes
- Derivatives have an absorption coefficient of  $\sim 3 \times 10^4$
- Derivatives can be detected by UV at 340nm with picomole sensitivity



#### FDAA, Marfey's Reagent

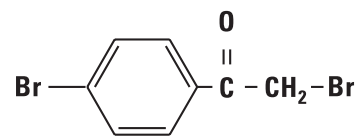
Description	Quantity	Cat. No.	Quantity
FDAA, Marfey's Reagent	50mg	<b>TS-48895</b>	1 Each



## p-Bromophenacylate Reagent

Gives quantitative yields with few or no side reactions

- Premixing of phenacylbromide and crown ether is not necessary
- Derivatization is both rapid and quantitative, with yields of >95% in 15 to 20 minutes at 80°C
- Excess reactants do not interfere
- Large excess of alkylating reagent is not necessary
- Small amounts of water or alcohol do not interfere
- If isolation is desired, products are usually crystalline



**p-Bromophenacylate**  
MW 277.94

### p-Bromophenacylate Reagent

Description	Quantity	Cat. No.	Quantity
p-Bromophenacylate Reagent	10mL	<b>TS-48891</b>	1 Each

## TNBSA (Trinitrobenzene Sulfonic Acid)

An excellent choice for spectrophotometric detection

- Couples with primary amines, sulfhydryls and hydrazides in aqueous solution at pH 8, without undesirable side reactions
- Excellent for solution or solid phase analysis
- Suitable for qualitative and quantitative estimation of biomolecules; including amino acids, peptides or proteins
- Chromogenic,  $O_{\max} = 335\text{nm}$
- Colored derivatives are monitored at 345nm and have extinction coefficients in range of  $1-1.5 \times 10^4$

### TNBSA

Description	Quantity	Cat. No.	Quantity
TNBSA	100mL	X <b>TS-28997</b>	1 Each

X in the ordering table indicates that hazardous shipping charges apply.

## Hydrolysis Reagents

### Constant Boiling (6N) Hydrochloric Acid

Sequencing-grade reagent for total protein hydrolysis

- Hydrolyzes peptides in 6 hours at 150°C
- Specially purified to give ninhydrin-negative blank on hydrolysis
- Packaged in prescored ampules to eliminate contamination and ensure product integrity

#### Constant Boiling (6N) Hydrochloric Acid

Description	Quantity	Cat. No.	Quantity
Hydrochloric Acid 6N	10 × 1mL	<b>TS-24308</b>	1 Pack

### Amino Acid Standard H

High-purity calibration standard for protein hydrolysates

- Uses L-form configuration to permit standardization of microbial and other assays
- Molar concentration verified by conventional amino acid analysis methods
- With the exception of cystine, each amino acid is supplied at a concentration of 2.5µmoles/mL in 0.1N HCl

#### The following amino acids are included in Amino Acid Standard H:

L-Alanine, Ammonia [(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>], L-Arginine, L-Aspartic Acid, L-Cystine, L-Glutamic Acid, Glycine, L-Histidine, L-Isoleucine, L-Leucine, L-Lysine•HCl, L-Methionine, L-Phenylalanine, L-Proline, L-Serine, L-Threonine, L-Tyrosine, L-Valine.

#### Amino Acid Standard H

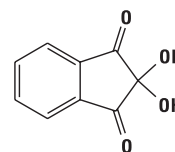
Description	Quantity	Cat. No.	Quantity
Amino Acid Standard H	10 × 1mL	<b>TS-20088</b>	1 Pack

When kept frozen, an unopened vial has an indefinite storage life. Once the seal is broken, the reagent has a maximum storage life of six months. Store frozen between uses.

## Amino Acid Detection Reagents

### Ninhydrin

The reagent of choice for detection of amino acids



**Ninhydrin**  
MW 178.14

- Used in amino acid chromatography
- Offers superb color response and low blank
- Indefinitely stable and requires no refrigeration

#### Ninhydrin

Description	Quantity	Cat. No.	Quantity
Ninhydrin	500g	<b>TS-21003</b>	1 Each

Indefinitely stable. No refrigeration required. Keep bottle tightly sealed. Avoid exposure to direct sunlight and ammonia.

## HPLC and Spectrophotometric Grade Solvents

Ultrapure solvents are carefully packed for thorough protection

- Distilled in glass, filtered through 0.2µm TFE membranes and packed in solvent-rinsed, amber glass bottles
- TFE-lined screw caps seal bottles

#### Acetonitrile, HPLC Grade, Physical Properties

- UV Cutoff: 190nm
- Optical Absorbance: <0.02 at 220nm
- Refractive Index at 25°C: 1.342

#### Water, HPLC Grade, Physical Properties

- UV Cutoff: 190nm
- Optical Absorbance: <0.005 at 220nm
- Refractive Index at 25°C: 1.332

#### Dimethylformamide (DMF), Sequencing Grade, Physical Properties

- $\text{HCON}(\text{CH}_3)_2$
- Purity (GC): ≥99%
- MW: 73.09
- Density: 0.944
- B.P. 153°C
- Water: 0.1%

#### Dimethylsulfoxide (DMSO), Sequencing Grade, Physical Properties

- $\text{C}_2\text{H}_6\text{OS}$
- Purity (GC): >99.5%
- MW: 78.13
- Density: 1.101
- Water: ≤0.2%

#### Pyridine, Physical Properties

- $\text{C}_5\text{H}_5\text{N}$
- Purity (GC): ≥99%
- MW: 79.10
- Density: 0.978
- B.P. 115°C

#### HPLC and Spectrophotometric Grade Solvents

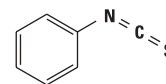
Description	Quantity		Cat. No.	Quantity
Acetonitrile	1L	X	<b>TS-51101</b>	1 Each
Water	1L		<b>TS-51140</b>	1 Each
Dimethylformamide (DMF)	50mL	X	<b>TS-20673</b>	1 Each
Dimethylsulfoxide (DMSO)	950mL	X	<b>TS-20688</b>	1 Each
Pyridine	100g	X	<b>TS-25104</b>	1 Each

X in the ordering table indicates that hazardous shipping charges apply.

## High-Purity Pre-Column Derivatization Reagents

### PITC (Phenylisothiocyanate)

High-purity reagent for pre-column quantitative derivatization of amino acids by reversed-phase HPLC



**PITC**  
Edman's Reagent  
MW 135.19

- Also known as Edman's Reagent
- Reacts readily with amino acids in 5 to 10 minutes at room temperature
- Resulting phenylthiocarbonyl derivatives can be separated and quantified in 30 minutes using reverse-phase HPLC to produce stable products with all amino acids including proline

#### PITC (Phenylisothiocyanate)

Description	Quantity	Cat. No.	Quantity
PITC (Edman's Reagent)	10 × 1mL	<b>TS-26922</b>	1 Pack

## Peptide Standards

### Peptide Retention Standard

Allows accurate prediction of elution time for peptides of known amino acid composition up to 20 residues in length

- Save time in peptide purification
- Simplify identification of specific peptides in a complex mixture
- Increase the efficiency of predicting peptide elution profiles
- Determine the relative order of peptide elution of a complex mixture
- Evaluate reverse-phase supports of varying n-alkyl chain lengths and ligand densities

Retention times are predicted by totaling the values that represent the contribution in minutes of each amino acid residue and the peptide terminal groups. Retention time is dependent upon the molecular weight of the peptide. The effect on retention is relatively unimportant with a small peptide, but it increases with the size of the molecule. The accuracy of predicting peptide retention time significantly decreases beyond 20 residues. To ensure accuracy, a peptide standard is used to correct for instrument variation, column aging, n-alkyl chain length variation and ligand density.

#### Peptide Retention Standard

Description	Quantity	Cat. No.	Quantity
Peptide Retention Standard, S1-S5	1 vial	<b>TS-31700</b>	1 Each

### Peptide Retention Time Calibration Mixture

Heavy peptide mixture for column assessment and prediction of peptide retention times

- Assessment of chromatography and MS instrument performance
- Prediction of peptide retention across multiple instrument platforms
- Prediction of peptide retention time from sequence using calculated hydrophobicity factor
- Optimization of scheduled MS acquisition windows for improving quantification and increased multiplexing
- Internal standard to normalize for variation in retention times and peak intensities between runs

#### Peptide Retention Time Calibration Mixture

Description	Quantity	Cat. No.	Quantity
Peptide Retention Time Calibration Mixture, 0.5pmol/μL	50μL	<b>TS-88320</b>	1 Each
Peptide Retention Time Calibration Mixture, 5pmol/μL	200μL	<b>TS-88321</b>	1 Each

## LC and LC-MS Instruments

Our liquid chromatographs and mass spectrometers advance scientific knowledge, enable drug discovery, improve manufacturing processes and protect people and the environment. You can expect the best results and highest productivity, keeping your research or processes moving smoothly.

### Vanquish Flex System

The Thermo Scientific™ Vanquish™ Flex system is a biocompatible UHPLC system with state-of-the-art quaternary solvent blending, ideally suited for the biopharma industry.

The Vanquish UHPLC platform is designed to set new benchmarks on accuracy, precision, and sensitivity in liquid chromatography. As a new part of this family, the Vanquish Flex system shares all Vanquish-inherent values, such as a design focus on uptime, robustness and reliability.



### Vanquish System

The Vanquish system takes high-end UHPLC to a new level, offering more resolution while meeting the throughput demands of modern laboratories. The system is driven by the gold standard Thermo Scientific™ Dionex™ Chromeleon™ Chromatography Data System (CDS) software and delivers better separations, more results and easier interaction. The Vanquish system delivers these values simultaneously, without compromise.

When combined with the Thermo Scientific Charger module, the Vanquish system allows for added sample capacity, performing the highest throughput UHPLC analysis. This setup combines enough sample capacity to run over the weekend, while Chromeleon CDS ensures convenient sample tracking and results processing of even the largest sample sets.

Visit [www.thermoscientific.com/vanquish](http://www.thermoscientific.com/vanquish)





## Basic Automated and Standard (SD) Systems

The Thermo Scientific™ Dionex™ UltiMate™ 3000 Basic Automated System is optimized for reliability and ease-of-use with routine LC applications, and also offers full UHPLC compatibility. The ACC-3000 Autosampler Column Compartment is at the heart of the system. Its unique instrument design combines a rugged sample injection principle with a powerful column oven.

UltiMate 3000 Standard (SD) Systems are designed to meet current and future challenges. System components provide low extra-column and gradient delay volume for high separation efficiency and low gradient response times, as well as superior mixing performance. They offer full support of all HPLC applications and provide UHPLC compatibility – allowing you to move to UHPLC whenever you are ready.

Visit [www.thermoscientific.com](http://www.thermoscientific.com)



## Rapid Separation (RS) and BioRS Systems

UltiMate 3000 Rapid Separation (RS) Systems provides unrivaled performance and flexibility in UHPLC. Precision-engineered instrumentation, advanced data processing, and highly optimized chemistries meet all chromatographic performance challenges. With an outstanding product portfolio, UltiMate 3000 RS Systems offers industry-leading versatility covering the maximum range of UHPLC applications, while keeping fully compatible to conventional LC.

UltiMate 3000 Biocompatible Rapid Separation (BioRS) Systems are powered by UltiMate 3000 Rapid Separation technology to support the high pressures required for the separation of bioanalytes on high resolution bio UHPLC columns. This state-of-the-art technology combined with a biocompatible, low-dispersion flow path, provides the highest peak capacity and sensitivity for complex samples, whether proteins, peptides, or biotherapeutics. Bio UHPLC enables faster gradients and shorter run times compared to conventional Bio LC analysis. This results in increased sample throughput in typical modes of biochromatography.

Visit [www.thermoscientific.com](http://www.thermoscientific.com)



## x2 Dual LC Systems

UltiMate 3000 x2 Dual LC Systems are the ideal choice to maximize sample throughput of conventional HPLC and UHPLC separations by combining the flexibility of ternary solvent selection with the productivity and performance of x2 Dual technology.

Operate conventional or high speed applications, increase sample throughput, achieve higher chromatographic resolution, or automate tedious sample preparation steps such as analyte enrichment or matrix elimination.

Visit [www.thermoscientific.com](http://www.thermoscientific.com)



## Thermo Scientific LC-MS Systems

### Ion Traps and Orbitrap Series

Thermo Scientific™ Orbitrap™ LC-MS systems are the recognized standards for high-resolution, accurate-mass measurements.

Orbitrap LC-MS technology routinely delivers the superior mass resolution and mass accuracy necessary to reduce analysis times and increase confidence in results. This makes it the platform of choice for the most confident protein and metabolite identification, characterization and quantitation. Combined with superior dynamic range and unsurpassed sensitivity, Orbitrap systems are the only mass spectrometers capable of providing all four benefits at the same time, without compromise.

With market and technology leadership for over 25 years, we offer ion trap LC-MS systems for every application and budget. Ion trap LC-MS systems offer unique capabilities such as MS<sup>n</sup> and data-dependent analysis along with excellent full-scan sensitivity to provide routine detection and rapid identification of low-level analytes. Ion trap systems support a variety of applications from compound identification and routine HPLC detection through the most demanding analyses of low-level components in complex biological matrices.

Visit [www.thermoscientific.com/orbitrap](http://www.thermoscientific.com/orbitrap)

### TSQ Series Triple Quadrupole LC-MS

Robust triple-stage quadrupole LC-MS systems enable ultra-sensitive quantitation of target compounds in complex matrices.

TSQ Series triple-stage quadrupole LC-MS systems offer a wide range of capabilities. From the value-conscious Thermo Scientific™ TSQ Endura™ LC-MS to the precise Thermo Scientific™ TSQ Quantiva™ LC-MS, our mass spectrometers couple perfectly with our HPLC, UHPLC, and nano-LCs to easily accommodate complex matrices encountered in a variety of applications.

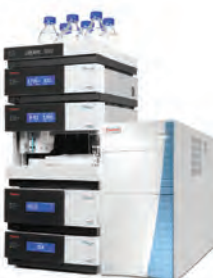
Visit [www.thermoscientific.com/tsq](http://www.thermoscientific.com/tsq)

### MSQ Plus Single Quadrupole LC-MS

Our single quadrupole LC-MS system offers superior ease-of-use and modest price and space requirements.

The system can be used with both HPLC and IC systems in a wide range of applications and methodologies.

Visit [www.thermoscientific.com](http://www.thermoscientific.com)



# GC Columns and Accessories

Thermo Scientific GC columns and accessories are designed to give optimum system performance for today's challenging analyses. Thermo Scientific™ TraceGOLD™, Thermo Scientific™ TRACE™ and Thermo Scientific™ TracePLOT™ columns provide excellent quality and performance. Our range of GC accessories include all the tools needed by today's gas chromatographers.

## Featured Products



### LinerGOLD GC Liners

The GOLD standard in GC liner performance, providing enhanced inertness, leading to increased accuracy and precision in analysis.

**PAGE 5-016**



### TraceGOLD GC Columns

The premium standard in GC column performance, delivering low bleed, excellent reproducibility and high levels of inertness.

**PAGE 5-036**



## Section Contents

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Injection Port Septa .....	<b>5-014</b>	TracePLOT GC Columns .....	<b>5-076</b>
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### GC Derivatization Reagents

Making the undetectable detectable. Thermo Scientific GC Derivatization reagents provide high levels of purity and reproducibility in analysis.

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### Reacti-Therm Sample Derivatization System

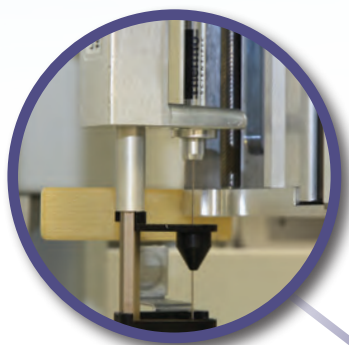
Heating, stirring and evaporation in a single system, offering a complete solution for derivatization and other small-scale reactions.

**PAGE 5-093**

# GC Columns and Accessories

## Product Selection Guide

Selection of the correct GC columns and accessories is critical to ensure optimum system performance. The selection guide below is designed to simplify this process



**GC Syringes**



**Vials and Closures**



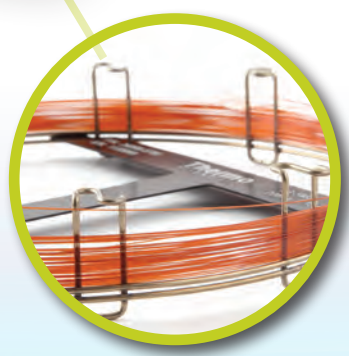
**GC Liners**



**GC Septa**



**GC Ferrules**



**GC Columns**






## Vials and Closures

Nature of Sample	Vial Type Recommended
Routine samples	Clear glass (with or without patch) as SureStop 9mm screw thread or 11mm crimp vial
Light sensitive samples	Amber glass (with or without patch) as SureStop 9mm screw thread or 11mm crimp vial
Low volume samples	Micro-Inserts or Microsampling and High Recovery vials with fixed inserts or reduced internal volume
Trace levels	Silanized glass and/or Certified Kits
Ultra Trace MS analysis	MSCERT kits: The first low particle, low background chromatography vials, pre-cleaned to provide unmatched consistency; tested and certified for up to 15 critical physical characteristics affecting vial performance for mass spectrometry

## GC Septa

Material	Max Operating Temperature	Key Features
BTO	400 °C (330 °C for 17 mm size)	Low bleed
TR-Green	350 °C	Long lifetime
Marathon	350 °C	High mechanical durability
TR-Blue	200–250 °C	Easy to penetrate for routine applications

## GC Liners






Injection Method	Injection Requirements	Liner Requirements
<b>Split</b> 	Enables rapid vaporization and effective mixing of sample	<ul style="list-style-type: none"> <li>Typically open-ended</li> <li>Large surface area &amp; volume</li> <li>Design to aid mixing</li> <li>Low activity</li> </ul>
<b>Splitless</b> 	Sample focused onto column – minimizes sample contact with reactive metal components	<ul style="list-style-type: none"> <li>Typically tapered</li> <li>Small volume to aid transfer</li> <li>Low activity</li> </ul>
<b>PTV</b> 	Rapid heating and cooling, fast transfer to column-used for active compounds such as pesticides and large volume injections	<ul style="list-style-type: none"> <li>Small to aid sample transfer</li> <li>Good thermal properties for rapid heating &amp; cooling</li> <li>Siltek coating provides highly inert surface</li> </ul>

## GC Columns

Column Parameter	Parameters Affecting Resolution			Performance Changes
	Efficiency	Retention	Selectivity	
Column Length (m)	✓			Doubling column length increases resolution by ~ 40%
Internal Diameter (mm)	✓	✓		The smaller the column ID, the greater the efficiency and better the resolution
Film Thickness (µm)		✓		The thicker the film, the greater the retention, e.g. ideal for highly volatile compounds. The thinner the film, the sharper the peaks and lower the bleed
Stationary Phase Chemistry			✓	Altering the stationary phase can affect elution order and help separate closely, or co-eluting peaks

## GC Syringes

### Syringe Selection by Needle Tip Style

Needle Tip Style	Features / Applications
<b>Cone (Tapered tip)</b> 	Most versatile needle for autosampler use and resist coring of vial and inlet septa
<b>Bevel (Sharp tip)</b> 	Typically used for manual injections. The tip shape helps reduce septa coring
<b>Side Hole (Dome tip with a side hole for sample exit)</b> 	Usually used for headspace and large volume injections
<b>Blunt End or 90° (flat top)</b> 	Used for injectors that do not contain an inlet septa such as Merlin MicroSeal™
<b>Dual Gauge</b> 	Narrow gauge part suitable for megabore on-column injection. Wider part suitable for autosampler use

### Syringe Selection by Needle Gauge Size

- Gauge is a measure of the “thickness” of the needle
- The higher the gauge number, the thinner the needle e.g. a 23 gauge is thicker than a 26 gauge
- Suffix “s” e.g. 23s refers to a needle with a narrower internal diameter
- For on-column injection ensure that the column ID is greater than the needle gauge

## GC Ferrules

Material	Uses	Advantages	Limitations
100% Graphite	FID, NPD, high temperature	<ul style="list-style-type: none"> <li>Easy-to-use stable seal</li> <li>Higher temperature limit</li> <li>Can be easily removed</li> <li>Can be re-used</li> </ul>	<ul style="list-style-type: none"> <li>Not for MS or oxygen-sensitive detectors</li> <li>Soft, easily deformed or destroyed</li> <li>Possible system contamination</li> </ul>
85% Vespel / 15% Graphite	MS and oxygen-sensitive detectors	<ul style="list-style-type: none"> <li>Long lifetime</li> <li>High temperature limit</li> <li>MS compatible</li> </ul>	<ul style="list-style-type: none"> <li>Cannot be re-used</li> <li>Must be re-tightened after initial temperature cycles</li> </ul>
SilTite™ Metal	MS and oxygen-sensitive detectors	<ul style="list-style-type: none"> <li>Long lifetime</li> <li>High temperature limit</li> <li>MS compatible</li> </ul>	<ul style="list-style-type: none"> <li>Cannot be re-used</li> </ul>

# Gas Management

## Click-On Inline Filters

Easy-to-use format eliminates contamination

- Pure gas output 99.9999% or 6.0 grade
- No carrier gas line contamination during filter change
- Easy and fast replacement without the need for tools
- TUEV approved
- Maximum pressure 11 bar (160 psi)
- Maximum flow 25L/min



Filters	For Gas	Indicator Change	Filter Capacity (Click-On Inline)	Filter Capacity (Super Clean)
Moisture	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR, Air		21g H <sub>2</sub> O	7.2g H <sub>2</sub> O
Oxygen	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR		3L O <sub>2</sub>	1L O <sub>2</sub>
Hydrocarbon	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR, Air		36g (as n-butane)	24g (as n-butane)
Combi – Moisture, Oxygen	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR		10g H <sub>2</sub> O, 1.5L O <sub>2</sub>	–
Combi – Moisture, Hydrocarbons	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR, Air		10g H <sub>2</sub> O, 18g HCs (as n-butane)	3.5g H <sub>2</sub> O, 12g HCs (as n-butane)
Triple – Moisture, Oxygen, Hydrocarbons	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR		6g H <sub>2</sub> O, 1L O <sub>2</sub> , 12g HCs (as n-butane)	1.8g H <sub>2</sub> O, 500mL O <sub>2</sub> , 7g HCs (as n-butane)
Triple – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS	He		6g H <sub>2</sub> O, 1L O <sub>2</sub> , 12g HCs (as n-butane)	–
Indicating Triple – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS	He	<b>Moisture:</b> Yellow to Clear <b>Oxygen:</b> Green to Gray	0.1g H <sub>2</sub> O, 100mL O <sub>2</sub> , 0.07g HCs (as n-butane)	–

### Click-On Inline Filters

Type	Cat No.	Quantity
Moisture Filter	<b>60180-801</b>	1 Each
Oxygen Filter	<b>60180-802</b>	1 Each
Hydrocarbon Filter	<b>60180-803</b>	1 Each
Combi – Moisture, Oxygen	<b>60180-804</b>	1 Each
Combi – Moisture, Hydrocarbons	<b>60180-843</b>	1 Each
Triple – Moisture, Oxygen, Hydrocarbons	<b>60180-805</b>	1 Each
Triple – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS	<b>60180-806</b>	1 Each
Indicating Triple – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS	<b>60180-808</b>	1 Each

### Connectors and Accessories

Description	Cat No.	Quantity
Brass End Fitting, 0.125in.	<b>60180-809</b>	2 Pack
Steel End Fitting, 0.125in.	<b>60180-810</b>	2 Pack
Brass End Fitting, 0.25in.	<b>60180-811</b>	2 Pack
Steel End Fitting, 0.25in.	<b>60180-812</b>	2 Pack
Double Ended Connector to connect Filter to Indicator	<b>60180-813</b>	1 Each
Replacement O-Rings	<b>60180-833</b>	1 Each
Wall Mounting Clamp	<b>60180-834</b>	4 Pack

## Super Clean Cartridge Filters

Replace easily without tools

- 99.9999% pure gas (or 6.0 grade) output
- No carrier gas line contamination during cartridge change
- Cost effective
- TUEV approved
- Max. pressure 11 bar (160 psi)
- Max. flow 7L/min



### Super Clean Cartridge Filters

Type	Base Included	Cat. No.	Quantity
Indicating Moisture Cartridge Filter	No	<b>60180-819</b>	1 Each
Indicating Oxygen Cartridge Filter	No	<b>60180-820</b>	1 Each
Hydrocarbon Cartridge Filter	No	<b>60180-821</b>	1 Each
Indicating Combi Filter – Moisture, Hydrocarbons	No	<b>60180-826</b>	1 Each
Indicating Triple Filter – Moisture, Oxygen, Hydrocarbons	No	<b>60180-824</b>	1 Each
Indicating Triple Filter – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC-MS	No	<b>60180-825</b>	1 Each
Triple Filter – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC-MS	Yes	<b>60180-830</b>	1 Each
Indicating Triple Filter – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC-MS	Yes	<b>60180-829</b>	1 Each
3 Cartridge Pack – contains 1 x Triple Filter and 2 x Combi Filter (Moisture, Hydrocarbons)	No	<b>60180-822</b>	1 Each
4 Cartridge Pack – contains 1 x Moisture Filter, 1 x O <sub>2</sub> Filter and 2 x Hydrocarbon Filter	Yes	<b>60180-827</b>	1 Each
3 Cartridge Pack – contains 1 x Triple Filter and 2 x Combi Filter (Moisture, Hydrocarbons)	Yes	<b>60180-828</b>	1 Each
High Flow Pack of 2 x Hydrocarbon Filters for LC-MS – no Indicator	No	<b>60180-839</b>	1 Each
High Flow Pack of 2 x Moisture Filters for LC-MS – with Indicator	No	<b>60180-841</b>	1 Each

## Super Clean Cartridge Filter Baseplates

One-time installation procedure

- Can be configured to the individual user requirements
- Needle valves ensure gas line is not contaminated during cartridge change

*Filters are not included*



Type	For Use With	For Gas
Single Base	Triple Filter	Carrier Gas Only
Dual Base	2 x Combi Filter	Air and Fuel Gas
Triple Base	Triple and 2 x Combi Filter	Carrier, Make-Up, and Fuel Gas
Four-position Base	Moisture, Oxygen, 2 x Hydrocarbon	High Capacity Carrier, Fuel, Make Up
Two-position, High-flow Base	N <sub>2</sub> in LC/MS, H <sub>2</sub> O in H <sub>2</sub> /air generators	Carrier, Make Up and Fuel

### Super Clean Cartridge Filter Baseplates

Type	Cat. No.	Quantity
Single Base	<b>60180-814</b>	1 Each
Dual Base	<b>60180-815</b>	1 Each
Triple Base	<b>60180-817</b>	1 Each
Four-position Base	<b>60180-818</b>	1 Each
O-rings for Base Plates	<b>60180-837</b>	20 Pack
Flush Cap	<b>60180-838</b>	2 Pack



## eVol XR Dispensing System

Allows precise and accurate, operator-independent dispensing for better deployment of laboratory staff

- Can be calibrated easily by user to ensure validity of results
- Intuitive interface with touch wheel and full-color screen
- Complies to GLP and GMP protocols
- Improves confidence in reported results
- Unifies two precision devices, a digitally controlled electronic drive and an XCHANGE™ analytical syringe
- Integrated XCHANGE coupling allows syringes to be quickly and easily changed
- XCHANGE syringes offer exceptional versatility and functionality

### eVol XR Dispensing System

Description	Cat. No.	Quantity
Sample Dispensing System	<b>66002-020</b>	1 Each
eVol™ XCHANGE Syringe 5µL	<b>66002-021</b>	1 Each
eVol XCHANGE Syringe 50µL	<b>66002-022</b>	1 Each
eVol XCHANGE Syringe 100µL	<b>66002-038</b>	1 Each
eVol XCHANGE Syringe 500µL	<b>66002-023</b>	1 Each
eVol XCHANGE Syringe 1000µL	<b>66002-039</b>	1 Each
Sample Dispensing System Kit*	<b>66002-024</b>	1 Each
eVol Stand	<b>66002-025</b>	1 Each
Charger for eVol System	<b>66002-026</b>	1 Each
Charging Stand for eVol System	<b>66002-027</b>	1 Each
Replacement Battery for eVol System	<b>66002-028</b>	1 Each
Replacement Plunger for 5µL eVol Syringe	<b>66002-029</b>	1 Each
Replacement Plunger for 50µL eVol Syringe	<b>66002-030</b>	1 Each
Replacement Plunger for 100µL eVol Syringe	<b>66002-040</b>	1 Each
Replacement Plunger for 500µL eVol Syringe	<b>66002-031</b>	1 Each
Replacement Plunger for 1000µL eVol Syringe	<b>66002-041</b>	1 Each

\* Sample Dispensing Kit contains 1 eVol XR unit, 1x5µL, 1x50µL and 1x500µL syringe.



### Applications:

- Routine dispensing of volatile solvents, hazardous, corrosive or viscous chemicals



## Syringes for GC Instruments

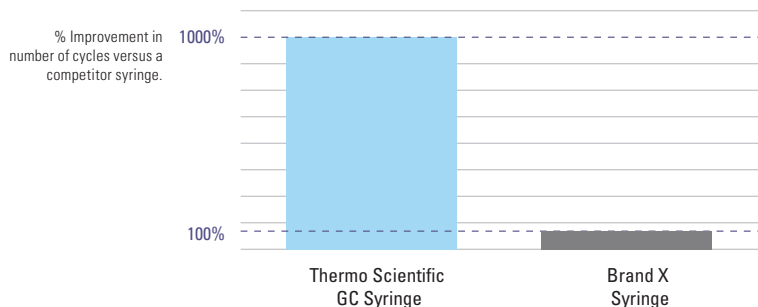
Providing durability, clarity and accuracy for your sample

Thermo Scientific™ syringes for GC instruments are designed to provide enhanced durability, clarity and accuracy in sample introduction. This gives confidence in analytical results, time-after-time.

### Durability in your GC Syringe

The enhanced design of the syringes delivers:

- Improved solvent resistance
- Greater temperature range
- Increased operational smoothness
- Longer lifetime and improved cycle life



### Clarity in your GC Syringe

Syringes are provided with a clear, easy-to-read black scale, which aids in consistent delivery of samples for manual syringes and easy identification of installed autosampler syringes.

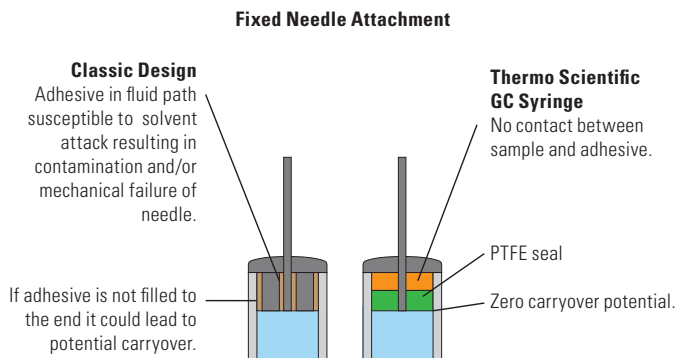


### Accuracy in your GC Syringe

The enhanced design of the syringe has eliminated areas where the sample can become trapped and potentially cause carryover:

- Closer fit between the plunger tip and PTFE insert at the zero position
- Tighter fit between PTFE insert and glass barrel
- Improved fixed needle attachment

In addition, the reduction in adhesive from the fluid path enhances durability and reduces the risk of sample interaction with the adhesive.



## GC Syringes for Thermo Scientific TriPlus RSH Autosampler

## Removable Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat. No.	Quantity	Repair Kit Cat. No.	Quantity
0.5	57	23	Cone	Split	<b>365A0241*</b>	1 Each	<b>365RN617</b>	1 Each
1	57	23	Cone	Split	<b>365B0251*</b>	1 Each	<b>365RN656</b>	1 Each

## Fixed Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat. No.	Quantity
5	85	23s	Cone	Merlin Valve SSL Injector: Splitless	<b>365C0221</b>	1 Each
	57	23s	Cone	Merlin Valve Injector: PTV and split	<b>365C0231*</b>	1 Each
	85	26s	Cone	Splitless and OC	<b>365C0241</b>	1 Each
	57	26s	Cone	Split and PTV	<b>365C0251*</b>	1 Each
10	85	23s	Cone	Merlin Valve SSL Injector: Splitless	<b>365D0261</b>	1 Each
	57	23s	Cone	Merlin Valve Injector: PTV and split	<b>365D0271*</b>	1 Each
	85	26s	Cone	Splitless and OC	<b>365D0281</b>	1 Each
	57	26s	Cone	Split and PTV	<b>365D0291*</b>	1 Each

## Fixed Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat. No.	Quantity
10	85	23s	Cone	Merlin Valve SSL Injector: Splitless	<b>365D0301</b>	1 Each
	57	23s	Cone	Merlin Valve Injector: PTV and split	<b>365D0311*</b>	1 Each
	85	26s	Cone	Splitless and OC	<b>365D0321</b>	1 Each
	57	26s	Cone	Split and PTV	<b>365D0331*</b>	1 Each
25	85	23s	Cone	Merlin Valve SSL Injector: Splitless	<b>365F2431</b>	1 Each
	57	23s	Cone	Merlin Valve Injector: PTV and split	<b>365F2441*</b>	1 Each
	85	26s	Cone	Splitless and OC	<b>365F2451</b>	1 Each
	57	26s	Cone	Split and PTV	<b>365F2461*</b>	1 Each
50	57	23s	Cone	Merlin Valve SSL Injector: LV Splitless	<b>365G2311*</b>	1 Each
	85	26s	Cone	LV OC	<b>365G2321</b>	1 Each
	57	26s	Cone	LV Splitless	<b>365G2331*</b>	1 Each
100	57	23s	Cone	Merlin Valve SSL Injector: LV Splitless	<b>365H2141*</b>	1 Each
	85	26s	Cone	LV OC	<b>365H2151</b>	1 Each
	57	26s	Cone	LV Splitless	<b>365H2161*</b>	1 Each
	85	23	Side Hole	Variable depth LV PTV (w & w/o Merlin)	<b>365H2171</b>	1 Each
	57	23	Side Hole	LV PTV (with or without Merlin valve)	<b>365H2181*</b>	1 Each
250	85	26	Cone	LV OC	<b>365I2321</b>	1 Each
	57	26	Cone	LV Splitless	<b>365I2331</b>	1 Each
	85	23	Side Hole	Variable depth LV PTV (w & w/o Merlin)	<b>365I2341</b>	1 Each
	57	23	Side Hole	LV PTV (with or without Merlin valve)	<b>365I2351</b>	1 Each
500	85	26	Cone	LV OC	<b>365J2411</b>	1 Each
	57	26	Cone	Sample Dilution	<b>365J2421</b>	1 Each
	85	23	Side Hole	Variable depth LV PTV (w & w/o Merlin)	<b>365J2431</b>	1 Each
	57	23	Side Hole	LV PTV (with or without Merlin valve)	<b>365J2441</b>	1 Each
1000	65	23	Side Hole	Headspace	<b>365Q2121</b>	1 Each
	57	22	LC	Sample Dilution	<b>365K2811</b>	1 Each
2500	65	23	Side Hole	Headspace	<b>365Q2131</b>	1 Each
5000	65	22	Side Hole	Headspace	<b>365Q2141</b>	1 Each
10000	57	19	LC	Sample Dilution	<b>365N2721</b>	1 Each

\* Also suitable for use with the Thermo Scientific™ TriPlus™ 100LS Autosampler

## GC Syringes for Thermo Scientific Instruments

## Removable Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat No.	Quantity	Replacement Needle Cat. No.	Quantity	Instrument Compatibility
10	75	31	Cone	Manual OC	<b>36500520</b>	1 Each	<b>36550046</b>	2 Pack	
100	50	23	Side hole	See Note	<b>36520050</b>	1 Each	<b>36550040</b>	2 Pack	TriPlus, AS200/AS800
100	50	23	Cone	LV Splitless	<b>36500495</b>	1 Each	<b>36566485</b>	5 Pack	TriPlus, AS2000, AS200/AS800
250	80	26	Cone	LVOC	<b>36500490</b>	1 Each	<b>36566480</b>	5 Pack	TriPlus, AS2000
250	50	23	Side hole	See Note	<b>36520051</b>	1 Each	<b>36550040</b>	2 Pack	TriPlus, AS2000, AS200/AS800
1000	50	23	Bevel		<b>365K3041</b>	1 Each	<b>365RN235</b>	5 Pack	AS200/AS800

## Removable Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat No.	Quantity	Replacement Needle Cat. No.	Quantity	Instrument Compatibility
5	75	31	Cone	Manual OC	<b>36500510</b>	1 Each	<b>36550045</b>	2 Pack	
10	50	26	Cone		<b>365D1841</b>	1 Each	<b>365RN362</b>	2 Pack	AS3000, AS2000
10	50	23	Cone		<b>365D3731</b>	1 Each	<b>365RN372</b>	2 Pack	AS3000, AS2000, AS200/AS800
50	50	23	Cone	LV Splitless	<b>36503015</b>	1 Each	<b>36566485</b>	5 Pack	AS2000

Syringe 36520051 is to be used when performing PTV/LVI injections with a dedicated liner for thermal labile compounds (liner 45352060). Compatible with Merlin Microseal device installed on BEST PTV and with AS2000 and TriPlus autosamplers for liquids.

## Fixed Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat No.	Quantity	Instrument Compatibility
10	50	23	Cone		<b>365D3741</b>	1 Each	AS2000
100	50	25	Bevel		<b>365H2321</b>	1 Each	AS200/AS800
250	50	25	Bevel		<b>365I2561</b>	1 Each	AS200/AS800

## Fixed Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat No.	Quantity	Instrument Compatibility
5	50	26	Cone	Split/PTV	<b>36504047</b>	1 Each	TriPlus
5	50	23	Cone		<b>365C3701</b>	1 Each	AS3000, AS2000, AS200/AS800
5	50	26	Cone	Split/PTV	<b>36500505</b>	1 Each	AS3000, AS2000
5	80	26	Cone	Splitless and OC	<b>36502025</b>	1 Each	TriPlus
10	50	26	Cone		<b>365D3711</b>	1 Each	AS3000, AS200, AS200/AS800
10	50	26	Cone		<b>365D1856</b>	6 Pack	AS300, AS2000, AS200/AS800
10	50	25	Cone	Split/PTV	<b>36500525</b>	1 Each	TriPlus, AS3000, AS2000, AS200/AS800

**Fixed Needle Syringes (Continued)**

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat No.	Quantity	Instrument Compatibility
10	50	23	Cone	PTV/SSL Split	<b>36520060</b>	1 Each	TriPlus, AS300, AS2000, AS200/AS800
10	80	23	Cone	Merlin Valve SSL Splitless	<b>36520061</b>	1 Each	TriPlus, AS2000
10	50	23-26	Cone	OC in PTV Merlin Valve	<b>36500580</b>	1 Each	TriPlus, AS2000
10	80	26	Cone	OC and Splitless	<b>36502019</b>	1 Each	TriPlus, AS2000

**Plunger-in-Needle Syringes**

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat No.	Quantity	Instrument Compatibility
0.5	50	23	Cone	Split/PTV	<b>36504045</b>	1 Each	TriPlus, AS3000
0.5	75	31	Cone	Manual OC	<b>36500500</b>	1 Each	
0.5	80	26	Cone	Splitless and OC	<b>36504046</b>	1 Each	TriPlus

**GC Syringes for Agilent Instruments****Removable Needle Syringes**

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
10	42	23	Cone	<b>365D1611</b>	6 Pack	<b>365RN252</b>	2 Pack

**Fixed Needle, Gas Tight Syringes**

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	42	23-26	Cone	<b>365D0621</b>	1 Each
		23-26	Cone	<b>365D0626</b>	6 Pack

**Fixed Needle Syringes**

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
5	42	23	Cone	<b>365C0951</b>	1 Each
		23	Cone	<b>365C0956</b>	6 pack
		23-26s	Cone	<b>365C0971</b>	1 Each
		23-26s	Cone	<b>365C0976</b>	6 pack
		23-26s	Cone	<b>365C0976</b>	6 pack
10	42	23	Cone	<b>365D1571</b>	1 Each
		23	Cone	<b>365D1576</b>	6 pack
		23-26s	Cone	<b>365D1621</b>	1 Each
		23-26s	Cone	<b>365D1636</b>	6 pack
		23-26s	Cone	<b>365D1636</b>	6 pack

**Fixed Needle, Super-Elastic Plunger Syringes**

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	42	23-26s	Cone	<b>365D5416</b>	1 Each

## GC Syringes for Shimadzu Instruments

### Removable Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
5	42	26s	Cone	<b>365C6610</b>	1 Each	<b>365RN663</b>	2 Pack
		23s	Cone	<b>365C6620</b>	1 Each	<b>365RN661</b>	2 Pack
10	42	26s	Cone	<b>365D6610</b>	1 Each	<b>365RN272</b>	2 Pack
		23s	Cone	<b>365D6620</b>	1 Each	<b>365RN282</b>	2 Pack

## GC Syringes for CTC Instruments

### Removable Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
10	50	23	Cone	<b>365D3731</b>	1 Each	<b>365RN372</b>	2 Pack
		26	Cone	<b>365D1841</b>	1 Each	<b>365RN362</b>	2 Pack

### Fixed Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	50	23	Cone	<b>365D2976</b>	6 Pack
		26	Cone	<b>365D2977</b>	1 Each
		23	Cone	<b>365D3741</b>	1 Each
25	50	23	Cone	<b>365F3761</b>	1 Each
100	50	23	Cone	<b>365H3771</b>	1 Each
250	50	26	Cone	<b>365H6700</b>	1 Each
1000	50	26	Side Hole	<b>365K8135</b>	1 Each
2500	50	26	Side Hole	<b>365L8635</b>	1 Each

### Fixed Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
5	50	23	Cone	<b>365C3701</b>	1 Each
		26	Cone	<b>36500505</b>	1 Each
10	50	26	Cone	<b>365D3711</b>	1 Each
		23	Cone	<b>36520060</b>	1 Each
		26	Cone	<b>365D1856</b>	6 Pack
		23	Cone	<b>365D2971</b>	6 Pack

## Manual GC Syringes

## Removable Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
10	50	26s	Bevel	<b>365D0811</b>	1 Each	<b>365RN215</b>	5 Pack
25	50	25	Bevel	<b>365F1931</b>	1 Each	<b>365RN225</b>	5 Pack
		22s	Blunt End	<b>365FLG31</b>	1 Each	<b>365RNL25</b>	5 Pack
50	50	22s	Blunt End	<b>365GLG41</b>	1 Each	<b>365RNL25</b>	5 Pack
500	50	25	Bevel	<b>365J2881</b>	1 Each	<b>365RN225</b>	5 Pack
		22s	Blunt End	<b>365JLG71</b>	1 Each	<b>365RNL25</b>	5 Pack
1000	50	23	Bevel	<b>365K3041</b>	1 Each	<b>365RN235</b>	5 Pack
		22s	Blunt End	<b>365KLG81</b>	1 Each	<b>365RNL35</b>	5 Pack
5000	50	22	Bevel	<b>365M5212</b>	1 Each	<b>365RN463</b>	2 Pack
		22s	Blunt End	<b>365M6322</b>	1 Each	<b>365RN461</b>	2 Pack
		22s	Side Hole	<b>365M8922</b>	1 Each	<b>365RN465</b>	2 Pack
10000	50	22	Bevel	<b>365N5214</b>	1 Each	<b>365RN463</b>	2 Pack
		22s	Blunt End	<b>365N6323</b>	1 Each	<b>365RN461</b>	2 Pack
		22s	Side Hole	<b>365N8923</b>	1 Each	<b>365RN465</b>	2 Pack

## Removable Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
10	50	26	Bevel	<b>365D1171</b>	1 Each	<b>365RN215</b>	5 Pack
25	50	25	Bevel	<b>365F1901</b>	1 Each	<b>365RN225</b>	5 Pack
50	50	25	Bevel	<b>365G2091</b>	1 Each	<b>365RN225</b>	5 Pack

## Fixed Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	50	26	Bevel	<b>365D4433</b>	1 Each
		26s	Blunt End	<b>365D6314</b>	1 Each
25	50	22s	Blunt End	<b>365F6315</b>	1 Each
50	50	25	Bevel	<b>365G2111</b>	1 Each
		22s	Blunt End	<b>365G6316</b>	1 Each
100	50	25	Bevel	<b>365H2321</b>	1 Each
		22s	Blunt End	<b>365H6317</b>	1 Each
250	50	25	Bevel	<b>365I2561</b>	1 Each
500	50	25	Bevel	<b>365J2831</b>	1 Each
		22s	Blunt End	<b>365J6319</b>	1 Each
1000	50	22	Bevel	<b>365K3051</b>	1 Each

## Fixed Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
5	50	26	Bevel	<b>365C0741</b>	1 Each
		26	Bevel	<b>365C0746</b>	6 Pack
10	50	26	Bevel	<b>365D1091</b>	1 Each
		26	Bevel	<b>365D1096</b>	6 Pack
25	50	25	Bevel	<b>365F1891</b>	1 Each
100	50	25	Bevel	<b>365H2291</b>	1 Each

**PTFE Luer-Lok, Gas Tight Syringes**

Volume (µL)	Cat. No.	Quantity	Needle Cat. No.	Quantity
25	<b>365F7655</b>	1 Each	<b>365RNL22</b>	2 Pack
50	<b>365G7656</b>	1 Each	<b>365RNL22</b>	2 Pack
100	<b>365H7657</b>	1 Each	<b>365RNL22</b>	2 Pack
250	<b>365I7658</b>	1 Each	<b>365RNL22</b>	2 Pack
500	<b>365J7659</b>	1 Each	<b>365RNL22</b>	2 Pack
1000	<b>365KL531</b>	1 Each	<b>365RNL22</b>	2 Pack
2500	<b>365LL541</b>	1 Each	<b>365RNL22</b>	2 Pack
5000	<b>365ML551</b>	1 Each	<b>365RNL22</b>	2 Pack
10000	<b>365NL561</b>	1 Each	<b>365RNL22</b>	2 Pack
25000	<b>365PL571</b>	1 Each	<b>365RNL22</b>	2 Pack

Please note that the Luer-Lok syringes do not come with a needle and therefore the needle part number needs to be ordered separately

**Luer Tip, Gas Tight Syringes**

Volume (µL)	Cat. No.	Quantity
25	<b>365F7812</b>	1 Each
50	<b>365G7813</b>	1 Each
100	<b>365H7814</b>	1 Each
250	<b>365I7815</b>	1 Each
500	<b>365J7816</b>	1 Each
1000	<b>365K7817</b>	1 Each
2500	<b>365L7818</b>	1 Each
5000	<b>365M7819</b>	1 Each
10000	<b>365N7820</b>	1 Each





## Injection Port Septa

Quality materials for all applications

### BTO Septa

- Low bleed septa - ideal for MS applications
- Excellent mechanical properties
- Maximum temperature 400°C

### TR-Green Septa

- Long injection lifetime
- Low injection port adhesion
- Maximum temperature 350°C

### Marathon Septa

- Pre-pierced for reliable performance
- Up to 400 injections per septa
- Maximum temperature 350°C

### TR-Blue Septa

- General purpose septa
- Easy to penetrate
- Maximum temperature 200-250°C

### Septa

Material	ID (mm)	Cat. No. (Blister Pack)	Quantity (Blister Pack)	Cat. No. (Glass Jar)	Quantity (Glass Jar)
BTO	9	31303240-BP	50 Pack	31303240	50 Pack
BTO	11	31303233-BP	50 Pack	31303233	50 Pack
BTO	11.5	31303230-BP	50 Pack	31303230	50 Pack
BTO	12.7	31303250-BP	48 Pack	31303228	50 Pack
BTO	17	31303215-BP	48 Pack	31303211	50 Pack
TR-Green	9	313G3240-BP	50 Pack	313G3240	50 Pack
TR-Green	11	313G3230-BP	50 Pack	313G3230	50 Pack
TR-Green	12.7	313G3250-BP	48 Pack	313G3228	50 Pack
TR-Green	17	313G3215-BP	48 Pack	313G3211	50 Pack
Marathon	9	313P3240-BP	50 Pack	313P3240	50 Pack
Marathon	11	313P3233-BP	50 Pack	313P3233	50 Pack
Marathon	11.5	313P3230-BP	50 Pack	313P3230	50 Pack
Marathon	17	313P3215-BP	48 Pack	313P3211	50 Pack
TR-Blue	9	N/A	N/A	313B3240	50 Pack
TR-Blue	11	N/A	N/A	313B3233	50 Pack
TR-Blue	11.5	N/A	N/A	313B3230	50 Pack
TR-Blue	17	N/A	N/A	313B3211	50 Pack



## Gold and Siltek Inlet Base Seals

- Precision machined to provide exceptional sealing properties
- Gold plating and Siltek coatings provide a surface with exceptional inertness for analysis of highly active compounds
- High grade stainless steel providing reproducible seal
- Compatible with Thermo Scientific TRACE 1300 Series GC & Agilent split/splitless injection ports

### Gold Inlet Base Seals

For Use With	ID (mm)	Cat. No.	Quantity
Single Column Installation	0.8	<b>290GA081</b>	10 Pack
Single Column Installation	0.8	<b>290GA082</b>	2 Pack
Single Column Installation (Cross Version)	0.8	<b>290GA084</b>	10 Pack
Single Column Installation (Cross Version)	0.8	<b>290GA083</b>	2 Pack
Dual Column Installation	1.2	<b>290GA121</b>	10 Pack
Dual Column Installation	1.2	<b>290GA122</b>	2 Pack

### Siltek Inlet Base Seals

For Use With	ID (mm)	Cat. No.	Quantity
Single Column Installation	0.8	<b>290GA091</b>	10 Pack
Single Column Installation	0.8	<b>290GA092</b>	2 Pack
Single Column Installation (Cross Version)	0.8	<b>290GA094</b>	10 Pack
Single Column Installation (Cross Version)	0.8	<b>290GA093</b>	2 Pack



# Injection Port Liners

## LinerGOLD GC Liners

The GOLD standard in GC liner performance!

- **Increased accuracy and sensitivity in analysis** – LinerGOLD prevents the loss of sensitive compounds in analysis
- **Lower detection limits** – when analyzing active and sensitive compounds
- **Excellent reproducibility** – gives confidence in your results from liner to liner – setting the GOLD standard

### The GOLD standard in liner consistency

Consistency in your GC liner is of paramount importance – you expect to see a consistently high level of performance time after time. Thermo Scientific™ LinerGOLD™ GC liners are manufactured and tested to ensure that you have confidence with every liner that it installed onto your GC system.

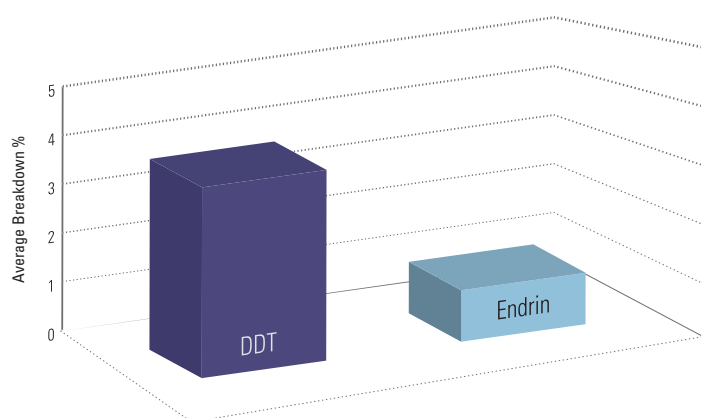


Figure 1: Endrin and DDT breakdown test results showing the lot-to-lot reproducibility and low levels of inertness of LinerGOLD

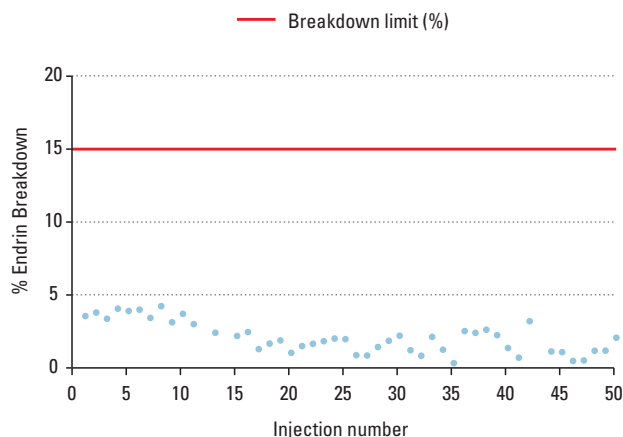
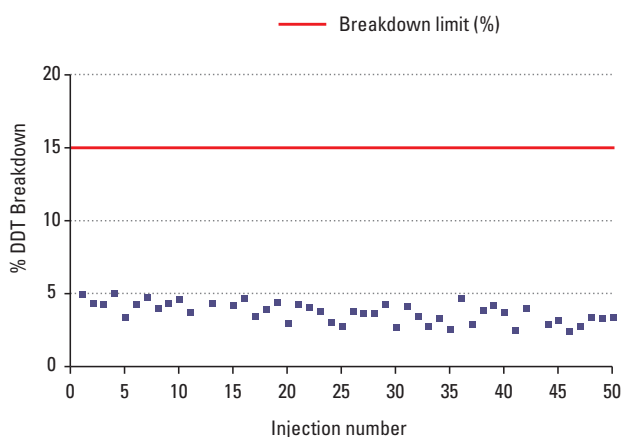

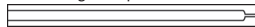



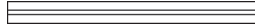
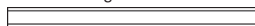
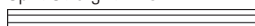

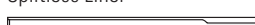


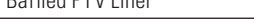


Figure 2: Compound degradation after 50 injections – LinerGOLD exhibits minimal breakdown

## LinerGOLD GC Liners for Thermo Scientific TRACE 1300 Series and Agilent Instruments

Injection Type	ID x OD (mm)	Length (mm)	Packing	Cat. No. 1 Pack	Cat. No. 5 Pack	Cat. No. 25 Pack
Split/Splitless Liner 	4 x 6.3	78.5	Quartz Wool	453A0164-UI	453A2265-UI	453A1262-UI
Split/Splitless Straight Liner 	4 x 6.3	78.5	No	453A0294-UI	453A1295-UI	453A2292-UI
Splitless Liner with Single Taper 	4 x 6.3	78.5	No	453A0344-UI	453A1345-UI	453A2342-UI
Splitless Liner with Single Taper 	4 x 6.3	78.5	Quartz Wool	453A0924-UI	453A1925-UI	453A2922-UI
Splitless Liner with Double Taper 	4 x 6.3	78.5	No	453A0354-UI	453A1355-UI	453A2352-UI
Precision Liner 	4 x 6.3	78.5	Quartz Wool	453A0254-UI	453A1255-UI	453A1252-UI
Direct Straight Liner 	1 x 6.3	78.5	No	453A0334-UI	453A1335-UI	453A2332-UI

## LinerGOLD GC Liners for Thermo Scientific TRACE Ultra and FOCUS Instruments

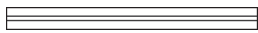
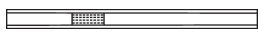





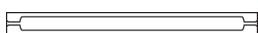
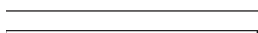
Injection Type	ID x OD (mm)	Length (mm)	Packing	Cat. No. 1 Pack	Cat. No. 5 Pack	Cat. No. 25 Pack
Direct Straight Liner 	5 x 8	105	No	45310030-UI	45350030-UI	45354030-UI
Split Straight Liner 	3 x 8	105	No	45310031-UI	45350031-UI	45354031-UI
Splitless Liner 	3 x 8	105	No	45310032-UI	45350032-UI	45354032-UI
Splitless Liner 	5 x 8	105	No	45351033-UI	45350033-UI	45354033-UI
Precision Liner 	5 x 8	105	Quartz Wool	453T0905-UI	453T1905-UI	453T4905-UI
Splitless Precision Liner 	5 x 8	105	Quartz Wool	453T0999-UI	453T2999-UI	453T4999-UI
Baffled PTV Liner 	2 x 2.75	120	No	453T0845-UI	453T2845-UI	453T4845-UI






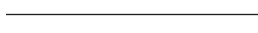



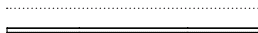
## Injection Port Liners for Thermo Scientific Instruments

Highly deactivated and produced to exacting tolerances to ensure a high degree of reproducibility

### Liners for Thermo Scientific TRACE 1300 Series SSL Instruments

	Injection Type	ID x OD (mm)	Length (mm)	Packing	Cat. No. 5 Pack	Cat. No. 25 Pack
	Direct Straight Liner	1.2 x 6.3	78.5	No	<b>453A1335</b>	<b>453A2332</b>
	Split Straight Liner	4 x 6.3	78.5	Quartz Wool	<b>453A2265</b>	<b>453A1262</b>
	Split Straight Liner	4 x 6.3	78.5	No	<b>453A1295</b>	<b>453A2292</b>
	Split/Splitless FocusLiner	4 x 6.3	78.5	Quartz Wool	<b>453A1255</b>	<b>453A1252</b>
	Split/Splitless FocusLiner with Single Taper	4 x 6.3	78.5	Quartz Wool	<b>453A1315</b>	<b>453A1312</b>
	Split/Splitless Liner with Single Taper	4 x 6.3	78.5	No	<b>453A1345</b>	<b>453A2342</b>
	Split/Splitless Liner with Double Taper	4 x 6.3	78.5	No	<b>453A1355</b>	<b>453A2352</b>
	Split/Splitless Liner w/ Recessed Gooseneck	4 x 6.3	78.5	Quartz Wool	<b>453A1305</b>	<b>N/A</b>
	Splitless Liner with Single Taper	4 x 6.3	78.5	Quartz Wool	<b>453A1925</b>	<b>N/A</b>
	Split/Splitless Mini-Lam Liner	4 x 6.3	78.5	No	<b>453A2009</b>	<b>N/A</b>
	Split/Splitless Mixed Liner Sample Pack	Mixed	Mixed	Mixed	<b>453TH002</b>	<b>N/A</b>



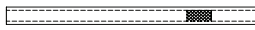








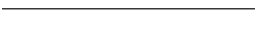
### Liners for Thermo Scientific TRACE 1300 Series and TRACE ULTRA PTV Instruments

	Injection Type	ID x OD (mm)	Length (mm)	Packing	Cat. No. 2 Pack	Cat. No. 5 Pack	Cat. No. 25 Pack
	PTV Straight Liner	1 x 2.75	120	No	<b>N/A</b>	<b>45352054</b>	<b>N/A</b>
	PTV Straight Liner	2 x 2.75	120	No	<b>N/A</b>	<b>45352057</b>	<b>45354057</b>
	PTV Straight Liner (deactivated)	2 x 2.75	120	No	<b>45322045</b>	<b>N/A</b>	<b>N/A</b>
	PTV Liner with Sintered Lining	1 x 2.75	120	No	<b>N/A</b>	<b>45352060</b>	<b>N/A</b>
	PTV Liner with Three Baffles	1 x 2.75	120	No	<b>N/A</b>	<b>45352062</b>	<b>N/A</b>
	PTV Siltek Metal Liner	1 x 2.75	120	No	<b>45322046</b>	<b>N/A</b>	<b>N/A</b>
	PTV Siltek Metal Liner	2 x 2.75	120	No	<b>45322044</b>	<b>N/A</b>	<b>N/A</b>
	PTV Siltek Metal Liner	2 x 2.75	120	Wool	<b>45322056</b>	<b>N/A</b>	<b>N/A</b>
	PTV Baffle Liner (Siltek)	2 x 2.75	120	No	<b>N/A</b>	<b>453T2120</b>	<b>N/A</b>
	PTV Split Liner with Recessed Gooseneck	2 x 2.75	120	Quartz Wool	<b>N/A</b>	<b>45352070</b>	<b>N/A</b>
	PTV Silcosteel Liner for OC	1 x 2.75	120	No	<b>45322052</b>	<b>N/A</b>	<b>N/A</b>
	PTV Mixed Liner Sample Pack	Mixed	Mixed	Mixed	<b>N/A</b>	<b>453TH003</b>	<b>N/A</b>

## Liner Sealing Rings for Thermo Scientific Instruments

Description	Cat. No.	Quantity
Liner Sealing Ring for TRACE 1300 Series GC SSL Injector	<b>29001312</b>	1 Each
Liner Sealing Ring for TRACE 1300 Series GC PTV Injector	<b>29001318</b>	1 Each
Viton Liner Sealing Ring for TRACE 1300 Series GC	<b>2900A241</b>	10 Pack
Liner sealing Ring for TRACE and FOCUS GC SSL Injector	<b>29033406</b>	10 Pack
Liner sealing Ring for TRACE PTV Injector	<b>29013417</b>	2 Pack

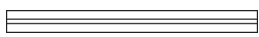
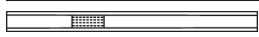
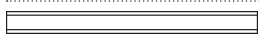

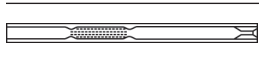

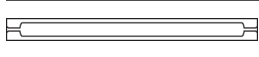

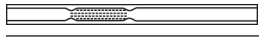
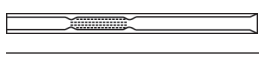
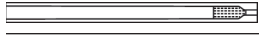
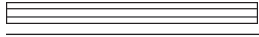
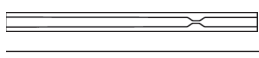
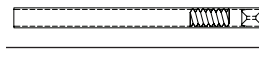

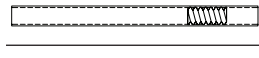
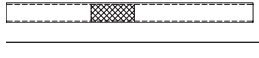

## Liners for Thermo Scientific TRACE ULTRA and FOCUS SSL Instruments

	Injection Type	ID x OD (mm)	Length (mm)	Packing	Cat. No. 5 Pack	Cat. No. 25 Pack
	Split Straight Liner	5 x 8	105	No	<b>45350030</b>	<b>45354030</b>
	Split Straight Liner	3 x 8	105	No	<b>45350031</b>	<b>45354031</b>
	Split Straight Liner	5 x 8	105	CarboFrit	<b>453T2131</b>	<b>N/A</b>
	Splitless Straight Liner	3 x 8	105	No	<b>45350032</b>	<b>45354032</b>
	Splitless Straight Liner	5 x 8	105	No	<b>45350033</b>	<b>45354033</b>
	Splitless Straight Liner	5 x 8	105	CarboFrit	<b>453T2130</b>	<b>N/A</b>
	Splitless Straight Liner (Siltek)	3 x 8	105	No	<b>453T2121</b>	<b>N/A</b>
	Split FocusLiner for 50mm Needle	5 x 8	105	Quartz Wool	<b>453T1905</b>	<b>453T4905</b>
	Splitless FocusLiner for 50mm Needle	5 x 8	105	Quartz Wool	<b>453T2999</b>	<b>453T4999</b>
	Splitless FocusLiner for 70mm Needle	5 x 8	105	Quartz Wool	<b>453T2895</b>	<b>453T4895</b>
	Baffle Liner	2 x 8	105	No	<b>453T1001</b>	<b>N/A</b>
	Split/Splitless Straight Liner	0.75 x 2.75	105	No	<b>45352083</b>	<b>N/A</b>



# Injection Port Liners for Agilent Instruments

## Liners for Agilent Instruments

	Injection Type	ID x OD (mm)	Length (mm)	Packing	Cat. No. 5 Pack	Cat No. 25 Pack
	Direct Straight Liner	1.2 x 6.3	78.5	No	<b>453A1335</b>	<b>453A2332</b>
	Split Straight Liner	4 x 6.3	78.5	Quartz Wool	<b>453A2265</b>	<b>453A1262</b>
	Split Straight Liner	4 x 6.3	78.5	No	<b>453A1295</b>	<b>453A2292</b>
	Split/Splitless FocusLiner	4 x 6.3	78.5	Quartz Wool	<b>453A1255</b>	<b>453A1252</b>
	Split/Splitless FocusLiner with Single Taper	4 x 6.3	78.5	Quartz Wool	<b>453A1315</b>	<b>453A1312</b>
	Split/Splitless Liner with Single Taper	4 x 6.3	78.5	No	<b>453A1345</b>	<b>453A2342</b>
	Split/Splitless Liner with Double Taper	4 x 6.3	78.5	No	<b>453A1355</b>	<b>453A2352</b>
	Split/Splitless Liner w/ Recessed Gooseneck	4 x 6.3	78.5	Quartz Wool	<b>453A1305</b>	<b>N/A</b>
	Split/Splitless FAST FocusLiner	2.3 x 6.3	78.5	Quartz Wool	<b>453A1285</b>	<b>453A2282</b>
	Split/Splitless FAST FocusLiner with Single Taper	2.3 x 6.3	78.5	Quartz Wool	<b>453A2375</b>	<b>453A1372</b>
	Splitless Liner with Single Taper	4 x 6.3	78.5	Quartz Wool	<b>453A1925</b>	<b>N/A</b>
	Splitless Straight Liner	2.0 x 6.3	78.5	No	<b>453A2275</b>	<b>N/A</b>
	Splitless Liner with Recessed Gooseneck	2.0 x 6.3	78.5	No	<b>453A2325</b>	<b>N/A</b>
	Cyclo/Single Gooseneck (Deactivated Metal)	5.2 x 6.3	78.5	No	<b>453A2000</b>	<b>N/A</b>
	Single Gooseneck (Deactivated Metal)	5.2 x 6.3	78.5	No	<b>453A2001</b>	<b>N/A</b>
	Cyclosplitter Liner (Deactivated Metal)	5.2 x 6.3	78.5	No	<b>453A2002</b>	<b>N/A</b>
	Split/Splitless Liner with Wool (Deactivated Metal)	5.2 x 6.3	78.5	No	<b>453A2003</b>	<b>N/A</b>
	Split/Splitless Mixed Liner Sample Pack	Mixed	Mixed	No	<b>453AG001</b>	<b>N/A</b>

## Liner Sealing Rings for Agilent Instrument

Description	Cat. No.	Quantity
Graphite Liner Sealing Ring for Agilent Direct Straight Liners	<b>290GA242</b>	10 Pack
Graphite Liner Sealing Ring for Agilent SSL Liners	<b>290GA243</b>	10 Pack
Graphite Liner Sealing Ring for Agilent 2.0mm Liners	<b>290GA244</b>	10 Pack
Viton Liner Sealing Ring for Agilent SSL Injector	<b>290OA241</b>	10 Pack

Thermo Scientific GC consumables are suitable for use with Agilent GC systems



## Ferrules

Wide range of choices for a wide range of instruments and applications

Thermo Scientific ferrules are available in three different materials and various dimensions to match the instrument and capillary column ID. The choice of material is dependent upon the use; guidelines are given in the table.

Material Type	Suitable for GC-MS	Temp Limit (°C)	Re-usable
Graphite	No	450	Yes
Graphite/Vespel	Yes	350	No
Stainless Steel (SiITite)	Yes	500	No

### 100% Graphite Ferrules



Thermo Scientific 100% graphite ferrules are a soft material that is porous to oxygen, making them suitable

for most applications except GC-MS interface connections. These easy-to-use ferrules form a soft grip with the column and provide a stable seal.

### 15% Graphite / 85% Vespel Ferrules



The mechanically robust 15% Graphite/85% Vespel ferrules have a long lifetime and are compatible with GC-MS. These

ferrules form a strong grip with the column and cannot be reused as they form a permanent seal with the column. They have a temperature limit of 350°C, but must be re-tightened after initial temperature cycles.

### SiITite Metal Ferrules



The SiITite ferrule forms a strong, permanent, airtight seal around the capillary column, eliminating leaks.

The base of the ferrule is flat and forms a perfect seal with the MS interface. The ferrule's temperature tolerance is well above the limit of the injector, MS interface or GC oven. Unlike other ferrules, SiITite Ferrules do not need re-tightening after installation.

*Please also see syringes on page 5-007.*

All varieties of ferrules are supplied in contaminant-free, individual blister packs, allowing removal of an individual item without risk of contamination to the other supplied items.

To select the most appropriate ferrule for your GC system, refer to the table below:

	100% Graphite	15% Graphite/ 85% Vespel	SiITite
Suitable for Thermo Scientific TRACE ULTRA SSL Injector	•	•	
Suitable for Thermo Scientific TRACE 1300/1310 & Agilent SSL Injectors	•	•	•
Suitable for Thermo Scientific TRACE ULTRA non-MS detectors	•	•	
Suitable for Thermo Scientific TRACE 1300/1310 & Agilent non-MS detectors	•	•	
Suitable for all Thermo Scientific & Agilent MS Detectors		•	•
Suitable for Thermo Scientific PTV Injector	•	•	



## Ferrules for Thermo Scientific Instruments

For Use with	Material Type	Ferrule Size (Column ID) (mm)	Cat. No.	Quantity
Thermo Scientific TRACE 1300/1310 SSL injectors and non-MS detectors	100 % Graphite	0.1-0.32	<b>290GA139</b>	10 Pack
		0.45-0.53	<b>290GA140</b>	10 Pack
	15% Graphite/85% Vespel	0.1-0.25	<b>290VA191</b>	10 Pack
		0.32	<b>290VA192</b>	10 Pack
		0.53	<b>290VA193</b>	10 Pack
Capillary Column Nut for injectors and non-MS Detectors	Stainless Steel		<b>35050458</b>	5 Pack
Thermo Scientific TRACE Ultra SSL injectors and non-MS detectors	100 % Graphite	0.1-0.25	<b>29053488</b>	10 Pack
		0.32	<b>29053487</b>	10 Pack
		0.53	<b>29053486</b>	10 Pack
	15% Graphite/85% Vespel	0.1-0.25	<b>29033461</b>	10 Pack
		0.32	<b>29033460</b>	10 Pack
		0.53	<b>29033471</b>	10 Pack
		Packed Column 1/8" OD	<b>290VT168</b>	10 Pack
	Packed Column 1/4" OD	<b>290VT165</b>	10 Pack	
	15% Graphite/85% Vespel (3.4mm length)	0.1-0.25	<b>290VT186</b>	10 Pack*
		0.32	<b>290VT187</b>	10 Pack*
		0.53	<b>290VT188</b>	10 Pack*
Capillary Column Nut for Graphite/Vespel Ferrules	Brass		<b>290BT239</b>	2 Pack
All Thermo Scientific PTV injectors	100 % Graphite	0.1-0.25	<b>29053488</b>	10 Pack
		0.32	<b>29053487</b>	10 Pack
		0.53	<b>29053486</b>	10 Pack
Thermo Scientific MS detectors	15% Graphite/85% Vespel	0.1-0.25	<b>29033496</b>	10 Pack
		0.32	<b>29033497</b>	10 Pack
Capillary Column Nut for MS Detectors	Brass		<b>290BT240</b>	5 Pack
	Stainless Steel		<b>290BT241</b>	5 Pack
SilTite Kit for Thermo Scientific TRACE 1300/1310 GC SSL injectors	SilTite Metal	0.1-0.25	<b>290MA215</b>	1 Each**
		0.32	<b>290MA216</b>	1 Each**
		0.53	<b>290MA217</b>	1 Each**
SilTite Kit for Thermo Scientific ISQ GC-MS interface	SilTite Metal	0.1-0.25	<b>290MA194</b>	1 Each**
		0.32	<b>290MA195</b>	1 Each**
		0.53	<b>290MA196</b>	1 Each**
Replacement SilTite Ferrules for Thermo Scientific TRACE 1300/1310 SSL and ISQ GC-MS interface kits	SilTite Metal	0.1-0.25	<b>290MA201</b>	10 Pack
		0.32	<b>290MA202</b>	10 Pack
		0.53	<b>290MA203</b>	10 Pack
SilTite Nuts for MS interface			<b>290MA205</b>	5 Pack
SilTite Nuts for SSL injectors			<b>290MA207</b>	5 Pack
SilTite Kits for Thermo Scientific DSQ GC-MS interface	SilTite Metal	0.1-0.25	<b>290MT229</b>	1 Each**
		0.32	<b>290MT230</b>	1 Each**
		0.53	<b>290MT231</b>	1 Each**
		Replacement SilTite Nuts	<b>290MT211</b>	5 Pack
Replacement SilTite Ferrules for Thermo Scientific DSQ GC-MS interface kits	SilTite Metal	0.1-0.25	<b>290MT221</b>	10 Pack
		0.32	<b>290MT222</b>	10 Pack
		0.53	<b>290MT223</b>	10 Pack

\* Vespel Ferrules must be used in conjunction with brass nut part number 290BT239

\*\* SilTite Kits contain 2 SilTite nuts and 10 ferrules

## Ferrules for Agilent Instruments

For Use with	Material Type	Ferrule Size (Column ID) (mm)	Cat. No.	Quantity
Agilent injectors and non-MS detectors	100 % Graphite	0.1-0.32	<b>290GA139</b>	10 Pack
		0.45-0.53	<b>290GA140</b>	10 Pack
		Packed Column 1/8" OD	<b>290GA108</b>	10 Pack
		Packed Column 1/4" OD	<b>290GA107</b>	10 Pack
	15% Graphite/85% Vespel	0.1-0.25	<b>290VA191</b>	10 Pack
		0.32	<b>290VA192</b>	10 Pack
		0.53	<b>290VA193</b>	10 Pack
		Packed Column 1/8" OD	<b>290VT168</b>	10 Pack
Packed Column 1/4" OD		<b>290VT165</b>	10 Pack	
Capillary Column Nut for injectors and non-MS Detectors		Stainless Steel		<b>35050458</b>
Agilent MS detectors	15% Graphite/85% Vespel	0.1-0.25	<b>29033496</b>	10 Pack
		0.32	<b>29033497</b>	10 Pack
		0.53	<b>290VP144</b>	10 Pack
SilTite Kits for Agilent SSL injectors	SilTite Metal	0.1-0.25	<b>290MA215</b>	1 Each*
		0.32	<b>290MA216</b>	1 Each*
		0.53	<b>290MA217</b>	1 Each*
SilTite Nuts for MS interface			<b>290MA205</b>	5 Pack
SilTite Kit for Agilent MS detectors	SilTite Metal	0.1-0.25	<b>290MA194</b>	1 Each**
		0.32	<b>290MA195</b>	1 Each**
		0.53	<b>290MA196</b>	1 Each**
Replacement SilTite Ferrules for all SilTite Kits	SilTite Metal	0.1-0.25	<b>290MA201</b>	10 Pack
		0.32	<b>290MA202</b>	10 Pack
		0.53	<b>290MA203</b>	10 Pack
SilTite Nuts for SSL injectors			<b>290MA207</b>	5 Pack
Replacement Baseplate Seals			<b>290MA227</b>	2 Pack
			<b>290MA228</b>	10 Pack

Thermo Scientific GC consumables are suitable for use with Agilent GC systems

\* Kit contains 2 nuts, 10 ferrules and 2 base seals

\*\* Kit contains 2 nuts and 10 ferrules



# Capillary Accessories

## SilTite $\mu$ -Union

The tiny connection for GC Columns

The SilTite  $\mu$ -Union is a connector for GC capillary columns, giving zero dead volume. The product has low thermal mass – it is only 9mm in length and has a mass <0.5g. It is available in kits to connect columns from 0.1mm ID to 0.53mm ID.

- Zero dead volume – giving optimized peak shapes
- FingerTite technology – easy to install and leak-free
- Highly inert and robust

Each SilTite  $\mu$ -Union kit contains the following:

- 5 x ferrules
- 2 x union fittings
- Installation jigs
- Installation instructions



### SilTite $\mu$ -Union Kits, Ferrules and Replacement Unions

Column ID (mm)	2nd Column ID (mm)	SilTite $\mu$ -Union Kit Cat. No. (1 Each)	SilTite $\mu$ -Union Ferrules Cat. No. (10 Pack)	SilTite $\mu$ -Union Replacement Union Cat. No. (1 Each)
0.1 – 0.25	0.1-0.25	<b>290SM301</b>	<b>290SM401</b>	<b>290SM321</b>
	0.32	<b>290SM302</b>	<b>290SM402</b>	<b>290SM321</b>
	0.53	<b>290SM303</b>	<b>290SM403</b>	<b>290SM322</b>
0.32	0.32	<b>290SM304</b>	<b>290SM404</b>	<b>290SM321</b>
	0.53	<b>290SM305</b>	<b>290SM405</b>	<b>290SM322</b>
0.53	0.53	<b>290SM306</b>	<b>290SM406</b>	<b>290SM323</b>

## SilTite Capillary Column Connectors

For use with capillary GC columns

- For fused silica capillary columns
- Glass lined for inertness
- Low thermal mass
- Each pack contains 1 Connector, 2 Nuts and 5 Ferrules

### SilTite Capillary Column Connectors and Ferrules

Column ID (mm)	2nd Column ID (mm)	SilTite Column Connector Kit Cat. No. (1 Each)	SilTite Ferrules Cat. No. (10 Pack)	Replacement SilTite Connector Nuts* Cat. No. (5 Pack)
0.1-0.25	0.1-0.25	<b>290MU498</b>	<b>290MF229</b>	<b>290MN211</b>
0.32	0.32-0.53	<b>290MU499</b>	<b>290MF230</b>	<b>290MN211</b>
0.53	0.45-0.53	<b>290MU500</b>	<b>290MF231</b>	<b>290MN211</b>

\* SilTite nuts must be used with SilTite ferrules

### GC Capillary Connectors

Description	Cat. No.	Quantity
Universal Capillary Connector	<b>64000-001</b>	1 Each
Y Capillary Connector	<b>64000-002</b>	1 Each

## Finger Tite Connectors

Easier fit, reliability and leak-free connections

- No need to re-tighten ferrules as they expand and contract with the fitting
- Easy to handle with the nut touchable even with a hot injector/detector
- No tools required



### Finger Tite Connectors for TRACE 1300 Series GC and Agilent GCs

Description	Cat. No.	Quantity
Male Nut	<b>290SA130</b>	5 Pack
Split/Splitless and MS Starter Kit	<b>290SA131</b>	1 Each
Split/Splitless and FID Starter Kit	<b>290SA132</b>	1 Each
Split/Splitless Injector Base Seal	<b>290SA133</b>	2 Pack
Ferrules for 0.1-0.25mm ID Columns	<b>290S1132</b>	10 Pack
Ferrules for 0.32mm ID Columns	<b>290S1131</b>	10 Pack

### Finger Tite Connectors for TRACE GC Ultra and FOCUS GCs

Description	Cat. No.	Quantity
Female Nut	<b>290ST130</b>	5 Pack
Split/Splitless and MS Starter Kit	<b>290ST131</b>	1 Each
Split/Splitless and FID Starter Kit	<b>290ST132</b>	1 Each
Split/Splitless and MS Starter Kit for ISQ	<b>290ST136</b>	1 Each
Ferrules for 0.1-0.25mm ID Columns	<b>290S1132</b>	10 Pack
Ferrules for 0.32mm ID Columns	<b>290S1131</b>	10 Pack

## Retention Gap Kits

Support Thermo Scientific gas chromatography consumables

- Kit contains one union and five ferrules
- Length of deactivated fused silica tubing



### Retention Gap Kits

Description	Cat. No.	Quantity	Replacement Union Cat. No.	Quantity
Retention Gap Kit, 0.22 – 0.32mm ID, 2m	<b>260RG497</b>	1 Each	<b>290GU498</b>	1 Each
Retention Gap Kit, 0.53mm ID, 2m	<b>260RG499</b>	1 Each	<b>290GU499</b>	1 Each
Retention Gap Kit, 0.53mm ID, 5m	<b>260RG500</b>	1 Each	<b>290GU499</b>	1 Each

### Deactivated Silica Tubing

Description	Cat. No.	Quantity
Deactivated silica tubing, 0.32mm ID; 2m Length	<b>260G498P</b>	1 Each
Deactivated silica tubing, 0.53mm ID; 2m Length	<b>260G499P</b>	1 Each
Deactivated silica tubing, 0.25mm ID; 5m Length	<b>260G495P</b>	1 Each
Deactivated silica tubing, 0.32mm ID; 5m Length	<b>260G496P</b>	1 Each
Deactivated silica tubing, 0.53mm ID; 5m Length	<b>260G500P</b>	1 Each
Deactivated silica tubing, 0.53mm ID; 1m Length (Siltek)	<b>260G401P</b>	1 Each

## Capillary GuardGOLD and HydroGOLD Columns

Providing protection to the analytical column

- Protects against column contamination caused by non-volatile materials, extending the column lifetime
- Focuses target analytes at the head of the analytical column, leading to better chromatographic peak shape
- Highly deactivated to provide superior inertness, essential for analysis of active compounds
- HydroGOLD extends column lifetime by preventing degradation from harsh “steam-cleaning” water injections

### Capillary GuardGOLD and HydroGOLD Columns

ID (mm)	Length (m)	GuardGOLD Cat. No.	Quantity	HydroGOLD Cat. No.	Quantity
0.18	2	<b>26050-0218</b>	1 Each	<b>26H50-0218</b>	1 Each
0.25	2	<b>26050-0225</b>	1 Each	<b>26H50-0225</b>	1 Each
0.32	2	<b>26050-0232</b>	1 Each	<b>26H50-0232</b>	1 Each
0.53	2	<b>26050-0253</b>	1 Each	<b>26H50-0253</b>	1 Each
0.18	5	<b>26050-0518</b>	1 Each	<b>26H50-0518</b>	1 Each
0.25	5	<b>26050-0525</b>	1 Each	<b>26H50-0525</b>	1 Each
0.32	5	<b>26050-0532</b>	1 Each	<b>26H50-0532</b>	1 Each
0.53	5	<b>26050-0553</b>	1 Each	<b>26H50-0553</b>	1 Each
0.18	10	<b>26050-1018</b>	1 Each	<b>26H50-1018</b>	1 Each
0.25	10	<b>26050-1025</b>	1 Each	<b>26H50-1025</b>	1 Each
0.32	10	<b>26050-1032</b>	1 Each	<b>26H50-1032</b>	1 Each
0.53	10	<b>26050-1053</b>	1 Each	<b>26H50-1053</b>	1 Each

## Capillary Column End Caps

Feature a universal fit to all GC capillary columns

- Eliminate column contamination caused by leaving a column unsealed or sealed with a septum
- Color-coordinated fittings ensure that the column is reinstalled the same way it came out
- Reusable



### Capillary Column End Caps

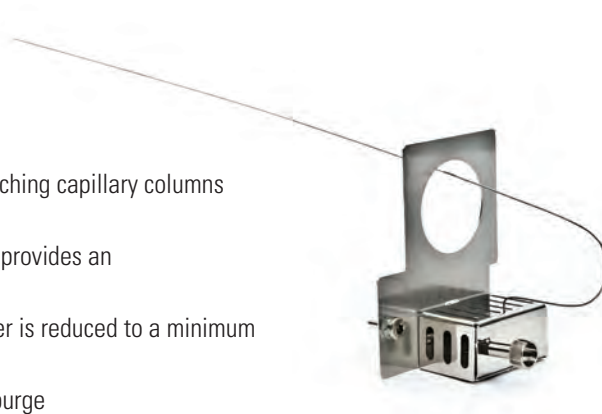
Description	Cat No.	Quantity
Capillary Column End Caps, Paired	<b>260EC111</b>	10 Pack

# SWAP-IT GC-MS Interface System

Easy to install for quick column changeovers

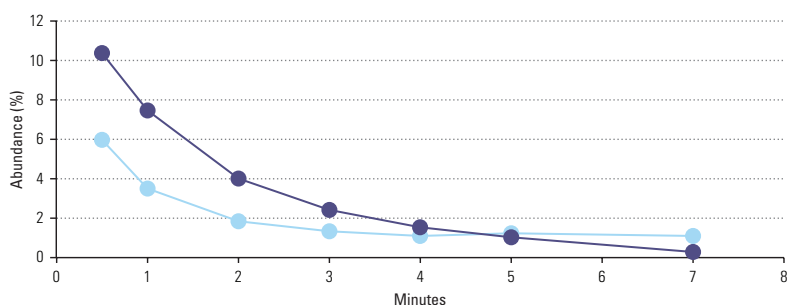
The SWAP-IT GC-MS Interface provides a powerful tool for switching capillary columns without the need to vent the MS

- Specially deactivated, robust stainless steel transfer capillary provides an interface between the analytical column and the MS detector
- Small ID of transfer capillary ensures exposure to air and water is reduced to a minimum during disconnection of the analytical column
- The system works without the requirement for additional He-purge
- Finger-tight connections make exchanging the analytical column quick and easy without the need for tools



## SWAP-IT GC-MS Interface System

Description	Cat. No.	Quantity
<b>For Thermo Scientific Instruments (ISQ GC-MS, TSQ 8000 GC-MS/MS)</b>		
SWAP-IT GC-MS Interface Kit: SWAP-IT GC-MS Interface, Nuts, Ferrules, Accessories	<b>60180-791</b>	1 Each
<b>For Thermo Scientific Instruments (DSQ GC-MS, DSQ II GC-MS, Polaris Q GC-MS, ITQ GC-MS only)</b>		
SWAP-IT GC-MS Interface Kit: SWAP-IT GC-MS Interface, Nuts, Ferrules, Accessories	<b>60180-790</b>	1 Each
SWAP-IT GC-MS Interface, SWAP-IT only	<b>60180-792</b>	1 Each
Transfer Line Nut	<b>290SG001</b>	1 Each
Graphite/Vespel Ferrule for Transfer Line	<b>290SG020</b>	10 Pack
<b>For Agilent Instruments</b>		
SWAP-IT GC-MS Interface Kit: SWAP-IT GC-MS Interface, Nuts, Ferrules, Accessories	<b>60180-794</b>	1 Each
SWAP-IT GC-MS Interface, SWAP-IT Only	<b>60180-796</b>	1 Each
Transfer Line Nut	<b>290SG004</b>	1 Each
Graphite/Vespel Ferrule for Transfer Line	<b>290SG021</b>	10 Pack
SWAP-Tight Nut and Adaptor for S/SL Injector	<b>290SG003</b>	1 Each
<b>Accessories</b>		
SWAP-Tight Nut	<b>290SG002</b>	1 Each
SWAP-Tight Ferrules, Blank	<b>290SG000</b>	10 Pack
SWAP-Tight Ferrules, 0.1 – 0.25mm	<b>290SG025</b>	10 Pack
SWAP-Tight Ferrules, 0.32mm	<b>290SG032</b>	10 Pack



● Mass 28, nitrogen  
● Mass 18, water

Removal of water and nitrogen to levels less than 2% is obtained within 3-4 minutes after column replacement

## 3-Port SilFlow Device

Switch your GC column without the need to vent

- Allows column switching in GC-MS without the need to vent
- Utilizes a make up gas module and a microfluidic device
- SilTite FingerTite fittings for easy set up and a reliable seal



### 3-Port SilFlow Device

Description	Cat. No.	Quantity
3 Port SilFlow MCD (0.25/0.32)	<b>60201-398</b>	1 Each

### 3-Port SilFlow Replacement Parts

Description	Cat. No.	Quantity
SilFlow Fingertight Ferrules for 0.25mm ID Columns	<b>29063466</b>	10 Pack
SilFlow Fingertight Ferrules for 0.32mm ID Columns	<b>29063467</b>	10 Pack
SilFlow Fingertight Tool	<b>60201-401</b>	1 Each
SilFlow Nuts	<b>290SF302</b>	10 Pack
Blanking Ferrule	<b>290ST414</b>	5 Pack
170µm Deactivated Tubing 0.363mm OD 60cm Length	<b>60201-390</b>	1 Each
75µm Untreated Fused Silica Tubing 0.363mm OD 30cm Length	<b>60201-391</b>	1 Each
170µm Deactivated Tubing 0.363mm OD 120cm Length	<b>60201-394</b>	1 Each
75µm Untreated Fused Silica Tubing 0.363mm OD 80cm Length	<b>60201-395</b>	1 Each

## GC Tubing

GC tubing for plumbing GC systems

### GC Tubing

Material	OD (in)	ID (in)	Length (ft)	Cat. No.	Quantity
Copper	1/8	0.065	50	<b>60181-632</b>	1 Each
	1/4	0.19	50	<b>60181-633</b>	1 Each
Stainless Steel	1/16	0.01	25	<b>60181-634</b>	1 Each
		0.02	25	<b>60181-635</b>	1 Each
		0.03	25	<b>60181-636</b>	1 Each
		0.04	25	<b>60181-637</b>	1 Each
	1/8	0.085	25	<b>60181-638</b>	1 Each
	1/4	0.21	25	<b>60181-639</b>	1 Each

## GC Tools

Support GC applications

### GC Tools

Description	Cat. No.	Quantity
Straight-Tipped Forceps	<b>60180-770</b>	1 Each
Angle-Tipped Forceps	<b>60180-771</b>	1 Each
Pin Vice	<b>60180-772</b>	1 Each
Pick-Up Tool	<b>60180-777</b>	1 Each
0.35mm Drill Bit	<b>60180-779</b>	1 Each
0.45mm Drill Bit	<b>60180-780</b>	1 Each
0.70mm Drill Bit	<b>60180-781</b>	1 Each
Adjustable Spanner	<b>60180-782</b>	1 Each
Tri-Scale Ruler	<b>60180-783</b>	1 Each
Shortix Capillary Column Cutter	<b>60180-835</b>	1 Each
Shortix Capillary Column Cutter Repair Kit	<b>60180-836</b>	1 Each
Ceramic Column Cutter	<b>60201-318</b>	1 Each



## GC Tool Kits

Includes: Wrench sets, flashlight, brushes, mini-drill set and other tools for maintaining your GC system performance

### GC Tool Kits

Description	Cat. No.	Quantity
Capillary Tool Kit for Thermo Scientific GCs	<b>60180-784</b>	1 Each
Capillary Tool Kit for Agilent GCs	<b>60180-786</b>	1 Each

## GC Installation Kit

Includes:

- Tubing cutter
- 1/8 x 1/4in. reamer
- 7/16in. wrench
- 1/2in. wrench
- 1/8in. brass tees, 4
- 1/8in. brass nuts, 10
- Brass front and back ferrules, 10
- 15.2m instrument-grade, cleaned 1/8in. copper tubing



### GC Installation Kit

Description	Cat. No.	Quantity
GC Installation Kit	<b>60180-888</b>	1 Each



## GLD Pro Gas Leak Detector

Aids in quickly locating and identifying gas leaks

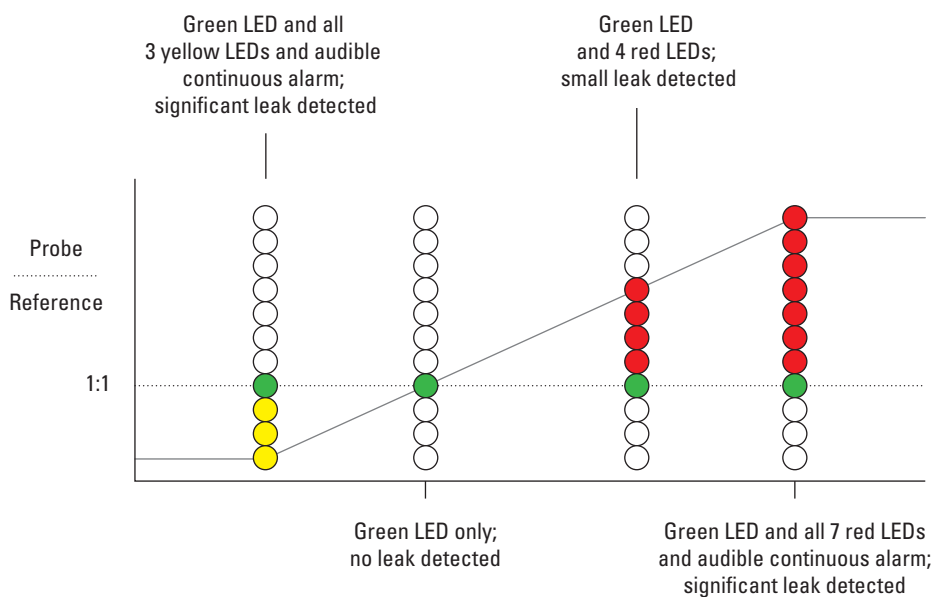
The Thermo Scientific™ GLD Pro™ Gas Leak Detector is specifically designed for use with gas chromatography instruments. Detection of leaks allows the user to reduce detector noise, provide a stable baseline, reduce carrier gas by minimizing waste, and maximize the lifetime of the analytical column by minimizing the presence of oxygen and other impurities in the carrier gas.

- Suitable for detection of a wide range of laboratory gases
- Push button on/off switch
- Push button zero function
- Automatic shutoff (5 minutes)
- LED light indicator for intensity of leak
- Rechargeable battery (up to 6 hrs. operation)
- Durable storage case
- Probe holder
- One year warranty



### GLD Pro Gas Leak Detector

Description	Cat. No.	Quantity
GLD Pro Leak Detector	<b>66002-001</b>	1 Each
Small Probe Adaptor	<b>66002-003</b>	1 Each
Soft-Sided Carry Case (Leak Detector not included)	<b>66002-002</b>	1 Each



## GFM Pro Electronic Flowmeter

Measure and monitor flow quickly and efficiently

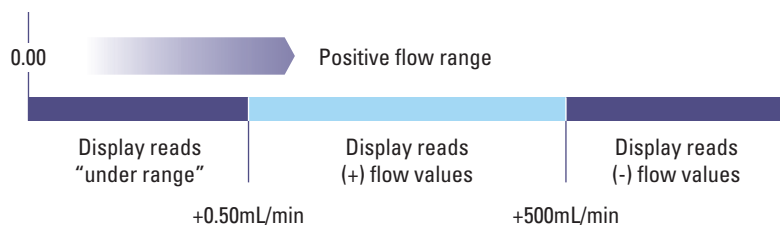
The Thermo Scientific™ GFM Pro™ Flowmeter is specifically designed for use with gas chromatography instruments. This versatile product is an electronic device capable of measuring volumetric flow for all types of gases. Real-time measurements can be made for various types of flow paths including continually changing gas types. The unit is portable so it can be hand-held or it also has an optional stand for bench-top convenience.

- Compact ergonomic design features side grips for added durability
- Easy-to-use interface features over-range warning indicator and auto-shutoff
- Measurement range of 0.5-500mL/min
- Accuracy of +/- 2% of flow or +/- 0.2mL/min, whichever is greater
- Data output via USB port
- Calibration: traceable to NIST primary standards
- Explosion-proof rating for flammable and explosive gases
- CE certified
- Uses 2-AA batteries
- Re-calibration service available



### GFM Pro Electronic Flowmeter

Description	Cat. No.	Quantity
GFM Pro Flowmeter	<b>66002-010</b>	1 Each
Soft-Sided Carry Case (Flowmeter not included)	<b>66002-002</b>	1 Each
GFM Pro Flowmeter Re-Calibration	<b>66002-GFMCAL</b>	1 Each







## GC Columns

A comprehensive column range providing excellent quality and performance, with guaranteed reproducibility

Get reliable, reproducible results for GC and GC-MS with our comprehensive portfolio of GC columns that meet all of your analytical needs.

- **TraceGOLD**  
Offering a leap forward in column performance delivering low bleed and superior inertness
- **TRACE**  
For excellent quality and reproducibility for a wide range of applications
- **UltraFast**  
Short, narrow-bore columns for use with the Thermo Scientific UltraFast instrument
- **TracePLOT**  
Providing reproducible analyses of permanent gases, hydrocarbons and solvents



The GC columns web page contains the latest news, applications and downloads for the range.

Visit [www.thermoscientific.com/columnsforgc](http://www.thermoscientific.com/columnsforgc)

# GC Columns

## Technical Resources



visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert) to access the following information:

- GC Column Selection
- GC Column Selection by Manufacturer
- GC Column Selection by US Pharmacopeia Specifications
- GC Column Selection by ASTM Method
- GC Column Selection by US EPA Drinking Water Test Method
- GC Column Selection by US EPA Waste Water Test Method
- GC Column Selection by US EPA Solid Water Test Method
- GC Column Selection by NIOSH Method
- GC Method Selection and Optimization
- GC Troubleshooting
- GC Equations
- Carrier Gas Choice
- Selection of Injection Method
- Column Conditioning



## TraceGOLD GC Columns

TraceGOLD GC columns offer you a leap forward in column performance delivering low bleed and superior inertness ideally suited to MS applications.

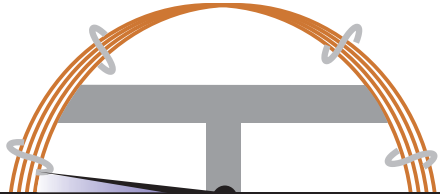
TG-1MS .....	<b>5-037</b>	TG-225MS .....	<b>5-051</b>
TG-5MS .....	<b>5-038</b>	TG-200MS .....	<b>5-052</b>
TG-5SiIMS .....	<b>5-038</b>	TG-WaxMS .....	<b>5-053</b>
TG-5MS AMINE .....	<b>5-040</b>	TG-WaxMS A .....	<b>5-054</b>
TG-5HT .....	<b>5-041</b>	TG-WaxMS B .....	<b>5-055</b>
TG-SQC .....	<b>5-045</b>	TG-POLAR .....	<b>5-056</b>
TG-35MS .....	<b>5-043</b>	TG-XLBMS .....	<b>5-057</b>
TG-35MS AMINE .....	<b>5-044</b>	TG-VRX .....	<b>5-058</b>
TG-1301MS .....	<b>5-045</b>	TG-VMS .....	<b>5-059</b>
TG-624 .....	<b>5-046</b>	TG-OCP I / TG OCP II .....	<b>5-060</b>
TG-624SiIMS .....	<b>5-047</b>	TG-OPP I / TG-OPP II .....	<b>5-061</b>
TG-1701MS .....	<b>5-048</b>	TG-ALC Plus I / TG-ALC Plus II .....	<b>5-062</b>
TG-17MS .....	<b>5-049</b>	TG-Dioxin .....	<b>5-063</b>
TG-17SiIMS .....	<b>5-050</b>		



## TraceGOLD TG-1MS GC Columns

Exceptionally low bleed for optimal signal-to-noise ratio, sensitivity and MS integrity

- Non-polar
- Equivalent to USP G2



Phase:	100% dimethyl polysiloxane
Max. Temps.:	330°C/350°C for Standard Columns 430°C for Metal Columns
USP Listing:	G2

### TraceGOLD TG-1MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	<b>26099-0200</b>	1 Each
0.20	12	0.33	<b>26099-5820</b>	1 Each
0.15	10	0.15	<b>26099-2750</b>	1 Each
	20	0.15	<b>26099-2760</b>	1 Each
	40	0.15	<b>26099-2940</b>	1 Each
0.18	20	0.18	<b>26099-5780</b>	1 Each
0.25	15	0.25	<b>26099-1300</b>	1 Each
		0.5	<b>26099-2110</b>	1 Each
		1.0	<b>26099-2840</b>	1 Each
	30	0.25	<b>26099-1420</b>	1 Each
		0.5	<b>26099-2230</b>	1 Each
		1.0	<b>26099-2960</b>	1 Each
	30 with 5m SafeGuard	0.25	<b>26099-1425</b>	1 Each
	60	0.25	<b>26099-1540</b>	1 Each
		0.5	<b>26099-2350</b>	1 Each
		1.0	<b>26099-3080</b>	1 Each
0.32	15	0.25	<b>26099-1310</b>	1 Each
		1.0	<b>26099-2850</b>	1 Each
		3.0	<b>26099-4840</b>	1 Each
	30	0.25	<b>26099-1430</b>	1 Each
		0.5	<b>26099-2240</b>	1 Each
		1.0	<b>26099-2970</b>	1 Each
		3.0	<b>26099-4840</b>	1 Each
		0.25	<b>26099-1550</b>	1 Each
		0.5	<b>26099-2360</b>	1 Each
	60	1.0	<b>26099-3090</b>	1 Each
		0.5	<b>26099-2130</b>	1 Each
		1.0	<b>26099-2860</b>	1 Each
0.53	15	1.5	<b>26099-3340</b>	1 Each
		0.5	<b>26099-2250</b>	1 Each
		1.0	<b>26099-2980</b>	1 Each
	30	1.5	<b>26099-3360</b>	1 Each
		1.0	<b>26099-2985</b>	1 Each
		1.0	<b>26099-2985</b>	1 Each
	30 with 5m SafeGuard	1.0	<b>26099-2985</b>	1 Each

### TraceGOLD TG-1MT Metal GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26M99-1300</b>	1 Each
	30	0.25	<b>26M99-1420</b>	1 Each
0.53	5	0.1	<b>26M99-4130</b>	1 Each
		0.88	<b>26M99-4120</b>	1 Each
	6	0.15	<b>26M99-4100</b>	1 Each

### Applications:

- Hydrocarbons
- Solvent impurities
- PCB congeners
- Aroclor mixes
- Simulated distillation
- Drugs of abuse
- Natural gas odorants
- Essential oils
- Pesticides

### Similar to:

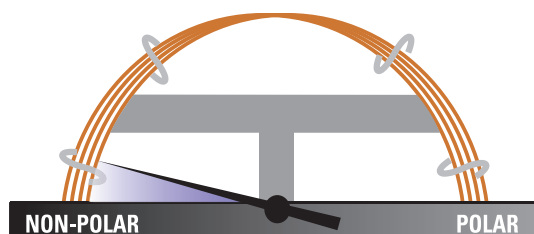
- Rxi-1ms
- DB-1
- DB-1ms
- HP-1
- HP-1ms
- Ultra-1
- SPB-1
- Equity-1
- VF-1ms
- CP-Sil 5 CB Low Bleed/MS



## TraceGOLD TG-5MS GC Columns

The most widely used MS phase in gas chromatography

- Low polarity phase
- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Exceptional inertness ideal for analysis of active compounds
- Equivalent to USP G27 phase



Phase:	5% diphenyl / 95% dimethyl polysiloxane
Max. Temps.:	330°C/350°C for Standard Columns 430°C for Metal Columns
USP Listing:	G27, G36

### TraceGOLD TG-5MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	<b>26098-0200</b>	1 Each
0.15	10	0.15	<b>26098-2750</b>	1 Each
	20	0.15	<b>26098-2760</b>	1 Each
	40	0.15	<b>26098-2940</b>	1 Each
0.18	20	0.18	<b>26098-5780</b>	1 Each
	20 with 5m SafeGuard	0.18	<b>26098-5785</b>	1 Each
0.25	10	0.25	<b>26098-1180</b>	1 Each
	15	0.25	<b>26098-1300</b>	1 Each
		1.0	<b>26098-2840</b>	1 Each
	15 with 5m SafeGuard	0.25	<b>26098-1305</b>	1 Each
	30	0.25	<b>26098-1420</b>	1 Each
		0.5	<b>26098-2230</b>	1 Each
		1.0	<b>26098-2960</b>	1 Each
	30 with 5m SafeGuard	0.1	<b>26098-0475</b>	1 Each
		0.25	<b>26098-1425</b>	1 Each
	60	0.25	<b>26098-1540</b>	1 Each
		0.5	<b>26098-2350</b>	1 Each
0.32	15	1.0	<b>26098-2850</b>	1 Each
	30	0.25	<b>26098-1430</b>	1 Each
		0.5	<b>26098-2240</b>	1 Each
		1.0	<b>26098-2970</b>	1 Each
	30 with 5m SafeGuard	0.25	<b>26098-1435</b>	1 Each
	60	0.25	<b>26098-1550</b>	1 Each
		0.5	<b>26098-2360</b>	1 Each
0.53	15	0.25	<b>26098-1320</b>	1 Each
		0.5	<b>26098-2130</b>	1 Each
		1.0	<b>26098-2860</b>	1 Each
		1.5	<b>26098-3340</b>	1 Each
	30	0.25	<b>26098-1440</b>	1 Each
		0.5	<b>26098-2250</b>	1 Each
		1.0	<b>26098-2980</b>	1 Each
		1.5	<b>26098-3360</b>	1 Each
		5.0	<b>26098-4100</b>	1 Each
		60	5.0	<b>26098-4100</b>

### TraceGOLD TG-5MT Metal GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.1	<b>26M98-0350</b>	1 Each
		0.25	<b>26M98-1300</b>	1 Each
	30	0.25	<b>26M98-1420</b>	1 Each
	60	0.25	<b>26M98-1540</b>	1 Each

### Applications:

- Semi-volatiles
- Phenols
- Amines
- Residual solvents and solvent impurities
- Drugs of abuse
- Pesticides
- PCB congeners
- Aroclor mixes

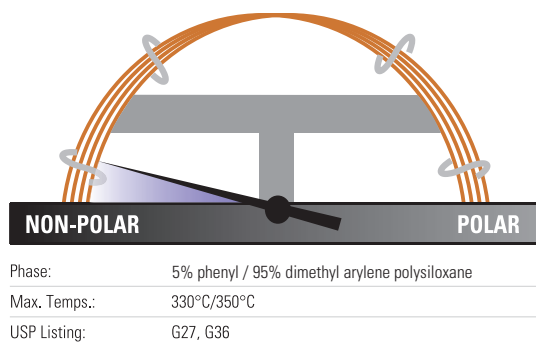
### Similar to:

- Rxi-5ms
- DB-5
- HP-5
- HP-5ms
- Ultra-2
- SPB-5
- Equity-5
- CP-Sil 8

## TraceGOLD TG-5SiIMS GC Columns

Incorporate phenyl groups in the polymer backbone for improved thermal stability, reduced bleed and reduced susceptibility to oxidation

- Low polarity, silarylene phase
- Designed for low bleed and outstanding inertness



### TraceGOLD TG-5SiIMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.15	10	0.15	<b>26096-2750</b>	1 Each
	20	0.15	<b>26096-2760</b>	1 Each
	40	0.15	<b>26096-2940</b>	1 Each
0.18	20	0.18	<b>26096-5780</b>	1 Each
0.25	15	0.25	<b>26096-1300</b>	1 Each
		0.5	<b>26096-2110</b>	1 Each
	15 with 10m SafeGuard	0.25	<b>26096-1301</b>	1 Each
	30	0.25	<b>26096-1420</b>	1 Each
		0.5	<b>26096-2230</b>	1 Each
		1.0	<b>26096-2960</b>	1 Each
	30 with 5m SafeGuard	0.25	<b>26096-1425</b>	1 Each
		0.5	<b>26096-2235</b>	1 Each
	30 with 10m SafeGuard	0.25	<b>26096-1421</b>	1 Each
	60	0.25	<b>26096-1540</b>	1 Each
		1.0	<b>26096-3080</b>	1 Each
0.25		<b>26096-1310</b>	1 Each	
0.32	15	0.25	<b>26096-1310</b>	1 Each
		0.25	<b>26096-1430</b>	1 Each
	30	0.5	<b>26096-2240</b>	1 Each
		1.0	<b>26096-2970</b>	1 Each
0.53	30	1.5	<b>26096-3360</b>	1 Each

### Applications:

- GC-MS applications using ion-trap systems
- Polycyclic aromatics
- Hydrocarbons including chlorinated hydrocarbons
- Phthalates
- Phenols
- Amines
- Organophosphate

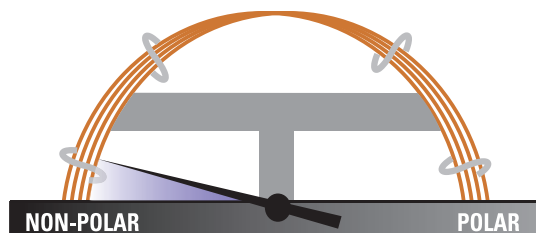
### Similar to:

- DB-5ms Ultra Inert
- VF-5ms
- CP-Sil 8 Low-Bleed/MS
- Rxi-5SiIMS
- BPX5
- ZB-5ms
- Optima-5MS
- SLB-5

## TraceGOLD TG-5MS AMINE GC Columns

Analysis of ppm levels of amines without column priming

- Low polarity phase, base optimized
- Tubing surface is chemically altered to reduce tailing of active basic compounds
- Also allows analysis of neutral or weakly acidic compounds (e.g. phenols) and compounds susceptible to hydrogen bonding
- Low bleed at maximum operating temperature



Phase:	Modified 5% diphenyl / 95% dimethyl polysiloxane for basic compounds
Max. Temps.:	300°C / 315°C
USP Listing:	N/A

### TraceGOLD TG-5MS AMINE GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26097-1300</b>	1 Each
		1.0	<b>26097-2840</b>	1 Each
	30	0.25	<b>26097-1420</b>	1 Each
		0.5	<b>26097-2230</b>	1 Each
		1.0	<b>26097-2960</b>	1 Each
0.32	30	1.0	<b>26097-2970</b>	1 Each
0.53	15	1.0	<b>26097-2860</b>	1 Each
	30	1.0	<b>26097-2980</b>	1 Each
		3.0	<b>26097-3960</b>	1 Each

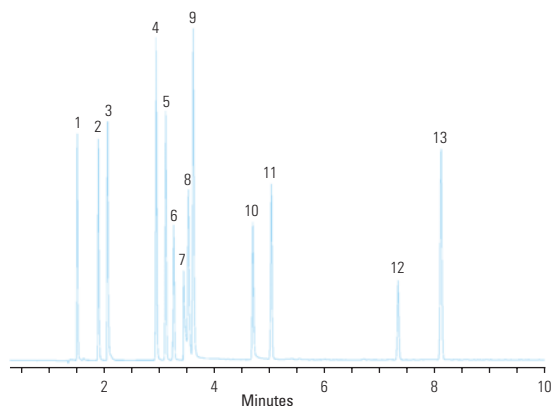
### Applications:

- Amines and other basic compounds, including alkylamines, diamines, triamines, ethanolamines
- Nitrogen-containing heterocyclics

### Similar to:

- Rtx-5 Amine

### Amines and phenols



#### TG-5MS Amine 30m x 0.32mm x 1.0µm

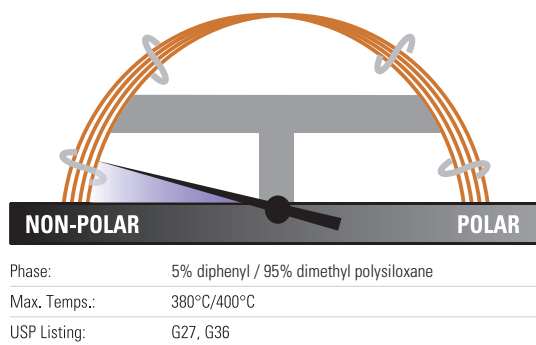
Temperature:	120°C to 220°C at 10°C/minute
Detector Type:	FID
Carrier Gas:	Hydrogen
Flow Rate:	40cm/min
Injection Volume:	1.0µL
Injection Mode:	Split 25:1, 300°C

- |                       |                           |
|-----------------------|---------------------------|
| 1. diethylamine       | 8. octylamine             |
| 2. pyridine           | 9. 1-methyl-2-pyrrolidone |
| 3. morpholine         | 10. 2-nitrophenol         |
| 4. phenol             | 11. 2,6-dimethylaniline   |
| 5. aniline            | 12. nicotine              |
| 6. 2-chlorophenol     | 13. 2-nitroaniline        |
| 7. diethylenetriamine |                           |

## TraceGOLD TG-5HT GC Columns

Offers extended operation up to 400°C, ideal for high temperature extended GC applications

- Low polarity
- Lower bleed and better inertness than comparable high-temperature columns
- Special design of fused silica tubing extends column lifetime by up to 40%



### TraceGOLD TG-5HT GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.1	<b>26095-0350</b>	1 Each
		0.25	<b>26095-1300</b>	1 Each
	30	0.1	<b>26095-0470</b>	1 Each
		0.25	<b>26095-1420</b>	1 Each
0.32	15	0.1	<b>26095-0360</b>	1 Each
	30	0.1	<b>26095-0480</b>	1 Each
		0.25	<b>26095-1430</b>	1 Each
0.53	10	0.15	<b>26095-1640</b>	1 Each
	30	0.15	<b>26095-0620</b>	1 Each

#### Applications:

- Phenols
- Residual solvents
- Solvents
- Semivolatiles
- Pesticides
- PCBs
- Solvent impurities

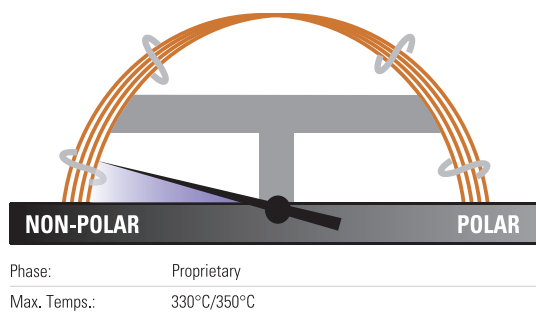
#### Similar to:

- Rxi-5HT
- BP-5HT
- VF-5HT
- ZB-5HT

## TraceGOLD TG-SQC GC Columns

Ensure the quality of a Thermo Scientific instrument when installed on site

- Optimized for system qualification tests for new GC-MS installations or during service/maintenance of an existing instrument
- We recommend reserving this column for benchmark testing only



### TraceGOLD TG-SQC GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26070-1300</b>	1 Each
	30	0.25	<b>26070-1420</b>	1 Each

### Applications:

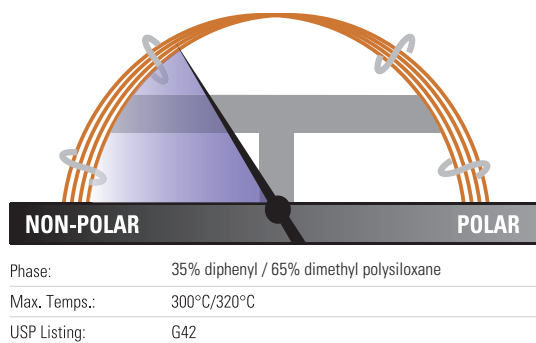
- System Qualification Tests (Thermo Scientific GC-MS)



## TraceGOLD TG-35MS GC Columns

Higher phenyl content for useful elution order and retention time changes

- Mid-polarity phase
- Equivalent to USP G42 phase



### TraceGOLD TG-35MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26094-1300</b>	1 Each
		0.25	<b>26094-1420</b>	1 Each
		0.5	<b>26094-2230</b>	1 Each
0.32	15	0.25	<b>26094-1310</b>	1 Each
		0.5	<b>26094-2120</b>	1 Each
		0.25	<b>26094-1430</b>	1 Each
	30	0.5	<b>26094-2240</b>	1 Each
		0.5	<b>26094-2130</b>	1 Each
0.53	15	1.0	<b>26094-2860</b>	1 Each
		1.5	<b>26094-3340</b>	1 Each
		0.5	<b>26094-2250</b>	1 Each
	30	1.0	<b>26094-2980</b>	1 Each
		1.5	<b>26094-3360</b>	1 Each

#### Applications:

- Organochlorine pesticides and herbicides
- Pharmaceuticals
- PCB congeners
- Aroclor mixes
- Sterols
- Rosin acids
- Phthalate esters

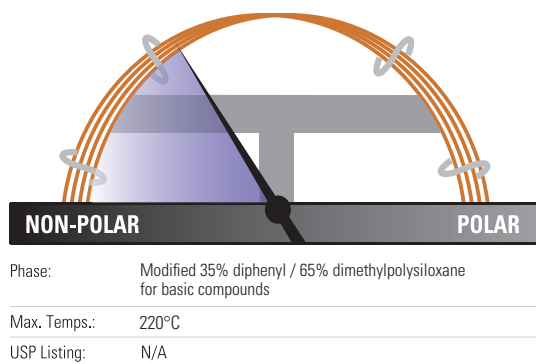
#### Similar to:

- Rtx-35
- BP-35
- HP-35
- SPB-35
- SPB-608

## TraceGOLD TG-35MS AMINE GC Columns

Chemically altered tubing surface reduces tailing and eliminates the need for column priming

- Mid-polarity phase, base optimized
- Developed for analysis of active basic compounds without derivatization
- Also allows analysis of neutral compounds and adsorptive compounds with oxygen groups susceptible to hydrogen bonding
- Low bleed at maximum operating temperature



### TraceGOLD TG-35MS AMINE GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	1.0	<b>26092-2840</b>	1 Each
	30	0.5	<b>26092-2230</b>	1 Each
		1.0	<b>26092-2960</b>	1 Each
0.32	15	1.0	<b>26092-2850</b>	1 Each
	30	1.0	<b>26092-2970</b>	1 Each
		1.5	<b>26092-3350</b>	1 Each
0.53	15	1.0	<b>26092-2860</b>	1 Each
	30	1.0	<b>26092-2980</b>	1 Each
		3.0	<b>26092-3960</b>	1 Each

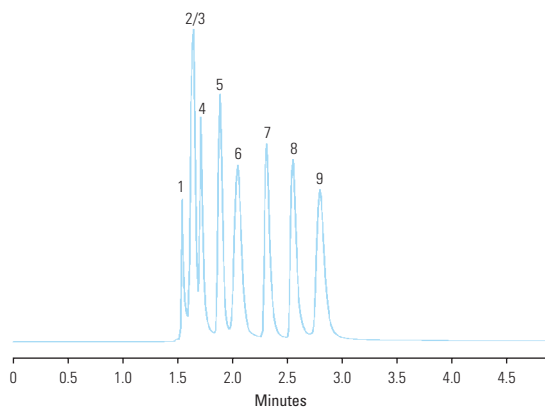
### Applications:

- Amines including alkylamines, diamines, triamines and ethanolamines
- Nitrogen-containing heterocyclics

### Similar to:

- Rtx-35 Amine

### Primary amines



#### TG-35MS AMINE 30m x 0.53mm x 1.0µm

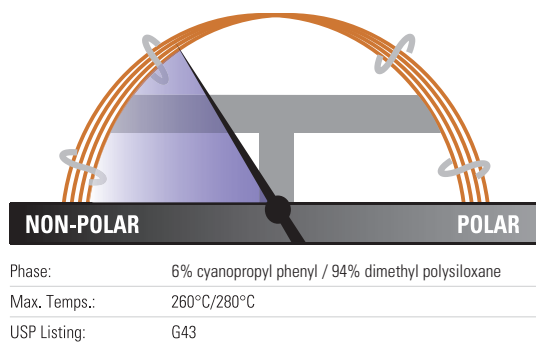
Temperature:	35°C (5 minute hold) Isothermal
Detector Type:	FID
Carrier Gas:	He
Flow Rate:	35cm/sec
Injection Volume:	1.0µL
Injection Mode:	Split (10:1), 250°C

- |                   |                    |
|-------------------|--------------------|
| 1. methylamine    | 6. tert-butylamine |
| 2. dimethylamine  | 7. n-propylamine   |
| 3. trimethylamine | 8. diethylamine    |
| 4. ethylamine     | 9. sec-butylamine  |
| 5. isopropylamine |                    |

## TraceGOLD TG-1301MS GC Columns

Low bleed, excellent reproducibility and column-to-column consistency even with sensitive detectors like ECD and MS

- Mid-polarity phase
- Long lifetime
- Excellent inertness
- Equivalent to USP G43 phase



### TraceGOLD TG-1301MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26091-1300</b>	1 Each
		0.5	<b>26091-2110</b>	1 Each
	30	0.25	<b>26091-1420</b>	1 Each
		0.5	<b>26091-2230</b>	1 Each
		1.0	<b>26091-2960</b>	1 Each
	60	0.25	<b>26091-1540</b>	1 Each
1.0		<b>26091-3080</b>	1 Each	
0.32	15	0.25	<b>26091-1310</b>	1 Each
		0.25	<b>26091-1430</b>	1 Each
	30	0.5	<b>26091-2240</b>	1 Each
		1.0	<b>26091-2970</b>	1 Each
		1.5	<b>26091-3350</b>	1 Each
		1.8	<b>26091-3390</b>	1 Each
		0.5	<b>26091-2360</b>	1 Each
	60	1.0	<b>26091-3090</b>	1 Each
		1.8	<b>26091-3410</b>	1 Each
0.53	30	0.25	<b>26091-1440</b>	1 Each
		1.0	<b>26091-2980</b>	1 Each
		1.5	<b>26091-3360</b>	1 Each
	60	3.0	<b>26091-3960</b>	1 Each
		0.25	<b>26091-1560</b>	1 Each
		0.5	<b>26091-2370</b>	1 Each
		3.0	<b>26091-4080</b>	1 Each

### Applications:

- Alcohols
- Volatile organics
- Oxygenates
- Residual solvents

### Similar to:

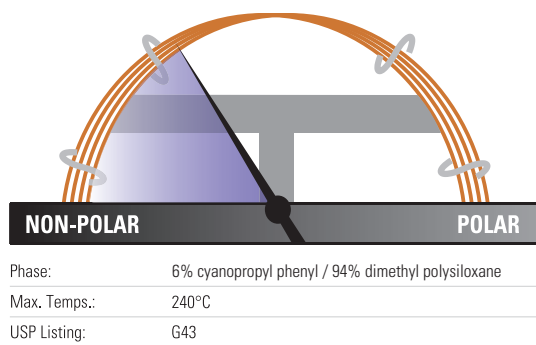
- Rtx-1301
- DB-1301
- BP-624
- HP-1301
- HP-624
- SPB-1301
- SPB-624
- VP-1301
- BF-624ms
- CP-1301
- CP-Select 624 CB



## TraceGOLD TG-624 GC Columns

Offers 90+% resolution of the first six gases in EPA Method 8260 and EPA Method 524.2 for volatile organics analysis

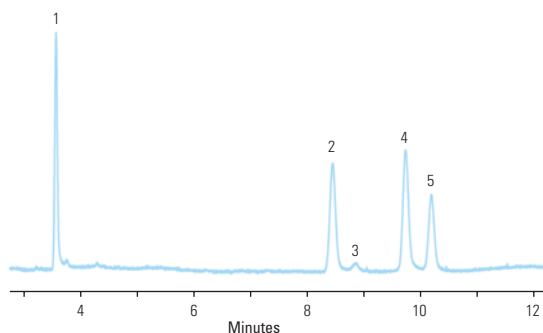
- Mid-polarity phase
- Ideal for EPA methods 624 and 608
- Allows resolution of 2-nitropropane from 1,1-dichloropropanone under EPA Method 524.2 revision IV



### TraceGOLD TG-624 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	1.0	<b>26085-4950</b>	1 Each
	40	1.0	<b>26085-4960</b>	1 Each
0.25	30	1.4	<b>26085-3320</b>	1 Each
	60	1.4	<b>26085-3330</b>	1 Each
0.32	30	1.8	<b>26085-3390</b>	1 Each
	60	1.8	<b>26085-3410</b>	1 Each
0.53	30	3.0	<b>26085-3960</b>	1 Each
	60	3.0	<b>26085-4080</b>	1 Each
	75	3.0	<b>26085-4900</b>	1 Each
	105	3.0	<b>26085-4090</b>	1 Each

### Residual solvents class 1



#### TG-624 30m x 0.32mm x 1.80µm

Temperature: 40°C (20 minute hold) to 240°C at 10°C/min (20 minute hold)

Detector Type: FID

Carrier Gas: He

Flow Rate: 2.15mL/min

Injection Volume: 1mL

Injection Mode: Headspace, Split (1:5), 140°C

- 1,1-dichloroethane
- 1,1,1-trichloroethane
- carbon tetrachloride
- benzene
- 1,2-dichloroethane

### Applications:

- Residual Solvents
- Volatile Organic Compounds
- Alcohols
- Oxygenates

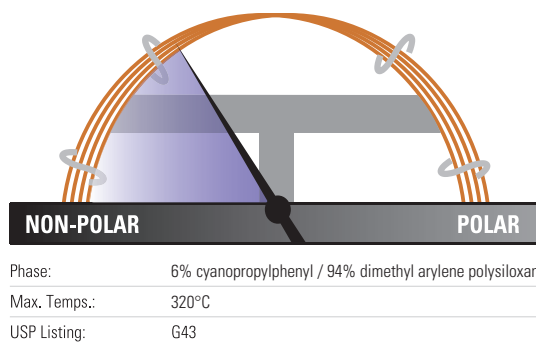
### Similar to:

- DB-1301
- DB-624
- HP-1301
- HP-624
- SPB-1301
- SPB-624
- VF-1301
- VF-624ms
- CP-1301
- CP-Select 624 CB
- Rtx-624
- BP-624
- ZB-624
- Optima-1301
- Optima-624
- AT-624
- 007-1301

## TraceGOLD TG-624SiIMS GC Columns

High thermal stability column ideal for volatile organics analysis

- Mid-polarity phase
- High thermal stability – maximum temperatures up to 320°C
- Highly inert – excellent peak shape for a wide range of compounds



### TraceGOLD TG-624SiIMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	1.0	<b>26059-4950</b>	1 Each
0.25	30	1.4	<b>26059-3320</b>	1 Each
	60	1.4	<b>26059-3330</b>	1 Each
0.32	30	1.8	<b>26059-3390</b>	1 Each
	60	1.8	<b>26059-3410</b>	1 Each
0.53	30	3.0	<b>26059-3960</b>	1 Each
	60	3.0	<b>26059-4080</b>	1 Each
	75	3.0	<b>26059-4900</b>	1 Each
	105	3.0	<b>26059-4090</b>	1 Each

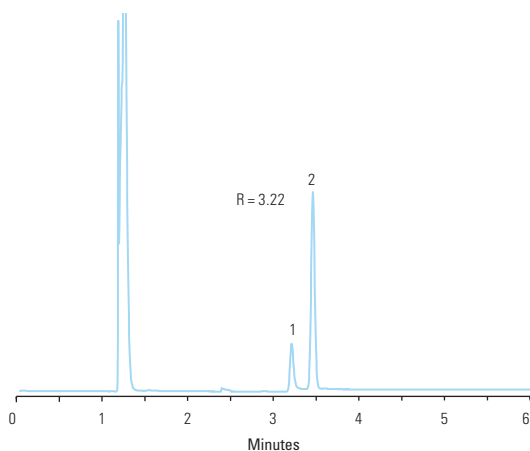
### Applications:

- Residual Solvents
- Volatile Organic Compounds
- Alcohols
- Oxygenates

### Similar to:

- DB-624 Ultra Inert
- VF-624ms
- CP-Select 624 CB
- ZB-624

### Acetonitrile and Dichloromethane



#### TG-624SiIMS 30m x 0.32mm x 1.8µm

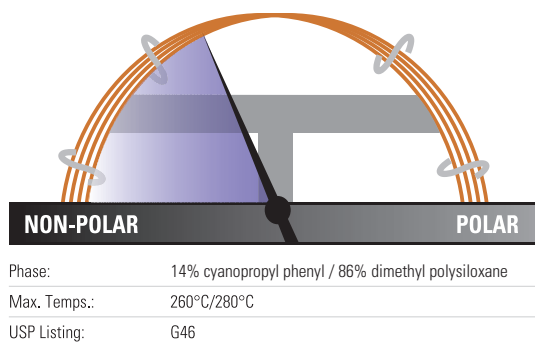
Temperature: 40°C for 6 minutes  
 Detector Type: MS (ISQ); m/z 40,41 for Acetonitrile (1), m/z 49, 84 for Dichloromethane (2)  
 Carrier Gas: Helium  
 Flow Rate: 1.5 mL/min  
 Injection Volume: 500µL  
 Injection Mode: Headspace, Split (20:1) 220°C

1. Acetonitrile
2. Dichloromethane

## TraceGOLD TG-1701MS GC Columns

Feature a mix of cyano and phenyl groups for increased polarity and a different elution order relative to less polar columns

- Mid-polarity phase, 14% cyanopropylphenyl methylpolysiloxane
- Fully characterized for long-term reproducibility, column-to-column consistency and low bleed
- Optimal for confirmation analysis
- Equivalent to USP G46 phase



### TraceGOLD TG-1701MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	<b>26090-0200</b>	1 Each
	0.25	15	0.25	<b>26090-1300</b>
0.25			<b>26090-1420</b>	1 Each
0.5		<b>26090-2230</b>	1 Each	
1.0		<b>26090-2960</b>	1 Each	
60		0.25	<b>26090-1540</b>	1 Each
	1.0	<b>26090-3080</b>	1 Each	
	0.32	15	0.25	<b>26090-1310</b>
0.25			<b>26090-1430</b>	1 Each
30		0.5	<b>26090-2240</b>	1 Each
		1.0	<b>26090-2970</b>	1 Each
		60	0.25	<b>26090-1550</b>
1.0	<b>26090-3090</b>		1 Each	
0.53	15		0.25	<b>26090-1320</b>
		0.25	<b>26090-1440</b>	1 Each
	30	0.5	<b>26090-2250</b>	1 Each
		1.0	<b>26090-2980</b>	1 Each
		3.0	<b>26090-3960</b>	1 Each

### Applications:

- Alcohols
- Pesticides
- Oxygenates
- PCB congeners
- Aroclor mixes

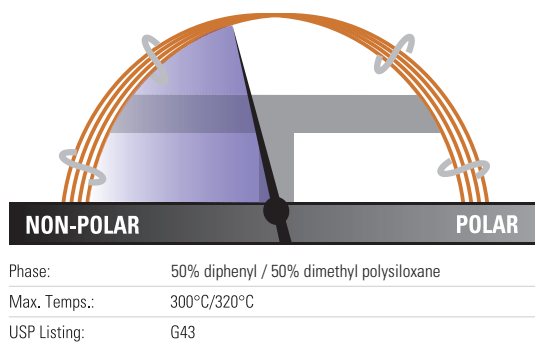
### Similar to:

- Rtx-1701
- DB-1701
- HP-1701
- SPB-1701
- VF-1701
- CP-Sil 19 CB

## TraceGOLD TG-17MS GC Columns

Particularly suited to GC-MS applications that require more polarity than a 5% phenyl phase

- Mid-polarity phase
- Ideal for confirmational analysis
- Excellent inertness for active compounds such as pesticides
- Very low bleed ideal for analysis by GC-MS



### TraceGOLD TG-17MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	<b>26089-0200</b>	1 Each
0.25	15	0.25	<b>26089-1300</b>	1 Each
		0.25	<b>26089-1420</b>	1 Each
		0.5	<b>26089-2230</b>	1 Each
		1.0	<b>26089-2960</b>	1 Each
		0.25	<b>26089-1540</b>	1 Each
0.32	15	0.25	<b>26089-1310</b>	1 Each
		0.25	<b>26089-1430</b>	1 Each
		0.5	<b>26089-2240</b>	1 Each
		1.0	<b>26089-2970</b>	1 Each
0.53	30	0.25	<b>26089-1440</b>	1 Each
		0.5	<b>26089-2250</b>	1 Each
		1.0	<b>26089-2980</b>	1 Each
		1.5	<b>26089-3360</b>	1 Each

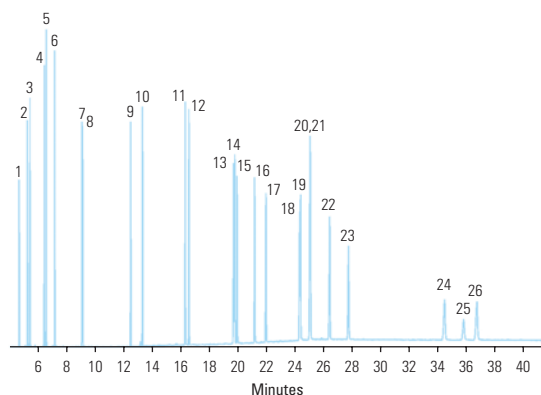
### Applications:

- Pesticides and herbicides
- Rosin acids
- Phthalate esters
- Triglycerides
- Sterols

### Similar to:

- Rxi-17
- DB-17
- DB-608
- VF-17ms
- CP-Sil 24 CB

### Polycyclic aromatic hydrocarbons



#### TG-17MS 30m x 0.25mm x 0.25µm

Temperature: 90°C (1.0 minute hold) to 215°C (0.5 minute hold) at 25°C/minute to 235°C at 4°C/minute to 280°C/minute at 15°C/minute to 320°C (20 minute hold) at 4°C/minute

Detector Type: MS

Carrier Gas: He

Flow Rate: 1.2mL/min

Injection Volume: 1.0µL

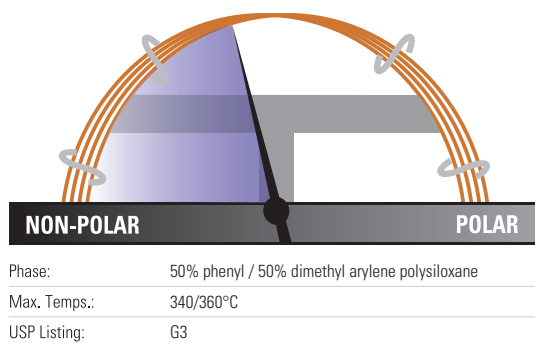
Injection Mode: Splitless, 300°C

- |                          |                              |
|--------------------------|------------------------------|
| 1. naphthalene           | 15. benzo(j)fluoranthene     |
| 2. 1-methylnaphthalene   | 16. benzo(a)pyrene           |
| 3. 2-methylnaphthalene   | 17. 3-methylcholanthrene     |
| 4. acenaphthylene        | 18. dibenzo(a,h)acridine     |
| 5. acenaphthene          | 19. dibenzo(a,j)acridine     |
| 6. fluorene              | 20. indeno(1,2,3-cd)pyrene   |
| 7. phenanthrene          | 21. dibenzo(a,h)anthracene   |
| 8. anthracene            | 22. benzo(ghi)perylene       |
| 9. fluoranthene          | 23. 7H-dibenzo(c,g)carbazole |
| 10. pyrene               | 24. dibenzo(a,e)pyrene       |
| 11. benzo(a)anthracene   | 25. dibenzo(a,i)pyrene       |
| 12. chrysene             | 26. dibenzo(a,h)pyrene       |
| 13. benzo(b)fluoranthene |                              |
| 14. benzo(k)fluoranthene |                              |

## TraceGOLD TG-17SiIMS GC Columns

Excellent separation of active environmental compounds

- Mid-polarity phase
- High thermal stability – maximum temperatures up to 340/360°C
- Excellent inertness for active environmental compounds such as PAHs



### TraceGOLD TG-17SiIMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.15	10	0.15	<b>26072-2750</b>	1 Each
	20	0.15	<b>26072-2760</b>	1 Each
0.18	20	0.18	<b>26072-5780</b>	1 Each
		0.36	<b>26072-1380</b>	1 Each
0.25	15	0.25	<b>26072-1300</b>	1 Each
	30	0.25	<b>26072-1420</b>	1 Each
0.32	15	0.25	<b>26072-1310</b>	1 Each
	30	0.25	<b>26072-1430</b>	1 Each

### Applications:

- PAHs
- Pesticides and herbicides
- Phthalate esters
- Triglycerides

### Similar to:

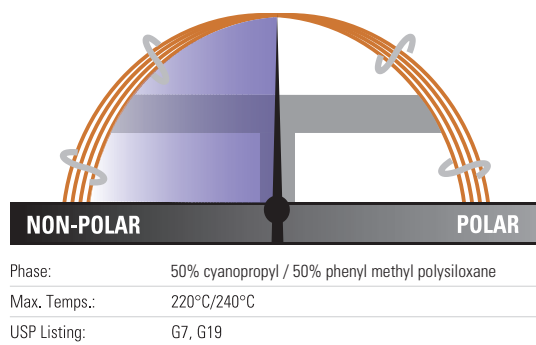
- DB-17ms
- VF-17ms
- CP-Sil 24 CB
- ZB-50
- BPX-50



## TraceGOLD TG-225MS GC Columns

Offers better thermal stability than comparable columns

- Polar phase
- Innovative deactivation process for siloxane reduces tailing and improves efficiency over comparable columns
- Equivalent to USP G7, G19 phases



### TraceGOLD TG-225MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26083-1300</b>	1 Each
	30	0.25	<b>26083-1420</b>	1 Each
	60	0.25	<b>26083-1540</b>	1 Each
0.32	30	0.25	<b>26083-1430</b>	1 Each
		0.5	<b>26083-2240</b>	1 Each

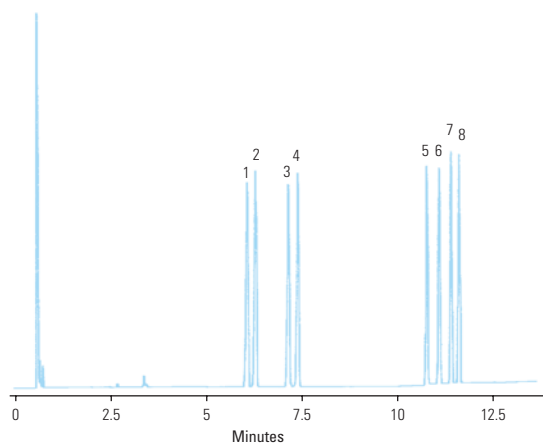
### Applications:

- FAMES
- Carbohydrates
- Sterols
- Flavor compounds

### Similar to:

- Rtx-225
- DB-225
- HP-225
- SPB-225

### Sugars



### TG-225MS 15m x 0.25mm x 0.25µm

Temperature: 190°C (5 minute hold) to 250°C at 8°C/min (5 minute hold)

Detector Type: FID

Carrier Gas: Hydrogen

Flow Rate: 45cm/sec

Injection Volume: 0.5µL

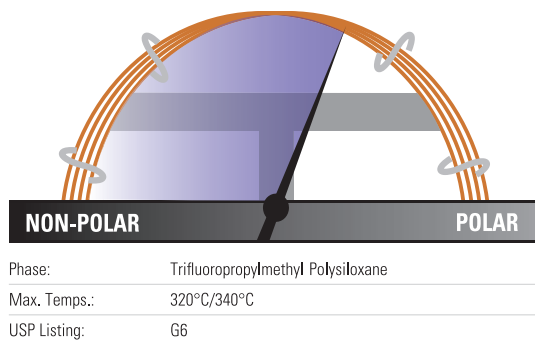
Injection Mode: Split (35:1), 260°C

- |               |               |
|---------------|---------------|
| 1. rhamnitol  | 5. mannitol   |
| 2. fucitol    | 6. galactitol |
| 3. ribitol    | 7. glucitol   |
| 4. arabinitol | 8. inositol   |

## TraceGOLD TG-200MS GC Columns

Exceptionally inert mid-polarity columns with selectivity and elution order optimized for difficult separations

- Polar phase, trifluoropropyl methyl polysiloxane solid phase resolves compounds that phenyl and cyano phases cannot
- Outstanding thermal stability and low bleed
- Suitable for use with sensitive detectors including ECD, NPD and MS
- Confirmation column in combination with another GC column



### TraceGOLD TG-200MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.15	10	0.15	<b>26084-2750</b>	1 Each
	20	0.15	<b>26084-2760</b>	1 Each
0.25	30	0.25	<b>26084-1420</b>	1 Each
		0.5	<b>26084-2230</b>	1 Each
		1.0	<b>26084-2960</b>	1 Each
0.32	30	0.25	<b>26084-1430</b>	1 Each
		0.5	<b>26084-2240</b>	1 Each
		1.0	<b>26084-2970</b>	1 Each

### Applications:

- Solvents
- Fluorocarbons
- Alcohols and ketones
- Silanes
- Glycols

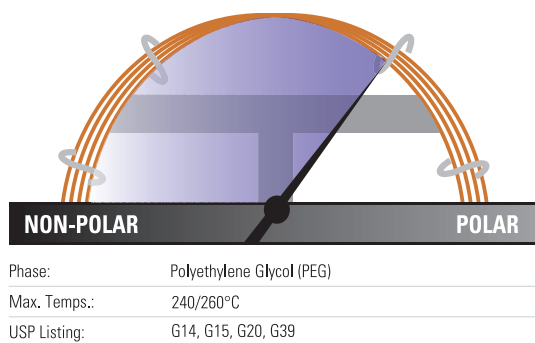
### Similar to:

- Rtx-200MS
- DB-200
- DB-210

# TraceGOLD TG-WaxMS GC Columns

Manufactured for better column-to-column reproducibility

- Polar phase, polyethylene glycol
- Polar-deactivated surface tightly binds polymer for excellent thermal stability
- Resists oxidative damage, damage from strongly acidic or basic volatiles better than silicone solid phases



## TraceGOLD TG-WaxMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity	
0.0	10	0.1	<b>26088-0200</b>	1 Each	
0.15	10	0.15	<b>26088-2750</b>	1 Each	
	20	0.15	<b>26088-2760</b>	1 Each	
	40	0.15	<b>26088-2940</b>	1 Each	
0.18	20	0.18	<b>26088-5780</b>	1 Each	
0.25	15	0.25	<b>26088-1300</b>	1 Each	
		0.25	<b>26088-1420</b>	1 Each	
	30	0.5	<b>26088-2230</b>	1 Each	
		0.25	<b>26088-1421</b>	1 Each	
		0.25	<b>26088-1540</b>	1 Each	
		0.5	<b>26088-2350</b>	1 Each	
0.32	15	0.25	<b>26088-1310</b>	1 Each	
		0.5	<b>26088-2120</b>	1 Each	
		1.0	<b>26088-2850</b>	1 Each	
	30	0.25	<b>26088-1430</b>	1 Each	
		0.5	<b>26088-2240</b>	1 Each	
		1.0	<b>26088-2970</b>	1 Each	
		30m with 5m SafeGuard	0.25	<b>26088-1435</b>	1 Each
		60	0.25	<b>26088-1550</b>	1 Each
			0.5	<b>26088-2360</b>	1 Each
	1.0		<b>26088-3090</b>	1 Each	
	0.53	15	0.5	<b>26088-2130</b>	1 Each
			1.0	<b>26088-2860</b>	1 Each
30			0.25	<b>26088-1440</b>	1 Each
30		0.5	<b>26088-2250</b>	1 Each	
		1.0	<b>26088-2980</b>	1 Each	
		1.5	<b>26088-3360</b>	1 Each	
		60	0.25	<b>26088-1560</b>	1 Each
			0.5	<b>26088-2370</b>	1 Each
			1.0	<b>26088-3100</b>	1 Each

## TraceGOLD TG-WaxMT Metal GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>26M88-1420</b>	1 Each
		0.5	<b>26M88-2230</b>	1 Each
	60	0.25	<b>26M88-1540</b>	1 Each
0.53	30	0.25	<b>26M88-1440</b>	1 Each
		0.5	<b>26M88-2250</b>	1 Each
		1.0	<b>26M88-2880</b>	1 Each
		1.5	<b>26M88-3360</b>	1 Each

### Applications:

- FAMES
- Flavor compounds and essential oils
- Solvents
- Xylene isomers
- EPA Method 603 for Acrolein/ Acrylonitrile

### Similar to:

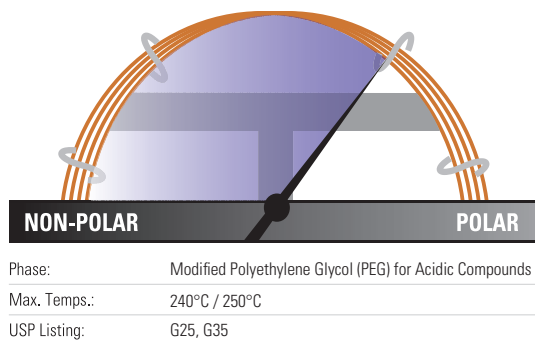
- DB-WAX
- DB-WAXetr
- HP-Wax
- HP-Innowax
- Supelcowax 10
- CP-Wax 52 CB
- Stabilwax
- Rtx-Wax
- BP20
- ZB-Wax
- Optima Wax
- AT-Wax



## TraceGOLD TG-WaxMS A GC Columns

Acidic functionality in the polymer structure allows analysis of acidic compounds without derivatization

- Polar phase, acid-deactivated polyethylene glycol
- Resists oxidative damage and adsorption of acids
- Excellent peak shapes for high MW acids
- Equivalent to USP G25, G35 phases



### TraceGOLD TG-WaxMS A GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26087-1300</b>	1 Each
		0.25	<b>26087-1420</b>	1 Each
	60	0.5	<b>26087-2230</b>	1 Each
		0.25	<b>26087-1540</b>	1 Each
		0.5	<b>26087-2350</b>	1 Each
0.32	15	0.25	<b>26087-1310</b>	1 Each
		0.5	<b>26087-2120</b>	1 Each
	30	0.25	<b>26087-1430</b>	1 Each
		0.5	<b>26087-2240</b>	1 Each
		1.0	<b>26087-2970</b>	1 Each
	60	0.25	<b>26087-1550</b>	1 Each
		0.5	<b>26087-2360</b>	1 Each
0.53		0.5	<b>26087-2130</b>	1 Each
		1.0	<b>26087-2860</b>	1 Each
30	0.25	<b>26087-1440</b>	1 Each	
	0.5	<b>26087-2250</b>	1 Each	
	1.0	<b>26087-2980</b>	1 Each	

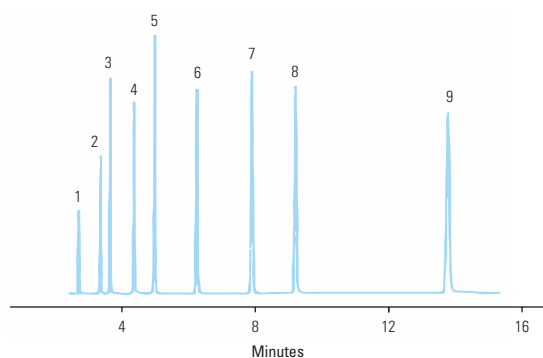
### Applications:

- Organic acids
- Free fatty acids
- Alcohols

### Similar to:

- DB-FFAP
- HP-FFAP
- NUKOL
- OV-351
- CP-Wax 58 CB
- FFAP
- Stabilwax-DA
- BP-21
- Optima FFAP

### Free fatty acids



#### TG-WaxMS A 30m x 0.25mm x 0.25µm

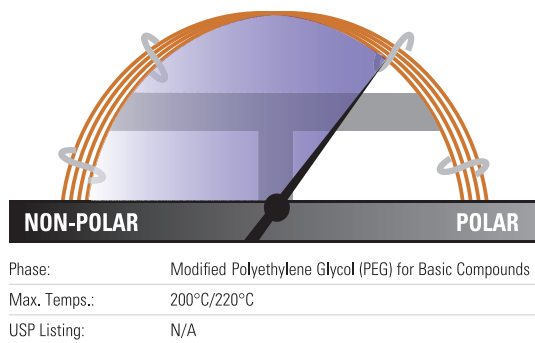
Temperature:	145°C Isothermal
Detector Type:	FID
Carrier Gas:	Hydrogen
Flow Rate:	40cm/sec
Injection Volume:	1.0µL
Injection Mode:	Split (50:1), 250°C

- |                    |                    |
|--------------------|--------------------|
| 1. acetic acid     | 7. isocaproic acid |
| 2. propionic acid  | 8. caproic acid    |
| 3. isobutyric acid | 9. heptanoic acid  |
| 4. n-butyric acid  |                    |
| 5. isovaleric acid |                    |
| 6. n-valeric acid  |                    |

## TraceGOLD TG-WaxMS B GC Columns

Base deactivation allows analysis of basic analytes without derivatization or column priming

- Polar phase, base deactivated polyethylene glycol
- Reduced absorption and improved responsiveness for basic compounds
- Not suitable for use with water or alcohols



### TraceGOLD TG-WaxMS B GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>26086-1420</b>	1 Each
		0.5	<b>26086-2230</b>	1 Each
0.32	30	0.25	<b>26086-1430</b>	1 Each
		0.5	<b>26086-2240</b>	1 Each
		1.0	<b>26086-2970</b>	1 Each
		1.0	<b>26086-3090</b>	1 Each
0.53	30	0.5	<b>26086-2250</b>	1 Each
		1.0	<b>26086-2980</b>	1 Each

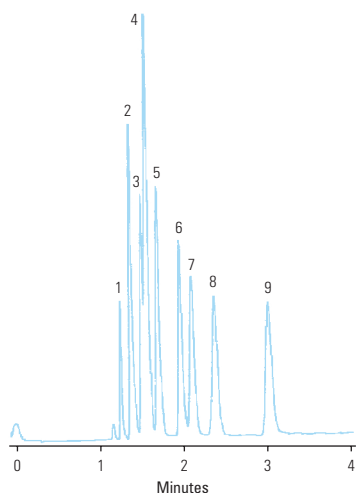
#### Applications:

- Amines
- Alkylamines
- Diamines
- Other basic compounds

#### Similar to:

- CAM
- Carbowax Amine
- CP Wax51
- Stabilwax-DB

### Amines



#### TG-WaxMS B 30m x 0.53mm x 1.0µm

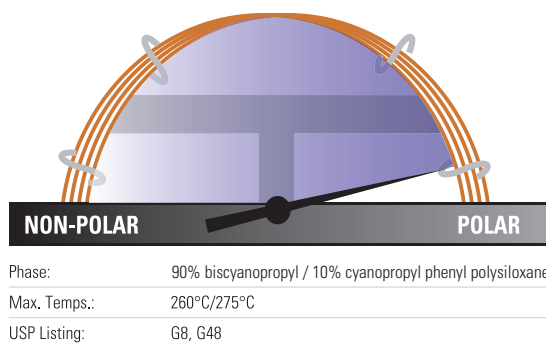
Temperature:	45°C Isothermal
Detector Type:	FID
Carrier Gas:	Hydrogen
Flow Rate:	40cm/sec
Injection Volume:	1µL
Injection Mode:	Direct Injection, 250°C

- |                   |                    |
|-------------------|--------------------|
| 1. trimethylamine | 7. tert-butylamine |
| 2. dimethylamine  | 8. diethylamine    |
| 3. ethylamine     | 9. sec-butylamine  |
| 4. methylamine    |                    |
| 5. isopropylamine |                    |
| 6. n-propylamine  |                    |

## TraceGOLD TG-POLAR GC Columns

Specifically designed polymer and surface treatment overcome traditional problems with high-polarity columns

- Highly polar phase
- Strong dipole moment and high selectivity for cis/trans compounds or compounds with conjugated double bonds
- Equivalent to USP G8 and G48



### TraceGOLD TG-POLAR GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.1	<b>26082-0470</b>	1 Each
		0.2	<b>26082-5010</b>	1 Each
	60	0.1	<b>26082-0590</b>	1 Each
		0.2	<b>26082-5020</b>	1 Each
	105	0.1	<b>26082-5000</b>	1 Each
		0.2	<b>26082-5030</b>	1 Each
0.32	30	0.2	<b>26082-5040</b>	1 Each
	60	0.2	<b>26082-5050</b>	1 Each
0.53	30	0.1	<b>26082-0490</b>	1 Each
		0.2	<b>26082-5070</b>	1 Each
	60	0.1	<b>26082-0610</b>	1 Each
		0.2	<b>26082-5080</b>	1 Each

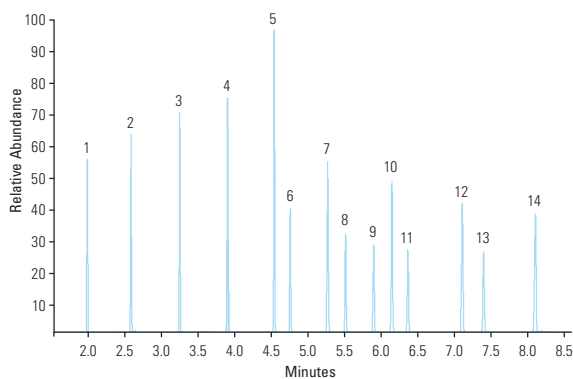
### Applications:

- Cis/Trans FAMES
- Dioxins

### Similar to:

- DB-23
- HP-23
- Rtx-2330
- SP-2330
- SP-2380
- SPB-2560
- HP-88
- Silar 10c
- CP-Sil 88 FAME
- CP-Sil 88
- BPX 70
- BPX 90

### FAMES C8-C24



#### TG-POLAR 30m x 0.25mm x 0.2µm

Temperature: 100°C (0.5 minute hold) to 195°C at 25°C/minute (1 minute hold) to 250°C at 10°C/minute (3 minute hold)

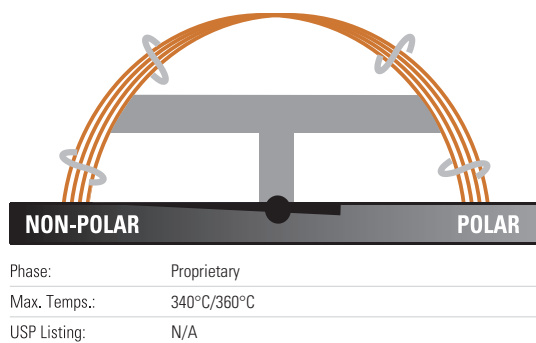
Detector Type: MS  
Carrier Gas: He  
Flow Rate: 1.2mL/min  
Injection Volume: 0.1µL  
Injection Mode: Split (100:1), 250°C

- |                        |                               |
|------------------------|-------------------------------|
| 1. Methyl octanoate    | 10. Methyl linolenate         |
| 2. Methyl decanoate    | 11. Methyl arachidate         |
| 3. Methyl decanoate    | 12. Methyl behenate           |
| 4. Methyl myristate    | 13. Methyl cis-13-docosenoate |
| 5. Methyl palmitate    | 14. Methyl tetracosanoate     |
| 6. Methyl palmitoleate |                               |
| 7. Methyl stearate     |                               |
| 8. Methyl oleate       |                               |
| 9. Methyl linoleate    |                               |

## TraceGOLD TG-XLBMS GC Columns

General purpose columns exhibiting extremely low bleed

- Low polarity phase, proprietary
- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Ideal for analysis of active, high molecular weight compounds with sensitive GC-MS systems



### TraceGOLD TG-XLBMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	0.18	<b>26079-5780</b>	1 Each
0.25	15	0.1	<b>26079-0350</b>	1 Each
		0.25	<b>26079-1300</b>	1 Each
		0.1	<b>26079-0470</b>	1 Each
		0.25	<b>26079-1420</b>	1 Each
		0.5	<b>26079-2230</b>	1 Each
		0.25	<b>26079-1540</b>	1 Each
0.32	30	0.1	<b>26079-0480</b>	1 Each
		0.25	<b>26079-1430</b>	1 Each
		0.5	<b>26079-2240</b>	1 Each
		1.0	<b>26079-2970</b>	1 Each

### Applications

- Pesticides
- PCB congeners
- PAHs
- Aroclor mixes

### Similar to:

- Rxi-XLB
- DB-XLB
- VF-Xms

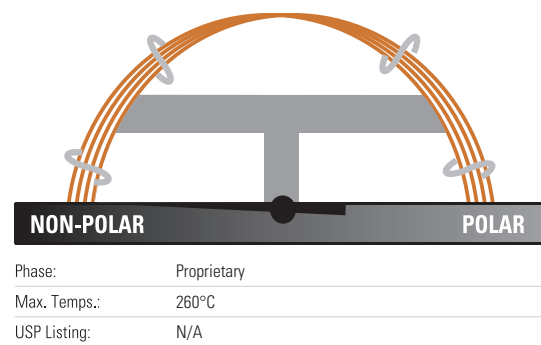
### Semi-Volatile Drinking Water Application Kit

Description	Cat. No.	Quantity
Semi-Volatile Drinking Water Application Kit	<b>60181-736</b>	1 Each
Containing the following:		
TraceGOLD TG-XLBMS GC Column 30m x 0.25mm x 0.25µm	<b>26079-1420</b>	1 Each
BTO Septa 17mm Diameter	<b>31303211</b>	50 Pack
S/SL Injector – Split/Splitless Liner, 5mm ID x 8mm OD x 105mm Length	<b>45350033</b>	5 Pack
S/SL Injector – Silver Seals	<b>29033629</b>	10 Pack
S/SL Injector – Graphite Liner Seals	<b>29033406</b>	10 Pack
S/SL Injector – Graphite Ferrules for 0.25mm ID Column	<b>29053488</b>	10 Pack
MS Interface – Graphite/Vespel Ferrules for 0.25mm ID Column	<b>29033496</b>	10 Pack
2mL Screw Top Vials, Amber Glass	<b>60180-567</b>	100 Pack
Blue Caps With PTFE/Red Rubber Seals	<b>60180-569</b>	100 Pack
5µL Fixed Needle Syringe, 50mm Length, 26 Gauge, Cone Needle	<b>36500505</b>	1 Each

## TraceGOLD TG-VRX GC Columns

Application specific column for volatile organic pollutants

- Highly stable polymer phase
- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Excellent resolution for analysis of volatile compounds
- Fast analysis times for volatile compounds



### TraceGOLD TG-VRX GC Columns

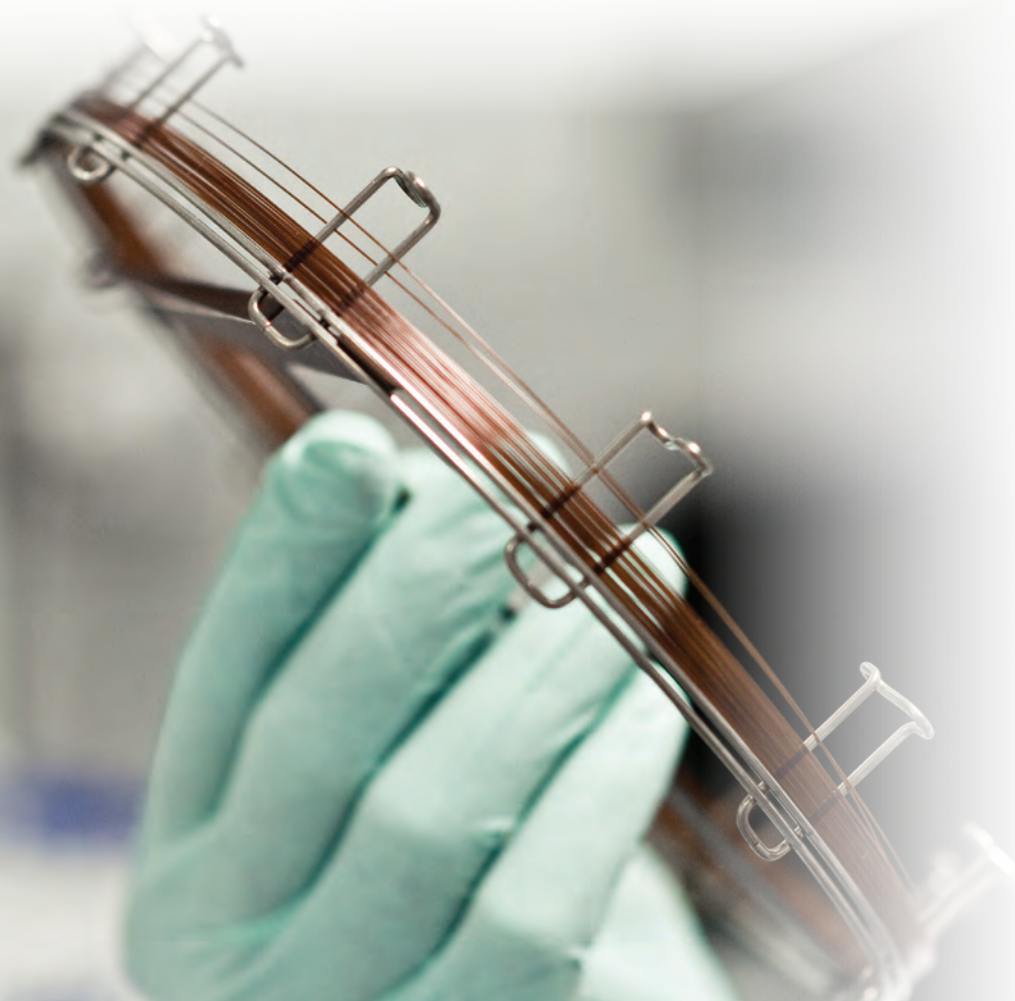
ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	1.0	<b>26081-4950</b>	1 Each
	40	1.0	<b>26081-4960</b>	1 Each
0.25	30	1.4	<b>26081-3320</b>	1 Each
	60	1.4	<b>26081-3330</b>	1 Each
0.32	30	1.8	<b>26081-3390</b>	1 Each
	60	1.8	<b>26081-3410</b>	1 Each

### Applications:

- Volatile organic pollutants
- US EPA Method 8021 compounds

### Similar to:

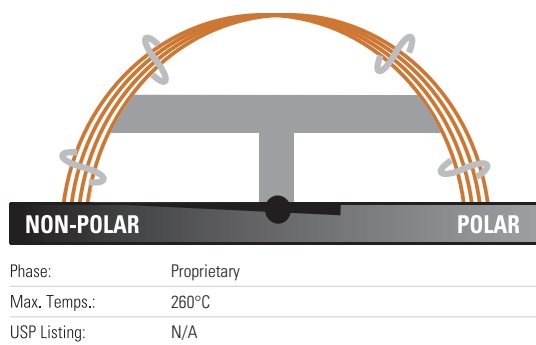
- Rtx-VRX
- DB-VRX



## TraceGOLD TG-VMS GC Columns

Application specific column for volatile organic pollutants

- Highly stable polymer phase
- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Excellent resolution for analysis of volatile compounds
- Fast analysis times for volatile compounds



### TraceGOLD TG-VMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	1.0	<b>26080-4950</b>	1 Each
	40	1.0	<b>26080-4960</b>	1 Each
0.25	30	1.4	<b>26080-3320</b>	1 Each
	60	1.4	<b>26080-3330</b>	1 Each
0.32	30	1.8	<b>26080-3390</b>	1 Each
	60	1.8	<b>26080-3410</b>	1 Each

### Applications:

- Volatile organic pollutants
- US EPA Method 8260B compounds

### Similar to:

- Rtx-VMS

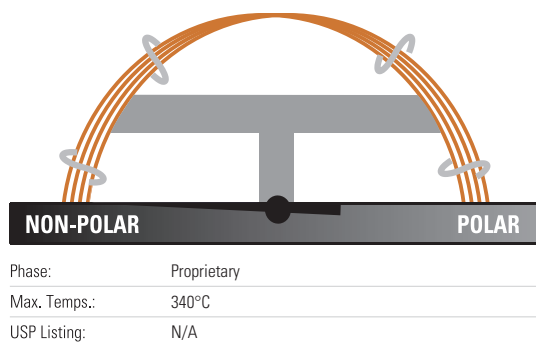
### Volatile Organic Compound (VOC) Application Kit

Description	Cat. No.	Quantity
Volatile Organic Compound (VOC) Application Kit	<b>60181-734</b>	1 Each
Containing the following:		
TraceGOLD TG-VMS GC Column 20m x 0.18mm x 1.00µm	<b>26080-4950</b>	1 Each
S/SL Injector – BTO Septa 9mm Diameter	<b>31303240</b>	50 Pack
S/SL Injector – Silver Seals	<b>29033629</b>	10 Pack
S/SL Injector – Graphite Liner Seals	<b>29033406</b>	10 Pack
S/SL Injector – Graphite Ferrules for 0.25mm ID Column	<b>29053488</b>	10 Pack
MS Interface – Graphite/Vespel Ferrules for 0.25mm ID Column	<b>29033496</b>	10 Pack
2mL Screw Top Vials, Amber Glass	<b>60180-567</b>	100 Pack
Blue Caps with PTFE/Red Rubber Seals	<b>60180-569</b>	100 Pack
40mL VOA Sample Vials with Caps and Seals	<b>60180-573</b>	72 Pack

## TraceGOLD TG-OCP I / TG-OCP II GC Columns

Application-specific columns for organochlorine pesticides and herbicides

- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Fast analysis time giving full separation of chlorinated pesticides
- Ideal for US EPA methods 8081, 608 and CLP



### TraceGOLD TG-OCP I GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	<b>26078-0200</b>	1 Each
	15	0.25	<b>26078-1300</b>	1 Each
		30	0.25	<b>26078-1420</b>
0.25	30	0.25	<b>26078-1540</b>	1 Each
		0.32	<b>26078-5760</b>	1 Each
	60	0.5	<b>26078-2240</b>	1 Each

### Applications:

- Organochlorine pesticides
- Herbicides

### Similar to:

- Rtx-CLPesticides/  
Rtx-CLPesticides2

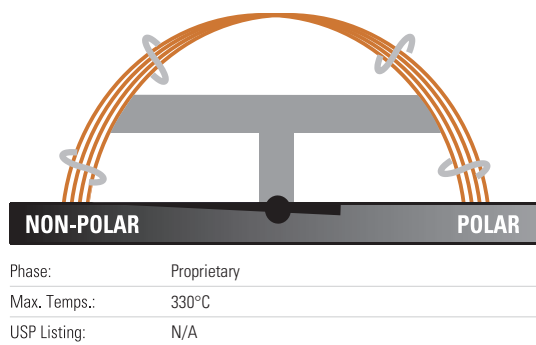
### TraceGOLD TG-OCP II GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	<b>26077-0200</b>	1 Each
	20	0.1	<b>26077-1450</b>	1 Each
0.18	10	0.14	<b>26077-5700</b>	1 Each
	20	0.14	<b>26077-5690</b>	1 Each
0.25	15	0.2	<b>26077-5730</b>	1 Each
	30	0.2	<b>26077-5720</b>	1 Each
		60	0.2	<b>26077-5710</b>
0.32	15	0.25	<b>26077-1310</b>	1 Each
		0.25	<b>26077-1430</b>	1 Each
	30	0.5	<b>26077-2240</b>	1 Each
0.53	15	0.42	<b>26077-5750</b>	1 Each
	30	0.42	<b>26077-5740</b>	1 Each

## TraceGOLD TG-OPP I / TG-OPP II GC Columns

Application-specific columns for organophosphorus pesticides

- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Fast analysis time giving full separation of organophosphorus pesticides
- Ideal for US EPA methods 8141A



### TraceGOLD TG-OPP I GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>26076-1420</b>	1 Each
0.32	30	0.5	<b>26076-2240</b>	1 Each
0.53	30	0.83	<b>26076-0690</b>	1 Each

### TraceGOLD TG-OPP II GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>26075-1420</b>	1 Each
0.32	30	0.32	<b>26075-5760</b>	1 Each
0.53	30	0.5	<b>26075-2250</b>	1 Each

### Applications:

- Organophosphorus pesticides

### Similar to:

- Rtx-OPPesticides/  
Rtx-OPPesticides2

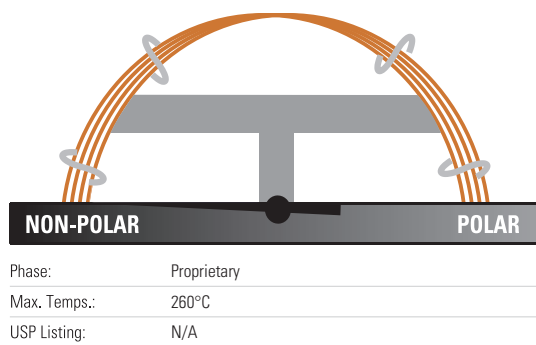




## TraceGOLD TG-ALC Plus I / TG-ALC Plus II GC Columns

Application-specific columns for blood alcohol analysis

- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Fast analysis time giving full separation of blood alcohols



### TraceGOLD TG-ALC Plus I GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	30	1.8	<b>26063-3390</b>	1 Each
0.53	30	3.0	<b>26063-3960</b>	1 Each

### TraceGOLD TG-ALC Plus II GC Columns

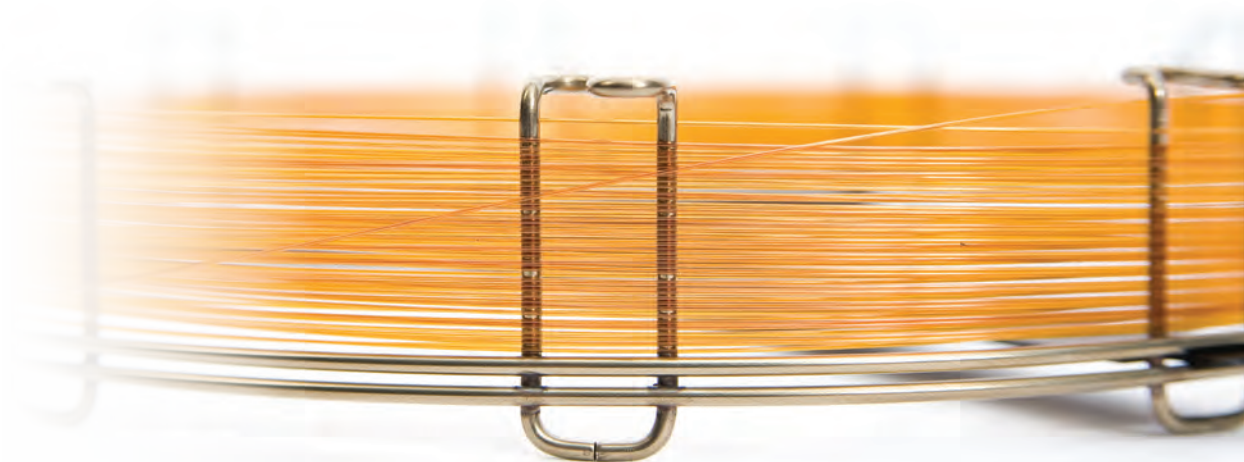
ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	30	0.5	<b>26063-2240</b>	1 Each
0.53	30	1.0	<b>26063-2980</b>	1 Each

### Applications:

- Blood alcohol analysis
- Abused inhalent anesthetics
- $\gamma$ -hydroxybutyrate (GHB)
- $\gamma$ -butyrolactone (GBL)
- Glycols
- Common industrial solvents

### Similar to:

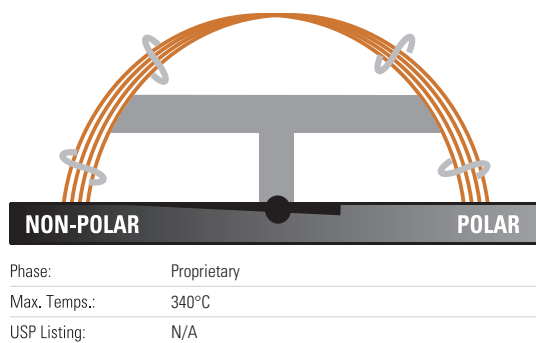
- Rtx BAC Plus 1 / Rtx BAC Plus 2



## TraceGOLD TG-Dioxin GC Columns

Excellent separation of toxic dioxin and furan congeners

- Isomer specificity for 2,3,7,8-TCDD and 2,3,7,8-TCDF achieved with a single GC column
- High thermal stability – maximum temperatures up to 340°C
- Unique selectivity for toxic dioxin and furan congeners allows use as a confirmation GC column



### TraceGOLD TG-Dioxin GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	40	0.18	<b>26066-4800</b>	1 Each
0.25	60	0.25	<b>26066-1540</b>	1 Each

### Persistent Organic Pollutants (POPs) Confirmation Kit

Description	Cat. No.	Quantity
Persistent Organic Pollutants (POPs) Confirmation Kit	<b>TS-MKITG503</b>	1 Each
Containing the following:		
TraceGOLD TG-Dioxin GC Column 60m x 0.25mm x 0.25µm	<b>26066-1540</b>	1 Each
S/SL Injector – BTO Septa 11mm diameter	<b>31303233</b>	50 Pack
S/SL Injector – Split Straight Liner 4 x 6.3 x 78.5mm, Quartz Wool	<b>453A2265</b>	5 Pack
S/SL Injector – Splitless Liner with Single Taper 4 x 6.3 x 78.5mm, Quartz Wool	<b>453A1925</b>	5 Pack
Gold Inlet Base Seals, Single Column Installation	<b>290GA081</b>	10 Pack
Graphite Liner Sealing Rings	<b>290GA243</b>	10 Pack
Graphite Ferrules for 0.1-0.32mm Column	<b>290GA139</b>	10 Pack
Graphite/Vespel Ferrules for 0.1-0.25mm Column	<b>290VA191</b>	10 Pack
1.1mL Screw Top Tapered Vial, Clear Gold Grade Glass	<b>1.1-STVG</b>	500 Pack
8mm Screw Caps with Pre-Fitted Silicone/PTFE Septa	<b>8-SC-ST15</b>	500 Pack
10µL Fixed Needle Syringe for TriPlus RSH, 57mm Length, 26s Gauge	<b>365D0291</b>	1 Each

### Applications:

- Dioxins
- Furans

### Similar to:

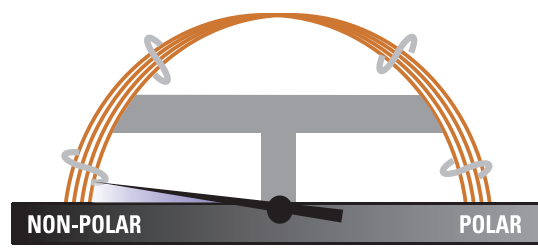
- Rtx-Dioxin2
- DB-Dioxin

# TRACE GC Columns

## TRACE TR-1 GC Columns

Designed for method development

- Non-polar phase, 100% dimethyl polysiloxane
- High operating temperature



Phase:	100% Dimethyl Polysiloxane
Max. Temps.:	340°C/360°C
USP Listing:	G1, G2, G38

### TRACE TR-1 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>260A130P</b>	1 Each
	30	0.1	<b>260A047P</b>	1 Each
		0.25	<b>260A142P</b>	1 Each
	60	0.25	<b>260A154P</b>	1 Each
0.32	15	0.25	<b>260A131P</b>	1 Each
	30	0.25	<b>260A143P</b>	1 Each

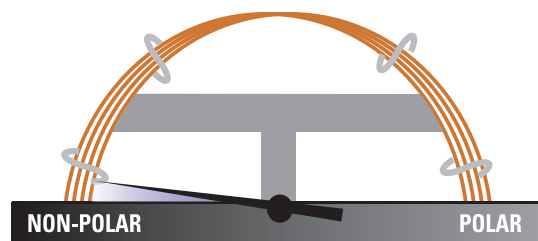
### Applications:

- Chlorinated and nitroaromatic compounds
- Environmental analyses

## TRACE TR-1MS GC Columns

Extremely low-bleed non-polar columns suitable for GC-MS applications

- Non-polar phase, 100% dimethyl polysiloxane
- High operating temperature
- Inert phase suited for environmental analyses



Phase:	100% Dimethyl Polysiloxane
Max. Temps.:	340°C/360°C
USP Listing:	G1, G2, G38

### TRACE TR-1MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.1	<b>260B047P</b>	1 Each
		0.25	<b>260B142P</b>	1 Each
		0.25	<b>260B154P</b>	1 Each
0.32	30	0.25	<b>260B143P</b>	1 Each
		0.25	<b>260B155P</b>	1 Each
		1.0	<b>260B309P</b>	1 Each

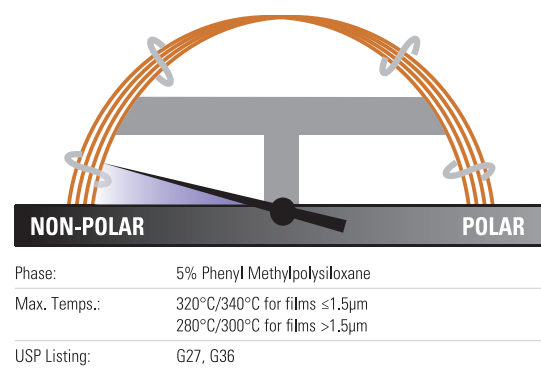
### Applications:

- Chlorinated and nitroaromatic compounds
- GC-MS environmental analyses

## TRACE TR-5 GC Columns

Excellent starting columns for method development, capable of performing most required separations

- Non-polar phase, 5% phenyl methyl polysiloxane
- High operating temperature and extremely low bleed
- Widely used in a variety of applications



### TRACE TR-5 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>260E130P</b>	1 Each
	30	0.25	<b>260E142P</b>	1 Each
		0.5	<b>260E223P</b>	1 Each
	60	0.25	<b>260E154P</b>	1 Each
0.32	7	0.25	<b>260E113P</b>	1 Each
	15	0.25	<b>260E131P</b>	1 Each
	30	0.25	<b>260E143P</b>	1 Each
		0.5	<b>260E224P</b>	1 Each
		1.0	<b>260E297P</b>	1 Each
	60	0.25	<b>260E155P</b>	1 Each
	100	0.5	<b>260E242P</b>	1 Each
0.53	30	0.5	<b>260E225P</b>	1 Each
		1.0	<b>260E298P</b>	1 Each
		1.5	<b>260E336P</b>	1 Each
		5.0	<b>260E470P</b>	1 Each

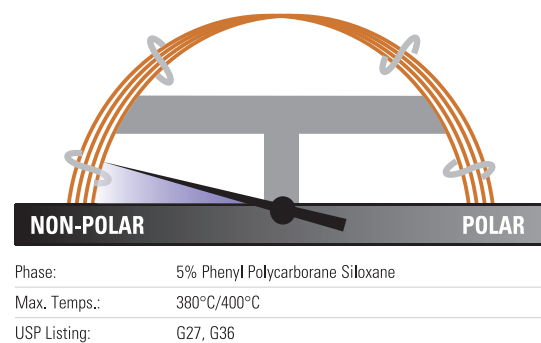
#### Applications:

- Alcohols
- Free fatty acids
- Aromatics
- Flavors
- Low polarity pesticides

## TRACE TR-5HT GC Columns

Feature upper temperature limits as high as 400°C

- Non-polar phase, 5% phenyl polycarborane siloxane
- Allow the elution of higher-boiling hydrocarbons up to C100
- Low bleed even at elevated temperatures



### TRACE TR-5HT GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.1	<b>260H035P</b>	1 Each
	30	0.1	<b>260H047P</b>	1 Each
		0.25	<b>260H142P</b>	1 Each
0.32	12	0.1	<b>260H030P</b>	1 Each

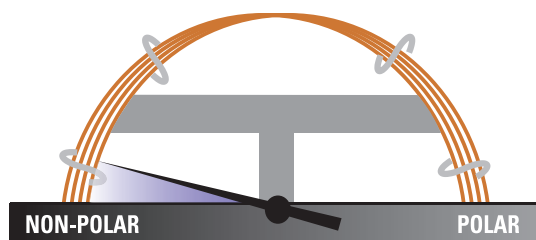
#### Applications:

- Hydrocarbons
- Solvents
- Pesticides
- Herbicides
- Phenols
- Amines

## TRACE TR-5MS GC Columns

Features a popular GC-MS phase for many applications

- Non-polar phase, 5% phenyl polysilphenylene-siloxane
- Low bleed and high stability
- High signal-to-noise ratio for increased sensitivity
- High robustness to oxygen and water contamination



Phase:	5% Phenyl Polysilphenylene-siloxane
Max. Temps.:	360°C/370°C for films ≤1.5µm 350°C/360°C for films >1.5µm
USP Listing:	G27, G36

### TRACE TR-5MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity	
0.10	10	0.1	<b>260F020P</b>	1 Each	
0.15	25	0.25	<b>260F134P</b>	1 Each	
0.18	20	0.18	<b>260F578P</b>	1 Each	
0.25	15	0.1	<b>260F035P</b>	1 Each	
		0.25	<b>260F130P</b>	1 Each	
		0.1	<b>260F047P</b>	1 Each	
		0.25	<b>260F142P</b>	1 Each	
		0.25	<b>260F142J</b>	1 Each	
		0.5	<b>260F223P</b>	1 Each	
		1.0	<b>260F296P</b>	1 Each	
60	25	0.25	<b>260F154P</b>	1 Each	
		1.0	<b>260F308P</b>	1 Each	
		1.0	<b>260F285P</b>	1 Each	
0.32	15	1.0	<b>260F285P</b>	1 Each	
		30	0.25	<b>260F143P</b>	1 Each
		0.5	<b>260F224P</b>	1 Each	
		1.0	<b>260F297P</b>	1 Each	
0.53	30	0.5	<b>260F225P</b>	1 Each	
		1.0	<b>260F298P</b>	1 Each	
		1.5	<b>260F336P</b>	1 Each	
		3.0	<b>260F396P</b>	1 Each	
		3.0	<b>260F396P</b>	1 Each	

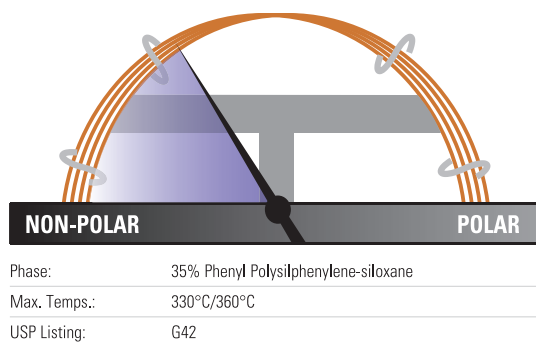
### Applications:

- Hydrocarbons
- Solvents
- Pesticides
- Herbicides
- Phenols
- Amines

## TRACE TR-35MS GC Columns

Mid-polarity columns excellent for many applications

- Mid-polarity phase, 35% phenyl polysilphenylene-siloxane
- Exceptionally low surface activity
- Low bleed even at elevated temperatures



### TRACE TR-35MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>260C130P</b>	1 Each
	30	0.25	<b>260C142P</b>	1 Each
	60	0.25	<b>260C154P</b>	1 Each
0.32	30	0.25	<b>260C143P</b>	1 Each
0.53	15	1.0	<b>260C286P</b>	1 Each
	30	1.0	<b>260C298P</b>	1 Each

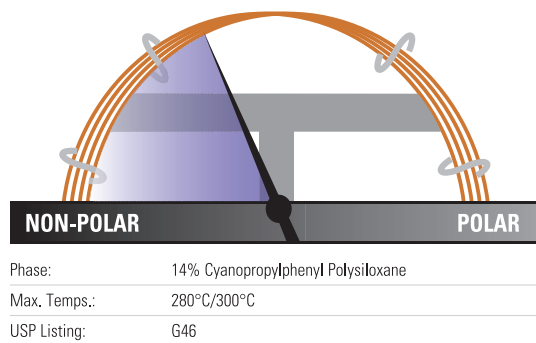
### Applications:

- Pesticides
- Herbicides
- Drugs of abuse
- PAHs
- Pharmaceuticals

## TRACE TR-1701 GC Columns

Mid-polarity column with alternative selectivity

- Mid-polarity phase, 14% cyanopropylphenyl polysiloxane
- Low bleed even at a high operating temperature
- Excellent starting point for method development
- Suitable for a wide variety of applications



### TRACE TR-1701 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>260Q142P</b>	1 Each
	60	0.25	<b>260Q154P</b>	1 Each
0.32	15	0.25	<b>260Q131P</b>	1 Each
	30	0.25	<b>260Q143P</b>	1 Each
	60	1.0	<b>260Q309P</b>	1 Each
		0.25	<b>260Q155P</b>	1 Each
0.53	30	1.0	<b>260Q298P</b>	1 Each

### Applications:

- Pesticides
- PCBs
- PAHs
- Organic acids
- Drugs
- Steroids
- EPA 608, 8081

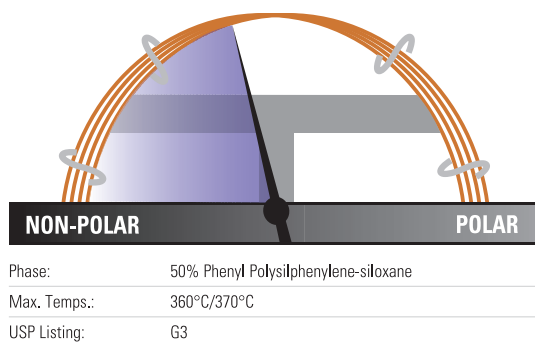
## TRACE TR-50MS GC Columns

Mid-polarity columns well-suited to GC-MS applications

- Mid-polarity phase, 50% phenyl polysilphenylene-siloxane
- Low bleed decreases MS contamination
- Particularly useful for applications requiring a higher temperature and more polarity than a 5% phenyl column
- Column inertness results in minimal peak tailing and decreased breakdown of sensitive samples

### TRACE TR-50MS GC Columns

ID (mm)	Length (m)	Film Thickness ( $\mu\text{m}$ )	Cat. No.	Quantity
0.25	15	0.25	<b>260R130P</b>	1 Each
	30	0.15	<b>260R050P</b>	1 Each
		0.25	<b>260R142P</b>	1 Each
0.32	30	0.25	<b>260R143P</b>	1 Each



### Applications:

- Herbicides
- Drugs of abuse
- EPA 604, 608, 8060, 8081
- Pharmaceuticals

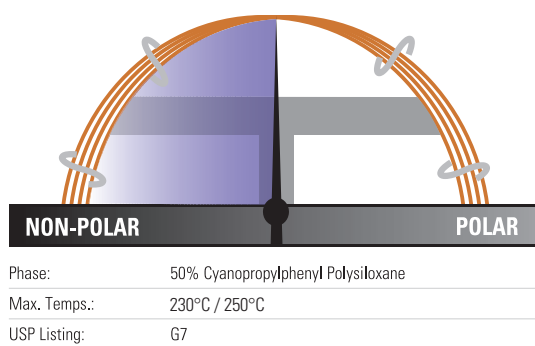
## TRACE TR-225 GC Columns

Reliable and reproducible performance

- Mid-polarity phase, 50% cyanopropylphenyl polysiloxane
- Low bleed even at elevated temperatures
- Outstanding robustness for difficult separations
- Manufactured to minimize risk of damage from contaminated carrier gas

### TRACE TR-225 GC Columns

ID (mm)	Length (m)	Film Thickness ( $\mu\text{m}$ )	Cat. No.	Quantity
0.25	30	0.25	<b>260Y142P</b>	1 Each
	60	0.25	<b>260Y154P</b>	1 Each
0.32	25	0.25	<b>260Y137P</b>	1 Each



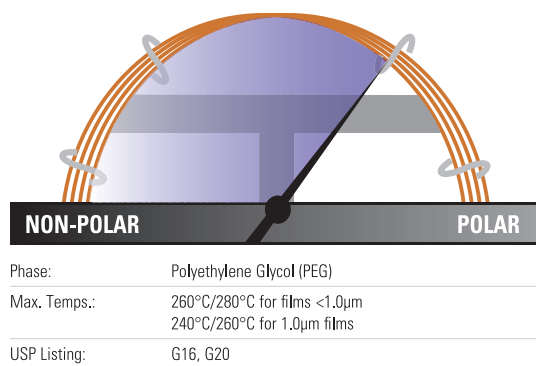
### Applications:

- Fatty Acid Methyl Esters (FAMES)
- Carbohydrates
- Neutral sterols

## TRACE TR-Wax GC Columns

General purpose, high-polarity columns

- Polar phase, polyethylene glycol
- Highly crosslinked and fully deactivated
- Solvent washable



### TRACE TR-Wax GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>260W142P</b>	1 Each
		0.5	<b>260W223P</b>	1 Each
		1.0	<b>260W296P</b>	1 Each
0.32	60	0.25	<b>260W154P</b>	1 Each
		0.25	<b>260W131P</b>	1 Each
	30	0.25	<b>260W143P</b>	1 Each
		0.5	<b>260W224P</b>	1 Each
		1.0	<b>260W297P</b>	1 Each
		0.25	<b>260W155P</b>	1 Each
0.53	15	1.0	<b>260W286P</b>	1 Each
		0.5	<b>260W225P</b>	1 Each
	30	1.0	<b>260W298P</b>	1 Each
		1.0	<b>260W310P</b>	1 Each

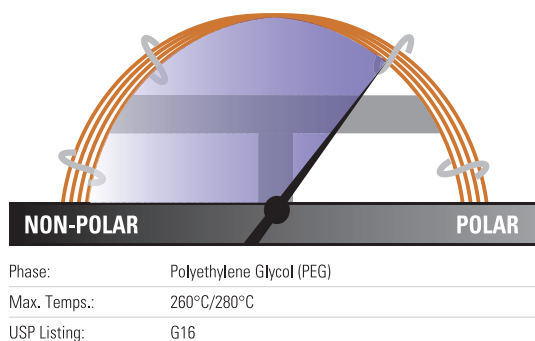
### Applications:

- Esters
- Alcohols
- Ketones
- Glycols
- Aromatic isomers

## TRACE TR-WaxMS GC Columns

Feature a high-polarity phase designed for mass spectrometry detectors

- Polar phase, polyethylene glycol
- Proprietary bonding method expands operating temperatures
- Extremely low bleed improves sensitivity and library matches
- High stability with oxygen and water



### TRACE TR-WaxMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>260X142P</b>	1 Each
		0.5	<b>260X223P</b>	1 Each
		1.0	<b>260X296P</b>	1 Each
0.32	60	0.25	<b>260X154P</b>	1 Each
		0.25	<b>260X143P</b>	1 Each
	30	0.25	<b>260X143P</b>	1 Each
0.5		<b>260X224P</b>	1 Each	
60	0.25	<b>260X155P</b>	1 Each	

### Applications:

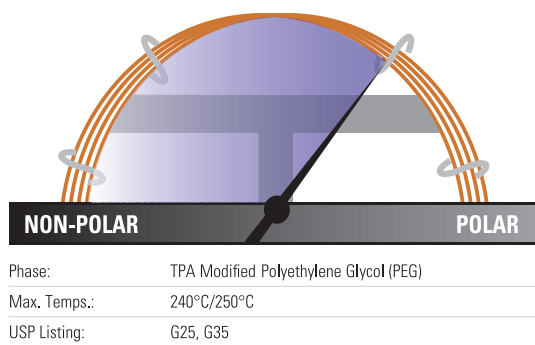
- Aromatic hydrocarbons
- Food additives
- Essential oils
- Alcohols
- Esters
- Aldehydes
- Ketones



## TRACE TR-FFAP GC Columns

High-polarity phase optimized for FFAP analysis

- Polar phase, TPA modified polyethylene glycol
- Bonded FFAP phase
- Quality tested for acidic compound analysis



### TRACE TR-FFAP GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>260N130P</b>	1 Each
	30	0.25	<b>260N142P</b>	1 Each
	60	0.25	<b>260N154P</b>	1 Each
0.32	30	0.25	<b>260N143P</b>	1 Each
	50	0.5	<b>260N230P</b>	1 Each
0.53	15	0.5	<b>260N213P</b>	1 Each
	30	0.5	<b>260N225P</b>	1 Each
		1.0	<b>260N298P</b>	1 Each

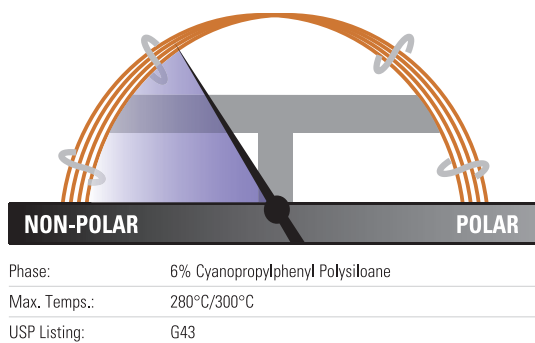
### Applications:

- FFAP analysis
- Acidic compound analysis

## TRACE TR-V1 GC Columns

Mid-polarity, thick-film columns

- Mid-polarity phase, 6% cyanopropylphenyl polysiloxane
- Thick films for the analysis of volatile analytes
- Low bleed suitable for MS detection



### TRACE TR-V1 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	1.0	<b>260V495P</b>	1 Each
0.25	30	1.4	<b>260V332P</b>	1 Each
	60	1.4	<b>260V333P</b>	1 Each
0.32	30	1.8	<b>260V339P</b>	1 Each
	60	1.8	<b>260V341P</b>	1 Each
0.53	30	3.0	<b>260V396P</b>	1 Each

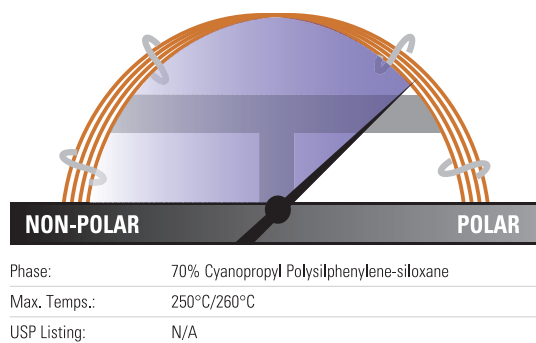
### Applications:

- Volatile organics
- Alcohols
- EPA 502.2, 608 and 624

## TRACE TR-FAME GC Columns

High-polarity phase optimized for FAME analysis

- Polar phase, 70% cyanopropyl polysilphenylene-siloxane
- High operating temperature compared to competitor columns
- Low bleed for mass spectrometry use



### TRACE TR-FAME GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.2	<b>260M096P</b>	1 Each
	25	0.25	<b>260M135P</b>	1 Each
0.22	30	0.25	<b>260M141P</b>	1 Each
	50	0.25	<b>260M147P</b>	1 Each
	60	0.25	<b>260M153P</b>	1 Each
	30	0.25	<b>260M142P</b>	1 Each
0.25	60	0.25	<b>260M154P</b>	1 Each
	120	0.25	<b>260M166L</b>	1 Each
	25	0.25	<b>260M137P</b>	1 Each
0.32	30	0.25	<b>260M143P</b>	1 Each
	60	0.25	<b>260M155P</b>	1 Each

### Applications:

- Fatty Acid Methyl Esters (FAMEs)
- FAMEs Cis/Trans Isomers

## TRACE GC Columns for EPA Methods

Low bleed and temperature-stable performance tailored to specific EPA methodologies

- TRACE TR-524 and TRACE TR-525 Columns: US EPA Drinking Water Test Methods 524 or 525
- TRACE TR-527 Columns: US EPA Drinking Water Test Method 527, features the robust, low-bleed performance required for analysis of pesticides and flame retardants
- TRACE TR-8270 Columns: US EPA Solid Waste Test Method 8270
- TRACE TR-8095 Columns: US EPA Method 8095 for Explosives Testing featuring high max temperature and low surface activity

### TRACE GC Columns for EPA Methods

Phase	ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
TR-524	0.18	20	1.0	<b>26RV495P</b>	1 Each
TR-525	0.25	30	0.25	<b>26RX142P</b>	1 Each
TR-527	0.25	30	0.25	<b>26RF142P</b>	1 Each
TR-8095	0.32	12	0.25	<b>260P123P</b>	1 Each
TR-8270	0.25	30	0.5	<b>26RF223P</b>	1 Each
TR-8270	0.25	30	1.0	<b>26RF296P</b>	1 Each

### Applications:

- Volatile Organic Compounds (VOCs)
- Pesticides
- Flame retardants
- Explosives

## TRACE GC Columns for Pesticides

Specifically designed and tested for analysis of pesticides

- Low bleed decreases MS contamination
- Particularly useful for applications requiring a higher temperature
- Column inertness results in minimal peak tailing and decreased breakdown of sensitive samples

### Applications:

- Organophosphate pesticides
- Organochlorine pesticides
- Pyrethroid pesticides
- Herbicides

### TRACE GC Columns for Pesticides

Phase	ID (mm)	Length (m)	Film Thickness (µm)	Guard	Cat. No.	Quantity
TR-Pesticide	0.25	30	0.25	5m guard column attached	<b>26RF142F</b>	1 Each
TR-Pesticide II	0.25	30	0.25	5m guard column attached	<b>26RD142F</b>	1 Each
TR-Pesticide III	0.25	30	0.25	5m guard column attached	<b>26RC142F</b>	1 Each
TR-Pesticide IV	0.25	30	0.25	–	<b>26RC142P</b>	1 Each

## TRACE GC Columns for Dioxin and PCB Analysis

Designed to meet the requirements of high resolution GC-MS methods

- TRACE TR-Dioxin 5MS Columns; Specifically designed for Dioxin and Furan testing
- Wide coverage of the 17 congeners with the highest toxicological significance
- TRACE TR-PCB 8MS Columns; meets the requirements for HR GC-MS analysis of PCBs
- Low bleed

### TRACE GC Columns for Dioxin and PCB Analysis

Phase	ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
TR-PCB 8MS	0.25	50	0.25	<b>26AJ148P</b>	1 Each
TR-Dioxin 5MS	0.25	60	0.25	<b>26AF154P</b>	1 Each
TR-Dioxin 5MS	0.25	30	0.1	<b>26AF047P</b>	1 Each
TR-Dioxin 5MS	0.25	60	0.1	<b>26AF059P</b>	1 Each

#### Applications:

- Dioxins (PCDDs)
- Furans (PCDFs)
- PCB congeners

## TRACE GC Columns for Biodiesel Analysis

Designed for use in carbon neutral fuels development applications

- GC columns designed for specific EN methods and ASTM methods
- Specific columns for the determination of methanol, FAMES or glycerides

#### Applications:

- Biodiesel
- ASTM D-6584
- EN14214

### TRACE GC Columns for Biodiesel Analysis

Phase	Method	ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
TR-BioDiesel (M)	EN 14110	0.32	30	3.0	<b>26AA395P</b>	1 Each
TR-BioDiesel (G)	EN 14105	0.32	10	0.1	<b>26AF024P</b>	1 Each
TR-BioDiesel (F)	EN 14103	0.25	30	0.25	<b>26AX142P</b>	1 Each
TR-BioDiesel (G) ASTM	ASTM D-6584	0.32	10	0.1	<b>26RF024P</b>	1 Each

## TRACE GC Columns for Drugs of Abuse

Specifically designed for the analysis of common drugs of abuse

- TRACE TR-DoA 5MS Columns; widely used for the analysis and determination of a range of toxicological target compounds including amphetamines, codeine and morphine
- TRACE TR-DoA 35MS Columns; the recommended column for use in drug testing labs for the confirmation of THC

### TRACE GC Columns for Drugs of Abuse

Phase	ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
TR-DoA35	0.20	15	0.33	<b>26AC497P</b>	1 Each
TR-DoA5	0.25	15	0.25	<b>26AF130P</b>	1 Each

#### Applications:

- Amphetamines, codeine and morphine

## UltraFast GC Columns

The huge demand of samples to be analyzed every day by labs in industries such as environmental and petrochemical requires an increased speed of analysis

A significant gain in analysis speed compared to conventional GC procedures is obtained through UltraFast Gas Chromatography. UltraFast GC utilizes short (2-10m) narrow bore capillaries and temperature programming conditions usually faster than 2°C/s. This leads to peak widths in the 50-200ms range. The analysis times are in the range of 1 minute or even less.

### Benefits of UltraFast GC Columns

- Dramatically shorter analysis times – typically a minute or less
- Ideal for applications in petrochemical and environmental markets
- Long column lifetimes

### Application – UltraFast Analysis of Pure Petroleum Products through Nanovolumes Injection

The analyses were performed in the UltraFast GC mode using a TRACE GC Ultra System equipped with a Split/Splitless injector (SSL) and a Digital Pressure and Flow Controller, as well as a FAST FID detector. The GC System was also equipped with an UltraFast Module (UFM).

Split injections were performed with a AS3000 Autosampler using a 0.5µL plunger-in-needle syringe p/n 36504045. A minimum penetration depth in the injector (cold needle mode) was set, and 0.3µL of air was automatically withdrawn after the sample to ensure that the part of the needle inserted into the injector was empty. A 3mm ID upper-tapered empty liner with an 8mm long and 1mm wide restriction at the top was installed. The SSL injector was set to 225°C and the FID to 320°C.

#### UFC-1 10m x 0.32mm x 3µm

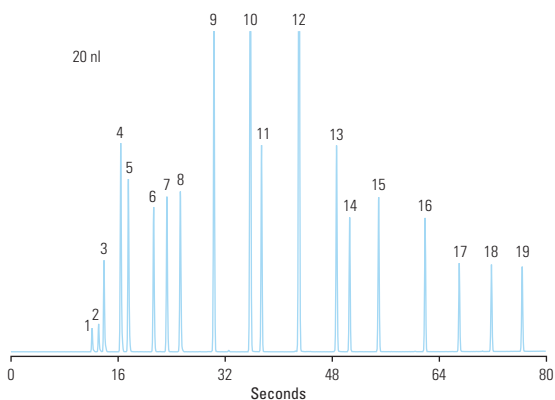
Temperature: 40°C (6 sec hold) to 300°C  
(6 sec hold) at 180°C/min

Detector Type: FID

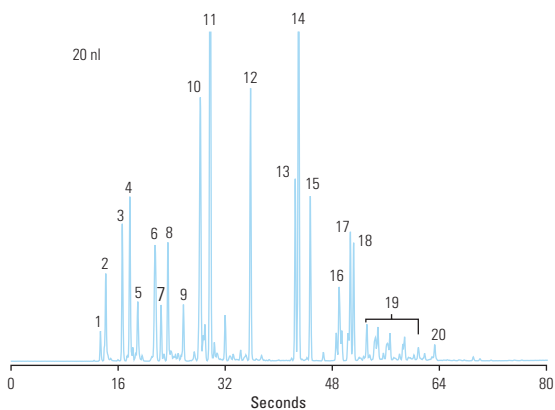
Carrier Gas: Helium

Flow Rate: 0.5mL/min

Injection Mode: Split/Splitless



- |                     |                    |
|---------------------|--------------------|
| 1. propane          | 11. octane         |
| 2. methyl-propane   | 12. p-xylene       |
| 3. butane           | 13. propyl-benzene |
| 4. methyl-butane    | 14. n-decane       |
| 5. pentane          | 15. butyl-benzene  |
| 6. methyl-pentane   | 16. n-dodecane     |
| 7. hexane           | 17. n-tridecane    |
| 8. dimethyl-pentane | 18. n-tetradecane  |
| 9. heptane          | 19. n-pentadecane  |
| 10. toluene         |                    |



- |                      |                                     |
|----------------------|-------------------------------------|
| 1. methyl-propane    | 12. toluene                         |
| 2. butane            | 13. ethyl-benzene                   |
| 3. 2-methyl-butane   | 14. p-xylene                        |
| 4. pentane           | 15. m-xylene                        |
| 5. ter-butyl alcohol | 16. propyl-benzene                  |
| 6. methyl-pentane    | 17. tetramethyl-octane              |
| 7. 3-methyl-pentane  | 18. 1,2,4-trimethyl-benzene         |
| 8. hexane            | 19. tri/tetramethyl-benzene isomers |
| 9. dimethyl-pentane  | 20. naphthalene                     |
| 10. cyclohexane      |                                     |
| 11. dimethyl-hexane  |                                     |

## UltraFast GC Columns

Short, narrow-bore columns for use with the Thermo Scientific TRACE GC UltraFast instrument

- Dramatically shorter analysis times
- Increase sample throughput by a factor of 20
- Lengthen column lifetimes

### Applications:

- Chemical
- Petrochemical
- Environmental
- Flavors and fragrances

### UltraFast GC Columns

Phase	ID (mm)	Length (m)	Film Thickness (µm)	Uses	Cat. No.	Quantity
UFC-1	0.10	5	0.1	General	<b>UFMC00001010401</b>	1 Each
		5	0.1	ASTM D-2887	<b>UFMC00001070401</b>	1 Each
	0.32	5	0.25	ISO 9377-2	<b>UFMC00001070404</b>	1 Each
		10	3.0	ASTM D-3710	<b>UFMC00002070414</b>	1 Each
UFC-5	0.10	2.5	0.4	General	<b>UFMC00100000000</b>	1 Each
		5	0.4	General	<b>UFMC00200000000</b>	1 Each
		5	0.1	General	<b>UFMC00300000000</b>	1 Each
		10	0.1	General	<b>UFMC00002010601</b>	1 Each
		10	0.4	General	<b>UFMC00502010006</b>	1 Each
UFC-1701	0.10	5	0.1	General	<b>UFMC00400000000</b>	1 Each
UFC-WAX	0.10	5	0.1	FAMES, Essential Oils	<b>UFMC00001010501</b>	1 Each
		5	0.2	General	<b>UFMC00001010503</b>	1 Each
UFC-264	0.10	10	0.5	Volatiles	<b>UFMC00002010207</b>	1 Each
UFC-BioDiesel	0.32	5	0.5	Biodiesel	<b>UFMC00001070600</b>	1 Each
UFC-M1	0.32	5	0.25	General	<b>UFMC00001070904</b>	1 Each
UFC-POR Q					<b>UFMC00002060614</b>	1 Each



# TracePLOT GC Columns

## TracePLOT TG-BOND Alumina GC Columns: Na<sub>2</sub>SO<sub>4</sub> and KCl Deactivation

Optimized for linear and quantitative analysis of polar unsaturated hydrocarbons

- Strong bonding to prevent particle generation suits these columns in valve-switching operations without damage to injection and detection systems from particle release
- Columns to which water has adsorbed may be regenerated to restore full efficiency and selectivity
- Each column has been tested to ensure proper film thickness (1,3-butadiene), selectivity (propadiene and methyl acetylene), resolution (trans-2-butene and 1-butene) and coating efficiency (1,3-butadiene)

### TracePLOT TG-BOND Alumina GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
<b>Na<sub>2</sub>SO<sub>4</sub> Deactivation</b>				
0.32	30	5	<b>26001-6020</b>	1 Each
	50	5	<b>26001-6050</b>	1 Each
0.53	30	10	<b>26001-6080</b>	1 Each
	50	10	<b>26001-6110</b>	1 Each
<b>KCl Deactivation</b>				
0.32	30	5	<b>26002-6020</b>	1 Each
	50	5	<b>26002-6050</b>	1 Each
0.53	30	10	<b>26002-6080</b>	1 Each
	50	10	<b>26002-6110</b>	1 Each

### Applications:

- C1-C5 hydrocarbons
- Unsaturated hydrocarbon isomers

## TracePLOT TG-BOND Msieve 5A GC Columns

Designed for separation of Ar/O<sub>2</sub> and other permanent gases

- Specially designed coating and deactivation procedures for chromatographic efficiency and the integrity of the coating porous layer
- Deactivation process yields a sharp peak for CO elution rather than the tailing commonly seen in other columns
- High retention of molecular sieve permits separation of permanent gases at temperatures above ambient
- Uniform particles remain adherent to the tubing even following continuous valve-cycling

### TracePLOT TG-BOND Msieve 5A GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	15	30	<b>26003-6010</b>	1 Each
	30	30	<b>26003-6040</b>	1 Each
0.53	15	50	<b>26003-6070</b>	1 Each
	30	50	<b>26003-6100</b>	1 Each
	50	50	<b>26003-1630</b>	1 Each

### Applications:

- Permanent gases
- Refinery or natural gases

## TracePLOT TG-BOND Q GC Columns

Non-polar columns for oxygenated compounds and solvents

- Non-polar 100% divinyl benzene phase
- Particles incorporated into the walls of the tubing for essentially no particle release

### TracePLOT TG-BOND Q GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	15	10	<b>26004-6000</b>	1 Each
	30	10	<b>26004-6030</b>	1 Each
0.53	15	20	<b>26004-6060</b>	1 Each
	30	20	<b>26004-6090</b>	1 Each

### Applications:

- C1 to C3 isomers and alkanes up to C12
- Separation of CO<sub>2</sub>, methane and O<sub>2</sub>/N<sub>2</sub>/CO
- Analysis of oxygenated compounds and solvents

## TracePLOT TG-BOND Q+ GC Columns

Intermediate polarity columns for baseline separation of ethane, ethylene and acetylene

- Intermediate polarity, porous divinyl benzene homopolymer
- Particles incorporated into the walls of the tubing for essentially no particle release

### TracePLOT TG-BOND Q+ GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	15	10	<b>26005-6000</b>	1 Each
	30	10	<b>26005-6030</b>	1 Each
0.53	15	20	<b>26005-6060</b>	1 Each
	30	20	<b>26005-6090</b>	1 Each

### Applications:

- Separation of ethane, ethylene and acetylene to baseline



## TracePLOT TG-BOND S GC Columns

Columns for analysis of non-polar and mid-polar compounds

- Mid-polarity, divinylbenzene 4-vinylpyridine solid phase
- Particles incorporated into the walls of the tubing for essentially no particle release

### TracePLOT TG-BOND S GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	15	10	<b>26006-6000</b>	1 Each
	30	10	<b>26006-6030</b>	1 Each
0.53	15	20	<b>26006-6060</b>	1 Each
	30	20	<b>26006-6090</b>	1 Each

### Applications:

- Non-polar and mid-polar compounds

## TracePLOT TG-BOND U GC Columns

Columns for analysis of polar compounds

- Polar, divinylbenzene ethylene glycol/dimethylacrylate phase
- Particles incorporated into the walls of the tubing for essentially no particle release

### TracePLOT TG-BOND U GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	15	10	<b>26007-6000</b>	1 Each
	30	10	<b>26007-6030</b>	1 Each
0.53	15	20	<b>26007-6060</b>	1 Each
	30	20	<b>26007-6090</b>	1 Each

### Applications:

- Analysis of polar compounds

## TracePLOT Particle Traps for GC Instruments

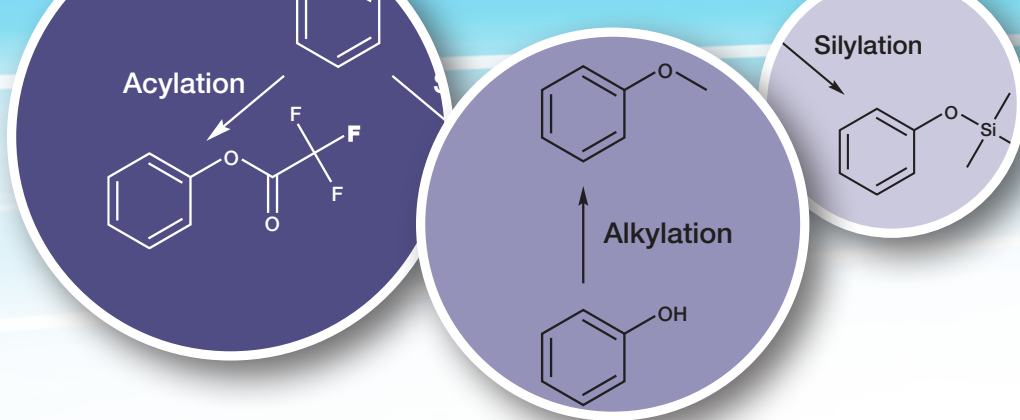
Provides a safeguard from dislodged particles entering the detector

- Provides a safeguard from dislodged particles entering the detector

### TracePLOT Particle Traps for GC Instruments

Description	ID (mm)	Cat. No.	Quantity
PLOT Particle Trap 2.5m x 0.25mm	0.25	<b>60180-862</b>	1 Each
PLOT Particle Trap 2.5m x 0.32mm	0.32	<b>60180-860</b>	1 Each
PLOT Particle Trap 2.5m x 0.53mm	0.53	<b>60180-861</b>	1 Each





## GC Reagents

### Making the undetectable, detectable

Improve separation and detection for GC and GC-MS applications with our selection of derivatization reagents.

#### The Ideal Derivatization Procedure Will:

- Accomplish the desired modification.
- Proceed quantitatively, or at least reproducibly.
- Produce products that are readily distinguishable and separable from the starting materials.
- Proceed rapidly with simple and straightforward laboratory techniques that will be both selective and applicable to a number of similar compounds.
- Involve reagents and reactions that present no unusual hazards.

#### Why Derivatize:

- To make a compound that otherwise could not be analyzed by a particular method suitable for analysis.
- To improve the analytical efficiency of the compound.
- To improve the detectability of the compound.

The GC Reagents web page contains the latest news, applications and downloads for the GC Reagents range. Visit [www.thermoscientific.com/gcreagents](http://www.thermoscientific.com/gcreagents)



# GC Reagents

## Technical Resources



visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)  
to access the following information:

- Thermo Scientific Silylation Reagents Overview
- Thermo Scientific Acylation Reagents Overview
- Thermo Scientific Alkylation Reagents Overview
- Derivatization Reagents for Specific Functional Groups
- Derivatization Reagents for Drugs of Abuse
- Troubleshooting Reagents

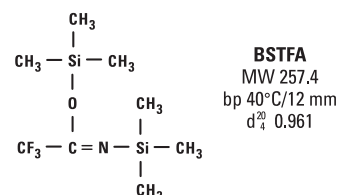


## Silylation Reagents

### BSTFA and BSTFA + TMCS

For excellent chromatographic separations and difficult-to-silylate compounds

- Increased volatility makes it possible to derivatize smaller molecules with which the TMS derivatives elute with the byproducts from BSA
- Excellent for derivatizing fatty acid amides, slightly hindered hydroxyls and other compounds
- Catalyzed formulation is stronger than BSTFA alone



#### BSTFA and BSTFA + TMCS

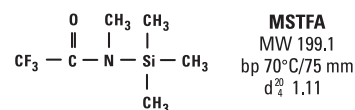
Description	Quantity	Cat. No.	Quantity
BSTFA	10 × 1mL ampules	<b>TS-38830</b>	1 Pack
	25g	<b>TS-38828</b>	1 Each
	100g	X <b>TS-38829</b>	1 Each
BSTFA + 1% TMCS	10 × 1mL ampules	<b>TS-38831</b>	1 Pack
	10g	<b>TS-38832</b>	1 Each
	25g	<b>TS-38833</b>	1 Each
	100g	X <b>TS-38834</b>	1 Each
BSTFA + 10% TMCS	10 × 1mL ampules	<b>TS-38840</b>	1 Pack

X in the ordering table indicates that hazardous shipping charges apply.

### MSTFA and MSTFA + 1% TMCS

Offers maximum volatility

- Trimethylsilyl donor strength comparable to BSA and BSTFA
- Reacts to replace labile hydrogens on a wide range of polar compounds with a Si(CH<sub>3</sub>)<sub>3</sub> group
- Used to prepare volatile and thermally stable derivatives for GC and GC-MS
- Addition of Thermo Scientific TMCS aids derivatization of amides, secondary amines and hindered hydroxyls not derivatized by MSTFA alone



#### MSTFA and MSTFA + 1% TMCS

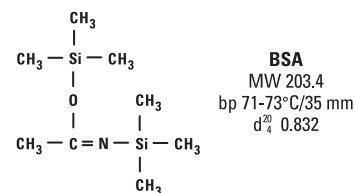
Description	Quantity	Cat. No.	Quantity
MSTFA	10 × 1mL ampules	<b>TS-48910</b>	1 Pack
	10g	<b>TS-48911</b>	1 Each
	25mL	<b>TS-48913</b>	1 Each
	100mL	X <b>TS-48914</b>	1 Each
MSTFA + 1% TMCS	10 × 1mL ampules	<b>TS-48915</b>	1 Pack

X in the ordering table indicates that hazardous shipping charges apply.

## BSA

The perfect reagent for rapid silylation reactions

- Highly reactive trimethylsilyl donor that reacts quantitatively to form volatile, stable TMS derivatives
- Reacts quickly and quantitatively under mild conditions with a variety of compounds
- Derivatizes alcohols, amines, amides, carboxylic acids, phenols, steroids, biogenic amines and alkaloids



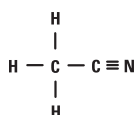
### BSA

Description	Quantity	Cat. No.	Quantity
BSA	10 x 1mL	<b>TS-38836</b>	1 Pack

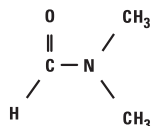
## Silylation Grade Solvents

Manufactured to meet your exacting silylation needs

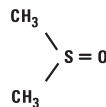
- Purified, dried and packaged under nitrogen in convenient 50mL Hypo-Vial Sample Storage Vials
- Supplied with elastomer septa, allowing immediate access to the sample without exposure to moisture and oxygen
- Use polar solvents (acetonitrile, dimethylformamide, dimethylsulfoxide, pyridine, tetrahydrofuran) to facilitate reactions; nonpolar organic solvents may be used, but they will not accelerate the rate of reaction



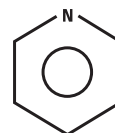
**Acetonitrile**  
MW 41.05  
bp 81.6°C



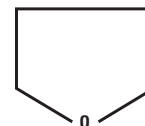
**Dimethylformamide**  
MW 73.09  
bp 153°C



**Dimethylsulfoxide**  
MW 78.13  
bp 189°C



**Pyridine**  
MW 79.10  
bp 115.2°C



**Tetrahydrofuran**  
MW 72.10  
bp 66°C

### Silylation Grade Solvents

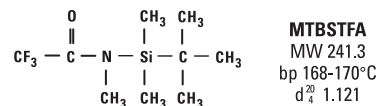
Description	Quantity	Cat. No.	Quantity
Acetonitrile	50mL	X <b>TS-20062</b>	1 Each
Dimethylformamide (DMF)	50mL	X <b>TS-20672</b>	1 Each
Dimethylsulfoxide (DMSO)	50mL	X <b>TS-20684</b>	1 Each
Pyridine	50mL	X <b>TS-27530</b>	1 Each
Tetrahydrofuran (THF)	50mL	X <b>TS-27860</b>	1 Each

X in the ordering table indicates that hazardous shipping charges apply.

## MTBSTFA and MTBSTFA + 1% TBDMCS

Offers stable TBDMS (tert-butyldimethylsilyl) derivatization

- Derivatizes hydroxyl, carboxyl, thiol and primary and secondary amines
- Typical yields are >96%
- Reaction byproducts are neutral and volatile
- Silylating potential increased by adding 1% TBDMCS



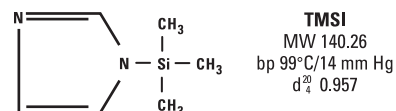
### MTBSTFA and MTBSTFA + 1% TBDMCS

Description	Quantity	Cat. No.	Quantity
MTBSTFA	5mL ampules	<b>TS-48920</b>	1 Each
MTBSTFA + 1% TBDMCS	10 × 1mL	<b>TS-48927</b>	1 Pack

## TMSI (*N*-Trimethylsilylimidazole)

The strongest silylator available for carbohydrates and steroids

- Reacts quickly and smoothly with hydroxyls and carboxylic acids, but not with amines
- Used in the derivatization of alcohols, phenols, organic acids, steroids, hormones, glycols, nucleotides and narcotics
- Excellent for C1 through C5 fatty acids in serum and urine



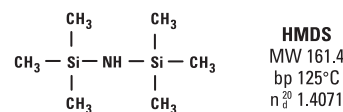
### TMSI

Description	Quantity	Cat. No.	Quantity
TMSI ( <i>N</i> -Trimethylsilylimidazole)	10 × 1mL ampules	<b>TS-88623</b>	1 Pack
	25g	<b>TS-88625</b>	1 Each
	100g	<b>TS-88626</b>	1 Each

## HMDS (Hexamethyldisilazane)

The popular choice for silylation of sugars and related substances

- Greatly extends the practical range of GC, improving chromatographic results
- Suitable for deactivating and coating chromatographic supports
- Monofunctional, making polymerization not possible and eliminating surface moisture



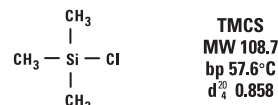
### HMDS

Description	Quantity	Cat. No.	Quantity
HMDS (Hexamethyldisilazane)	25g	<b>TS-84770</b>	1 Each

## TMCS (Trimethylchlorosilane)

An excellent catalyst for difficult-to-silylate compounds

- Excellent adjunct for forming trimethylsilyl ethers for GC determinations
- Used to prepare TMS derivatives of organic acids



### TMCS

Description	Quantity	Cat. No.	Quantity
TMCS	25g	<b>TS-88530</b>	1 Each

## MOX (Methoxamine) Reagent

Useful for preparing oximes of steroids and ketoacids prior to silylation

- 2% methoxyamine HCl (M.W. 83.51) in pyridine
- Prevents formation of multiple derivatives when enols are present during silylation

### MOX Reagent

Description	Quantity	Cat. No.	Quantity
MOX (Methoxamine) Reagent (2% methoxyamine•HCl in pyridine)	10mL	<b>TS-45950</b>	1 Each



## Tri-Sil HTP (HMDS:TMCS:Pyridine) Reagent

Reagent-catalyst mixture for one-step derivatization

- Derivatizes carbohydrates, phenols, steroids, sterols, organic acids, alcohols and some amines
- Useful for rapid production of TMS derivatives of polar compounds for gas chromatographic determination and biochemical synthesis
- The versatility, speed and ease of use of Tri-Sil HTP Reagent has made it the most widely used silylation formulation available

### Tri-Sil HTP Reagent

Description	Quantity	Cat. No.	Quantity
Tri-Sil HTP Reagent HMDS:TMCS:Pyridine (2:1:10)	10 × 1mL ampules	<b>TS-48999</b>	1 Pack
Tri-Sil HTP Reagent HMDS:TMCS:Pyridine (2:1:10)	50mL	X <b>TS-49001</b>	1 Each

X in the ordering table indicates that hazardous shipping charges apply.

## Tri-Sil BP (BSA:Pyridine) Reagent

Derivatizes alcohols, phenols, organic acids, aromatic amides and amines

Tri-Sil BP Reagent reacts with:

- Alcohols, phenols, some enols and other hydroxyl and polyhydroxyl compounds to form trimethylsilyl esters
- Organic acids to form trimethylsilyl esters
- Aromatic amides to form N-trimethylsilyl derivatives
- Amino acids to form both N- and O-trimethylsilyl derivatives
- Amines to form N-trimethylsilyl derivatives

### Tri-Sil BP Reagent

Description	Quantity	Cat. No.	Quantity
Tri-Sil BP Reagent (2.5mEq/mL BSA in pyridine)	25mL	<b>TS-49012</b>	1 Each

## Tri-Sil TBT (TMSI:BSA:TMCS) Reagent

A catalyzed silylation reagent formulation containing three parts TMSI, three parts BSA and two parts TMCS

- Converts all classes of hydroxyl groups to TMS ethers
- Under usual conditions, the reaction is complete in a short period of time at 60 to 80°C, although very hindered hydroxyls may require several hours

### Tri-Sil TBT Reagent

Description	Quantity	Cat. No.	Quantity
Tri-Sil TBT Reagent TMSI:BSA:TMCS (3:3:2)	10 × 1mL ampules	<b>TS-49016</b>	1 Pack

## Tri-Sil TP (TMSI:Pyridine) Reagent

Derivatizes hydroxyl compounds, particularly carbohydrates

- Silylates alcohols and phenols, organic acids, hydroxylamines, amino acids, carbohydrates, flavonoids, glycols and polyglycols, nucleotides, steroids, hydroxyl acids, barbiturates, narcotics, indoles and vitamins
- Does not react with amines
- May be used with water as long as there is enough reagent present to react with both the water and the sample

### Tri-Sil TP Reagent

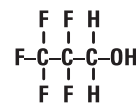
Description	Quantity	Cat. No.	Quantity
Tri-Sil TP Reagent TMSI: Pyridine (1:4)	10 × 1mL ampules	<b>TS-49230</b>	1 Pack
Tri-Sil TP Reagent TMSI: Pyridine (1:4)	25mL	<b>TS-49231</b>	1 Each

## Acylation Reagents

### Pentafluoropropanol

Purified for GC-MS applications

- Addition of fluorine atoms into compounds greatly enhances the sensitivity of certain detectors for all those materials
- Carboxylic acids can be derivatized using a two-step reaction involving reaction with anhydride, followed by a fluorinated alcohol



#### Pentafluoropropanol

MW 150.05  
bp 80.6°C  
d<sub>4</sub><sup>20</sup> 1.2880

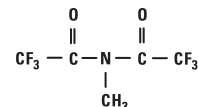
#### Pentafluoropropanol

Description	Quantity	Cat. No.	Quantity
Pentafluoropropanol	10 x 1mL ampules	<b>TS-65195</b>	1 Pack

## MBTFA

For trifluoroacetylating primary and secondary amines, hydroxyl and thiol groups and carbohydrates

- Reacts under non-acidic conditions
- Principle byproduct from the derivatization reaction is N-methyltrifluoroacetamide, which is stable, volatile and does not present problems in subsequent GC
- Produces very volatile derivatives of carbohydrates
- Can be used to selectively acylate amines in the presence of hydroxyl and carboxyl groups that have been protected by silylation



**MBTFA**  
MW 223.08  
bp 123-124°C  
d<sub>4</sub><sup>20</sup> 1.55

#### MBTFA

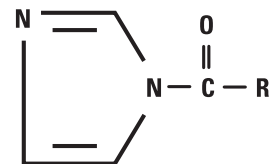
Description	Quantity	Cat. No.	Quantity
MBTFA [N-Methyl-bis(trifluoroacetamide)]	10 x 1mL ampules	<b>TS-49700</b>	1 Pack
	25mL	<b>TS-49703</b>	1 Each
	100mL	X <b>TS-49704</b>	1 Each
	5g	<b>TS-49701</b>	1 Each

X in the ordering table indicates that hazardous shipping charges apply.

## Perfluoroacylimidazoles (HFBI and TFAI)

Offer effective acylation of hydroxyl groups and primary and secondary amines

- Reactions are smooth, quantitative and produce no acid byproducts
- Excellent for FID and ECD techniques
- Derivatives are volatile, despite size of group
- Closely bound fluorines contribute to stability



R	Name	M.W.	Boiling Point
C <sub>3</sub> F <sub>7</sub>	HFBI	264.10	57 to 58°C/10mm
CF <sub>3</sub>	TFAI	164.08	38 to 40°C/14mm

### Perfluoroacylimidazoles (HFBI and TFAI)

Description	Quantity	Cat. No.	Quantity
HFBI	5g	* <b>TS-44211</b>	1 Each
TFAI	10 x 1mL ampules	<b>TS-48882</b>	1 Pack

\* indicates that additional dry ice and/or freight charges apply.

## Perfluoro Acid Anhydrides (TFAA, PFAA and HFAA)

Highly purified for optimal preparation of fluoracyl derivatives

- Used to prepare fluoracyl derivatives for GC-MS
- Produce stable volatile derivatives for FID and ECD techniques



### Perfluoro Acid Anhydrides

Description	Quantity	Cat. No.	Quantity
TFAA (Trifluoroacetic Acid Anhydride)	100g	X <b>TS-67363</b>	1 Each
PFAA (Pentafluoropropionic Acid Anhydride)	10 x 1mL ampules	<b>TS-65193</b>	1 Pack
PFAA	25g	X <b>TS-65192</b>	1 Each
PFAA	100g	X <b>TS-65191</b>	1 Each
HFAA (Heptafluorobutyric Acid Anhydride)	10 x 1mL ampules	<b>TS-63164</b>	1 Pack
HFAA	25g	X <b>TS-63163</b>	1 Each
HFAA	100g	X <b>TS-63162</b>	1 Each

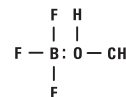
X in the ordering table indicates that hazardous shipping charges apply.

## Alkylation Reagents

### BF<sub>3</sub>-Methanol

Provides convenient, fast and quantitative esterification of fatty acids

- Supplied in septum-sealed Hypo-Vial Sample Storage Vial for convenient syringe removal
- Consists of 14% BF<sub>3</sub>, MW 67.82, and 86% CH<sub>3</sub>OH, MW 32.04



**BF<sub>3</sub>-Methanol**  
14% BF<sub>3</sub> MW 67.82  
86% CH<sub>3</sub>OH MW 32.04

#### BF<sub>3</sub>-Methanol

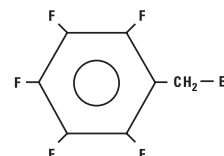
Description	Quantity	Cat. No.	Quantity
BF <sub>3</sub> -Methanol	100mL	X <b>TS-49370</b>	1 Each

X in the ordering table indicates that hazardous shipping charges apply.

## Pentafluorobenzyl Bromide (PFBBr)

For electron capture GC analysis of carboxyl acids, phenols and sulfonamides

- Fast reaction times for extraction alkylation technique: ~20 minutes
- Derivatives are highly EC-sensitive
- Analysis of trace organics in asphalt



**PFBBr**  
MW 260.9  
bp 174-175°C  
d<sub>4</sub><sup>20</sup> 1.86

#### Pentafluorobenzyl Bromide

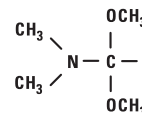
Description	Quantity	Cat. No.	Quantity
PFBBr (Pentafluorobenzyl Bromide)	5g	<b>TS-58220</b>	1 Each

## Methylate Reagent (DMFDMA)

For easy, effective preparation of methyl esters from fatty acids and amino acids

Advantages for preparation of methyl esters for gas chromatography:

- Speed: the reaction is complete upon dissolution (except long chain solid acids)
- No water washing, extraction or concentration of derivatives required
- No water formed
- Convenient: ready-to-use reagent contains 2mEq/mL pyridine



**Methylate Reagent**  
MW 119.17  
bp 102-104°C  
d<sub>4</sub><sup>20</sup> 0.897

#### Methylate Reagent

Description	Quantity	Cat. No.	Quantity
Methylate Reagent (N, N-Dimethylformamide dimethyl acetal)	25mL	<b>TS-49350</b>	1 Each

## MethElute Reagent (TMPAH)

Provides accurate sensitive on-column methylation

- 0.2M trimethylanilinium hydroxide (TMPAH) in methanol solution
- For quantitative methylation and detection of barbiturates, sedatives, xanthine bases, phenolic alkaloids and phenytoin by gas chromatography
- Single quantitative peak for each substance
- Comparable to or better than UV/TLC method (when phenobarbital and phenytoin are present, GC is superior to UV/TLC)
- Coefficient of variation is 5% or less
- Detects barbiturates to 0.2mg/dL

### MethElute Reagent

Description	Quantity	Cat. No.	Quantity
MethElute Reagent (TMPAH)	10mL	<b>TS-49300</b>	1 Each
MethElute Reagent (TMPAH)	12 × 1mL ampules	<b>TS-49301</b>	1 Pack



## Siliconizing Fluids

### Water-Soluble Siliconizing Fluid

Attaches the silane polymer, octadecyltrialkylsilane, to make the surface inert or polymerizes to create an inert film

- Easy-to-use silane monomer solution that is supplied as a 20% solid solution in a mixture of diacetone alcohol and tertiary butyl alcohol
- Greater resistance to base hydrolysis than other surface treatments
- Can be used on plastic surfaces

#### Water-Soluble Siliconizing Fluid

Description	Quantity		Cat. No.	Quantity
Siliconizing Fluid-Water Soluble	120mL	X	<b>TS-42799</b>	1 Each

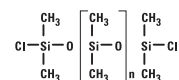
X in the ordering table indicates that hazardous shipping charges apply.

### Hydrocarbon-Soluble Siliconizing Fluid

Attaches a short-chain silane polymer to make the surface inert or polymerizes to create an inert film

When applied to glass, quartz or similar materials, the unhydrolyzed chlorines present on the chain react with surface silanols to form a neutral, hydrophobic and tightly bonded film over the entire surface.

- Soluble in organic solvents
- Excellent for modifying metals, glass, ceramics and fiber optics
- Can be used for certain plastic surfaces
- Well-suited for treatment of GC injection port liners

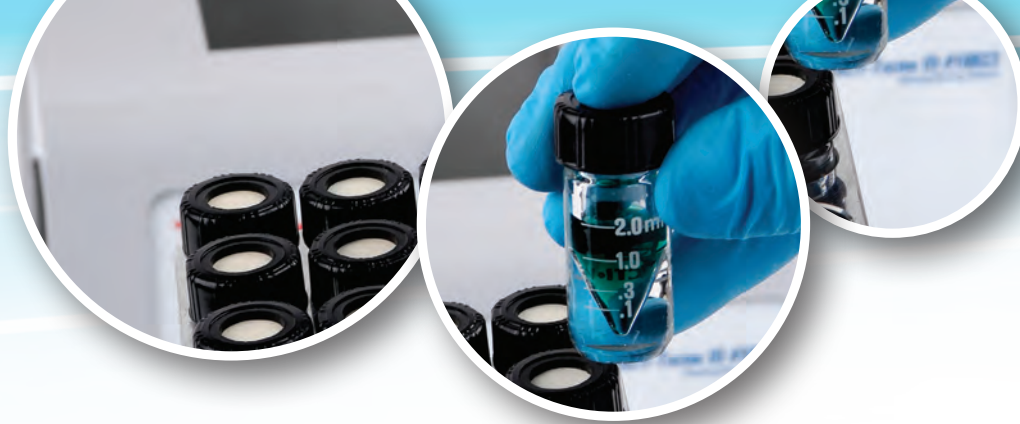


Siliconizing Fluid –  
Hydrocarbon Soluble

#### Hydrocarbon-Soluble Siliconizing Fluid

Description	Quantity		Cat. No.	Quantity
Siliconizing Fluid-Hydrocarbon Soluble	120mL	X	<b>TS-42800</b>	1 Each
Siliconizing Fluid-Hydrocarbon Soluble	480mL	X	<b>TS-42801</b>	1 Each

X in the ordering table indicates that hazardous shipping charges apply.



# Reacti-Therm Heating, Stirring and Evaporation System

Reliable and easy-to-use for constant temperatures and easy sample evaporation

Thermo Scientific Reacti-Therm and Reacti-Vap Evaporators provide the complete solution for derivatization and small-scale reactions.

- **Heating and Stirring Systems**

Unmatched convenience and versatility

- **Reacti-Vap**

Providing uniform dry heat to samples

- **Complete Solution**

For derivatization and small scale reactions

- **Complimentary Accessories**

Reacti-Vials and caps



Learn more about the Reacti-Therm and Reacti-Vap Systems.  
Visit [www.thermoscientific.com/columns](http://www.thermoscientific.com/columns)



## Reacti-Therm Heating and Stirring Modules

Reliable and easy-to-use for constant temperatures

- Uniform, stable heating: steady temperature incubation between ambient plus 10°C to 200°C
- LED display: match digital display to in-block thermometer to calibrate temperature set-point
- Modular design: switch aluminum blocks and vials; attach compatible evaporator manifold
- In-block temperature control option by Remote Temperature Probe, an optional accessory to allow temperature regulation from block wells or actual sample vials
- Magnetic stirrers for heating / stirring module for simultaneous stirring of samples in multiple vials

### Reacti-Therm Heating Modules

Type	Size of Unit	Cat. No.	Quantity
Heating Function	Single-block	<b>TS-18822</b>	1 Each
	Triple-block	<b>TS-18824</b>	1 Each
Remote Temperature Probe		<b>TS-18820</b>	1 Each

### Reacti-Therm Heating and Stirring Modules

Type	Size of Unit	Cat. No.	Quantity
Heating and Stirring Function	Single block	<b>TS-18821</b>	1 Each
	Triple-block	<b>TS-18823</b>	1 Each
Magnetic Stirrers for 3.0, 5.0 & 10.0mL Reacti-Vials		<b>TS-16000</b>	6 Pack
Magnetic Stirrers for 0.3 and 1mL Small Reaction Vials		<b>TS-16010</b>	6 Pack

### Applications:

- General sample incubation and evaporation in a variety of tube and vial sizes
- Silylation, alkylation and acylation derivatization reactions for GC sample preparation
- Protein hydrolysis and vacuum hydrolysis reactions for amino acid analysis by HPLC

## Reacti-Vap Evaporators

Manifolds for easy sample evaporation

- Integrated pressure-relief valve protects against excessive gas-flow and dangerous pressure build up
- Easy set-up: attach to corresponding Reacti-Therm Module, attach tubing from gas supply, and lower into position over samples and start gas flow
- Choose 9-port or 27-port model for compatibility with single-block and triple-block Reacti-Therm Modules, respectively

### Reacti-Vap Evaporators

No. of Ports	For Use With	Cat. No.	Quantity
9	Single-block Reacti-Therm Module	<b>TS-18825</b>	1 Each
27	Triple-block Reacti-Therm Module	<b>TS-18826</b>	1 Each

### Gas Regulators

Description	Cat. No.	Quantity
1/8" tube fitting	<b>60181-625</b>	1 Each
1/4" tube fitting	<b>60181-626</b>	1 Each



### Applications:

- General sample incubation and evaporation in a variety of tube and vial sizes
- Silylation, alkylation and acylation derivatization reactions for GC sample preparation

## Reacti-Block Aluminum Blocks

Optimal thermal conductivity

- Constructed of an aluminum alloy for optimal thermal conductivity
- Each Reacti-Block aluminium block contains a thermometer well
- Block dimensions are 9.4 L x 7.5 W x 5.1cm H for all blocks except for F, G, J and M which have a depth (height) of 7.6cm



### Reacti-Block Aluminum Blocks

Description		Cat. No
<b>Reacti-Block A-1</b> Holds 13 x 0.3mL or 1mL Reacti-Vials; 13 holes/14mm dia. x 23mm deep		TS-18801
<b>Reacti-Block B-1</b> Holds 9 x 3mL or 5mL Reacti-Vials; 9 holes/21mm dia. x 32mm deep		TS-18802
<b>Reacti-Block C-1</b> Holds 13 x 3.5mL Screw Cap Septum Vials; 13 holes/15mm dia. x 34mm deep		TS-18803
<b>Reacti-Block Z-1</b> Holds 9 x 0.1mL Reacti-Vials; 9 holes/12mm dia. x 21mm deep		TS-18804
<b>Reacti-Block M-1</b> Holds 6 x 27.5mL Reacti-Vials; 6 holes/28.5mm dia. x 70mm deep		TS-18811
<b>Reacti-Block S-1</b> Holds 13 x 13mm dia. Test Tubes; 13 holes/14mm dia. x 45mm deep		TS-18816
<b>Reacti-Block T-1</b> Holds 9 x 16mm dia. Test Tubes; 9 holes/17mm dia. x 45mm deep		TS-18817
<b>Reacti-Block U-1</b> Holds 8 x 20mm dia. Test Tubes; 8 holes/21mm dia. x 45mm deep		TS-18818
<b>Reacti-Block V-1</b> Holds 17 Microcentrifuge Test Tubes; 17 holes/11mm dia. x 45mm deep		TS-18819

The Reacti-Block aluminium blocks below are designed to be used exclusively with the Reacti-Therm modules. The hole patterns do not match the needle configuration of Reacti-Vap Evaporators.

Description		Cat. No
<b>Reacti-Block F</b> Holds 8 x 6mL Vacuum Hydrolysis Tubes; 8 holes/10mm dia. x 64mm deep		TS-18806
<b>Reacti-Block G</b> Holds 4 x 18mL Vacuum Hydrolysis Tubes; 4 holes/19mm dia. x 64mm deep		TS-18807
<b>Reacti-Block J</b> Blank/no holes (for custom drilling) 7.6cm tall		TS-18809
<b>Reacti-Block K</b> Blank/no holes (for custom drilling) 5.1cm tall		TS-18810
<b>Reacti-Block L</b> Holds 16 x 0.1mL Reacti-Vials; 16 holes/12mm dia. x 21mm deep		TS-18812

## Reacti-Therm Thermometers

Thermometers specially designed for use in dry block heaters

- Mercury-free: alcohol-filled for greater safety
- PTFE coating ensures that glass is impervious to corrosive materials
- Shock-resistant glass and coatings
- Standard laboratory size: 225mm length x 8mm diameter
- Compatible for use in Reacti-Therm Heating Modules and other laboratory equipment



### Reacti-Therm Thermometers

Min. Temperature (°C)	Max. Temperature (°C)	Cat. No.	Quantity
0	100	<b>TS-18914</b>	1 Each
0	200	<b>TS-18915</b>	1 Each

## Reacti-Vap Replacement Parts

### Reacti-Vap Replacement Parts

Description	Cat. No.	Quantity
Reacti-Vap Replacement Tube Kit 2.5 inch (64mm) (Tubes and Plugs)	<b>TS-18782</b>	9 Pack
Reacti-Vap PTFE-Coated Needles 102mm (4in) Length	<b>TS-18784</b>	9 Pack
Reacti-Vap PTFE-Coated Needles 152mm (6in) Length	<b>TS-18786</b>	9 Pack
Replacement Luer-Lok Fitting	<b>TS-18827</b>	1 Each
Replacement Screws for Mounting Bracket	<b>TS-18828</b>	4 Pack
Replacement Height Adjustment Knob	<b>TS-18829</b>	1 Each
Replacement Mounting Bracket	<b>TS-18830</b>	1 Each
Replacement Metal Rod	<b>TS-18831</b>	1 Each
Replacement Dial for Flow Control	<b>TS-18832</b>	1 Each
Replacement Long Screws for Mounting Bracket	<b>TS-18833</b>	4 Pack



## Vacuum Hydrolysis Tubes

For fast, effective protein and peptide hydrolysis

- The upper temperature limit of the Vacuum Hydrolysis Tubes is 260°C; however, do not heat the tubes greater than 100°C in an oven
- Vacuum hydrolysis tubes fit conveniently into Reacti-Block aluminium heating blocks



### Vacuum Hydrolysis Tubes

Volume (mL)	OD (mm)	Length (mm)	Cat. No.	Quantity
1	8	60	<b>TS-29570</b>	1 Each
6	10	150	<b>TS-29571</b>	1 Each
18	19	100	<b>TS-29572</b>	1 Each

## Reacti-Vial Small Reaction Vials

An internal cone makes small sample handling easy and convenient

- Extra thick glass wall magnifies the sample, making these vials ideal for observing chemical reactions
- Amber vials available for light-sensitive compounds
- Supplied complete with Open-Top Screw Caps and PTFE/Rubber Discs



### Reacti-Vial Small Reaction Vials

Capacity	Cat. No.	Quantity
<b>Amber</b>		
1mL	<b>TS-13097</b>	12 Pack
5mL	<b>TS-13099</b>	12 Pack
<b>Clear</b>		
100µL	<b>TS-13100</b>	12 Pack
300µL	<b>TS-13220</b>	12 Pack
1mL	<b>TS-13221</b>	12 Pack
3mL	<b>TS-13222</b>	12 Pack
5mL	<b>TS-13223</b>	12 Pack
10mL	<b>TS-13225</b>	12 Pack

### Applications:

- Residue isolation, derivative preparation, maximum sample retrieval, moisture protection, sample storage, precipitations, centrifugations, solvent evaporation

## Thermo Scientific Tuf-Bond PTFE/Silicone Discs

Discs that combine the inertness of PTFE with the resealability of silicone

- Structurally bonded PTFE to silicone; no cement to leak out of your sample after needle penetration
- Reseals instantly, puncture after puncture
- Autoclavable
- Compresses to maintain a tight seal forcing the PTFE to conform to the sealing surface
- Standard syringe and GC needles penetrate the entire disc with ease



### Thermo Scientific Tuf-Bond PTFE/Silicone Discs

Diameter (mm)	Fits	Cat. No.	Quantity
8	100µL Reacti-Vial Small Reaction Vials, 1.5mL Screw Cap Septum Vials	<b>TS-12708</b>	72 Pack
12	0.3 and 1mL Reacti-Vial Small Reaction Vials, 3.5mL Screw Cap Septum Vials	<b>TS-12712</b>	72 Pack
13	7mL Screw Cap Septum Vials	<b>TS-12713</b>	72 Pack
16	14mL Screw Cap Septum Vials; 15mL (0.5 oz.) Screw Cap Bottles	<b>TS-12716</b>	72 Pack
18	3 and 5mL Reacti-Vial Small Reaction Vials	<b>TS-12718</b>	72 Pack
22	25 and 40mL Screw Cap Septum Vials, 240mL (8 oz.) Screw Cap Bottles, 10mL Reacti-Vial	<b>TS-12722</b>	72 Pack

## PTFE/Rubber Laminated Discs

Provides a highly inert and unreactive seal

- Constructed of white pharmaceutical rubber with PTFE bonded to one side
- Discs are autoclavable with no loss of integrity after heating above 100°C for 5 hours



### PTFE/Rubber Laminated Discs

Diameter (mm)	Fits	Cat. No.	Quantity
12	0.3 and 1mL Reacti-Vial Small Reaction Vials, 2 and 3.5mL Screw Cap Septum Vial	<b>TS-12412</b>	72 Pack
18	3 and 5mL Reacti-Vial Small Reaction Vials; 10 and 25mL Reacti-Flask	<b>TS-12418</b>	72 Pack

## Open-Top Screw Caps

Provide inert, air-tight seal and direct puncture-access to sample with a syringe needle

- Fits into Reacti-Vial Small reaction vials
- Used with PTFE/Rubber laminated discs



### Open-Top Screw Caps

Fits	Cat. No.	Quantity
3 and 5mL Reacti-Vials	<b>TS-13218</b>	72 Pack
0.3 and 1.0mL Reacti-Vials, 3.5mL Screw Cap Septum Vial	<b>TS-13215</b>	72 Pack
10mL Reacti-Vials, 40mL Screw Cap Septum Vials	<b>TS-13219</b>	72 Pack

## Screw Cap Septum Vials

Economy, convenience and versatility in a vial and closure system

- Flat bottom vials
- Heavy-duty flip-top divider box provides easy access to vials, caps and septa and offers a convenient sample storage center
- Storage of reagents and standards under complete seal with instant syringe access



### Screw Cap Septum Vials

Capacity (mL)	Cat. No.	Quantity
<b>Clear</b>		
3.5	<b>TS-13019</b>	72 Pack
7	<b>TS-13028</b>	72 Pack

**Ordering Alerts:** Septa not included with vials; must be ordered separately.

## Mininert Valves

Excellent closures for chemicals that deteriorate or evaporate through conventional vial caps and seals

Thermo Scientific™ Mininert™ Valves are screw caps that have integrated resealable valves to allow repeated and unlimited syringe-needle access to samples. Slide the valve one way to open the needle-port. Slide the valve back to close and completely seal the close.

- Available in two sizes – 20mm (thread size 20/400) and 27mm (thread size 24/400) to fit 3 and 5mL Reacti-Vial Small Reaction Vials and 40mL Screw Cap Septum Vials, respectively
- Precision crafted from PTFE plastic for repeated use and chemical resistance
- Valve design eliminates the septum-boring that occurs with repeated puncture of traditional septa



### Mininert Valves

Size (mm)	Fits	Cat. No.	Quantity
20	Fits 3 and 5mL Reacti-Vial Small Reaction Vials	<b>TS-10135</b>	12 Pack
27	Fits 40mL Screw Cap Septum Vials	<b>TS-10130</b>	12 Pack

## GC and GC-MS Instruments

Our gas chromatography and mass spectrometry instruments offer solutions to food, environmental, pharmaceutical laboratories and industrial customers. Our instruments stimulate to advance scientific knowledge, enable drug discovery and to improve manufacturing processes. Using our GC and GC-MS you can expect the best results and highest level of productivity to keep your research or processes moving smoothly.

### TRACE 1300 Series GC

- User-installable injectors and detectors
- Easy adoption of standard GC methods
- Unmatched detector sensitivity in trace analysis
- Increased robustness of injector technology
- Shorter sample cycle time



For routine GC and GC-MS laboratories that need flexibility for a wide range of applications, the Thermo Scientific™ TRACE™ 1300 Series GC Gas Chromatograph is the latest technology to simplify workflow and increase analytical performance.

The TRACE 1300 Series offers the most versatile GC platform in the market, with unique instant connect modularity for ground-breaking ease of use and performance, setting a new era in GC technology. GC users now have the unique ability to easily configure the system themselves, to increase throughput or for a rapid exchange of configurations, with the added benefit of continuous operation since modules can be swapped and routine maintenance performed offline to fit laboratory's schedule.

Visit [www.thermoscientific.com/trace1300](http://www.thermoscientific.com/trace1300)

### TriPlus RSH Autosampler

- Reliable GC and GC-MS automation
- Liquid injection/headspace/SPME, all-in-one unattended sequence
- Enhanced productivity and powerful versatility in sample preparation

The Thermo Scientific™ TriPlus™ RSH Autosampler offers scalable flexibility from simple liquid injection to extended sample preparation. An innovative Automated Tool Change (ATC) station addresses sampling demand and selects the most suitable syringe during a sequence. Up to 6 different syringes can be programmed in a sequence for extended sample preparation capabilities and different sampling modes (liquid, HS, SPME). Unsurpassed sample handling flexibility combined with high sample capacity, places no limits even to more stringent productivity requirements. Multiple sample trays increase unattended operation up to 972 x 2mL vials. The unique Bottom Vial Sensing feature secured syringe depth positioning in your vial for the last  $\mu\text{L}$  sample. Even nanovolume injections through the use of plunger-in-needle syringes can be programmed in a flexible sequence. All these, combined with large volume injections deliver unsurpassed sample handling flexibility.

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## AI/AS 1310 Autosampler

- Automated liquid injection systems for all Thermo Scientific GC and GC-MS systems
- Performance and simplicity in liquid sampling
- “Tool-Free” upgradability from 8 to 155 vial positions

Engineered to meet the highest level requirements of ruggedness and ease-of-use, the AI/AS 1310 automatic sampling system is ideal for high throughput and QA/QC control on the Thermo Scientific GC and GC/MS product portfolio. Utmost precision and ease-of-use of the plug and inject concept are combined in the available configurations: 8-position single module system for small batches of samples; 155 position tray system for high sample throughput. Boost productivity further with the Gemini configuration, which allows two autosamplers to be mounted on the same GC, serving two injection ports simultaneously.

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*AI 1310 mounted onto a TRACE 1310 GC*



*AS 1310 155-vial Autosampler mounted on a TRACE 1300 GC with ISQ Mass Spectrometer*

## TriPlus 300 Headspace Autosampler

- Unprecedented productivity and accelerated analytical results
- High throughput operations with expanded sample capacity
- Ideal for organic volatiles analysis

The Thermo Scientific™ TriPlus™ 300 Headspace valve-and-loop autosampler offers a quick start-up and enables reliable, unattended and high throughput operations with expanded sample capacity. Its ability to fully comply with existing methods in pharmaceutical, forensic and environmental laboratories makes TriPlus 300 HS the product of choice for automated and dependable organic volatiles determinations.

Combined with the user-configurable TRACE 1300 Series GC and supported by a range of chromatography data systems that offer comprehensive system control, TriPlus 300 HS delivers unprecedented productivity and accelerated analytical results within the laboratory workflow.

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## ISQ Series Single Quadrupole GC-MS

- Unique Full Source Removal™ capability delivers maximum uptime and unstoppable productivity
- ExtractaBrite™ solid, inert ion source provides robust operations and low detection limits
- Versatile and flexible for a broad range of applications

The Thermo Scientific™ ISQ™ Series single quadrupole GC-MS system features time-proven technology developed with the accumulation of almost 50 years of mass spectrometry innovation, offering an affordable and robust solution. This GC-MS series offers operational simplicity, proven dependability, and unstoppable productivity.

The ISQ QD GC-MS offers quality design, MS operational simplicity, and proven dependability for QA/QC and low-to medium-throughput production environments, as well as in teaching and academic facilities.

For analytically-demanding, high-throughput laboratories, requiring utmost sensitivity and unstoppable productivity, the ISQ LT GC-MS does not need to be vented to exchange the source, and it boasts the lowest detection limits and unlimited flexibility.

Visit [www.thermoscientific.com/isq](http://www.thermoscientific.com/isq)



## TSQ 8000 Evo GC-Triple Quadrupole MS

- Unique full source removal capability delivers maximum uptime and unstoppable productivity
- ExtractaBrite™ solid, inert ion source provides robust operations and low detection limits
- Unprecedented ease of use with innovative AutoSRM software

The Thermo Scientific™ TSQ™ 8000 Evo Gas Chromatograph/Triple Quadrupole Mass Spectrometer offers the easiest way to achieve the lower detection limits and reduced sample preparation allowed by selected reaction monitoring (SRM). The TSQ 8000 Evo GC-MS/MS is the first triple quadrupole GC-MS/MS system to offer an extractable ion source under vacuum and software that fully automates SRM development.

Visit [www.thermoscientific.com/tsq8000](http://www.thermoscientific.com/tsq8000)



## TSQ™ Duo Triple Quadrupole GC-MS/MS

- AutoSRM: provides automated method development and method maintenance software
- SIM Bridge: assists transitioning from SIM to SRM methods
- Portable methods: use existing methods or develop master methods on the TSQ 8000 Evo in the core lab and run them on the TSQ Duo system in field labs
- Chromeleon CDS software: MS control and data processing
- Timed Acquisition upgrade: when your methods grow in analyte number
- Excellent performance in Full Scan mode, with NIST MS Library searchable spectra
- User-installable modules: can be changed in less than two minutes

This GC-MS/MS is like no other. The Thermo Scientific™ TSQ™ Duo GC-MS/MS system is tailored to chromatographers and single quadrupole GC-MS users who need easy access to powerful new MS/MS workflows and who need to satisfy current method requirements. The system provides excellent performance in both single and triple quadrupole modes that is easily achievable, even for less experienced users. The TSQ Duo is the only cost-sensitive instrument featuring efficient, simply intelligent software workflows made possible by Thermo Scientific™ Dionex™ Chromeleon™ Chromatography Data System (CDS) software.

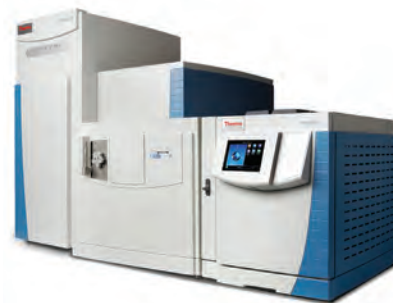
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## Q Exactive GC Orbitrap GC-MS/MS

Bring the power of the first-ever combination of high-resolution gas chromatography (GC) and high-resolution/accurate-mass (HR/AM) Orbitrap mass spectrometry to your laboratory. The Thermo Scientific™ Q Exactive™ GC Orbitrap™ GC-MS/MS system provides comprehensive characterization of samples in a single analysis for the highest confidence in compound discovery, identification, and quantitation. Q Exactive GC offers the quantitative power of a GC triple quadrupole MS combined with the high performance, full scan HR/AM capabilities that are only possible with Orbitrap MS technology.

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08-CPV	2-088	11-AC7(R)	2-072	12-6RT1	2-091	16126-153030	3-028	164712	3-043
08-CRV(A)	2-062	11-AC7(R)	2-090	12-CV	2-080	16126-154630	3-028	164713	3-043
08-CRV(A)	2-088	11-AC-AL	2-072	12-CV	2-089	16126-157569	3-044	164714	3-043
08-CV	2-062	11-ACB	2-072	12-NPEP4	2-079	16126-507569	3-044	164715	3-043
08-CV	2-088	11-ACB	2-090	12-NPEP4	2-091	16126-900379	3-046	164716	3-043
09-CTV	2-071	11-AC-CBT1	2-073	12-SC	2-078	163589	3-046	164717	3-043
09-CTV	2-088	11-AC-ST101	2-073	12-SC	2-091	163591	3-046	164718	3-043
09-FIV	2-071	11-AC-ST101	2-090	12-SC(R)	2-078	164197	3-047	164719	3-043
09-FIV	2-088	11-AC-ST101X	2-073	12-SC(W)	2-078	164199	3-046	164720	3-043
1.1-CTV(A)	2-071	11-AC-ST101X	2-090	12-SC(Y)	2-078	164205	3-047	164721	3-043
1.1-CTV(A)	2-088	11-AC-ST15	2-073	12-SC-8RT1	2-078	164213	3-046	164722	3-043
1.1-CTVG	2-071	11-ACT	2-073	12-SC-8RT1	2-091	164215	3-047	164723	3-043
1.1-CTVG	2-088	11-ACT	2-090	12-SCS	2-078	164454	3-043	164734	3-043
1.1-STVG	2-064	11-ACTS	2-073	12-SCS	2-091	164534	3-043	164738	3-043
1.1-STVG	2-088	11-AC-TST1	2-073	12-SC-ST2	2-078	164535	3-046	164739	3-043
1.2-CVV	2-062	11-AC-TST1	2-090	12-SC-ST2	2-091	164536	3-043	164769	3-043
1.2-CVV	2-088	11-LLX	2-072	12-ST101	2-078	164537	3-043	164899	3-043
1.2-UHRRV	2-075	11-MC-8RT1	2-073	12-ST101	2-091	164540	3-043	164900	3-043
1.2-UHRRV	2-088	11-MC-8RT1	2-090	12-ST18	2-078	164542	3-045	164901	3-043
1.2-UHRSV	2-067	11-MC-ST101	2-073	12-ST18	2-091	164543	3-045	164902	3-043
1.2-UHRSV	2-088	11-MC-ST101	2-090	12-ST2	2-078	164557	3-045	164921	3-045
1.5-HRCV	2-070	11-MC-ST15	2-073	12-ST2	2-091	164558	3-045	164922	3-045
1.5-HRRV	2-075	11-MC-ST15	2-090	12-SV	2-085	164560	3-043	164923	3-045
1.5-HRRV	2-088	11-PEC1	2-073	12-SV(A)	2-085	164561	3-043	164925	3-045
1.5-HRRV(S)	2-075	11-PEC1	2-090	12-T02	2-078	164562	3-043	164928	3-045
1.5-HRSV	2-067	11-PEC1X	2-073	12T02	2-091	164563	3-043	164929	3-045
1.5-HRSV	2-088	11-PEC1X	2-090	13-SCST	2-078	164564	3-046	164930	3-045
10-CV	2-081	11-PEC-ST1	2-073	13-SCST	2-085	164565	3-047	164931	3-045
10-CV	2-089	11-PEC-ST1	2-090	13-SCST	2-091	164566	3-047	164932	3-045
10-CV(A)	2-081	11-PSN(B)	2-076	13-SC-ST15	2-078	164567	3-043	164939	3-043
10-CV(A)	2-089	11-PSN(B)	2-091	13-SC-ST15	2-091	164568	3-043	16526-012105	3-029
10-HSV	2-081	11-PSN(B)-8RT1	2-076	15-SCST	2-085	164569	3-043	16526-013005	3-029
10-HSV	2-089	11-PSN(B)-8RT1	2-091	160434	3-046	164570	3-043	16526-014005	3-029
10-SV	2-077	11-PSN(B)-ST1	2-076	160438	3-046	164571	3-043	16526-032130	3-029
10-SV	2-089	11-PSN(B)-ST1	2-091	160454	3-046	164572	3-043	16526-033030	3-029
11-AC(B)-ST144	2-073	11-PSN(B)-ST101	2-076	161194	3-046	164584	3-045	16526-034630	3-029
11-AC-ST15	2-090	11-PSN(B)-ST101	2-091	16126-012015	3-028	164585	3-045	16526-052130	3-029
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16-SV(A)	2-085	17426-104630	4-015	18-MSA-ST201	2-091	20-MCB	2-082	25003-013001	4-021
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290SM401	5-024	2-SVJ(W)101-CP	2-066	30103-153030	4-072	30705-013001	4-074	313G3240	5-014
290SM402	5-024	2-SVW	2-067	30103-154030	4-072	30705-014001	4-074	313G3240-BP	5-014
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290ST414	5-028	2-SVW GK	2-067	30105-053030	4-072	30805-154630	4-074	313P3240-BP	5-014
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365RN372	5-011	39011-FLEX	4-085	44525-NP	1-036	453A1255	5-020	453A2342-UI	5-017
365RN461	5-012	39015-FLEX	4-085	44525-NPL	1-036	453A1255-UI	5-017	453A2352	5-018
365RN463	5-012	39028-FLEX	4-085	44525-PP	1-037	453A1262	5-018	453A2352-UI	5-017
365RN465	5-012	39040-FLEX	4-085	44525-PS	1-037	453A1262	5-020	453A2352-UI	5-017
365RN617	5-008	40725-GM	1-037	44525-PV	1-036	453A1262-UI	5-017	453A2375	5-020
365RN656	5-008	40-EPAVCS	2-087	44526-NN	1-036	453A1285	5-020	453A2922-UI	5-017
365RN661	5-011	40-EPAVCS(A)	2-087	45025-NN	1-036	453A1295	5-018	453AG001	5-020
365RN663	5-011	40-EPAVCS(A)-PC	2-087	45310030-UI	5-017	453A1295	5-020	453T0845-UI	5-017
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365RNL22	5-013	40-EPAVCS-PC3	2-087	45310032-UI	5-017	453A1305	5-018	453T0999-UI	5-017
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37007-20	4-086	42225-NPL	1-036	45354030-UI	5-017	453A2002	5-020	4-NW V-C	2-079
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37010-10	4-086	44502-CA	1-037	45354057	5-018	453A2265	5-063	4-SV(A)	2-089
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37010-50	4-086	44513-CA	1-037	453A0294-UI	5-017	453A2292	5-018	52225-RC	1-037
37020	4-086	44513-NN	1-036	453A0334-UI	5-017	453A2292	5-020	54504-RC	1-037
37020-10	4-086	44513-NP	1-036	453A0344-UI	5-017	453A2292-UI	5-017	54513-RC	1-037
37020-20	4-086	44513-NPL	1-036	453A0354-UI	5-017	453A2325	5-020	54525-RC	1-037
37020-30	4-086	44513-PP	1-037	453A0924-UI	5-017	453A2332	5-018	5-SV	2-077
37020-5	4-086	44513-PS	1-037	453A1252	5-018	453A2332	5-020	5-SV	2-089
37020-50	4-086	44513-PV	1-036	453A1252	5-020	453A2332-UI	5-017	6000-051	4-094
37030	4-086	44525-CA	1-037	453A1252-UI	5-017	453A2342	5-018	6000-054	4-094
37040	4-086	44525-NN	1-036	453A1255	5-018	453A2342	5-020	6000-055	4-094

6000-066	<b>4-094</b>	60104-271	<b>1-025</b>	60105-315	<b>1-033</b>	60107-206	<b>1-016</b>	60108-209	<b>1-023</b>
6000-109	<b>4-094</b>	60104-272	<b>1-025</b>	60105-316	<b>1-032</b>	60107-207	<b>1-016</b>	60108-301	<b>1-018</b>
6000-110	<b>4-094</b>	60104-273	<b>1-025</b>	60105-317	<b>1-033</b>	60107-208	<b>1-016</b>	60108-302	<b>1-018</b>
6000-111	<b>4-094</b>	60104-274	<b>1-025</b>	60105-318	<b>1-033</b>	60107-209	<b>1-016</b>	60108-303	<b>1-018</b>
6000-162	<b>4-094</b>	60104-284	<b>1-026</b>	60105-319	<b>1-033</b>	60107-211	<b>1-016</b>	60108-304	<b>1-018</b>
6000-209	<b>4-094</b>	60104-289	<b>1-026</b>	60105-320	<b>1-033</b>	60107-212	<b>1-016</b>	60108-305	<b>1-018</b>
6000-210	<b>4-094</b>	60105-202	<b>1-033</b>	60105-321	<b>1-033</b>	60107-214	<b>1-016</b>	60108-309	<b>1-018</b>
6000-211	<b>4-094</b>	60105-203	<b>1-033</b>	60105-322	<b>1-033</b>	60107-215	<b>1-016</b>	60108-315	<b>1-019</b>
6000-262	<b>4-094</b>	60105-204	<b>1-033</b>	60105-323	<b>1-033</b>	60107-217	<b>1-016</b>	60108-317	<b>1-019</b>
60002-354	<b>4-077</b>	60105-205	<b>1-033</b>	60105-324	<b>1-033</b>	60107-218	<b>1-016</b>	60108-360	<b>1-022</b>
60103-351	<b>1-026</b>	60105-206	<b>1-033</b>	60105-325	<b>1-033</b>	60107-219	<b>1-016</b>	60108-364	<b>1-023</b>
60104-230	<b>1-026</b>	60105-207	<b>1-033</b>	60105-326	<b>1-033</b>	60107-301	<b>1-016</b>	60108-376	<b>1-018</b>
60104-232	<b>1-028</b>	60105-208	<b>1-033</b>	60105-327	<b>1-033</b>	60107-302	<b>1-016</b>	60108-386	<b>1-020</b>
60104-233	<b>1-028</b>	60105-209	<b>1-033</b>	60105-330	<b>1-033</b>	60107-303	<b>1-016</b>	60108-387	<b>1-020</b>
60104-234	<b>1-026</b>	60105-210	<b>1-032</b>	60105-331	<b>1-033</b>	60107-304	<b>1-016</b>	60108-388	<b>1-020</b>
60104-235	<b>1-026</b>	60105-211	<b>1-032</b>	60105-332	<b>1-032</b>	60107-305	<b>1-016</b>	60108-389	<b>1-020</b>
60104-236	<b>1-025</b>	60105-212	<b>1-032</b>	60105-333	<b>1-032</b>	60107-306	<b>1-016</b>	60108-390	<b>1-018</b>
60104-240	<b>1-028</b>	60105-213	<b>1-033</b>	60105-334	<b>1-032</b>	60107-307	<b>1-016</b>	60108-391	<b>1-018</b>
60104-241	<b>1-026</b>	60105-214	<b>1-033</b>	60105-335	<b>1-032</b>	60107-308	<b>1-016</b>	60108-392	<b>1-018</b>
60104-241	<b>1-026</b>	60105-215	<b>1-033</b>	60105-336	<b>1-032</b>	60107-309	<b>1-016</b>	60108-393	<b>1-018</b>
60104-241	<b>1-028</b>	60105-216	<b>1-032</b>	60105-337	<b>1-032</b>	60107-311	<b>1-016</b>	60108-394	<b>1-018</b>
60104-242	<b>1-028</b>	60105-217	<b>1-033</b>	60105-338	<b>1-032</b>	60107-312	<b>1-016</b>	60108-402	<b>1-024</b>
60104-243	<b>1-026</b>	60105-218	<b>1-033</b>	60105-339	<b>1-032</b>	60107-314	<b>1-016</b>	60108-403	<b>1-024</b>
60104-243	<b>1-026</b>	60105-219	<b>1-033</b>	60105-340	<b>1-032</b>	60107-315	<b>1-016</b>	60108-404	<b>1-024</b>
60104-243	<b>1-028</b>	60105-220	<b>1-033</b>	60105-341	<b>1-032</b>	60107-317	<b>1-016</b>	60108-405	<b>1-024</b>
60104-244	<b>1-028</b>	60105-221	<b>1-033</b>	60105-342	<b>1-032</b>	60107-318	<b>1-016</b>	60108-409	<b>1-019</b>
60104-245	<b>1-028</b>	60105-222	<b>1-033</b>	60105-343	<b>1-032</b>	60107-319	<b>1-016</b>	60108-410	<b>1-019</b>
60104-248	<b>1-028</b>	60105-223	<b>1-033</b>	60105-344	<b>1-032</b>	60107-401	<b>1-016</b>	60108-411	<b>1-019</b>
60104-249	<b>1-028</b>	60105-224	<b>1-033</b>	60105-345	<b>1-032</b>	60107-402	<b>1-016</b>	60108-417	<b>1-022</b>
60104-250	<b>1-028</b>	60105-225	<b>1-033</b>	60105-346	<b>1-032</b>	60107-403	<b>1-016</b>	60108-418	<b>1-022</b>
60104-251	<b>1-028</b>	60105-226	<b>1-033</b>	60105-347	<b>1-032</b>	60107-404	<b>1-016</b>	60108-419	<b>1-022</b>
60104-252	<b>1-028</b>	60105-227	<b>1-033</b>	60105-348	<b>1-032</b>	60107-405	<b>1-016</b>	60108-420	<b>1-022</b>
60104-253	<b>1-028</b>	60105-230	<b>1-033</b>	60105-350	<b>1-033</b>	60107-406	<b>1-016</b>	60108-421	<b>1-022</b>
60104-254	<b>1-028</b>	60105-231	<b>1-033</b>	60106-301	<b>1-017</b>	60107-407	<b>1-016</b>	60108-422	<b>1-022</b>
60104-255	<b>1-028</b>	60105-232	<b>1-033</b>	60106-302	<b>1-017</b>	60107-408	<b>1-016</b>	60108-422	<b>1-022</b>
60104-256	<b>1-028</b>	60105-234	<b>1-032</b>	60106-303	<b>1-017</b>	60107-412	<b>1-016</b>	60108-423	<b>1-022</b>
60104-257	<b>1-028</b>	60105-235	<b>1-033</b>	60106-304	<b>1-017</b>	60107-413	<b>1-016</b>	60108-424	<b>1-023</b>
60104-258	<b>1-028</b>	60105-236	<b>1-033</b>	60106-402	<b>1-017</b>	60107-414	<b>1-016</b>	60108-425	<b>1-023</b>
60104-259	<b>1-028</b>	60105-238	<b>1-033</b>	60106-403	<b>1-017</b>	60107-415	<b>1-016</b>	60108-426	<b>1-019</b>
60104-260	<b>1-028</b>	60105-302	<b>1-033</b>	60106-404	<b>1-017</b>	60107-418	<b>1-016</b>	60108-427	<b>1-018</b>
60104-261	<b>1-028</b>	60105-303	<b>1-033</b>	60106-421	<b>1-033</b>	60107-419	<b>1-016</b>	60108-429	<b>1-023</b>
60104-262	<b>1-028</b>	60105-304	<b>1-033</b>	60106-422	<b>1-033</b>	60108-201	<b>1-023</b>	60108-431	<b>1-024</b>
60104-264	<b>1-028</b>	60105-305	<b>1-033</b>	60107- 411	<b>1-016</b>	60108-202	<b>1-023</b>	60108-432	<b>1-023</b>
60104-265	<b>1-025</b>	60105-306	<b>1-033</b>	60107- 417	<b>1-016</b>	60108-203	<b>1-023</b>	60108-433	<b>1-022</b>
60104-266	<b>1-025</b>	60105-310	<b>1-032</b>	60107-201	<b>1-016</b>	60108-204	<b>1-023</b>	60108-434	<b>1-022</b>
60104-267	<b>1-025</b>	60105-311	<b>1-032</b>	60107-202	<b>1-016</b>	60108-205	<b>1-023</b>	60108-500	<b>1-024</b>
60104-268	<b>1-025</b>	60105-312	<b>1-032</b>	60107-203	<b>1-016</b>	60108-206	<b>1-023</b>	60108-516	<b>1-020</b>
60104-269	<b>1-025</b>	60105-313	<b>1-033</b>	60107-204	<b>1-016</b>	60108-207	<b>1-023</b>	60108-517	<b>1-020</b>
60104-270	<b>1-025</b>	60105-314	<b>1-033</b>	60107-205	<b>1-016</b>	60108-208	<b>1-023</b>	60108-518	<b>1-023</b>

60108-519	1-023	60108-747	1-024	60109-20000-60-7	1-012	60109-418	1-015	60140-412	4-082
60108-520	1-022	60108-748	1-024	60109-20000-60-9	1-012	60109-419	1-015	60170-370	4-083
60108-521	1-022	60108-749	1-024	60109-2000-12-7	1-012	60109-420	1-015	60180-0632	2-086
60108-571	1-020	60108-750	1-024	60109-2000-12-9	1-012	60109-421	1-015	60180-1232	2-086
60108-572	1-020	60108-751	1-024	60109-200-2-7W	1-012	60109-422	1-015	60180-502	2-012
60108-573	1-020	60108-752	1-024	60109-200-2-9W	1-012	60109-424	1-015	60180-504	2-014
60108-574	1-020	60108-753	1-024	60109-200-3-7	1-012	60109-425	1-015	60180-505	2-014
60108-575	1-020	60108-755	1-020	60109-200-3-9	1-012	60109-500-2-7W	1-012	60180-506	2-014
60108-576	1-020	60108-756	1-020	60109-201	1-015	60109-500-2-9W	1-012	60180-507	2-010
60108-701	1-018	60108-757	1-020	60109-202	1-015	60109-500-3-7	1-012	60180-508	2-009
60108-702	1-018	60108-758	1-024	60109-203	1-015	60109-500-3-9	1-012	60180-509	2-010
60108-703	1-018	60108-764	1-021	60109-204	1-015	60109-500-6-7	1-012	60180-510	2-010
60108-704	1-018	60108-765	1-018	60109-205	1-015	60109-500-6-9	1-012	60180-511	2-014
60108-705	1-018	60108-767	1-021	60109-206	1-015	60110-201	1-014	60180-512	2-014
60108-706	1-018	60108-768	1-021	60109-207	1-015	60110-202	1-014	60180-513	2-014
60108-707	1-020	60108-769	1-021	60109-208	1-015	60110-203	1-014	60180-514	2-009
60108-708	1-020	60108-776	1-018	60109-209	1-015	60110-204	1-014	60180-515	2-009
60108-709	1-020	60108-777	1-021	60109-210	1-015	60110-205	1-014	60180-516	2-011
60108-710	1-019	60108-780	1-018	60109-211	1-015	60110-206	1-014	60180-519	2-014
60108-711	1-019	60108-786	1-018	60109-212	1-015	60110-207	1-014	60180-520	2-014
60108-712	1-019	60108-793	1-019	60109-213	1-015	60110-208	1-014	60180-521	2-014
60108-713	1-022	60108-850	1-019	60109-214	1-015	60110-209	1-014	60180-526	2-012
60108-714	1-022	60108-851	1-019	60109-215	1-015	60110-301	1-014	60180-543	2-012
60108-715	1-022	60108-852	1-019	60109-216	1-015	60110-302	1-014	60180-544	2-014
60108-716	1-022	60108-853	1-019	60109-217	1-015	60110-303	1-014	60180-557	2-014
60108-717	1-022	60108-857	1-022	60109-218	1-015	60110-304	1-014	60180-560	2-009
60108-718	1-022	60108-858	1-022	60109-300-2-7W	1-012	60110-305	1-014	60180-561	2-010
60108-719	1-021	60108-901	1-019	60109-300-2-9W	1-012	60110-306	1-014	60180-562	2-009
60108-720	1-021	60108-902	1-019	60109-4000-25-7	1-012	60110-307	1-014	60180-567	5-057
60108-721	1-021	60108-903	1-019	60109-4000-25-9	1-012	60110-308	1-014	60180-567	5-059
60108-722	1-021	60108-904	1-019	60109-400-2-7W	1-012	60110-309	1-014	60180-569	5-057
60108-723	1-021	60108-905	1-019	60109-400-2-9W	1-012	60110-401	1-014	60180-569	5-059
60108-724	1-021	60108-906	1-019	60109-401	1-015	60110-402	1-014	60180-573	5-059
60108-727	1-021	60108-907	1-019	60109-402	1-015	60110-403	1-014	60180-596	2-010
60108-728	1-021	60108-908	1-019	60109-403	1-015	60110-404	1-014	60180-597	2-012
60108-729	1-021	60108-909	1-019	60109-404	1-015	60110-405	1-014	60180-598	2-012
60108-730	1-021	60108-910	1-019	60109-405	1-015	60110-406	1-014	60180-599	2-011
60108-731	1-021	60108-911	1-019	60109-406	1-015	60110-407	1-014	60180-600	2-010
60108-732	1-021	60108-912	1-019	60109-407	1-015	60110-408	1-014	60180-660	2-009
60108-735	1-024	60109-001	1-011	60109-408	1-015	60110-409	1-014	60180-661	2-009
60108-736	1-024	60109-002	1-011	60109-409	1-015	60110-501	1-014	60180-662	2-009
60108-737	1-024	60109-003	1-011	60109-410	1-015	60110-502	1-014	60180-665	2-009
60108-738	1-023	60109-004	1-011	60109-411	1-015	60110-503	1-014	60180-666	2-009
60108-739	1-023	60109-005	1-011	60109-412	1-015	60110-504	1-014	60180-667	2-009
60108-740	1-023	60109-1000-6-7	1-012	60109-413	1-015	60110-505	1-014	60180-669	2-011
60108-741	1-021	60109-1000-6-9	1-012	60109-414	1-015	60110-506	1-014	60180-670	2-011
60108-742	1-021	60109-101	1-006	60109-415	1-015	60110-507	1-014	60180-671	2-011
60108-745	1-024	60109-102	1-006	60109-416	1-015	60110-508	1-014	60180-672	2-011
60108-746	1-024	60109-103	1-006	60109-417	1-015	60110-509	1-014	60180-676	2-013

60180-677	2-013	60180-821	5-005	60180-M120	2-098	60180-P135	2-095	60180-VT402	2-008
60180-678	2-013	60180-822	5-005	60180-M121	2-096	60180-P136	2-095	60180-VT403	2-008
60180-679	2-013	60180-824	5-005	60180-M121	2-098	60180-P137	2-095	60180-VT404A	2-008
60180-680	2-013	60180-825	5-005	60180-M122	2-098	60180-P138	2-095	60180-VT405	2-008
60180-694	2-011	60180-826	5-005	60180-M123	2-096	60180-P139	2-095	60180-VT500	2-008
60180-698	2-011	60180-827	5-005	60180-M123	2-098	60180-P201	2-097	60180-VT501	2-008
60180-706	2-012	60180-828	5-005	60180-M125	2-098	60180-P202	2-097	60180-VT502	2-008
60180-710	2-013	60180-829	5-005	60180-M126	2-096	60180-P203	2-097	60180-VT503	2-008
60180-712	2-013	60180-830	5-005	60180-M126	2-098	60180-P204	2-097	60180-VT504	2-008
60180-723	2-010	60180-833	5-004	60180-M131	2-098	60180-P205	2-097	60180-VTMSC402A	2-008
60180-724	2-010	60180-834	5-004	60180-M134	2-096	60180-P206	2-097	60180-VTMSC72LV	2-008
60180-728	2-011	60180-835	5-029	60180-M142	2-096	60180-P207	2-097	60180-V100	2-101
60180-729	2-011	60180-836	5-029	60180-M143	2-096	60180-P211	2-097	60180-V101	2-101
60180-741	2-014	60180-837	5-005	60180-M144	2-096	60180-P211	2-101	60180-V103	2-101
60180-744	2-014	60180-838	5-005	60180-M145	2-096	60180-P212	2-097	60180-V104	2-101
60180-770	5-029	60180-839	5-005	60180-M146	2-097	60180-P212	2-101	60180-V105	2-101
60180-771	5-029	60180-841	5-005	60180-M149	2-098	60180-P213	2-097	60180-V106	2-101
60180-772	5-029	60180-843	5-004	60180-M150	2-096	60180-P214	2-097	60180-V107	2-101
60180-777	5-029	60180-860	5-078	60180-M150	2-098	60180-P215	2-097	60180-V108	2-103
60180-779	5-029	60180-861	5-078	60180-M151	2-101	60180-P216	2-097	60180-V109	2-103
60180-780	5-029	60180-862	5-078	60180-M152	2-101	60180-P217	2-097	60180-V110	2-103
60180-781	5-029	60180-888	5-029	60180-M153	2-101	60180-P300	2-099	60180-V111	2-103
60180-782	5-029	60180-C100	2-103	60180-M154	2-101	60180-P302	2-099	60181-625	5-094
60180-783	5-029	60180-C101	2-103	60180-M155	2-101	60180-P304	2-099	60181-626	5-094
60180-784	5-029	60180-K 200	2-102	60180-M156	2-101	60180-P306	2-099	60181-632	5-028
60180-786	5-029	60180-K 201	2-102	60180-M157	2-101	60180-P308	2-099	60181-633	5-028
60180-790	5-027	60180-K 202	2-102	60180-M171	2-096	60180-P310	2-099	60181-634	5-028
60180-791	5-027	60180-K 203	2-102	60180-M176	2-097	60180-P312	2-099	60181-635	5-028
60180-792	5-027	60180-K 204	2-102	60180-M177	2-097	60180-P400	2-101	60181-636	5-028
60180-794	5-027	60180-K100	2-100	60180-M178	2-098	60180-P401	2-101	60181-637	5-028
60180-796	5-027	60180-K101	2-100	60180-M179	2-098	60180-P402	2-101	60181-638	5-028
60180-801	5-004	60180-K103	2-100	60180-M183	2-096	60180-P403	2-101	60181-639	5-028
60180-802	5-004	60180-K104	2-100	60180-M950	2-097	60180-P404	2-103	60181-734	5-059
60180-803	5-004	60180-K105	2-100	60180-M975	2-101	60180-P405	2-103	60181-736	5-057
60180-804	5-004	60180-K106	2-100	60180-M975	2-097	60180-P406	2-103	60182-357	4-087
60180-805	5-004	60180-K107	2-100	60180-M999	2-097	60180-P407	2-103	60182-500	4-084
60180-806	5-004	60180-K108	2-100	60180-P100	2-095	60180-VT100	2-008	60182-501	4-084
60180-808	5-004	60180-K109	2-100	60180-P102	2-095	60180-VT300	2-008	60182-502	4-084
60180-809	5-004	60180-M100	2-096	60180-P103	2-095	60180-VT301	2-008	60182-503	4-084
60180-810	5-004	60180-M101	2-096	60180-P104	2-095	60180-VT302	2-008	60182-504	4-084
60180-811	5-004	60180-M102	2-096	60180-P105	2-095	60180-VT302A	2-008	60182-505	4-084
60180-812	5-004	60180-M103	2-096	60180-P106	2-095	60180-VT303	2-008	60182-506	4-084
60180-813	5-004	60180-M105	2-098	60180-P107	2-095	60180-VT303A	2-008	60182-507	4-084
60180-814	5-005	60180-M108	2-098	60180-P108	2-095	60180-VT309	2-008	60182-508	4-084
60180-815	5-005	60180-M111	2-098	60180-P109	2-095	60180-VT309TR	2-008	60182-509	4-085
60180-817	5-005	60180-M112	2-098	60180-P130	2-095	60180-VT310	2-008	60182-510	4-085
60180-818	5-005	60180-M113	2-098	60180-P132	2-095	60180-VT310A	2-008	60201-318	5-029
60180-819	5-005	60180-M115	2-098	60180-P133	2-095	60180-VT400	2-008	60201-390	5-028
60180-820	5-005	60180-M116	2-098	60180-P134	2-095	60180-VT401	2-008	60201-391	5-028

60201-394	5-028	60300-821	1-024	60307-243	1-022	60310-501	1-029	6040.2375	4-079
60201-395	5-028	60300-822	1-024	60307-244	1-022	60310-502	1-029	6040.2380	4-079
60201-398	5-028	60300-823	1-024	60307-251	1-022	60311-201	1-029	6040.2385	4-079
60201-401	5-028	60300-824	1-024	60307-252	1-022	60311-202	1-029	6040.2390	4-079
60209-001	1-011	60300-831	1-019	60307-253	1-022	60311-301	1-029	6040.2395	4-079
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60209-005	1-011	60300-841	1-023	60307-263	1-021	60311-501	1-029	6040.2804	4-081
60300-445	1-018	60300-842	1-023	60307-264	1-021	60311-502	1-029	6040.2805	4-081
60300-446	1-018	60300-843	1-023	60307-271	1-021	60312-201	1-029	6040.2806	4-081
60300-447	1-018	60300-844	1-023	60307-272	1-021	60312-202	1-029	6040.2807	4-081
60300-448	1-018	60302-606	1-017	60307-273	1-021	60312-301	1-029	6040.2808	4-081
60300-485	1-019	60302-607	1-017	60307-274	1-021	60312-302	1-029	6040.2809	4-081
60300-486	1-019	60302-608	1-017	60307-281	1-024	60312-401	1-029	6040.2810	4-081
60300-487	1-019	60303-207	1-016	60307-282	1-024	60312-402	1-029	6040.2819	4-081
60300-488	1-019	60303-208	1-016	60307-283	1-024	60312-501	1-029	6040.2820	4-081
60300-505	1-023	60303-307	1-016	60307-284	1-024	60312-502	1-029	6041.5100	3-042
60300-506	1-023	60303-308	1-016	60307-291	1-023	60-EPAVCS	2-087	6041.5118	3-041
60300-507	1-023	60303-407	1-016	60307-292	1-023	6036.1045	4-080	6041.5120	3-041
60300-508	1-023	60303-408	1-016	60307-293	1-023	6040.2207	4-079	6041.5121	3-041
60300-565	1-022	60304-201	1-013	60307-294	1-023	6040.2215	4-079	6041.5122	3-041
60300-566	1-022	60306-207	1-016	60307-301	1-024	6040.2225	4-079	6041.5123	3-041
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60300-568	1-022	60306-303	1-016	60307-303	1-024	6040.2245	4-079	6041.5125	3-041
60300-585	1-022	60306-304	1-016	60307-304	1-024	6040.2255	4-079	6041.5126	3-041
60300-586	1-022	60306-403	1-016	60307-311	1-020	6040.2265	4-079	6041.5127	3-041
60300-587	1-022	60306-404	1-016	60307-312	1-020	6040.2301	4-081	6041.5128	3-041
60300-588	1-022	60306-501	1-017	60307-313	1-020	6040.2302	4-081	6041.5240	3-041
60300-630	1-020	60306-502	1-017	60307-314	1-020	6040.2303	4-080	6041.5260	3-041
60300-631	1-020	60306-503	1-017	60307-321	1-019	6040.2304	4-080	6041.5275	3-041
60300-632	1-020	60307-201	1-018	60307-322	1-019	6040.2305	4-079	6041.5280	3-041
60300-633	1-020	60307-202	1-018	60307-323	1-019	6040.2307	4-079	6041.5540	3-041
60300-685	1-020	60307-203	1-018	60307-324	1-019	6040.2308	4-081	6041.5560	3-041
60300-686	1-020	60307-204	1-018	60307-331	1-023	6040.2309	4-081	6041.5575	3-041
60300-687	1-020	60307-211	1-018	60307-332	1-023	6040.2310	4-079	6041.5580	3-041
60300-688	1-020	60307-212	1-018	60307-333	1-023	6040.2312	4-080	6041.5615	4-080
60300-725	1-024	60307-213	1-018	60307-334	1-023	6040.2315	4-079	6041.5616	4-080
60300-726	1-024	60307-214	1-018	60309-001	1-011	6040.2320	4-079	6041.5625	4-080
60300-727	1-024	60307-221	1-020	60309-002	1-011	6040.2325	4-079	6041.5665	4-080
60300-728	1-024	60307-222	1-020	60309-003	1-011	6040.2330	4-079	6041.5675	4-080
60300-805	1-021	60307-223	1-020	60309-004	1-011	6040.2335	4-079	6041.5685	4-080
60300-806	1-021	60307-224	1-020	60309-005	1-011	6040.2340	4-079	6041.5711	3-041
60300-807	1-021	60307-231	1-019	60310-201	1-029	6040.2345	4-079	6041.5730	3-041
60300-808	1-021	60307-232	1-019	60310-202	1-029	6040.2355	4-079	6041.5735	3-041
60300-813	1-021	60307-233	1-019	60310-301	1-029	6040.2357	4-079	6041.5760	3-041
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60300-815	1-021	60307-241	1-022	60310-401	1-029	6040.2365	4-079	6041.5780	3-041
60300-816	1-021	60307-242	1-022	60310-402	1-029	6040.2370	4-079	6041.5785	3-041

6041.5810	3-041	66002-025	5-006	69208-307780	4-077	72205-151030	3-025	73205-101030	3-023
6041.5811	3-041	66002-026	5-006	69208-903027	4-077	72205-152130	3-025	73205-102130	3-023
6041.5812	3-041	66002-027	5-006	69310-057726	4-077	72205-154630	3-025	73205-103030	3-023
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6041.5819	3-041	66002-040	5-006	7010	4-092	72305-014001	3-026	73205-252130	3-023
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6042.2360	4-080	6720.0372	4-081	72105-014001	3-025	73105-051030	3-023	74104-013001	4-019
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6042.2370	4-080	6720.0377	4-081	72105-101030	3-025	73105-054630	3-023	74104-052130	4-009
6042.2373	4-080	6720.0380	4-081	72105-102130	3-025	73105-101030	3-023	74104-052130	4-019
6042.2375	4-080	6720.0385	4-081	72105-103030	3-025	73105-102130	3-023	74104-053030	4-009
6042.2380	4-080	6720.0395	3-042	72105-104630	3-025	73105-103030	3-023	74104-053030	4-019
6042.2385	4-080	6826.2401	3-041	72105-151030	3-025	73105-104630	3-023	74104-054630	4-009
6042.2390	4-080	6826.2405	3-041	72105-152130	3-025	73105-151030	3-023	74104-054630	4-019
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64000-002	5-024	6826.2450	3-041	72105-254630	3-025	73105-251030	3-023	74104-103030	4-019
66002-001	5-030	6841.2301	4-081	72205-011001	3-025	73105-252130	3-023	74104-104630	4-009
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66002-010	5-031	69008-903027	4-077	72205-051030	3-025	73205-013001	3-023	74104-153030	4-009
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74104-253030	4-009	8023	4-091	851-00	4-024	8-AC6(R)	2-063	8-SV(A)	2-085
74104-253030	4-019	8125	4-091	851-00	4-025	8-AC6(R)	2-090	8-T02	2-065
74104-254630	4-009	8125-038	4-091	851-00	4-026	8-AC7	2-063	8-T02	2-090
74104-254630	4-019	8125-074	4-091	851-00	4-027	8-AC7	2-090	8-TST1	2-065
74204-012101	4-010	8125-094	4-093	851-00	4-028	8-ACB	2-063	8-TST1	2-090
74204-012101	4-019	8125-097	4-091	851-00	4-029	8-ACB	2-090	9- SC(BLK)-BST1	2-090
74204-013001	4-010	8125-098	4-091	851-00	4-030	8-AC-CBT1	2-063	9- SC(GY)-BST1X	2-090
74204-013001	4-019	8125-999	4-091	851-00	4-032	8-AC-CBT1	2-090	9- SCK(B)-8RT1X	2-090
74204-014001	4-010	850-00	4-008	851-00	4-033	8-AC-ST101	2-063	9- SCK(B)-ST1X	2-090
74204-014001	4-019	850-00	4-009	851-00	4-061	8-AC-ST101	2-090	9- SCK(G)-8RT1	2-090
74204-052130	4-010	850-00	4-010	851-00	4-071	8-AC-ST101X	2-063	9- SCK(G)-ST1	2-090
74204-052130	4-019	850-00	4-011	851-00	3-023	8-AC-ST101X	2-090	9- SCK(N)-8RT1	2-090
74204-053030	4-010	850-00	4-012	851-00	3-025	8-AC-ST15	2-063	9- SCK(N)-ST1	2-090
74204-053030	4-019	850-00	4-013	851-00	3-026	8-AC-ST15	2-090	9010	4-093
74204-054630	4-010	850-00	4-014	852-00	3-029	8-ACT	2-063	9010-051	4-093
74204-054630	4-019	850-00	4-015	852-00	4-023	8-ACT	2-090	9012	4-093
74204-102130	4-019	850-00	4-016	852-00	4-024	8-AC-TST1	2-063	9013	4-093
74204-103030	4-010	850-00	4-017	852-00	4-025	8-AC-TST1	2-090	9055-020	4-090
74204-103030	4-019	850-00	4-018	852-00	4-026	8-NPWP	2-079	9055-020	4-093
74204-104630	4-010	850-00	4-021	852-00	4-027	8-NPWP	2-091	9055-021	4-090
74204-104630	4-019	850-00	4-023	852-00	4-028	8-PEC1	2-090	9055-021	4-093
74204-152130	4-010	850-00	4-024	852-00	4-029	8-PEC1	2-063	9055-022	4-090
74204-152130	4-019	850-00	4-025	852-00	4-030	8-PEC1X	2-090	9055-022	4-093
74204-153030	4-010	850-00	4-026	852-00	4-031	8-PEC1X	2-063	9055-023	4-090
74204-153030	4-019	850-00	4-027	852-00	4-032	8-SC	2-065	9055-023	4-093
74204-154630	4-010	850-00	4-028	852-00	4-033	8-SC	2-090	9055-024	4-090
74204-154630	4-019	850-00	4-029	852-00	4-061	8-SC(R)	2-065	9055-024	4-093
74204-252130	4-010	850-00	4-030	852-00	4-063	8-SC(W)	2-065	9055-025	4-090
74204-252130	4-019	850-00	4-031	852-00	4-064	8-SC-8RT1	2-065	9055-025	4-093
74204-252130	4-019	850-00	4-032	852-00	4-065	8-SC-8RT1	2-090	9055-026	4-090
74204-253030	4-010	850-00	4-033	852-00	4-066	8-SCJ	2-065	9055-026	4-093
74204-253030	4-019	850-00	4-061	852-00	4-067	8-SCJ	2-090	9055-027	4-090
74204-254630	4-010	850-00	4-063	852-00	4-068	8-SCJ(W)	2-065	9055-027	4-093
74204-254630	4-019	850-00	4-064	852-00	4-069	8-SCJ(W)	2-090	9055-028	4-090
7725	4-089	850-00	4-065	852-00	4-071	8-SC-ST15	2-065	9055-029	4-090
7725i	4-089	850-00	4-066	852-00	3-015	8-SC-ST15	2-090	9055-029	4-093
7755-010	4-089	850-00	4-067	852-00	3-028	8-ST101	2-065	9125-043	4-093
7755-015	4-090	850-00	4-068	854-00	4-022	8-ST101	2-090	9125-076	4-090
7755-015	4-093	850-00	4-069	8-6RT1	2-065	8-ST14	2-065	92016	4-098
7755-020	4-089	850-00	4-071	8-6RT1	2-090	8-ST14	2-090	92016-150	4-098
7755-021	4-089	850-00	3-015	88200	4-082	8-ST143	2-065	92017	4-098
7755-022	4-089	850-00	3-023	88400	4-082	8-ST143	2-090	92018	4-098
7755-023	4-089	850-00	3-025	88700	4-082	8-ST144	2-065	97002-052130	4-068
7755-999	4-089	850-00	3-026	8-AC(B)-ST144	2-063	8-ST144	2-090	97002-102130	4-068
8- SC(R)	2-089	850-00	3-028	8-AC(B)-ST144	2-090	8-ST14X	2-065	97003-052130	4-068
8- SC(W)	2-089	850-00	3-029	8-AC6	2-063	8-ST14X	2-090	97005-012101	4-068
8020	4-091	850-RT	4-082	8-AC6	2-090	8-ST15	2-065	97005-013001	4-068
8021	4-091	850-WT	4-082	8-AC6(B)	2-063	8-ST15	2-090	97005-014001	4-068
8022	4-091	851-00	4-023	8-AC6(B)	2-090	8-SV	2-085	97005-014001	4-068

97005-052130	4-068	97205-102130	4-064	97505-154630	4-069	9-SCK(B)-ST101	2-068	B7950-1A	2-056
97005-102130	4-068	97205-103030	4-064	97505-254630	4-069	9-SCK(B)-ST1X	2-068	B7950-B	2-056
97005-152130	4-068	97205-104630	4-064	97702-052130	4-067	9-SCK(B)-TST1	2-068	B7950-VO	2-056
97005-153030	4-068	97205-152130	4-064	97702-102130	4-067	9-SCK(B)-TST1	2-090	B7951	2-056
97005-154030	4-068	97205-153030	4-064	97703-052130	4-067	9-SCK(G)-ST1	2-068	B7951-VO	2-056
97005-154630	4-068	97205-154630	4-064	97705-012101	4-067	9-SCK(GY)-BST1X	2-068	B7990-1	2-055
97005-253030	4-068	97205-253030	4-064	97705-013001	4-067	9-SCK(N)-ST1	2-068	B7990-12	2-055
97005-254030	4-068	97205-254630	4-064	97705-014001	4-067	9-SCNK(B)	2-068	B7990-12A	2-055
97005-254630	4-068	9725	4-090	97705-014001	4-067	9-SCSK(B)-8RT1	2-068	B7990-1A	2-055
97102-032130	4-063	9725i	4-090	97705-032130	4-067	9-SCSK-8RT1	2-090	B7990-2	2-055
97102-052130	4-063	97302-052130	4-065	97705-052130	4-067	A-302	4-084	B7990-2A	2-055
97102-102130	4-063	97302-054630	4-065	97705-054630	4-067	A-302A	4-084	B7990-3	2-055
97103-032130	4-063	97302-102130	4-065	97705-152130	4-067	A-327	4-087	B7990-4	2-055
97103-052130	4-063	97302-103030	4-065	97705-153030	4-067	A-328	4-087	B7990-5	2-055
97103-054630	4-063	97303-052130	4-065	97705-154030	4-067	A-436	4-083	B7990-6	2-055
97103-102130	4-063	97303-103030	4-065	97705-154630	4-067	A-437	4-083	B7990-6A	2-055
97103-103030	4-063	97303-104630	4-065	97705-253030	4-067	B-100	2-086	B7995-13	2-054
97103-104630	4-063	97303-154630	4-065	97705-254030	4-067	B7800-1	2-055	B7995-15	2-054
97103-152130	4-063	97305-012101	4-065	97705-254630	4-067	B7800-12	2-055	B7995-18	2-054
97103-154630	4-063	97305-013001	4-065	97902-052130	4-066	B7800-12A	2-055	B7995-20	2-054
97105-012101	4-063	97305-014001	4-065	97902-102130	4-066	B7800-1A	2-055	B7995-24	2-054
97105-013001	4-063	97305-014001	4-065	97903-052130	4-066	B7800-2	2-055	B7995-24	2-056
97105-014001	4-063	97305-052130	4-065	97903-104630	4-066	B7800-20	2-055	B7995-26	2-054
97105-032130	4-063	97305-053030	4-065	97903-154630	4-066	B7800-20A	2-055	B7995-8	2-054
97105-052130	4-063	97305-054630	4-065	97905-012101	4-066	B7800-2A	2-054	B7999-1	2-053
97105-053030	4-063	97305-102130	4-065	97905-013001	4-066	B7800-3	2-055	B7999-12	2-053
97105-054630	4-063	97305-104630	4-065	97905-014001	4-066	B7800-3A	2-055	B7999-12A	2-053
97105-102130	4-063	97305-152130	4-065	97905-053030	4-066	B7800-4	2-055	B7999-1A	2-053
97105-103030	4-063	97305-153030	4-065	97905-054630	4-066	B7800-4A	2-055	B7999-2	2-053
97105-104630	4-063	97305-154030	4-065	97905-103030	4-066	B7800-5	2-055	B7999-2A	2-053
97105-152130	4-063	97305-154630	4-065	97905-104630	4-066	B7800-6	2-055	B7999-3	2-053
97105-153030	4-063	97305-253030	4-065	97905-152130	4-066	B7800-6A	2-055	B7999-3A	2-053
97105-154630	4-063	97305-254030	4-065	97905-154630	4-066	B7807-13	2-054	B7999-4	2-053
97105-252130	4-063	97305-254630	4-065	97905-254630	4-066	B7807-15	2-054	B7999-4A	2-053
97105-253030	4-063	97502-052130	4-069	9-CV	2-081	B7807-18	2-054	B7999-5	2-053
97105-254630	4-063	97502-054630	4-069	9-CV	2-089	B7807-20	2-054	B7999-6	2-053
97202-052130	4-064	97502-102130	4-069	9-MSC(BG)-ST1	2-068	B7807-24	2-054	B7999-6A	2-053
97202-102130	4-064	97503-052130	4-069	9-MSC(BG)-ST1	2-090	B7807-8	2-054	C-1000	4-022
97203-052130	4-064	97503-104630	4-069	9-MSC(BG)-ST101	2-068	B7815-13	2-047	C2-1000	4-095
97203-103030	4-064	97503-154630	4-069	9-MSC(BG)-ST101X	2-068	B7815-13	2-054	C2-1000EP	4-095
97203-104630	4-064	97505-012101	4-069	9-SCJ(W)-ST101	2-068	B7815-15	2-054	C2-1006	4-095
97203-154630	4-064	97505-013001	4-069	9-SCJ(W)-ST101	2-090	B7815-18	2-054	C2-1006EH	4-095
97205-012101	4-064	97505-014001	4-069	9-SCK(BLK)-BST1	2-068	B7815-20	2-054	C2-1346EH	4-095
97205-013001	4-064	97505-052130	4-069	9-SCK(B)-8RT1	2-068	B7815-24	2-054	C4000-1	2-024
97205-014001	4-064	97505-054630	4-069	9-SCK(B)-8RT1	2-090	B7815-8	2-022	C4000-1	2-057
97205-032130	4-064	97505-102130	4-069	9-SCK(B)-8RT1X	2-068	B7815-8	2-054	C4000-11	2-025
97205-052130	4-064	97505-104630	4-069	9-SCK(B)-ST1	2-068	B7920	2-056	C4000-11	2-057
97205-053030	4-064	97505-152130	4-069	9-SCK(B)-ST1	2-090	B7921	2-056	C4000-12	2-024
97205-054630	4-064	97505-153030	4-069	9-SCK(B)ST101	2-090	B7950	2-056	C4000-12	2-057

C4000-14	2-024	C4008-1A	2-020	C4010-57W	2-033	C4010-95W	2-033	C4011-1G	2-035
C4000-14	2-057	C4008-2A	2-020	C4010-59	2-033	C4010-97W	2-033	C4011-1R	2-035
C4000-1B	2-024	C4008-4A	2-020	C4010-5A	2-032	C4010-98BLK	2-032	C4011-1W	2-035
C4000-1G	2-024	C4008-50	2-060	C4010-60	2-032	C4010-98W	2-032	C4011-1W	2-058
C4000-1R	2-024	C4008-632C	2-019	C4010-60A	2-032	C4010-99	2-032	C4011-1Y	2-035
C4000-1W	2-024	C4008-632C	2-057	C4010-60AR	2-032	C4010-K630	2-025	C4011-2	2-035
C4000-1W	2-057	C4008-632R	2-057	C4010-60AW	2-032	C4010-K630	2-031	C4011-2	2-058
C4000-1Y	2-024	C4008-632R	2-019	C4010-60BLK	2-032	C4010-K630	2-036	C4011-24	2-036
C4000-2W	2-024	C4008-730	2-019	C4010-627L	2-025	C4010-K630	2-041	C4011-24	2-041
C4000-2W	2-057	C4008-730	2-057	C4010-627L	2-031	C4010-LV1	2-030	C4011-24	2-059
C4000-30	2-026	C4008-739	2-057	C4010-627L	2-036	C4010-LV1	2-058	C4011-25	2-039
C4000-40	2-026	C4008-740	2-019	C4010-627L	2-041	C4010-LV2	2-030	C4011-2A	2-037
C4000-40Y	2-026	C4008-740	2-057	C4010-627L	2-058	C4010-LV2	2-058	C4011-2W	2-035
C4000-41	2-026	C4008-741	2-019	C4010-629	2-025	C4010-S1	2-030	C4011-2W	2-058
C4000-55	2-026	C4008-741	2-057	C4010-629	2-031	C4010-S1W	2-030	C4011-2WCV	2-038
C4000-60	2-026	C4008-742	2-019	C4010-629	2-036	C4010-S2W	2-030	C4011-3AL	2-037
C4000-60Y	2-026	C4008-742	2-057	C4010-629	2-041	C4010-S629	2-025	C4011-4	2-038
C4000-61	2-026	C4010-017AW	2-033	C4010-629	2-058	C4010-S629	2-031	C4011-4	2-059
C4000-9	2-025	C4010-017W	2-033	C4010-629L	2-025	C4010-S629	2-036	C4011-4A	2-037
C4000-9	2-057	C4010-019	2-033	C4010-629L	2-031	C4010-S629	2-041	C4011-4B	2-037
C4000-9A	2-025	C4010-1	2-030	C4010-629L	2-036	C4010-S630	2-025	C4011-4G	2-037
C4000-9A	2-057	C4010-1	2-058	C4010-629L	2-041	C4010-S630	2-031	C4011-4R	2-037
C4000-9TR	2-025	C4010-10	2-032	C4010-629L	2-058	C4010-S630	2-036	C4011-5	2-040
C4000-9TR	2-057	C4010-11	2-030	C4010-629P	2-025	C4010-S630	2-041	C4011-5	2-059
C4000-LV1	2-025	C4010-11	2-058	C4010-629P	2-031	C4010-V1	2-030	C4011-50	2-042
C4000-LV1	2-057	C4010-14	2-030	C4010-629P	2-036	C4010-V1	2-058	C4011-50B	2-042
C4000-LV1W	2-025	C4010-14	2-058	C4010-629P	2-041	C4011-1	2-035	C4011-50G	2-042
C4000-LV1W	2-057	C4010-17	2-033	C4010-629P	2-058	C4011-1	2-058	C4011-50R	2-042
C4000-LV2	2-025	C4010-17W	2-033	C4010-62BLK	2-032	C4011-10	2-035	C4011-51	2-042
C4000-LV2	2-057	C4010-1A	2-032	C4010-630	2-025	C4011-10	2-058	C4011-510OR	2-042
C4000-LV2W	2-025	C4010-1W	2-030	C4010-630	2-031	C4011-11	2-035	C4011-51B	2-042
C4000-LV2W	2-057	C4010-1W	2-058	C4010-630	2-036	C4011-11	2-041	C4011-51BLK	2-042
C4000-LV3W	2-025	C4010-2	2-030	C4010-630	2-041	C4011-11	2-059	C4011-51G	2-042
C4000-LV3W	2-057	C4010-2	2-058	C4010-630	2-058	C4011-13	2-035	C4011-51OR	2-042
C4000-MS	2-029	C4010-21	2-033	C4010-630P	2-025	C4011-13	2-040	C4011-51R	2-042
C4000-MS	2-039	C4010-2W	2-030	C4010-630P	2-031	C4011-13	2-059	C4011-52	2-042
C4000-S1	2-025	C4010-2W	2-058	C4010-630P	2-036	C4011-14	2-036	C4011-52B	2-042
C4000-S1W	2-025	C4010-30A	2-032	C4010-630P	2-041	C4011-14	2-041	C4011-52G	2-042
C4000-S2W	2-025	C4010-35	2-032	C4010-630P	2-058	C4011-14	2-059	C4011-52OR	2-042
C4000-S9	2-025	C4010-35BLK	2-032	C4010-63BLK	2-032	C4011-15	2-036	C4011-52R	2-042
C4000-V1	2-025	C4010-35W	2-032	C4010-65A	2-032	C4011-15	2-041	C4011-52Y	2-042
C4000-V1	2-057	C4010-40	2-032	C4010-67	2-033	C4011-15	2-059	C4011-53	2-042
C4000-V2	2-025	C4010-40A	2-032	C4010-67A	2-033	C4011-16	2-035	C4011-530OR	2-042
C4000-V2	2-057	C4010-55	2-032	C4010-67AW	2-033	C4011-16	2-041	C4011-53B	2-042
C4008-1	2-019	C4010-55A	2-032	C4010-67W	2-033	C4011-16	2-059	C4011-53OR	2-042
C4008-1	2-057	C4010-55BLK	2-032	C4010-88	2-033	C4011-1A	2-037	C4011-53R	2-042
C4008-100	2-020	C4010-57	2-033	C4010-88AW	2-033	C4011-1AP	2-037	C4011-53Y	2-042
C4008-101	2-020	C4010-57A	2-033	C4010-88W	2-033	C4011-1B	2-035	C4011-54	2-042
C4008-102	2-020	C4010-57AW	2-033	C4010-95	2-033	C4011-1CV	2-038	C4011-540OR	2-043

C4011-54B	2-042	C4011-87	2-038	C4012-15	2-059	C4013-1W	2-057	C4015-17AW	2-048
C4011-54BLK	2-042	C4011-87AW	2-038	C4012-1W	2-034	C4013-2	2-021	C4015-17W	2-048
C4011-54G	2-042	C4011-87W	2-038	C4012-1W	2-058	C4013-2	2-057	C4015-1A	2-047
C4011-54OR	2-043	C4011-88	2-038	C4012-2	2-034	C4013-2W	2-021	C4015-1AP	2-045
C4011-54R	2-043	C4011-88W	2-038	C4012-2	2-058	C4013-2W	2-057	C4015-1W	2-047
C4011-54Y	2-043	C4011-89W	2-038	C4012-25	2-039	C4013-30	2-022	C4015-2	2-046
C4011-55	2-043	C4011-9	2-035	C4012-2W	2-034	C4013-30A	2-022	C4015-2	2-060
C4011-55B	2-043	C4011-9	2-058	C4012-2W	2-058	C4013-32	2-022	C4015-21	2-048
C4011-55BLK	2-043	C4011-95	2-038	C4012-465	2-021	C4013-32A	2-023	C4015-25	2-048
C4011-55G	2-043	C4011-98B	2-037	C4012-465	2-034	C4013-36A	2-023	C4015-27	2-048
C4011-55R	2-043	C4011-98G	2-037	C4012-465	2-058	C4013-37Y	2-023	C4015-2W	2-046
C4011-55Y	2-043	C4011-98R	2-037	C4012-529	2-021	C4013-3A	2-022	C4015-2W	2-060
C4011-59	2-043	C4011-98Y	2-037	C4012-529	2-034	C4013-40	2-022	C4015-30	2-047
C4011-590OR	2-043	C4011-9TR	2-040	C4012-529	2-058	C4013-40A	2-022	C4015-30A	2-047
C4011-59OR	2-043	C4011-9TR	2-059	C4012-529L	2-034	C4013-492	2-023	C4015-4	2-044
C4011-5W	2-040	C4011-LV1	2-035	C4012-529L	2-058	C4013-492A	2-023	C4015-40	2-047
C4011-5W	2-059	C4011-LV1	2-040	C4012-530	2-021	C4013-494A	2-023	C4015-40A	2-047
C4011-6	2-040	C4011-LV1	2-059	C4012-530	2-034	C4013-50Y	2-022	C4015-45	2-047
C4011-6	2-059	C4011-LV1W	2-035	C4012-530	2-058	C4013-54Y	2-023	C4015-45W	2-047
C4011-631	2-025	C4011-LV1W	2-058	C4012-530P	2-021	C4013-57	2-023	C4015-46P	4-049
C4011-631	2-031	C4011-LV2	2-035	C4012-530P	2-034	C4013-58	2-023	C4015-47P	4-049
C4011-631	2-036	C4011-LV2	2-040	C4012-530P	2-058	C4013-60	2-022	C4015-47P	2-060
C4011-631	2-041	C4011-LV2	2-059	C4012-88	2-038	C4013-60A	2-022	C4015-48	2-060
C4011-631	2-058	C4011-LV2W	2-035	C4012-88A	2-038	C4013-60P	2-022	C4015-482A	2-048
C4011-631P	2-025	C4011-LV2W	2-058	C4012-S530	2-021	C4013-61	2-022	C4015-52	2-045
C4011-631P	2-031	C4011-S1	2-035	C4012-S530	2-034	C4013-61A	2-022	C4015-52	2-045
C4011-631P	2-036	C4011-S1W	2-035	C4013-010A	2-023	C4013-63A	2-022	C4015-54	2-045
C4011-631P	2-041	C4011-S2W	2-035	C4013-1	2-021	C4013-63W	2-022	C4015-55BLK	2-047
C4011-631P	2-058	C4011-S4	2-040	C4013-1	2-057	C4013-63Y	2-022	C4015-55W	2-047
C4011-67P	2-043	C4011-S5	2-040	C4013-10	2-022	C4013-64A	2-022	C4015-5A	2-047
C4011-688W	2-039	C4011-S5W	2-040	C4013-100	2-045	C4013-64W	2-022	C4015-60	2-047
C4011-6A	2-037	C4011-S631	2-025	C4013-100SS	2-045	C4013-69A	2-022	C4015-61	2-047
C4011-6AE	2-037	C4011-S631	2-031	C4013-101	2-045	C4013-74A	2-022	C4015-638	2-044
C4011-6W	2-040	C4011-S631	2-036	C4013-102	2-045	C4013-77A	2-022	C4015-638	2-046
C4011-6W	2-059	C4011-S631	2-041	C4013-102SS	2-045	C4013-95W	2-023	C4015-638	2-060
C4011-72	2-043	C4011-S6W	2-040	C4013-10A	2-023	C4013-97Y	2-023	C4015-640	2-044
C4011-72AW	2-043	C4011-V1	2-035	C4013-11	2-021	C4013-98W	2-022	C4015-640	2-046
C4011-72ORW	2-043	C4011-V1	2-058	C4013-11	2-057	C4013-98Y	2-022	C4015-643	2-044
C4011-73	2-043	C4012-1	2-034	C4013-13	2-021	C4013-S1	2-021	C4015-643	2-046
C4011-73ORW	2-043	C4012-1	2-058	C4013-13	2-057	C4015-017	2-048	C4015-643	2-060
C4011-73P	2-043	C4012-10	2-034	C4013-14	2-023	C4015-017A	2-048	C4015-66	2-047
C4011-73W	2-043	C4012-10	2-058	C4013-15	2-023	C4015-1	2-060	C4015-66A	2-047
C4011-7A	2-037	C4012-100	2-038	C4013-1500	2-021	C4015-10	2-047	C4015-67A	2-047
C4011-7B	2-037	C4012-100SS	2-038	C4013-15A	2-023	C4015-10	2-047	C4015-75A	2-047
C4011-7G	2-037	C4012-101	2-038	C4013-15P	2-023	C4015-11W	2-046	C4015-75W	2-047
C4011-7K	2-037	C4012-102	2-038	C4013-17	2-023	C4015-11W	2-060	C4015-88	2-048
C4011-7R	2-037	C4012-102SS	2-038	C4013-17A	2-023	C4015-14	2-046	C4015-88AW	2-048
C4011-7Y	2-037	C4012-15	2-034	C4013-17A	2-022	C4015-14	2-060	C4015-9	2-046
C4011-80	2-060	C4012-15	2-041	C4013-1W	2-021	C4015-17	2-048	C4015-9	2-060
						C4015-17A	2-048	C4015-95P	2-060

C4015-96	2-060	C5000-180	2-029	C5000-54Y Y	2-027	CERT4010-91	2-018	ECMJ-20FO	2-093
C4015-96A	2-060	C5000-180W	2-029	C5000-55A	2-027	CERT4011-89W	2-018	ECMJ-8	2-093
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2,6-Difluorophenol . . . . .	<b>4-015</b>	Acetaminophen . . . . .	<b>4-018</b>	Bromide . . . . .	<b>4-053</b>	Cytosine . . . . .	<b>4-042</b>
2,6-Dimethoxyphenol . . . . .	<b>4-015</b>	Acetaminophen . . . . .	<b>4-027</b>	BSA . . . . .	<b>3-030</b>	Cytosine . . . . .	<b>4-060</b>
2,6-Dimethoxyphenol . . . . .	<b>4-015</b>	Acetaminophen . . . . .	<b>4-043</b>	Budesonide epimers . . . . .	<b>3-027</b>	Decanal DNPH . . . . .	<b>4-058</b>
2,6-Dimethylaniline . . . . .	<b>5-040</b>	Acetic acid . . . . .	<b>4-052</b>	Butane . . . . .	<b>5-074</b>	Decyl sulfate . . . . .	<b>4-053</b>
2,6-DNT . . . . .	<b>4-055</b>	Acetic acid . . . . .	<b>5-054</b>	Butane . . . . .	<b>5-074</b>	Decyl-trimethylammonium . . . . .	<b>4-054</b>
21-Hydroxyprogesterone-		Acetone . . . . .	<b>4-060</b>	Butanone DNPH . . . . .	<b>4-058</b>	delta-Tocopherol . . . . .	<b>4-037</b>
21-acetate . . . . .	<b>4-032</b>	Acetone DNPH . . . . .	<b>4-058</b>	Butyl-benzene . . . . .	<b>5-074</b>	Demethoxycurcumin . . . . .	<b>4-040</b>
2-AB labelled glycans . . . . .	<b>3-015</b>	Acetonitrile . . . . .	<b>5-047</b>	Butylparaben . . . . .	<b>4-008</b>	Desethyl Atrazine . . . . .	<b>4-019</b>
2-AB labelled glycans . . . . .	<b>3-016</b>	Acetyl salicylic acid (Aspirin) . . . . .	<b>4-043</b>	Butyraldehyde DNPH . . . . .	<b>4-058</b>	Desethylatrazine . . . . .	<b>4-006</b>
2-AB labelled glycans . . . . .	<b>3-017</b>	Acrolein DNPH . . . . .	<b>4-058</b>	C10-LAS . . . . .	<b>4-053</b>	Desmethoxycurcumin . . . . .	<b>4-012</b>
2-Am-4,6-DNT . . . . .	<b>4-055</b>	Adenine . . . . .	<b>4-060</b>	C11-LAS . . . . .	<b>4-053</b>	Dexamethasone . . . . .	<b>4-044</b>
2-Chlorophenol . . . . .	<b>4-039</b>	Adenosine-5'-diphosphate . . . . .	<b>4-065</b>	C12-LAS . . . . .	<b>4-053</b>	DHA . . . . .	<b>4-038</b>
2-Chlorophenol . . . . .	<b>5-040</b>	Adenosine-5'-monophosphine . . . . .	<b>4-065</b>	C13-LAS . . . . .	<b>4-053</b>	diazepam . . . . .	<b>4-027</b>
2-methyl-butane . . . . .	<b>5-074</b>	Adenosine-5'-triphosphate . . . . .	<b>4-065</b>	Caffeine . . . . .	<b>4-043</b>	Dibenzo(a,e)pyrene . . . . .	<b>5-049</b>
2-Methylnaphthalene . . . . .	<b>5-049</b>	Adonitol . . . . .	<b>4-077</b>	Calcium . . . . .	<b>4-051</b>	dibenzo(a,h)acridine . . . . .	<b>5-049</b>
2-Nitroaniline . . . . .	<b>5-040</b>	ALA . . . . .	<b>4-038</b>	Caproic acid . . . . .	<b>5-054</b>	Dibenzo(a,h)anthracene . . . . .	<b>5-049</b>
2-Nitrophenol . . . . .	<b>4-039</b>	Aldicarb . . . . .	<b>4-057</b>	Carbaryl . . . . .	<b>4-057</b>	Dibenzo(a,h)pyrene . . . . .	<b>5-049</b>
2-Nitrophenol . . . . .	<b>5-040</b>	Aldicarb sulfone . . . . .	<b>4-057</b>	Carbofuran . . . . .	<b>4-057</b>	Dibenzo(a,i)pyrene . . . . .	<b>5-049</b>
2-NT . . . . .	<b>4-055</b>	Aldicarb sulfoxide . . . . .	<b>4-057</b>	Carbon tetrachloride . . . . .	<b>5-046</b>	dibenzo(a,j)acridine . . . . .	<b>5-049</b>
3,4-Dichlorophenol . . . . .	<b>4-015</b>	alpha-tocopherol (vitamin E) . . . . .	<b>4-037</b>	Carbonic anhydrase . . . . .	<b>3-029</b>	Dibenzylamine . . . . .	<b>4-045</b>
3,4-Difluorophenol . . . . .	<b>4-015</b>	Ametryn . . . . .	<b>4-009</b>	Carbonic anhydrase . . . . .	<b>3-030</b>	Dichloromethane . . . . .	<b>5-047</b>
3,4-Dimethoxyphenol . . . . .	<b>4-015</b>	Amitriptyline . . . . .	<b>4-008</b>	Catachol . . . . .	<b>4-069</b>	Diethylamine . . . . .	<b>5-040</b>
3,5-Dichlorophenol . . . . .	<b>4-015</b>	Angiotensin II . . . . .	<b>3-032</b>	Catechol . . . . .	<b>4-017</b>	Diethylamine . . . . .	<b>5-044</b>
3,5-Dimethoxyphenol . . . . .	<b>4-015</b>	Angiotensin III . . . . .	<b>3-028</b>	Cetyl betaine . . . . .	<b>4-053</b>	Diethylamine . . . . .	<b>5-055</b>
3,5-Dimethoxyphenol . . . . .	<b>4-015</b>	Aniline . . . . .	<b>5-040</b>	Chloride . . . . .	<b>4-050</b>	Diethylenetriamine . . . . .	<b>5-040</b>



Di-isopropyl phthalate . . . . .	<b>4-027</b>	Glucitol . . . . .	<b>5-051</b>	Leu-Enkephalin . . . . .	<b>3-028</b>	Methyl-pentane . . . . .	<b>5-074</b>
Dilaurin isomer 1 . . . . .	<b>4-041</b>	Glucose . . . . .	<b>4-029</b>	Linoleic acid . . . . .	<b>4-024</b>	Methyl-pentane . . . . .	<b>5-074</b>
Dilaurin isomer 2 . . . . .	<b>4-041</b>	Glucose . . . . .	<b>4-077</b>	Linolenic acid . . . . .	<b>4-024</b>	Methyl-propane . . . . .	<b>5-074</b>
Dimethylamine . . . . .	<b>5-044</b>	Glycerol . . . . .	<b>4-077</b>	Linuron . . . . .	<b>4-006</b>	Metobromuron . . . . .	<b>4-006</b>
Dimethylamine . . . . .	<b>5-055</b>	Glycine-Tyrosine . . . . .	<b>3-028</b>	Linuron . . . . .	<b>4-064</b>	Metolachlor . . . . .	<b>4-006</b>
Dimethyl-hexane . . . . .	<b>5-074</b>	Guanine . . . . .	<b>4-060</b>	LLA . . . . .	<b>4-038</b>	Metoprolol . . . . .	<b>4-021</b>
Dimethyl-pentane . . . . .	<b>5-074</b>	Hemoglobin . . . . .	<b>3-018</b>	L-tyrosine . . . . .	<b>4-017</b>	Metoxuron . . . . .	<b>4-006</b>
Dimethyl-pentane . . . . .	<b>5-074</b>	Hemoglobin C . . . . .	<b>3-018</b>	Luminol . . . . .	<b>4-045</b>	Metoxuron . . . . .	<b>4-064</b>
Di-n-propyl phthalate . . . . .	<b>4-027</b>	Heptanal DNPH . . . . .	<b>4-058</b>	Lutein . . . . .	<b>4-023</b>	Monoclonal antibody . . . . .	<b>3-013</b>
Diquat . . . . .	<b>4-056</b>	Heptane . . . . .	<b>5-074</b>	Lycopene . . . . .	<b>4-023</b>	Monolaurin . . . . .	<b>4-041</b>
Distearin isomer 1 . . . . .	<b>4-041</b>	Heptanoic acid . . . . .	<b>5-054</b>	Lysozyme . . . . .	<b>3-024</b>	Monolinuron . . . . .	<b>4-006</b>
Distearin isomer 2 . . . . .	<b>4-041</b>	Hexadecyl-trimethylammonium . . . . .	<b>4-054</b>	Lysozyme . . . . .	<b>3-031</b>	Monophosphates . . . . .	<b>4-031</b>
Diuron . . . . .	<b>4-006</b>	Hexanal DNPH . . . . .	<b>4-058</b>	Lysozyme . . . . .	<b>3-029</b>	Monostearin . . . . .	<b>4-041</b>
Diuron . . . . .	<b>4-019</b>	Hexane . . . . .	<b>5-074</b>	Mab . . . . .	<b>3-007</b>	Monuron . . . . .	<b>4-064</b>
Diuron . . . . .	<b>4-064</b>	Hexane . . . . .	<b>5-074</b>	Mab B . . . . .	<b>3-006</b>	Morpholine . . . . .	<b>5-040</b>
DNA . . . . .	<b>3-037</b>	Hexazinone . . . . .	<b>4-006</b>	Magnesium . . . . .	<b>4-051</b>	m-xylene . . . . .	<b>5-074</b>
Dodecyl sulfate . . . . .	<b>4-053</b>	HMX . . . . .	<b>4-055</b>	Malate . . . . .	<b>4-051</b>	Myoglobin . . . . .	<b>3-029</b>
Dodecyl-trimethylammonium . . . . .	<b>4-054</b>	Horseheart myoglobin . . . . .	<b>3-022</b>	Maleate . . . . .	<b>4-044</b>	Myoglobin . . . . .	<b>3-031</b>
DOPAC . . . . .	<b>4-017</b>	Hydrocortisone . . . . .	<b>4-032</b>	Malic acid . . . . .	<b>4-052</b>	Nadolol . . . . .	<b>4-021</b>
DOPAC . . . . .	<b>4-069</b>	Hydrocortisone . . . . .	<b>4-044</b>	Maltose . . . . .	<b>4-029</b>	Naphthalene . . . . .	<b>4-008</b>
Dopamine . . . . .	<b>4-017</b>	Hydroquinone . . . . .	<b>4-026</b>	Maltose . . . . .	<b>4-077</b>	Naphthalene . . . . .	<b>4-042</b>
Dopamine . . . . .	<b>4-069</b>	Ibuprofen . . . . .	<b>4-007</b>	Maltotriose . . . . .	<b>4-077</b>	Naphthalene . . . . .	<b>5-049</b>
EPA . . . . .	<b>4-038</b>	Ibuprofen . . . . .	<b>4-019</b>	Mannitol . . . . .	<b>4-077</b>	Naphthalene . . . . .	<b>5-074</b>
Erythritol . . . . .	<b>4-077</b>	Ibuprofen . . . . .	<b>1-010</b>	Mannitol . . . . .	<b>5-051</b>	Naproxen . . . . .	<b>4-007</b>
Estradiol (E2) . . . . .	<b>4-014</b>	indeno(1,2,3-cd)pyrene . . . . .	<b>5-049</b>	Meglumine . . . . .	<b>4-050</b>	Naproxen . . . . .	<b>4-044</b>
Estradiol (E3) . . . . .	<b>4-014</b>	Inositol . . . . .	<b>5-051</b>	Mesylate . . . . .	<b>4-050</b>	Naphthylamine . . . . .	<b>4-045</b>
Estrone (E1) . . . . .	<b>4-014</b>	Insulin . . . . .	<b>3-028</b>	Metazchlor . . . . .	<b>4-006</b>	NB . . . . .	<b>4-055</b>
Ethylamine . . . . .	<b>5-044</b>	Insulin . . . . .	<b>3-029</b>	Met-Enkephalin . . . . .	<b>3-028</b>	n-butyric acid . . . . .	<b>5-054</b>
Ethylamine . . . . .	<b>5-055</b>	Intact Mab . . . . .	<b>3-013</b>	Methacrolein DNPH . . . . .	<b>4-006</b>	n-decane . . . . .	<b>5-074</b>
Ethyl-benzene . . . . .	<b>5-074</b>	Iodide . . . . .	<b>4-050</b>	Methacrolein DNPH . . . . .	<b>4-058</b>	n-dodecane . . . . .	<b>5-074</b>
Ethinylestradiol . . . . .	<b>4-014</b>	Isobutyric acid . . . . .	<b>5-054</b>	Methiocarb . . . . .	<b>4-057</b>	Nicotine . . . . .	<b>5-040</b>
Fenopropfen . . . . .	<b>4-007</b>	Isocaproic acid . . . . .	<b>5-054</b>	Methomyl . . . . .	<b>4-057</b>	Niflumic acid . . . . .	<b>1-008</b>
Fetal hemoglobin . . . . .	<b>3-018</b>	iso-Citric acid . . . . .	<b>4-052</b>	Methyl arachidate . . . . .	<b>5-056</b>	Niflumic acid . . . . .	<b>1-009</b>
Fluoranthene . . . . .	<b>5-049</b>	Isopropylamine . . . . .	<b>5-044</b>	Methyl behenate . . . . .	<b>5-056</b>	Nitrate . . . . .	<b>4-050</b>
Fluorene . . . . .	<b>5-049</b>	Isopropylamine . . . . .	<b>5-055</b>	Methyl cis-13-docosenoate . . . . .	<b>5-056</b>	Nitrate . . . . .	<b>4-051</b>
Folic Acid . . . . .	<b>4-025</b>	Isoproturon . . . . .	<b>4-006</b>	Methyl decanoate . . . . .	<b>5-056</b>	Nitrate . . . . .	<b>4-053</b>
Formaldehyde DNPH . . . . .	<b>4-058</b>	Isovaleraldehyde DNPH . . . . .	<b>4-058</b>	Methyl linoleate . . . . .	<b>5-056</b>	Nitrobenzoic acid . . . . .	<b>4-045</b>
formic acid . . . . .	<b>4-052</b>	Isovaleric acid . . . . .	<b>5-054</b>	Methyl linolenate . . . . .	<b>5-056</b>	N-Methyl-N-nitrosaniline . . . . .	<b>4-045</b>
Fructose . . . . .	<b>4-029</b>	Ketoprofen . . . . .	<b>4-044</b>	Methyl myristate . . . . .	<b>5-056</b>	Nonanal DNPH . . . . .	<b>4-058</b>
Fructose . . . . .	<b>4-077</b>	Lactic acid . . . . .	<b>4-052</b>	Methyl octanoate . . . . .	<b>5-056</b>	n-pentadecane . . . . .	<b>5-074</b>
Fucitol . . . . .	<b>5-051</b>	Lactose . . . . .	<b>4-029</b>	Methyl oleate . . . . .	<b>5-056</b>	n-Propylamine . . . . .	<b>5-044</b>
Fucose . . . . .	<b>4-077</b>	Lactose . . . . .	<b>4-077</b>	Methyl palmitate . . . . .	<b>5-056</b>	n-propylamine . . . . .	<b>5-055</b>
Fumarate . . . . .	<b>4-051</b>	Lactulose . . . . .	<b>4-067</b>	Methyl palmitoleate . . . . .	<b>5-056</b>	n-tetradecane . . . . .	<b>5-074</b>
Fumaric acid 7 . . . . .	<b>4-052</b>	Lamivudine . . . . .	<b>4-011</b>	Methyl propane . . . . .	<b>5-074</b>	n-tridecane . . . . .	<b>5-074</b>
Galactitol . . . . .	<b>5-051</b>	Lauryldimethylbenzyl-ammonium chloride . . . . .	<b>4-053</b>	Methyl stearate . . . . .	<b>5-056</b>	n-valeric acid . . . . .	<b>5-054</b>
Galactose . . . . .	<b>4-077</b>	Laurylpyridinium chloride . . . . .	<b>4-053</b>	Methyl tatracosanoate . . . . .	<b>5-056</b>	Octanal DNPH . . . . .	<b>4-058</b>
gamma-Tocopherol . . . . .	<b>4-037</b>	L-DOPA . . . . .	<b>4-017</b>	Methylamine . . . . .	<b>5-044</b>	Octane . . . . .	<b>5-074</b>
Gentamicin . . . . .	<b>4-049</b>	L-DOPA . . . . .	<b>4-069</b>	Methylamine . . . . .	<b>5-055</b>	Octylamine . . . . .	<b>5-040</b>
GLA . . . . .	<b>4-038</b>			Methyl-butane . . . . .	<b>5-074</b>	o-Hydroxybenzoic acid . . . . .	<b>4-027</b>

Oligonucleotides	3-033	Propane	5-074	Simetryn	4-009	Tristearin	4-041
Oligonucleotides	3-034	Propanolol	4-021	Simizine	4-009	Tri-tetramethyl-benzene isomers	5-074
Oligonucleotides	3-035	Propazine	4-006	Sodium	4-050	Triton X-100	4-053
Orotic acid	4-045	Propazine	4-009	Sodium	4-051	Tromethamine	4-050
o-Toluic Acid	4-028	Propionaldehyde DNPH	4-058	Sorbitol	4-077	Tyrosine	4-069
Ovalbumin	3-029	Propionic acid	5-054	Soybean Trysin Inhibitor 66	3-022	Uracil	4-008
Ovalbumin	3-030	Propoxur	4-057	Succinic acid	4-052	Uracil	4-027
Ovalbumin	3-032	Propranolol	4-008	Sucrose	4-029	Uracil	4-060
Ovalbumin 66	3-022	Propyl-benzene	5-074	Sucrose	4-077	Urea	4-033
Oxacillin sodium	4-066	Propyl-benzene	5-074	Sulfate	4-051	Valeraldehyde DNPH	4-058
Oxalic acid	4-052	p-Toluic Acid	4-028	Tartaric acid	4-052	Valerophenone	4-019
Oxamyl	4-057	p-xylene	5-074	Tebuthiuron	4-064	Valine-Tyrosine-Valine	3-028
Oxazepam	4-027	p-xylene	5-074	Terbuthylazine	4-006	Vanillic acid	4-035
Oxprenolol	4-021	Pyrene	5-049	ter-butyl alcohol	5-074	Vanillin	4-035
Oxprenolol	4-044	Pyridine	4-045	Tert-butylamine	5-044	Vitamin B1 (thiamine)	4-025
PABA	4-045	Pyridine	5-040	tert-butylamine	5-055	Vitamin B12 (cyanocobalamin)	4-025
PABA	3-032	Pyrogallol	4-026	Testosterone	4-010	Vitamin B2 (riboflavin)	4-025
Papain digest	3-013	Raffinose	4-077	Tetrabutylammonium	4-054	Vitamin B3 (nicotinamide)	4-025
Paraquat	4-056	RDX	4-055	Tetradecyl-trimethylammonium	4-054	Vitamin B5 (pantothenic acid)	4-025
p-Cresol	4-060	Resorcinol	4-026	Tetraheptylammonium	4-054	Vitamin B6 (pyridoxine)	4-025
Pentachlorophenol	4-039	Retinol acetate		Tetrahexylammonium	4-054	Vitamin C	4-030
Pentane	5-074	(vitamin A acetate)	4-037	Tetramethyl-octane	5-074	Vitamin D2	4-037
Pentane	5-074	Rhamnitol	5-051	Tetrapentylammonium	4-054	Vitamin D3	4-037
Phenanthrene	5-049	Ribitol	5-051	Tetryl	4-055	Vitamin E acetate	4-037
Phenetole	4-060	Ribonuclease A	3-024	Thymine	4-060	Vitamin H (biotin)	4-025
Phenol	4-026	Ribonuclease A	3-028	Thyroglobulin	3-032	Vitamin K1	4-037
Phenol	4-039	Ribonuclease A	3-030	Timolol	4-021	Vitamin K1 (cis isomer)	4-016
Phenol	4-060	Ribonuclease A	3-031	Timolol	4-044	Vitamin K1 (trans isomer)	4-016
Phenol	5-040	Saccharin	4-036	Tolualdehyde DNPH	4-058	Vitamin K2	4-016
Phosphate	4-051	Salicylic Acid	4-018	Toluene	5-074	Vitamin K2	4-037
p-Hydroxybenzaldehyde	4-035	Salicylamide	4-043	Toluene	5-074	Xanthine	4-060
p-Hydroxybenzoic acid	4-027	Salicylic acid	4-043	trans-Aconitic acid	4-052	Xylene sulfonate	4-053
p-Hydroxybenzoic acid	4-035	SDA	4-038	Trastuzumab	3-014	Xylose	4-077
Pindolol	4-021	Sebuthylazin	4-006	Trastuzumab + DTT	3-014	Xylyaldehyde DNPH	4-058
p-Nitroaniline	4-045	sec-Butylamine	5-044	Trastuzumab + IdeS	3-014	Zidovudine	4-063
Polyacrylic acid	4-046	sec-butylamine	5-055	Trastuzumab + Papain	3-014	$\alpha$ -tocopherol	4-068
Potassium	4-050	Serotonin	4-017	Tribenzylamine	4-045	$\beta$ -Carotene	4-023
Potassium	4-051	Serotonin	4-069	Triclosan	4-036	$\beta$ -tocopherol	4-068
p-Phenylenediamine	4-045	Sickle cell hemoglobin	3-018	Trilaurin	4-041	$\gamma$ -tocopherol	4-068
Progesterone	4-032	Simazine	4-006	Trimethylamine	5-044	$\delta$ -tocopherol	4-068
Prometryn	4-009	Simazine	4-019	Trimethylamine	5-055		

# Terms and Conditions of Sale

UNLESS OTHERWISE EXPRESSLY AGREED IN WRITING, ALL SALES ARE SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS:

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# Resources

## for Chromatographers



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