



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



**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



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**, an online portal that will help you in every aspect of your analysis. Finally, 2016 marks the 40th 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.eu.fishersci.com/go/chromo



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



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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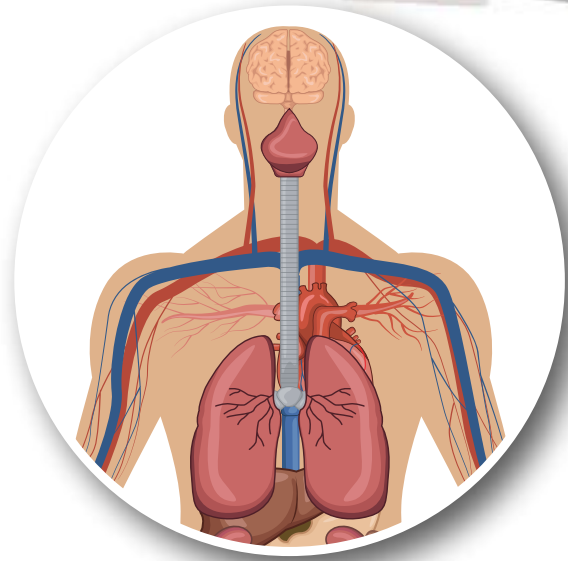
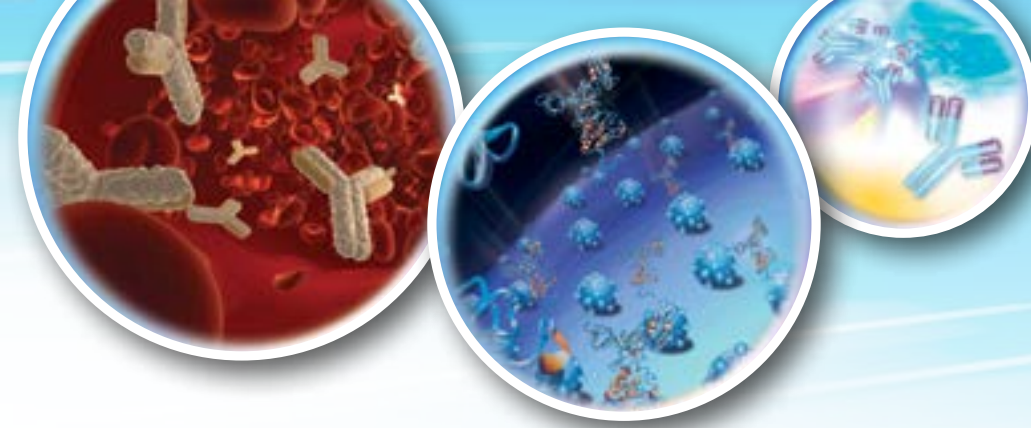
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for **biopharmaceutical markets**

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

WebSeal™

Sample integrity and cleanliness



Varioskan LUX™ Multimode Microplate Reader



Sample Handling

Orbitor™ RS Microplate Mover

High-throughput lab automation



Separation and Detection



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

Data Management

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



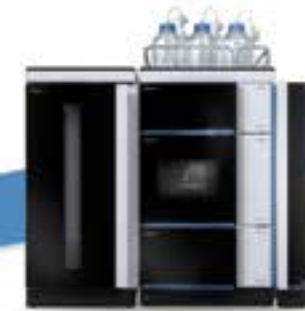
**Chromeleon™
Chromatography Data System**
Streamlining laboratory workflow



**Orbitrap Fusion™ Lumos™
Tribrid™ 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

Virtuoso™ Vials
The highest level of sample integrity
and sample information possible



Sample Handling

**Virtuoso™ Vial
Identification System**



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



Separation and Detection

**HPLC/UHPLC
Columns**



Vanquish™ UHPLC Systems
Built for every biopharma workflow



**TSQ Quantiva™ Triple
Quadrupole Mass Spectrometer**
exceeds stringent analytical
requirements with superb sensitivity,
speed and dynamic range



Data Management

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



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



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

Virtuoso™ Vials

The highest level of sample integrity and sample information possible



Sample Handling

Virtuoso™ Vial Identification System



HPLC/UHPLC Columns

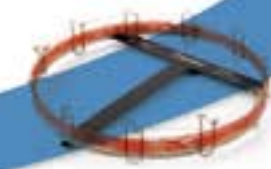


Separation and Detection



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



Data Management

Chromeleon™ Chromatography Data System
Streamlining laboratory workflow



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



Virtuoso™ Vials
The highest level of sample integrity and sample information possible



Virtuoso™ Vial Identification System



HPLC/UHPLC Columns



Sample Preparation

Sample Handling

Separation and Detection

Data Management

Vanquish™ UHPLC Systems
Built for every biopharma workflow



GC Columns

TRACE™ 1300 Series GC
Simplify workflow and increase analytical performance



Q Exactive™ GC Orbitrap™ GC-MS/MS System
Unprecedented depth in GC-MS analysis



Chromeleon™ Chromatography Data System
Streamlining laboratory workflow



Sample Preparation Products

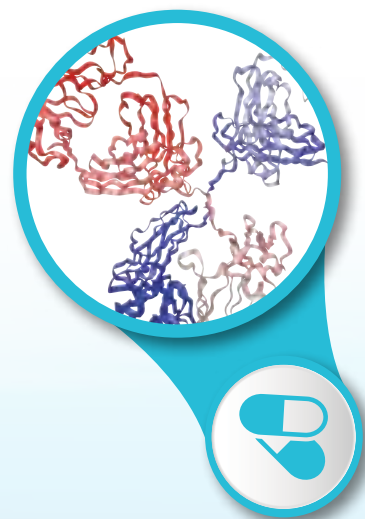
Your sample is precious and you cannot afford failures. We have a comprehensive range of products delivering clean and consistent extractions using innovative sample preparation technologies for your analytical needs.



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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.

PAGE 1-007



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 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

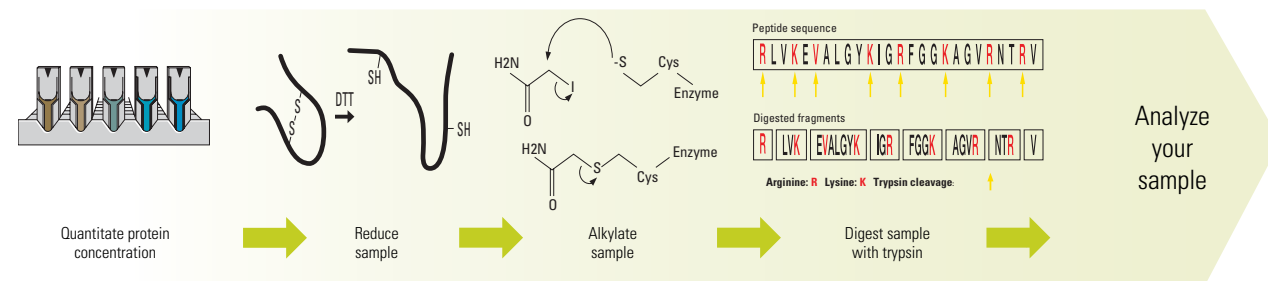


Simplicity of use with SMART Digest Kits

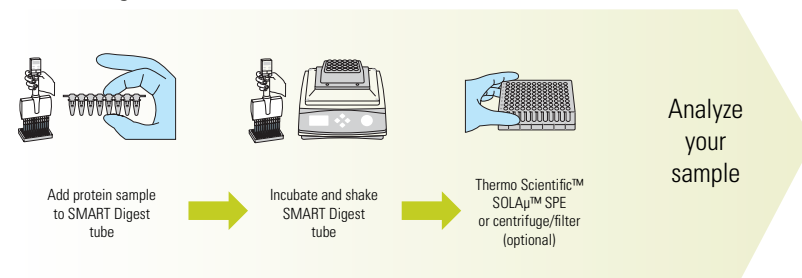
Current sample preparation protocols for the digestion of proteins are multifaceted and laborious. Without a single source solution, errors are far more likely to occur. Therefore, the overall protocol is subject to irreproducibility and significant sample processing time.

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



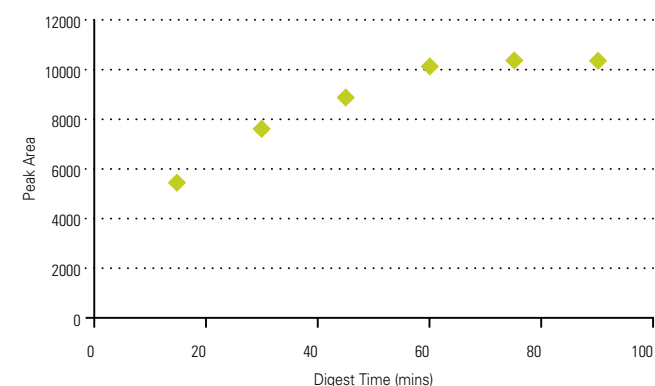
SMART Digest



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



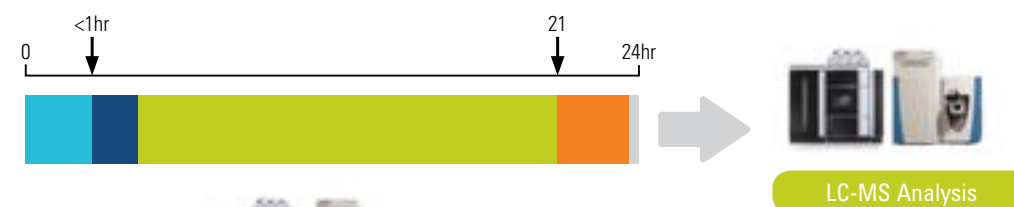
Recommended digestion starting conditions for known proteins*

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

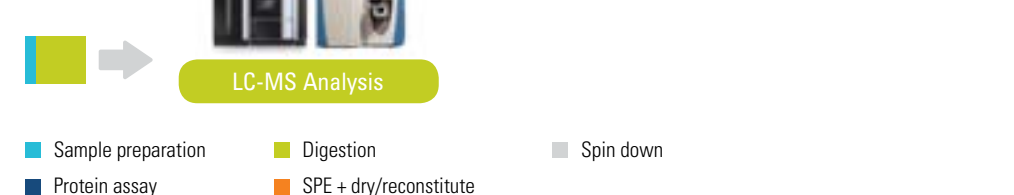
*200µL protein solutions were used for all samples. A concentration of 100µg/mL was used for all samples, except IgG in plasma which used 17.5mg/mL

SMART Digest vs. conventional in-solution digest protocol

In-solution digest



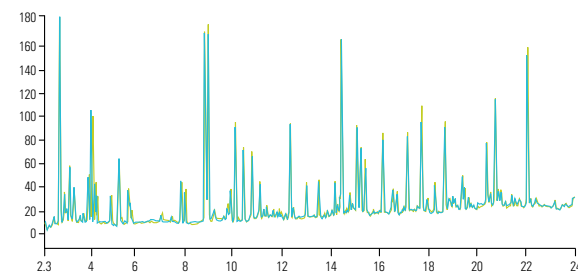
SMART Digest



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.

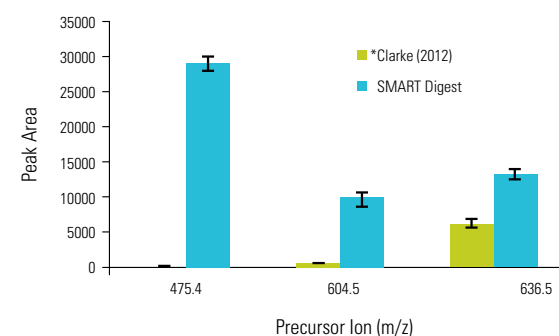


Higher sensitivity with the SMART Digest Kits

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	15382360
Smart Digest kit with 96 well filter plate	15357350
Smart Digest kit with SOLA μ HRP SPE plate	15317298

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

SOLA SPE Products

Consistent excellence for bioanalysis

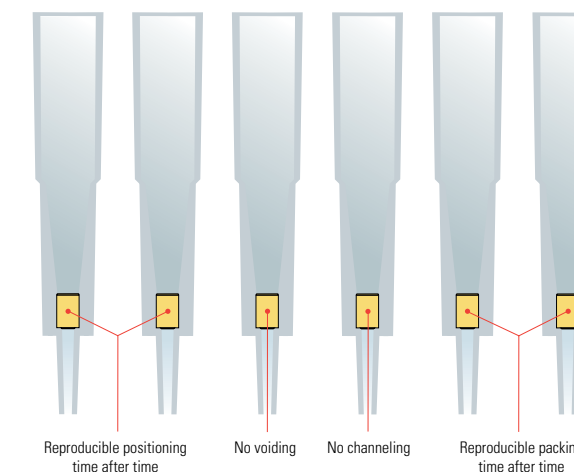
Thermo Scientific SOLA products are designed for bioanalytical and clinical research analysts who are tasked with providing high quality analytical results from complex biological samples in a high throughput environment, while complying with strict legislation. These demands are compounded by the continued 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.

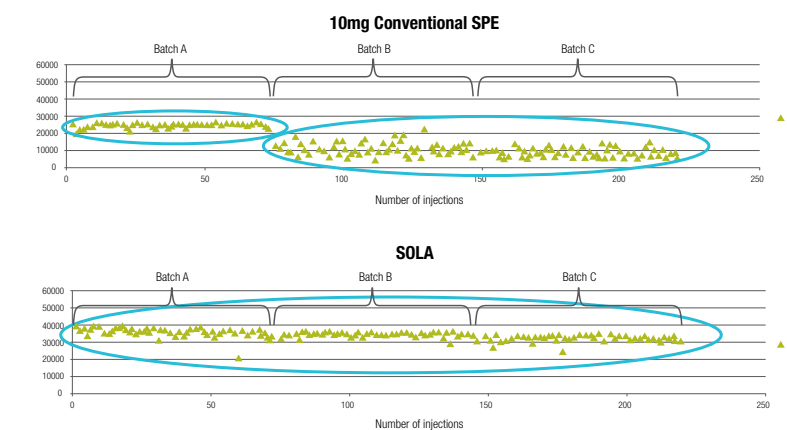


SOLA μ SPE design – limiting issues associated with conventional SPE formats

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 SOLA μ 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

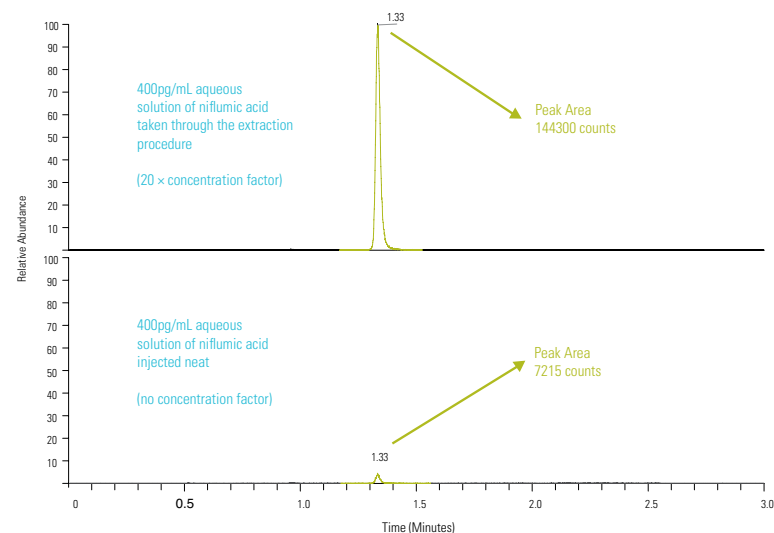
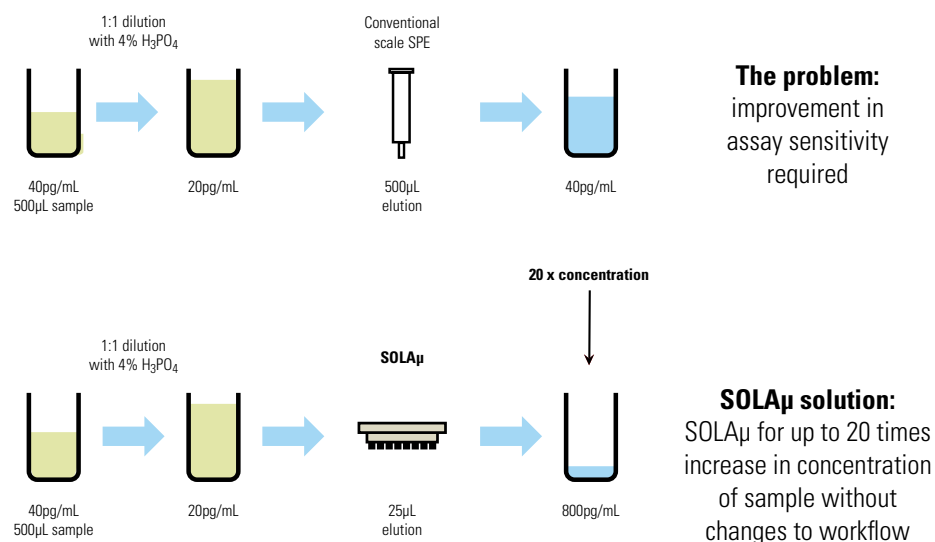


Batch to batch reproducibility of SOLA compared to a conventional SPE product

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.

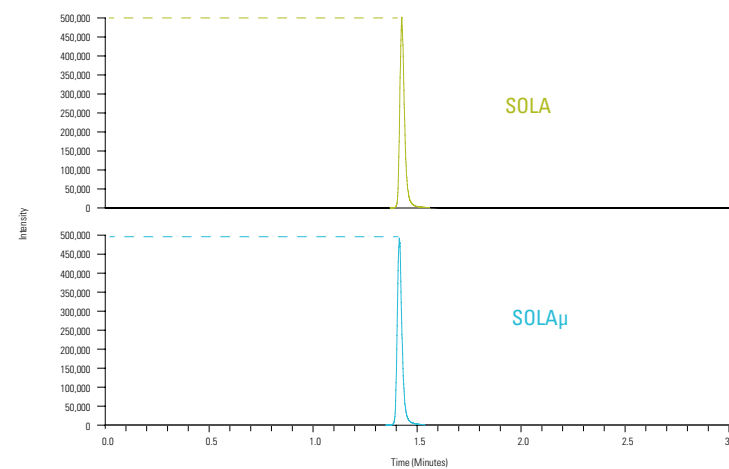
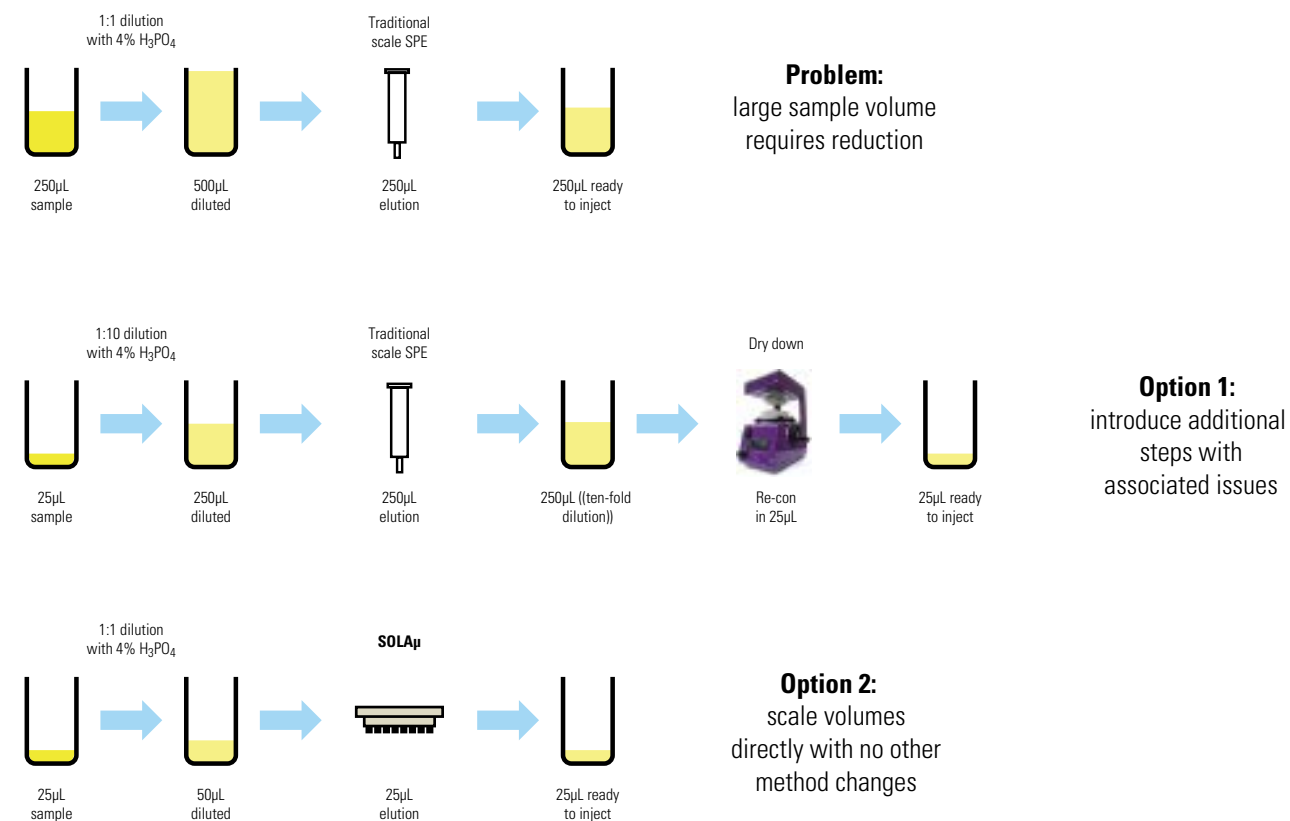


	Precision Data for Niflumic Acid Peak Area Ratio (%RSD) n = 18	Recovery of Niflumic Acid (%)	Matrix Effects (%)
QC Low (0.4ng/mL)	1.31	89.9	8.63
QC High (30ng/mL)	1.06	94.0	3.21

Sample limited assays

SOLAµ 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 25µL of niflumic acid sample onto the SOLAµ plate and eluting in a total volume of 25µL, 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.



Equivalent peak response achieved for Niflumic Acid with SOLAµ using 25µL of sample compared with 250µL of sample with a 10mg SOLA SPE device

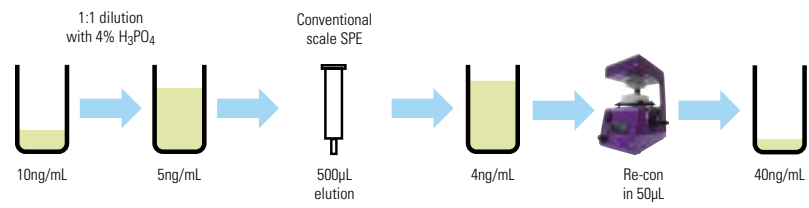
Precision Data for Niflumic Acid		
	Analyte Peak Area (%RSD)	Peak Area Ratio (%RSD)
Low QC	7.32	0.356
High QC	5.33	0.195

Increased workflow efficiency

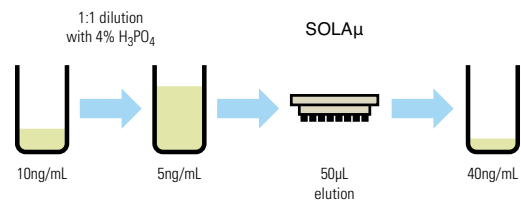
With traditional SPE the eluted sample is typically dried down to increase the concentration of the sample and thus improve the sensitivity. This causes an issue for certain compound types which can be lost during this step, resulting in reduced sensitivity.

SOLA μ 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.

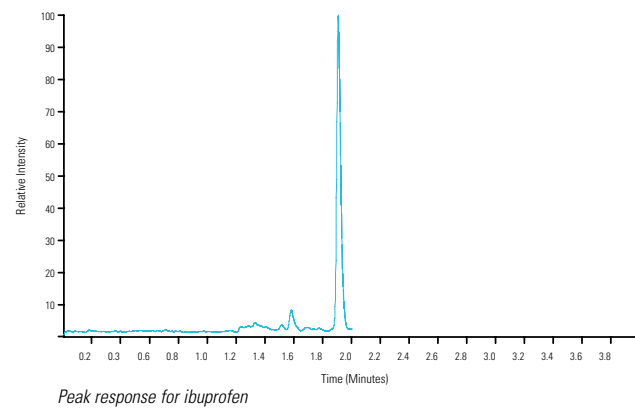
In the case of extraction of ibuprofen a four-fold pre-concentration was achieved without the need for dry down by loading 200 μ L of sample onto the SOLA μ plate and eluting in a total of 50 μ L. The results demonstrate that even with this low elution volume, excellent reproducibility was achieved.



The problem:
workflow requires
dry down to
achieve sensitivity



SOLA μ solution:
low elution volume
allows removal
of dry down



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

SOLA and SOLA μ 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 μ 96 Well Plates

Description	Bed Weight (mg)	Column Volume (mL)	Cat No.	Quantity
SOLA μ HRP	2	1	15261808	1 Each
SOLA μ SCX	2	1	15271808	1 Each
SOLA μ SAX	2	1	15281808	1 Each
SOLA μ WCX	2	1	15291808	1 Each
SOLA μ WAX	2	1	15201818	1 Each

SOLA SPE Cartridges

Description	Bed Weight (mg)	Column Volume (mL)	Cat No.	Quantity
SOLA HRP	10	1	11879163	100 Pack
SOLA SCX	10	1	11869163	100 Pack
SOLA SAX	10	1	11889163	100 Pack
SOLA WCX	10	1	15169653	100 Pack
SOLA WAX	10	1	15189653	100 Pack

SOLA 96 Well Plates

Description	Bed Weight (mg)	Well Volume (mL)	Cat No.	Quantity
SOLA HRP	10	2	11899163	1 Each
SOLA SCX	10	2	11809173	1 Each
SOLA SAX	10	2	15550163	1 Each
SOLA WCX	10	2	13493038	1 Each
SOLA WAX	10	2	15179653	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	12201188	50 Pack
	500	3	12201208	50 Pack
	500	6	12201168	30 Pack
	1,000	6	12201148	30 Pack
	2,000	12	12201128	20 Pack
	4,000	25	12201108	15 Pack
	20,000	60	12201088	10 Pack
pH=9	200	3	12201198	50 Pack
	500	3	12201218	50 Pack
	500	6	12201178	30 Pack
	1,000	6	12201158	30 Pack
	2,000	12	12201138	20 Pack
	4,000	25	12201118	15 Pack
	20,000	60	12201098	10 Pack

HyperSep SLE 96 Well Plates

Special treated diatomite SLE	Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
pH=7	200	2	11899123	1 Each
	300	2	12200829	1 Each
	400	2	12200849	1 Each
	500	2	12200869	1 Each
pH=9	200	2	12200819	1 Each
	300	2	12200839	1 Each
	400	2	12200859	1 Each
	500	2	12200879	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	10331435	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

HyperSep Lab Plates

Description	Cat. No. (Polystyrene)	Cat. No. (Polypropylene)	Quantity
C18	10289694	10594305	5 Pack
C8	10147514	10095624	5 Pack
C4	10763107	10544655	5 Pack
Hypercarb	10137594	10076454	5 Pack
Hypercarb and C18 (Mixed Mode)	10408484	10157794	5 Pack
Zirconium Dioxide	10723667	10753107	5 Pack
Titanium Dioxide	10138074	10279514	5 Pack
SCX	10524665	10714657	5 Pack
SAX	10127364	10468874	5 Pack

Applications:

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

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. (5-7µL Bed Volume)	Cat. No. (40µL Bed Volume)	Quantity
C18	10045694	10066254	1 Each
C8	10341055	10240145	1 Each
C4	10299694	10438104	1 Each
Hypercarb	10534285	10782137	1 Each
Hypercarb and C18 (Mix Mode)	10066174	10086454	1 Each
Zirconium Dioxide	10468474	10449444	1 Each
Titanium Dioxide	10793477	10544495	1 Each
SCX	10299514	10619095	1 Each
SAX	10744837	10259744	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. (1-10µL Capacity)	Cat. No. (10-200µL Capacity)	Quantity
Thermo Scientific™ BioBasic™ 18	10600184	10191213	96 Pack
BioBasic 8	10703487	10566375	96 Pack
BioBasic 4	10610184	10344083	96 Pack
Hypercarb	10456113	10223603	96 Pack
Hypercarb and C18 (mix mode)	10098952	10775174	96 Pack
HILIC	10223233	10465363	96 Pack
Trypsin	10426754	10055824	96 Pack
Titanium Dioxide	10059002	10652094	96 Pack
Zirconium Dioxide	10556005	10516015	96 Pack

HyperSep SpinTip Microscale Solid Phase Extraction Tips

Revolutionary micropipette tip for sample preparation

- Pipette tips with a 1 to 2µm wide slit at the bottom that permits the liquid to pass through but retains the chromatographic material (20 to 30µm)
- 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. (1-10µL Capacity)	Cat. No. (10-200µL Capacity)	Quantity
C18	10364513	10404603	96 Pack
C8	10488684	10488874	96 Pack
C4	10662094	10706334	96 Pack
Hypercarb	10314043	10111273	96 Pack
Hypercarb and C18 (mix mode)	10522075	10716334	96 Pack
HILIC	10304673	10314673	96 Pack
Trypsin	10611016	10426744	96 Pack
POROS Weak Anion Exchanger	10610046	10341145	96 Pack
POROS Strong Anion Exchanger	10620046	10498684	96 Pack
POROS Strong Cation Exchanger	10534085	10138004	96 Pack
Titanium Dioxide	10522265	10140503	96 Pack
Zirconium Dioxide	10065694	10535435	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	10595895	10176354	10635535	100 Pack
30	3	10259564	10382275	10772917	50 Pack
60	3	10505905	10471635	10635725	50 Pack
60	6	10269564	10466954	10055934	30 Pack
100	3	13406936	60107-317	12106590	50 Pack
100	6	10015894	10250145	10279904	30 Pack
150	3	60107-209	60107-309	60107-413	30 Pack
150	6	10279954	10620646	10046504	30 Pack
200	3	10448104	10554495	10117524	50 Pack
200	6	10565245	10712737	10404603	30 Pack
500	3	10351215	10036224	10595625	50 Pack
500	6	10618725	10046224	10075934	30 Pack
500	15	60107-219	60107-319	13466936	20 Pack
1,000	25	11514745	10496764	10270245	20 Pack
1,000	6	13436936	60107-318	60107-418	30 Pack
2,000	25	11504745	10382225	10260245	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	11507671	13436976	13476976	1 Each
60	1	13416976	13446976	13486976	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	10258124	10369444	10073584	1 Each
60	1	10661016	10066154	10076154	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	10714406	50 Pack
50	1	10786893	50 Pack
100	1	10513025	30 Pack
200	3	10190633	30 Pack
500	6	10233313	20 Pack
1,000	6	10748043	10 Pack
2,000	15	10026844	10 Pack

HyperSep Hypercarb 96 Fixed Well Plates

Bed Weight (mg)	Well Volume (mL)	Cat. No.	Quantity
10	1	13416986	1 Each
25	1	13496976	1 Each
50	1	13406986	1 Each

HyperSep Hypercarb 96 Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Cat. No.	Quantity
10	1	10009002	1 Each
25	1	10354083	1 Each
50	1	10101223	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	11830493	100 Pack
50	1	10610436	100 Pack
100	1	10571295	100 Pack
100	3	11514765	50 Pack
200	3	10631324	50 Pack
500	3	10434963	50 Pack
500	6	10098942	30 Pack
500	10	13476936	50 Pack
1,000	6	10344653	30 Pack
1,000	15	60108-776	20 Pack
2,000	15	10523364	20 Pack
2000	25	60108-780	20 Pack
5,000	25	10166203	20 Pack
10,000	75	10434445	10 Pack

HyperSep C18 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	13426986	60300-425	1 Each
25	1	13436986	60300-426	1 Each
50	1	13456986	60300-427	1 Each
100	1	13446986	60300-428	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	10514665	100 Pack
100	1	10089472	100 Pack
200	3	10584845	50 Pack
500	3	10444963	50 Pack
500	6	10171263	30 Pack
1,000	6	10330915	30 Pack
2,000	15	10167504	20 Pack
5,000	25	10733867	20 Pack
10,000	75	10703097	10 Pack

HyperSep C8 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	13466986	10513425	1 Each
25	1	13496986	10283593	1 Each
50	1	13486986	10485723	1 Each
100	1	13476986	10015874	1 Each

Applications:

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

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	10036414	100 Pack
100	1	10563985	100 Pack
200	3	10672284	50 Pack
500	3	10553985	50 Pack
500	6	10120743	30 Pack
500	10	13382120	50 Pack
1,000	6	10414603	30 Pack
2,000	15	10075674	20 Pack
5,000	25	10436934	20 Pack
10,000	25	13416946	20 Pack
10,000	75	10514105	10 Pack
50,000	150	13406946	10 Pack
20,000	75	13456826	10 Pack
70,000	150	13496936	10 Pack

HyperSep Silica 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	13446996	10495723	1 Each
25	1	13466996	10757883	1 Each
50	1	13456996	10553215	1 Each
100	1	13476996	10178024	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	60108-901	100 Pack
100	1	60108-902	100 Pack
100	10	60108-903	50 Pack
200	3	60108-904	50 Pack
200	10	60108-905	50 Pack
500	3	60108-906	50 Pack
500	6	60108-907	30 Pack
500	10	60108-908	50 Pack
1,000	6	60108-909	30 Pack
2,000	15	60108-910	20 Pack
5,000	25	60108-911	20 Pack
10,000	75	60108-912	10 Pack

HyperSep Acid Wash Silica 96 Fixed/Removable Well Plates

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

Applications:

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

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	10668535	100 Pack
100	1	10692664	100 Pack
200	3	10512455	50 Pack
500	3	10079472	50 Pack
500	6	10454593	30 Pack
1,000	6	10407134	30 Pack
2,000	15	10407894	20 Pack
5,000	25	10219694	20 Pack
10,000	75	10209274	10 Pack

HyperSep Phenyl 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	13406996	10561105	1 Each
25	1	13416996	10735973	1 Each
50	1	13436996	10099372	1 Each
100	1	13426996	10600436	1 Each

Applications:

- Extraction of aromatic compounds
- Extraction of basic analytes

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	10117754	100 Pack
100	1	10488854	100 Pack
200	3	10741937	50 Pack
500	3	10177734	50 Pack
500	6	10065864	30 Pack
1,000	6	10340955	30 Pack
2,000	15	10714457	20 Pack
5,000	25	10260145	20 Pack
10,000	75	10504295	10 Pack

HyperSep Diol 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	13477026	10514655	1 Each
25	1	13467026	10056204	1 Each
50	1	13487026	10713097	1 Each
100	1	60307-314	10157784	1 Each

Applications:

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

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	11557591	100 Pack
130	1	10796134	100 Pack
130	10	11544765	50 Pack
200	3	12676547	50 Pack
200	6	10557055	50 Pack
200	10	11567591	50 Pack
300	3	10130553	50 Pack
500	3	10300935	50 Pack
500	6	10058952	30 Pack
1,000	6	10629285	30 Pack

HyperSep Verify CX 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	13457006	10592445	1 Each
25	1	13477006	10424593	1 Each
50	1	13497006	10009192	1 Each
100	1	13487006	10545445	1 Each

Applications:

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

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	11547591	100 Pack
130	10	13486936	50 Pack
200	3	60108-768	30 Pack
200	6	10506205	50 Pack
200	10	11587671	50 Pack
300	3	10445923	50 Pack
500	3	10584495	50 Pack
500	6	10203083	30 Pack
1,000	6	10639285	30 Pack

HyperSep Verify AX 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	13407016	10672664	1 Each
25	1	13437016	10682664	1 Each
50	1	13417016	10660364	1 Each
100	1	13427016	10564125	1 Each

Applications:

- Analysis of THC and its metabolites

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	10147704	100 Pack
100	1	10273073	100 Pack
200	3	10157704	50 Pack
500	3	10384083	50 Pack
500	6	10776134	30 Pack
1,000	6	10447124	30 Pack
2,000	15	10361385	20 Pack
5,000	25	10249314	20 Pack
10,000	75	10448294	10 Pack
20,000	75	13426946	10 Pack
50,000	150	13446946	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	13427006	10631206	1 Each
25	1	13437006	10059182	1 Each
50	1	13447006	10110883	1 Each
100	1	13467006	10724627	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	10575615	100 Pack
100	1	10130743	100 Pack
200	3	10289414	50 Pack
500	3	10786134	50 Pack
500	6	10100693	30 Pack
1,000	6	10045724	30 Pack
2,000	15	10574465	20 Pack
5,000	25	10651006	20 Pack
10,000	75	10107714	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	13496996	10457894	1 Each
25	1	13407006	10728043	1 Each
50	1	13486996	10427073	1 Each
100	1	13417006	10085674	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	60108-201	100 Pack
100	1	60108-202	100 Pack
200	3	60108-203	50 Pack
200	10	60108-207	50 Pack
500	3	60108-204	50 Pack
500	6	60108-205	30 Pack
1,000	6	60108-206	30 Pack
2,000	15	60108-208	20 Pack
5,000	25	60108-209	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	60307-331	60300-841	1 Each
25	1	60307-332	60300-842	1 Each
50	1	60307-333	60300-843	1 Each
100	1	60307-334	60300-844	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	11577581	100 Pack
50	3	60108-429	50 Pack
100	1	10725764	100 Pack
200	3	10680046	50 Pack
500	3	10385053	50 Pack
500	6	10385003	30 Pack
1,000	6	10045824	30 Pack
2,000	15	10055634	20 Pack
5,000	25	10330955	20 Pack
10,000	75	10026164	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	13407026	10381235	1 Each
25	1	13497016	10555105	1 Each
50	1	13487016	10117454	1 Each
100	1	13417026	10259704	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	10620836	100 Pack
100	1	11527581	100 Pack
200	3	11814072	50 Pack
500	3	10344133	50 Pack
500	6	10203273	30 Pack
1,000	6	10394083	30 Pack
2,000	6	60108-758	30 Pack
2,000	15	10107414	20 Pack
5,000	25	10724057	20 Pack
10,000	75	10036844	10 Pack

HyperSep Florisil 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	13457016	10621134	1 Each
25	1	13447016	10028902	1 Each
50	1	13477016	10171163	1 Each
100	1	13467016	10585475	1 Each



Applications:

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

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	10556375	100 Pack
100	1	10755564	100 Pack
200	3	10121083	50 Pack
500	3	10765564	50 Pack
500	6	10213323	30 Pack
1,000	6	10364233	30 Pack
2,000	15	10239794	20 Pack
5,000	25	10417134	20 Pack
10,000	75	10630816	10 Pack

HyperSep Cyano 96 Fixed/Removable Well Plates

Bed Weight (mg)	Well Volume (mL)	Fixed Cat. No.	Removable Cat. No.	Quantity
10	1	13427026	10592255	1 Each
25	1	13437026	10444593	1 Each
50	1	13457026	10069472	1 Each
100	1	13447026	10783297	1 Each

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	11517651	1 Each
Positive Pressure Manifold with 16mm Collection Rack	13446926	1 Each
Adaptor Plate for 1mL Cartridges for PP Manifold	13486916	1 Each
Adaptor Plate for 3mL Cartridges for PP Manifold	13496916	1 Each
Adaptor Plate for 6mL Cartridges for PP Manifold	13406926	1 Each
Adaptor Plate for 10mL/15mL Cartridges for PP Manifold	13466926	1 Each
Collection Rack for 13mm Tubes	13426926	1 Each
Collection Rack for 16mm Tubes	15280349	1 Each
Pre-Drilled Waste Container	13416926	1 Each
Installation Kit	13436926	1 Each
In Line Air Filter	13456926	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



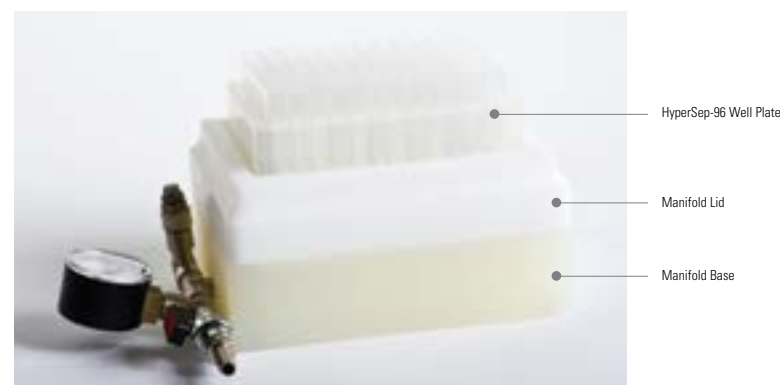
HyperSep Universal Vacuum Manifold

Description	Cat. No.	Quantity
Universal Vacuum Manifold	10641704	1 Each
Vacuum Pump, European Version	10419344	1 Each
Vacuum Pump, North American Version	10290715	1 Each
24 Well Extraction Plate	15277498	1 Each
48 Well Extraction Plate	12732947	1 Each
Plugs for 24-position Extraction Plate	10219474	24 Pack
Plugs for 48-position Extraction Plate	10321455	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	10283543	1 Each
Vacuum Pump, European Version	10419344	1 Each
Vacuum Pump, North American Version	10290715	1 Each

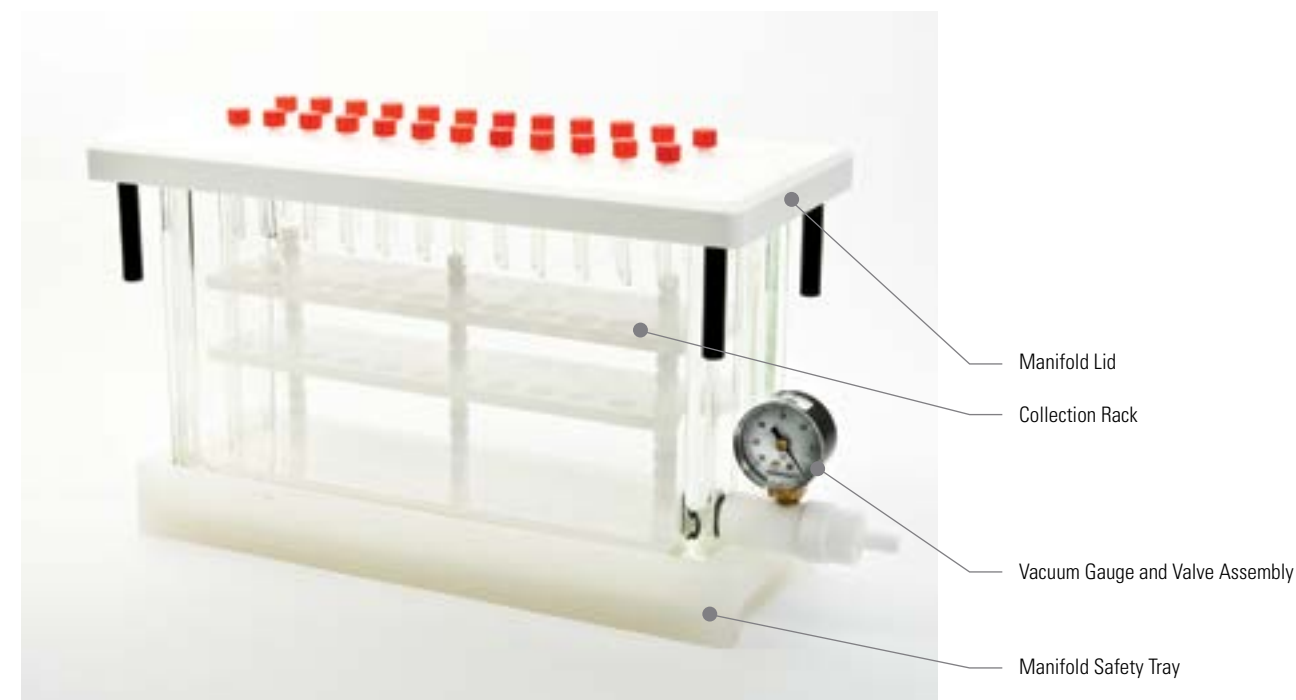
HyperSep Glass Block Manifolds

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. 11924576)

Retaining Clips for Collection Rack
(Cat. No. 10611226)

Bulkhead Luer Fittings
(Cat. No. 10678505)

Collection Rack
(Cat. No. 10361245 (16 port),
10289454 (24 port))



Vacuum Gauge
(Cat. No. 10352885)



Valve Assembly
(Cat. No. 10301245)



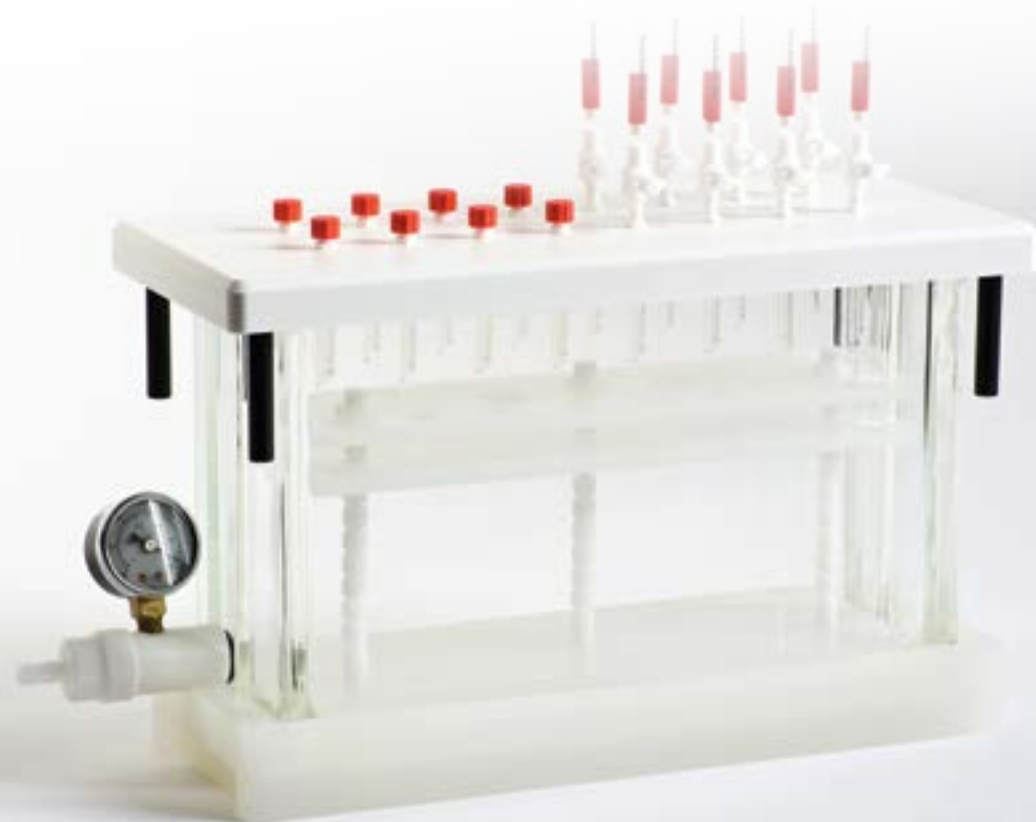
Tips
(Cat. No. 10699395)



Manifold Lid Legs
(Cat. No. 10147744)

HyperSep Glass Block Manifolds

Description	Cat. No.	Quantity
16-port Vacuum Manifold	10447263	1 Each
24-port Vacuum Manifold	10354413	1 Each
Vacuum Pump, European Version	10419344	1 Each
Vacuum Pump, North American Version	10290715	1 Each
Replacement Parts		
Vacuum Gauge	10352885	1 Each
Stopcocks for 16-port Vacuum Manifold	10692615	16 Pack
Stopcocks for 24-port Vacuum Manifold	11928168	24 Pack
Tips for Vacuum Manifold	10699395	12 Pack
Lid for 16-port Glass Block Manifold	10505045	1 Each
Lid for 24-port Glass Block Manifold	10187934	1 Each
Gasket for 16-port Manifold	10096694	1 Each
Gasket for 24-port Manifold	10362035	1 Each
Collection Rack for 16-port Vacuum Manifold	10361245	1 Each
Collection Rack for 24-port Vacuum Manifold	10289454	1 Each
Glass Block for 16-port Vacuum Manifold	10544115	1 Each
Glass Block for 24-port Vacuum Manifold	10498094	1 Each
Retaining Clips for Collection Rack	10611226	12 Pack
Bulkhead Luer Fittings	10678505	12 Pack
Manifold Lid Legs	10147744	4 Pack
Luer Lock Plugs	11924576	12 Pack
Column Adaptors	11939896	15 Pack
Manifold Safety Tray	10007654	1 Each
Vacuum Gauge and Valve Assembly	10301245	1 Each
Collection Rack Posts	15267498	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	10128044	10594275	10504855	10565225	4 Pack
3.0	10	10771957	10504285	10167694	10239314	4 Pack

HyperSep UNIGUARD Direct-Connect Online SPE Cartridges

ID (mm)	Length (mm)	Retain PEP	Retain CX	Retain AX	Hypercarb	Quantity
2.1	10	10259224	10259134	10005984	11584785	4 Pack
3.0	10	10187554	10783487	10772147	10015794	4 Pack

HyperSep HPLC Columns for Online SPE

ID (mm)	Length (mm)	Retain PEP	Retain CX	Retain AX	Hypercarb	Quantity
2.1	20	10578015	10199174	10547435	10240895	1 Each
3.0	20	10169044	10629375	10733976	10577435	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



HyperSep Dispersive SPE

Considerations in method development

- 1) 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
- 2) 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	11831082	11554725
4000mg anhydrous magnesium sulfate, 1000mg anhydrous sodium chloride	50	10269084	11564725
4000mg anhydrous magnesium sulfate, 1000mg sodium chloride, 1000mg sodium citrate tribasic dihydrate, 500mg disodium citrate sesquihydrate	50	11527671	11504735
6000mg anhydrous magnesium sulfate, 1500mg sodium chloride, 1500mg sodium citrate tribasic dihydrate, 750mg disodium citrate sesquihydrate	50	11557651	11574725
1500mg magnesium sulfate, 500mg C18	50	12693075	–

Each pack contains centrifuge tubes pre-packed with sorbents

HyperSep Dispersive SPE Multipacks

Description	Cat. No.	Quantity
4000mg anhydrous magnesium sulfate, 1000mg sodium chloride	12603085	50 Pack
4000mg anhydrous magnesium sulfate, 1000mg sodium chloride, 500mg sodium citrate dibasic sesquihydrate, 1000mg sodium citrate tribasic	12613085	50 Pack
4000mg anhydrous magnesium sulfate, 1000mg sodium acetate	12623085	50 Pack
6000mg anhydrous magnesium sulfate, 1500mg sodium acetate	12633085	50 Pack
6000mg anhydrous magnesium sulfate, 1500mg sodium chloride	12643085	50 Pack
6000mg anhydrous magnesium sulfate, 1500mg magnesium sulfate, 1500mg sodium citrate dihydrate, 750mg disodium citrate sesquihydrate	12653085	50 Pack
8000mg anhydrous magnesium sulfate, 2000mg of sodium chloride	13486816	50 Pack
8000mg anhydrous magnesium sulfate, 3500mg of sodium chloride	13496816	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	13486926	50 Pack
6000mg anhydrous magnesium sulfate, 1500mg sodium acetate (anhydrous)	13227979	50 Pack
6000mg anhydrous magnesium sulfate, 1500mg sodium chloride	13476926	50 Pack
6000mg anhydrous magnesium sulfate, 1500mg sodium chloride, 1500mg sodium citrate dihydrate, 750mg disodium citrate sesquihydrate	13406826	50 Pack
4000mg anhydrous magnesium sulfate, 1000mg sodium chloride, 500mg sodium citrate dibasic sesquihydrate, 1000mg sodium citrate tribasic	13496926	50 Pack
1200mg sodium chloride	13416936	50 Pack
4000mg sodium sulfate and 500mg anhydrous magnesium sulfate	13426936	50 Pack
4000mg anhydrous magnesium sulfate, 1000mg sodium chloride, 1500mg sodium citrate dibasic dihydrate	15217508	100 Pack
4000mg anhydrous magnesium sulfate, 2000mg sodium chloride, 1500mg sodium citrate dibasic dihydrate	15227508	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	11831282	15220359
150mg anhydrous magnesium sulfate, 50mg PSA	2	11891062	11524725
150mg anhydrous magnesium sulfate, 50mg PSA, 50mg C18	2	10794817	15230359
150mg anhydrous magnesium sulfate, 25mg PSA	2	10249644	11534735
150mg anhydrous magnesium sulfate, 25mg PSA, 25mg C18	2	11524715	11544735
150mg anhydrous magnesium sulfate, 25mg PSA, 2.5mg GCB	2	11534715	15250359
150mg anhydrous magnesium sulfate, 25mg PSA, 7.5mg GCB	2	11544715	11554735
150mg anhydrous magnesium sulfate, 50mg PSA, 50mg C18, 50mg GCB	2	10320885	15260359
150mg anhydrous magnesium sulfate, 50mg PSA, 50mg chlorofiltr™	2	15290349	–
150mg anhydrous magnesium sulfate, 150mg PSA	2	–	15220369

Description	Capacity (mL)	Cat. No. (100 Pack)	Cat. No. (10 Pack)
900mg anhydrous magnesium sulfate, 300mg PSA, 150mg GCB	15	11851082	11534725
900mg anhydrous magnesium sulfate, 300mg PSA, 150mg C18	15	10769145	15207508
750mg anhydrous magnesium sulfate, 250mg PSA, 250mg C18, 250mg GCB	15	10259954	11584725
900mg anhydrous magnesium sulfate, 300mg PSA	15	10619875	15240359
900mg anhydrous magnesium sulfate, 150mg PSA	15	10650446	11594725
900mg anhydrous magnesium sulfate, 150mg PSA, 45mg GCB	15	10117364	11514735
900mg anhydrous magnesium sulfate, 150mg PSA, 15mg GCB	15	10428664	11524735
1200mg anhydrous magnesium sulfate, 400mg PSA	15	11564715	15270359
1200mg anhydrous magnesium sulfate, 400mg PSA, 400mg C18	15	11574715	15280359
1200mg anhydrous magnesium sulfate, 400mg PSA, 400mg C18, 400mg GCB	15	10301995	15290359
900mg anhydrous magnesium sulfate, 150mg PSA, 150mg C18	15	10066344	11564735
150mg anhydrous magnesium sulfate, 50mg PSA, 50mg GCB	15	10649275	15200369
150mg anhydrous magnesium sulfate, 300mg PSA, 150mg chlorofiltr	15	10497724	15210369
1200mg anhydrous magnesium sulfate, 900mg PSA	15	15287498	–
4000mg anhydrous magnesium sulfate, 1000mg sodium chloride, 1000mg sodium citrate tribasic dihydrate, 500mg sodium citrate dibasic sesquihydrate	15	15297498	–
150mg anhydrous magnesium sulfate, 150mg PSA, 50mg C18	15	15210359	–

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	10639685	30 Pack
500mg PSA on bottom, 250mg GCB on top, separated by a frit	6	10289954	30 Pack
500mg PSA on bottom, 500mg GCB on top, separated by a frit	6	10127814	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

Syringes and Filtration Technical Resources



visit 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	13416896	100 Pack
	0.45	No	13416906	100 Pack
17	0.2	No	13486796	200 Pack
	0.45	No	13456906	200 Pack
30	0.2	Yes	13476896	100 Pack
	0.45	Yes	13406916	100 Pack
	0.45	No	13466916	100 Pack
	1.5	No	13486886	100 Pack
	5	No	13456916	100 Pack

Titan3 PTFE (Hydrophobic) Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	13517760	100 Pack
	0.45	No	13577770	100 Pack
17	0.2	No	13567760	200 Pack
	0.45	No	13527780	200 Pack
30	0.2	Yes	13416826	100 Pack
	0.45	Yes	13426826	100 Pack
	1.0	No	12622613	100 Pack

Titan3 PTFE (Hydrophilic) Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
17	0.2	No	13567760	200 Pack
	0.45	No	13527780	200 Pack
30	0.2	No	13416826	100 Pack
	0.45	No	13426826	100 Pack

Titan3 PVDF Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	13406896	100 Pack
	0.45	No	13446906	100 Pack
17	0.2	Yes	13456896	200 Pack
	0.45	No	13486906	200 Pack
30	0.2	Yes	13496896	100 Pack
	0.45	No	13446916	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	13557790	100 Pack
	0.45	No	13527800	100 Pack
17	0.2	Yes	13577790	200 Pack
	0.45	No	13517800	200 Pack
30	0.2	Yes	13597790	100 Pack
	0.45	No	13577800	100 Pack

Titan3 PES (Polyethersulfone) Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
17	0.2	No	13446896	200 Pack
	0.45	No	13496906	200 Pack
30	0.2	Yes	13486896	100 Pack
	0.45	No	13426916	100 Pack

Titan3 GMF (Glass Microfiber) Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
30	0.7	No	13416786	100 Pack
	1.2	No	13406786	100 Pack
	3.1	No	13426906	100 Pack

Titan3 Polypropylene Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
17	0.2	No	13436896	200 Pack
	0.45	No	13476906	200 Pack
30	0.2	No	13406906	100 Pack
	0.45	No	13436916	100 Pack

Titan3 Cellulose Acetate Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	13496886	100 Pack
	0.45	No	13436906	100 Pack
17	0.2	No	13426896	100 Pack
	0.45	No	13466906	100 Pack
30	0.2	No	13466896	100 Pack
	0.45	No	13416916	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	10351115	100 Pack
	0.45	No	11985693	100 Pack
17	0.2	No	10127794	100 Pack
	0.45	No	10301345	100 Pack
30	0.2	No	10085634	100 Pack
		Yes	10198894	100 Pack
	0.45	No	10631416	100 Pack
		Yes	10057444	100 Pack
	1.5	No	10458304	100 Pack
5.0	No	10782707	100 Pack	

Applications:

- General laboratory filtration
- Filtration for most HPLC samples

Target2 PTFE Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	10055984	100 Pack
	0.45	No	10007354	100 Pack
17	0.2	No	10187834	100 Pack
	0.45	No	10353015	100 Pack
30	0.2	No	10608615	100 Pack
		No	10189524	100 Pack
	0.45	Yes	10209134	100 Pack
1.0	No	10117614	100 Pack	

Applications:

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

Target2 PVDF Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	10576575	100 Pack
	0.45	No	10026174	100 Pack
17	0.2	No	10774247	100 Pack
	0.45	No	10269554	100 Pack
30	0.2	No	10618615	100 Pack
	0.45	No	10095634	100 Pack

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	10586005	100 Pack
	0.45	No	10036364	100 Pack
17	0.2	No	10037124	100 Pack
	0.45	No	10027124	100 Pack
30	0.2	No	10313025	100 Pack
	0.45	No	10017314	100 Pack

Applications:

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

Target2 PES (Polyethersulfone) Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
17	0.2	No	10017364	100 Pack
	0.45	No	10446684	100 Pack
30	0.2	No	10290855	100 Pack
	0.45	No	10210905	100 Pack

Applications:

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

Target2 GMF (Glass Microfiber) Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
30	0.7	No	10353465	100 Pack
	1.2	No	10352575	100 Pack
	3.1	No	10690706	100 Pack

Applications:

- Dissolution testing
- General filtration

Target2 Polypropylene Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	10638915	100 Pack
	0.45	No	10586575	100 Pack
17	0.2	No	10391205	100 Pack
	0.45	No	10549755	100 Pack
30	0.2	No	10065734	100 Pack
	0.45	No	10537835	100 Pack
		Yes	10772717	100 Pack

Applications:

- Filtration of biological samples
- Filtration of aggressive organic solutions

Target2 Cellulose Acetate Syringe Filters

Diameter (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	10058184	100 Pack
	0.45	No	10199524	100 Pack
17	0.2	No	10109564	100 Pack
	0.45	No	10713016	100 Pack
30	0.2	No	10159494	100 Pack
	0.45	No	10331075	100 Pack

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
Luer-Slip Syringes		
1	10280655	100 Pack
3	10608435	100 Pack
5	10271245	100 Pack
10	10178894	100 Pack
20	10785126	100 Pack
30	10313015	50 Pack
50	11901563	30 Pack
Luer Lock Syringes		
3	10362725	100 Pack
5	10744366	100 Pack
10	11991553	100 Pack
20	10302685	100 Pack

750µL Micro-Centrifugal Filters, Non-Sterile

Filter volumes as low as 50µL with low hold-up volume

- Filter volumes as low as 50µL up to 750µL 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



750µL Micro-Centrifugal Filters, Non-Sterile

Material	Pore Size (µm)	Cat. No.	Quantity
Cellulose Acetate	0.2	10639375	100 Pack
Cellulose Acetate	0.45	10743976	100 Pack
Nylon	0.2	10457234	100 Pack
Nylon	0.45	10129254	100 Pack
PVDF	0.2	10519555	100 Pack
PVDF	0.45	10169424	100 Pack
Regenerated Cellulose	0.2	11978846	100 Pack
Regenerated Cellulose	0.45	10179514	100 Pack
PTFE	0.2	10137404	100 Pack
PTFE	0.45	10459624	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	10201345	25 Pack
Cellulose Acetate	0.45	10608625	25 Pack
Nylon	0.2	10477254	25 Pack
Nylon	0.45	10097694	25 Pack
PVDF	0.2	10753016	25 Pack
PVDF	0.45	10017304	25 Pack
PTFE	0.2	10077344	25 Pack
PTFE	0.45	10587435	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	13476786	50 Pack
Cellulose Acetate	0.45	12604843	50 Pack
Nylon	0.2	10638815	50 Pack
Nylon	0.45	10139534	50 Pack
PVDF	0.2	10669855	50 Pack
PVDF	0.45	11975693	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.

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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



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

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Premium Vials and Closures	2-009	Chromacol Caps and Septa Comparison Chart	2-090
National Vials and Closures	2-015	Crimping and Decrimping Tools	2-092
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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

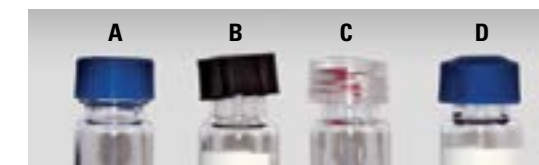
AVCS Closures and SureStop Vials

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

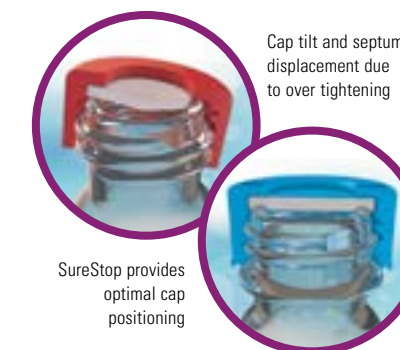
Top reasons why chemists should consider Advanced Vial Closure System (AVCS) closures and SureStop vials

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



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.

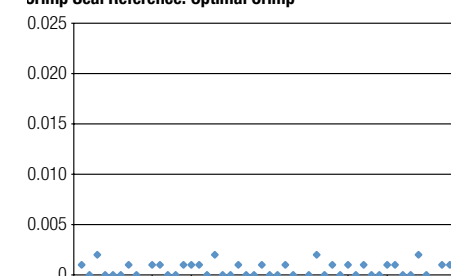


A study of the effects of the typical operator response to evaporative sample loss and septum dislodging during the use of 9 mm screw thread and 11 mm crimp vials and closures was conducted. Sample losses were measured for both overtightened vials and for vials perceived to be optimally tightened and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

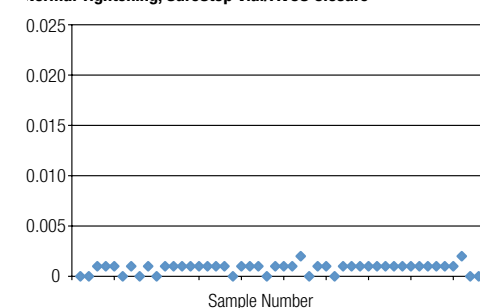
Test conditions

- 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

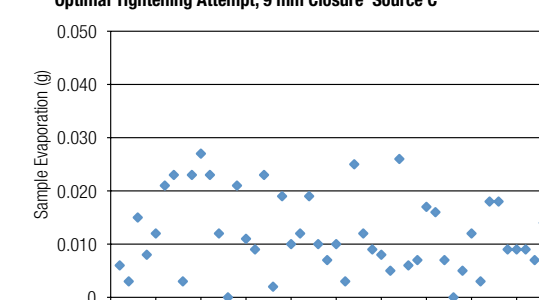
Crimp Seal Reference: Optimal Crimp



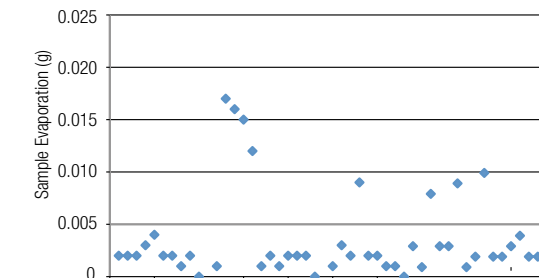
Normal Tightening, SureStop Vial/AVCS Closure



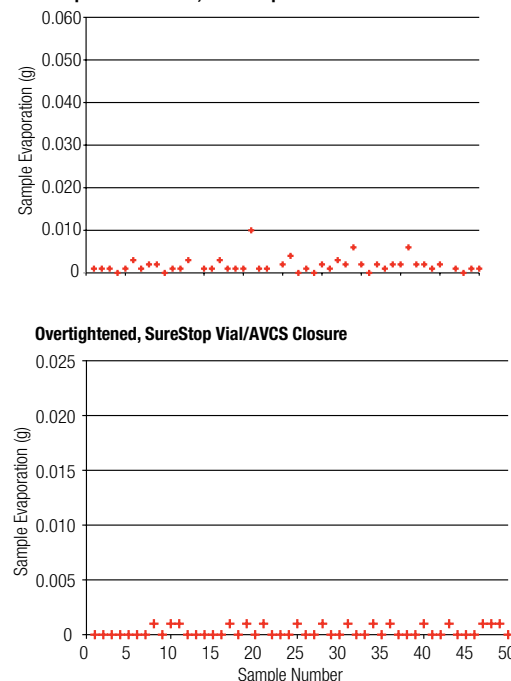
Optimal Tightening Attempt, 9 mm Closure Source C



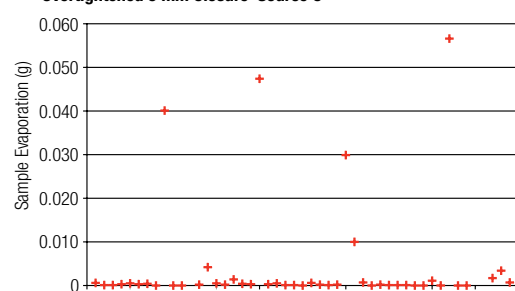
Optimal Tightening Attempt, 9 mm Closure Source D



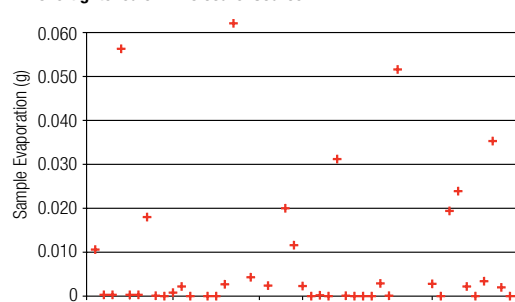
Crimp Seal Reference, Overcrimped



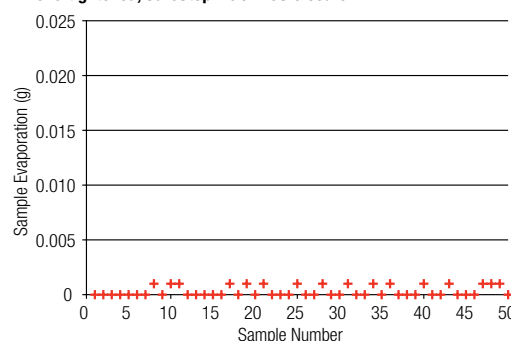
Overtightened 9 mm Closure Source C



Overtightened 9 mm Closure Source D



Overtightened, SureStop Vial/AVCS Closure

**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	15201918	1
Virtuoso 9mm Wide Opening SureStop Screw Thread Vial, 2mL, Clear Glass with V-Patch	15211918	100
Virtuoso 9mm Wide Opening SureStop Screw Thread Vial, 2mL, Amber Glass with V-Patch	15221918	100
Virtuoso 11mm Wide Opening Crimp Top Vial, 2mL, Clear Glass with V-Patch	15231918	100
Virtuoso 11mm Wide Opening Crimp Top Vial, 2mL, Amber Glass with V-Patch	15508760	100
Virtuoso 11mm Wide Opening Snap-It Vial, 2mL, Clear Glass with V-Patch	15241918	100
Virtuoso 11mm Wide Opening Snap-It Vial, 2mL, Amber Glass with V-Patch	60180-VT303A	100
Virtuoso 9mm SureStop Screw Thread High Recovery Vial 2mL, Clear Glass with V-Patch	15413031	100
Virtuoso 9mm SureStop Screw Thread Total Recovery Vial 2mL, Clear Glass with V-Patch	60180-VT309TR	100
Virtuoso 9mm SureStop Screw Thread Fused Insert MacroVial, 350uL, Clear Glass with V-Patch	15373029	100
Virtuoso 9mm SureStop Screw Thread Fused Insert MacroVial, 350uL, Amber Glass with V-Patch	15373029A	100
Virtuoso 9mm Wide Opening SureStop Screw Thread Vial, Convenience Kit Kit Contains 15211918 & 13206399	15251918	100
Virtuoso 9mm Wide Opening SureStop Screw Thread Vial, Convenience Kit Kit Contains 15211918 & 13296389	15261918	100
Virtuoso 9mm Wide Opening SureStop Screw Thread Vial, Convenience Kit Kit Contains 15211918 & 13486129	15271918	100
Virtuoso 11mm Wide Opening Crimp Top Vial, Convenience Kit Kit Contains 15231918 & 10734556	60180-VT403	100
Virtuoso 11mm Wide Opening Snap-It Vial Convenience Kit, Kit Contains 15241918A & 12443758	60180-VT404A	100
Virtuoso 9mm Wide Opening SureStop Screw Thread Vial, Convenience Kit Kit Contains 15211918 & 13226399	15480080	100
Virtuoso Mass Spec Certified 9mm SureStop Kit, Kit Contains 15373029A & 15368026	60180-VTMS72LV	100
Virtuoso Mass Spec Certified 9mm SureStop Kit, Kit Contains MSCERT15221918 & MS13266409	15450683	100
Virtuoso Replacement Tape	15281918	1
Virtuoso Multi Vial Holder	15291918	5
Virtuoso Vial Collection Tray	15201928	3
Virtuoso Screen Protector	60180-VT503	1
Virtuoso Multi Vial Guide	60180-VT504	1

Innovative Vial Unmatched Performance

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

SureStop™ Vials with AVCS Closures

AVCS
Advanced Vial Closure System



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



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	10236703	100
	Amber	Yes	12x32	Flat Bottom	2.0	1.5	<170	10713074	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	–	–	–	10732114	100
8mm Open Top Screw Cap, flanged, 8-425 thread, 5.5mm hole	Pink	Polypropylene	–	–	–	13111753	100
Septum for 8-425 Screw Caps	–	–	Blue Silicone/PTFE	30	1.1	10387713	500
	–	–	White Silicone/Red PTFE	50	1.5	11503830	100
8mm Open Top Screw Cap with flange, 8-425 thread, 5.5mm hole	Pink	Polypropylene	Red PTFE/White Silicone	45	1.3	13121753	100
	Pink	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	0.9	13131753	100
8mm Open Top Screw Cap, 8-425 thread, 5.5mm hole	Pink	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	13151753	100
	Pink	Polypropylene	Red PTFE/White Silicone/Red PTFE	45	1.0	13161753	100
	Pink	Polypropylene	Red PTFE/White Silicone	45	1.3	13171753	100

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

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

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	10236703	10732114/10387713	11543830	1000
	Clear	Yes	Black	Red PTFE/White Silicone	10236703	10732114/11503830	10246133	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



* 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	10083623	100
9mm Screw Thread Vial	Clear	Yes	12x32	Flat Bottom	2.0	1.5	<170	10299404	100
	Clear	No	12x32	Flat Bottom	2.0	1.5	<170	11593850	1000
	Amber	Yes	12x32	Flat Bottom	2.0	1.5	<170	10138044	100
	Amber	Yes	12x32	Flat Bottom	2.0	1.5	<170	13436826	1000
	Clear	No	15x46	Flat Bottom	4.0	3.5	<500	10143993	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	10296653	100
	Blue	Polypropylene	Red PTFE/White Silicone	55	1.0	11553860	1000
	Blue	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	11543860	1000
	Pink	Polypropylene	Red PTFE/White Silicone	55	1.0	13111763	100
	Pink	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	13191753	100
	Pink	Polypropylene	Red PTFE/White Silicone/Red PTFE	45	1.0	13107763	100
	Pink	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	13121763	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	10299404	10296653	10702547	100
	Clear	Yes	Pink	Red PTFE/White Silicone	11593850	13111763	13141773	100
	Amber	No	Pink	Red PTFE/White Silicone	13436826	13111763	13181773	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



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	10147404	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	10301195	100
11mm Crimp Cap, 5.5mm center hole	Silver	Aluminum	Red PTFE/White Silicone	45	1.3	11523840	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	10147404	10301195	10220435	100
	Clear	Yes	Silver	White Silicone/Red PTFE	10147404	11523840	10390875	100

11mm Crimping Tool

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 11mm aluminum crimp seals	11528470	1

Compatible with:

Most HPLC and GC autosamplers
For autosampler compatibility visit
www.thermoscientific.com/chromexpert

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



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	11563840	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	13476946	1000
	Pink	Polyethylene	Clear PTFE/Synthetic Red Rubber	60	1.0	13151763	100
	Pink	Polyethylene	Red PTFE/White Silicone	45	1.3	13161763	100
	Pink	Polyethylene	Red PTFE/White Silicone, Star-slit	45	1.3	13171763	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	11563840	13151763	13181763	100
	Clear	No	Pink	Red PTFE/White Silicone	11563840	13161763	13191763	100

We offer electronic crimping options

Visit **PAGE 2-092**

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

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	10035774	125
	Amber	No	22.5x46	Beveled Edge	Round Bottom	12	10	10330925	125
	Clear	Yes	22.5x75	Beveled Edge	Round Bottom	21	20	11573810	125
	Clear	No	22.5x75	Beveled Edge	Round Bottom	21	20	13456946	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	–	–	–	10554095	100
20mm Composite Magnetic Crimp Cap, 8mm hole	Blue	Alu/Tinplate	–	–	–	10713487	100
Stopper for 20mm Crimp Caps	–	–	20mm Gray Butyl Stopper	37	3.0	11583870	1000
Septum for 20mm Crimp Caps	–	–	Natural PTFE/Blue Silicone	45	3.2	10147784	100
20mm Crimp Cap, 8mm hole	Silver	Aluminum	20mm Gray Chlorobutyl/Gray PTFE	52	3.0	10772707	100
20mm Crimp Cap, 9.5mm hole	Silver	Aluminum	Natural PTFE/Blue Silicone	45	3.2	10629105	100
20mm Composite Magnetic Crimp Cap, 8mm hole	Blue	Alu/Tinplate	Natural PTFE/Blue Silicone	45	3.2	10046074	100

20mm Crimping and Decrimping Tools

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 20mm crimp seals	11538470	1
Manual Decrimper	Removes 20mm crimp seals without vial damage	11564815	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.

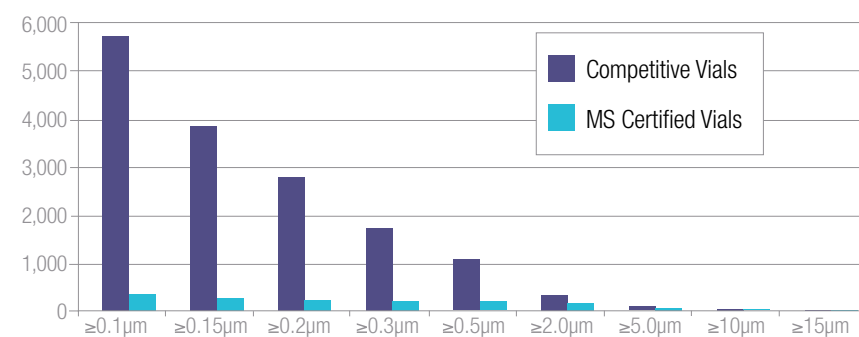
Thermo Scientific MS Certified Vials undergo a proprietary cleaning process that greatly reduces the background particulates along with their potential effect on high sensitivity chromatography. The table gives a comparison of the particle distribution obtained from an analysis of standard vials versus 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 0.5µm. 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	≥0.1µm	≥0.15µm	≥0.2µm	≥0.2µm	≥0.5µm	≥2.0µm	≥5.0µm	≥10µm	≥15µm
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	15220399	100
	Amber	Yes	Blue	Blue Silicone/PTFE	15230399	100
	Clear	Yes	Blue	Blue Silicone/PTFE, Pre-slit	15210399	100
	Amber	Yes	Blue	Blue Silicone/PTFE, Pre-slit	15240399	100
Convenience Kit, 9mm 200µL Fused Insert Screw Vial	Clear	Yes	Blue	Bonded Clear PTFE/Clear Silicone	15358056	100
Convenience Kit, 9mm 350µL Fused Insert Screw Vial	Clear	Yes	Blue	Bonded Clear PTFE/Clear Silicone	15378056	100
Convenience Kit, 9mm Wide Opening 1.7mL High Recovery Screw Vial with 30µL Reservoir	Clear	No	Blue	Bonded Clear PTFE/Clear Silicone	15388056	100
Convenience Kit, 9mm Wide Opening 1.5mL Total Recovery Screw Vial with 10µL Reservoir	Clear	No	Blue	Bonded Clear PTFE/Clear Silicone	15398056	100
	Clear	Yes	Blue	Bonded Clear PTFE/Clear Silicone	15308066	100
Convenience Kit, 9mm Wide Opening Screw Vial, 2mL	Amber	Yes	Blue	Bonded Clear PTFE/Clear Silicone	15318066	100
	Clear	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	15328066	100
Convenience Kit, 9mm 200µL Fused Insert Screw Vial	Clear	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	15338066	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	15359464	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	15348066	100
	Clear	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	15358066	100
Convenience Kit, 9mm Wide Opening Screw Vial, 2mL	Amber	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	15368066	100
	Clear	Yes	Blue	Bonded Clear PTFE/Clear Silicone	15378066	100
	Amber	Yes	Blue	Bonded Clear PTFE/Clear Silicone	15388066	100
	Clear	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	15374654	100
Convenience Kit, 9mm Wide Opening Screw Vial, 2mL, silanized	Amber	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	15398066	100
	Clear	Yes	Red	Clear PTFE/Clear Silicone, Pre-slit	12633595	100
Convenience Kit, 11mm Snap Top Vial, 2mL	Clear	Yes	Red	Clear PTFE/Clear Silicone, Pre-slit	12633595	100
Assembled Kit, 9mm Wide Opening Screw Vial, 2mL	Clear	Yes	Blue	Bonded Clear PTFE/Clear Silicone	15338056	100
	Amber	Yes	Blue	Bonded Clear PTFE/Clear Silicone	15348056	100
Assembled Kit, 13-425 Screw Vial, 4mL	Clear	Yes	Black	Bonded Clear PTFE/Clear Silicone	12663595	100
	Amber	Yes	Black	Bonded Clear PTFE/Clear Silicone	12673595	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	14849810	13296389	15210389	100
	Amber	Yes	Blue	Ivory PTFE/Red Rubber	14879810	13296389	15220389	100
	Clear	Yes	Blue	Red PTFE/White Silicone	14849810	13486129	15200389	100
	Amber	Yes	Blue	Red PTFE/White Silicone	14879810	13486129	15280379	100
	Clear	Yes	Blue	Blue PTFE/White Silicone, Pre-slit	14849810	13226399	15230389	100
	Amber	Yes	Blue	Blue PTFE/White Silicone, Pre-slit	14879810	13226399	15290379	100
Convenience Kit, Certified 9mm Wide Opening Screw Vial, 2mL	Clear	No	Blue	Ivory PTFE/Red Rubber	11975703	13296389	15240389	100
	Clear	Yes	Blue	Ivory PTFE/Red Rubber	11548240	13296389	15250389	100
	Amber	Yes	Blue	Ivory PTFE/Red Rubber	11921523	13296389	15260389	100
	Clear	Yes	Blue	Red PTFE/White Silicone	11548240	13486129	15270389	100
Convenience Kit, Certified 9mm Wide Opening High Recovery Screw Vial, 1.7mL	Clear	No	Black	Bonded Red PTFE/White Silicone	11568240	15368026	15398046	100
Convenience Kit, Certified 9mm Wide Opening Screw Vial, 2mL	Clear	Yes	Black	Bonded Red PTFE/White Silicone	11548240	15368026	15368046	100
	Amber	Yes	Black	White Silicone	11921523	15368026	15358046	100
Convenience Kit, Certified 9mm Screw Vial, 350µL Fused Insert	Clear	Yes	Black	Bonded Red PTFE/White Silicone	10578965	15368026	15318046	100
	Amber	Yes	Black	White Silicone	10429264	15368026	15338046	100
Convenience Kit, Certified 10-425 Screw Vial, 2mL	Clear	Yes	Black	Bonded Red PTFE/White Silicone	11991513	C4010-68A	11901553	100
Convenience Kit, Certified 13-425 Screw Vial, 4mL	Clear	No	Black	Bonded Red PTFE/White Silicone	12400178	12420228	11931553	100
Convenience Kit, Certified 9mm Wide Opening High Recovery Screw Vial, 1.7mL	Clear	No	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	11568240	15338036	15378046	100
Convenience Kit, Certified 9mm Wide Opening Screw Vial, 2mL	Clear	Yes	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	11548240	15338036	15368016	100
	Amber	Yes	Gray	Clear Silicone, Pre-slit	11921523	15338036	15364654	100
Convenience Kit, Certified 9mm Wide Opening Total Recovery Screw Vial, w/10µL Reservoir	Clear	No	Gray	Bonded Clear PTFE/Clear Silicone, Pre-slit	11317381	15338036	15308056	100
Convenience Kit, Certified Shell Vial 1mL with SepCap	Clear	No	Natural	Integral Molded Polyethylene	–	–	11951563	200
Convenience Kit, Certified Crimp Top Vial, 2mL	Clear	Yes	Silver	PTFE/Synthetic Red Rubber	11981513	–	10067114	100
Assembled Kit, Certified 9mm Wide Opening Screw Vial, 2mL	Amber	Yes	Black	Bonded Red PTFE/White Silicone	11921523	15368026	15388036	100
	Clear	Yes	Gray	Bonded Red PTFE/White Silicone, Pre-slit	11548240	15338036	15308046	100
	Amber	Yes	Gray	White Silicone, Pre-slit	11921523	15338036	15398036	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

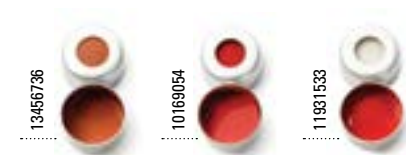
For autosampler compatibility visit www.thermoscientific.com/chromexpert

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	11921533	100
	Clear	No	6x32	Conical Base	250	200	<2	10712846	100
	Amber	No	7x30	Conical Base	550	400	<3	12433598	100
	Amber	No	7x40	Conical Base	575	450	<2	12453598	100
	Clear	No	7x40	Flat Base	775	650	<70	10097124	100
	Amber	No	7x40	Flat Base	775	650	<70	10661006	100
	Clear	No	8x30	Flat Base	800	800	<80	12423588	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	13456736	200
	Silver	Aluminum	Red PTFE/White Silicone/Red PTFE	45	1.0	10169054	200
	Silver	Aluminum	Red PTFE/White Silicone	45	1.3	11931533	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	10147664	1
Decapping Pliers	Removes 8mm aluminum crimp seals, Protective gloves recommended	10680056	1
Manual Decrimper	Removes 8mm aluminum crimp seals without vial damage	10259614	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



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	11999197	100
	Clear	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	12430108	1000
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	10466844	100
	Amber	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	11995703	100
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	13424016	100
8-425 Screw Thread Vial, silanized*	Clear	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	12698655	100
8-425 Screw Thread 250µL Conical MicroVial	Polypropylene	No	12x32	Conical	475µL	250µL	<4	12460098	100
8-425 Screw Thread 600µL Tapered MicroVial	Polypropylene	No	12x32	High Recovery	850µL	675µL	<8	12410108	1000
200µL MicroSert Insert	Clear	–	5x31	Flat Bottom	250µL	200µL	<12	10119084	500
150µL Polyspring Insert	Clear	–	5x29	Pulled point	200µL	175µL	<1	10538215	100
150µL Insert	Clear	–	5x29	Pulled point	200µL	175µL	<1	12440088	100
125µL Polyspring Insert	Polypropylene	–	5x29	Precision point	175µL	125µL	<2	12470088	100
150µL Polyspring Insert, silanized*	Clear	–	5x29	Pulled point	200µL	175µL	<1	12450098	100

* For information about silanized products visit 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	–	–	–	12400118	100
8mm Open Top Cap with flange, 5.5mm hole	Black	Polypropylene	–	–	–	13170983	100
	Yellow	Polypropylene	–	–	–	12440158	1000
	White	Polypropylene	–	–	–	12430158*	100
Septum for 8-425 Screw Caps	–	–	White Virgin PTFE, 0.01" Septum	53	0.25	12480098	1000
	–	–	Ivory PTFE/Red Rubber Septum	45	1.00	12450118	100
	–	–	Blue PTFE/White Silicone, Pre-slit Septum	55	0.90	12470118	100
	–	–	Red PTFE/White Silicone/ Red PTFE Septum	45	1.00	12490118	100
	–	–	Red PTFE/White Silicone Septum	45	1.30	13180983	100
	–	–	Tan PTFE/White Silicone Septum	45	1.50	12420138	1000
	8mm Open Top Cap, 5.5mm hole	Black	Polypropylene	Ivory PTFE/Red Rubber	45	1.00	12460118
Black		Polypropylene	Red PTFE/White Silicone/Red PTFE	45	1.00	12410128	100
Black		Polypropylene	Red PTFE/White Silicone	45	1.30	11935713	100
Pink		Polypropylene	Red PTFE/White Silicone	45	1.30	15297298	100
8mm Open Top Cap with flange, 5.5mm hole	Black	Polypropylene	Red PTFE/White Silicone	45	1.30	12490138	100
	White	Polypropylene	Red PTFE/White Silicone	45	1.30	11909207	100
	Yellow	Polypropylene	Red PTFE/White Silicone	50	1.30	C4013-63Y	100
	Black	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	0.90	11945713	100
	White	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	0.90	10459434	100
8mm Open Top Cap, 5.5mm hole	Black	Phenol	Red PTFE/White Silicone	45	1.30	12460148	100
8mm Open Top Cap with flange, 5.5mm hole	Black	Polypropylene	Red PTFE/White Silicone, Pre-slit	55	1.00	10584855	100
8mm Solid Top Cap, 8-425 thread	White	Urea	PTFE/PE Foam Liner	–	1.30	12458636	100
8mm Open Top Cap, 5.5mm hole	Black	Polypropylene	Bonded Red PTFE/White Silicone, Pre-slit	45	1.30	12440148	100
8mm Open Top Cap with flange with Integral PE Membrane	Yellow	Polyethylene	Polyethylene	N/A	N/A	C4013-50Y	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	11999197	12490138	10241965	100	
	Clear	No	Black	Red PTFE/White Silicone	11999197	11935713	11377371	100	
	Clear	No	Pink	Red PTFE/White Silicone	11999197	15297298	12601096	100	
	Amber	No	Black	Red PTFE/White Silicone	11995703	11935713	12470108	100	
	Clear	Yes	Black, flanged	Red PTFE/White Silicone, Pre-slit	10466844	10584855	10577245	100	
	Clear	No	Black, phenolic	Red PTFE/White Silicone	11999197	12460148	12440128	100	
	Clear	Yes	Yellow, flanged	Red PTFE/White Silicone	10466844	C4013-63Y	C4013-54Y	100	
	Clear	Yes	Yellow, flanged	Red PTFE/White Silicone/Red PTFE	10466844	C4013-67Y	C4013-97Y	100	
	Assembled Kit	Clear	No	Black	White Virgin PTFE, 0.01"	11999197	12400118/ 12480098	11955673	100
Clear		No	Black	Red PTFE/White Silicone	11999197	11935713	11965673	100	
Amber		No	Black	Red PTFE/White Silicone	11995703	11935713	11975673	100	
Clear		No	Black, flanged	Blue PTFE/White Silicone, Pre-slit	11999197	13170983/ 12470118	11905683	100	
Clear		Yes	Yellow, flanged	Red PTFE/White Silicone, Pre-slit	10466844	12440158/ C4013-60TW	11915683	100	
Clear		No	Black, flanged	Red PTFE/White Silicone	11999197	12490138	11985683	100	
Clear		No	White, flanged	Red PTFE/White Silicone	11999197	11909207	11905693	100	
Clear		No	Black, phenolic	Red PTFE/White Silicone	11999197	12460148	11965683	100	
Amber		No	Black, phenolic	Red PTFE/White Silicone	11995703	12460148	11975683	100	
Assembled Kit, in Polybag		Clear	No	Black	White Virgin PTFE, 0.01"	11999197	12400118/ 12480098	11901613	100
		Clear	Yes	Yellow, flanged	Red PTFE/White Silicone	10466844	C4013-63Y	C4013-37Y	100

National Target DP 9mm Wide Opening Screw Thread Vials

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

- 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

Recommended for most brands of autosamplers:

For autosampler compatibility visit www.thermoscientific.com/chromexpert

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	14839810	100
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	14849810	100
	Amber	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	15240379	100
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	14879810	100
9mm Target DP Vial	Clear	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	11975703	100
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	11548240	100
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	11921523	100
	Amber PP	Graduated	12x32	Flat Bottom	2.0mL	1.5mL	<170	15227298	100
	Clear PP	Graduated	12x32	Flat Bottom	2.0mL	1.5mL	<170	15270369	100
9mm Target DP ColorBand Vial	Clear	Blue**	12x32	Flat Bottom	2.0mL	1.5mL	<170	10529375	100
	Clear	Green**	12x32	Flat Bottom	2.0mL	1.5mL	<170	10251765	100
	Clear	Red**	12x32	Flat Bottom	2.0mL	1.5mL	<170	10118894	100
	Clear	Yellow**	12x32	Flat Bottom	2.0mL	1.5mL	<170	10428204	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	11568240	100
	Amber	No	12x32	Tapered Base	1.7mL	1.3mL	<4	15146463	100
9mm Target DP Vial, Total Recovery with 10µL Reservoir	Clear	No	12x32	Deep Well Base	1.5mL	1.2mL	<1	11317381	100
9mm Target DP MacroVial 350µL, Fused Insert	Clear	No	12x32	Insert Vial	475µL	350µL	<2	12443568	100
	Clear	Yes	12x32	Insert Vial	475µL	350µL	<2	10578965	100
	Amber	No	12x32	Insert Vial	475µL	350µL	<2	12463568	100
	Amber	Yes	12x32	Insert Vial	475µL	350µL	<2	10429264	100
9mm Target DP MacroVial 200µL, Fused Insert	Clear	Yes	12x32	Insert Vial	375µL	240µL	<1	12680356	100
9mm Target DP Micro-V Tapered MicroVial with 150µL reservoir	Clear	No	12x32	Tapered Base	1.4mL	1.0mL	<4	12656907	100
	Amber	No	12x32	Tapered Base	1.4mL	1.0mL	<4	10322185	100
9mm Target DP Vial, silanized*	Clear	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	12433578	100
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	12443578	100
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	12453578	100
9mm Target DP Vial, High Recovery, silanized*, with 30µL Reservoir	Clear	No	12x32	Tapered Base	1.7mL	1.3mL	<4	12473578	100
9mm Target DP 300µL Vial	Polypropylene	No	12x32	Conical	400µL	300µL	<2	11925703	100
350µL Insert	Clear	-	6x31	Pulled Point	400µL	350µL	<4	11911563	100
300µL Insert	Clear	-	6x29	Conical	375µL	300µL	<1	12403668	100
350µL Insert	Clear	-	6x31	Precision Point	400µL	350µL	<2	12812344	100
300µL Insert, Graduation Marks	Polypropylene	-	6x30	Conical	325µL	250µL	<2	12423668	100
300µL Polyspring Insert	Clear	-	6x29	Conical	375µL	300µL	<1	11961563	100
400µL MicroSert Insert	Polypropylene	-	6x30	Conical	325µL	250µL	<2	12133771	100
	Clear	-	6x31	Flat Bottom	500µL	450µL	<25	11941533	100
300µL Insert, silanized*	Polypropylene	-	6x31	Flat Bottom	500µL	450µL	<25	12624045	500
	Clear	-	6x29	Conical	375µL	300µL	<1	12493708	100
300µL Polyspring Insert, silanized*	Clear	-	6x29	Conical	375µL	300µL	<1	12403718	100
400µL MicroSert Insert, silanized*	Clear	-	6x31	Flat Bottom	500µL	450µL	<25	12410078	500
300µL Polyspring Insert, Kimshield*	Clear	-	6x29	Conical	375µL	300µL	<1	12443708	100

* For information about silanized products visit 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	15256543	100
Septum for 9mm Screw Thread Cap	—	—	Ivory PTFE/Red Rubber	35	1.0	12458696	100
	—	—	Red PTFE/White Silicone/Red PTFE	45	1.0	12478696	100
	—	—	Blue PTFE/White Silicone, Pre-slit	55	1.0	12478706	100
	—	—	Red PTFE/White Silicone	50	1.0	13151673	100
	—	—	Yellow PTFE/White Silicone	40	1.0	C4000-60Y	100
	—	—	Yellow PTFE/White Silicone	40	1.0	C4000-61	1000
	—	—	Yellow PTFE/White Silicone/Yellow PTFE	40	1.0	C4000-40Y	100
	—	—	Yellow PTFE/White Silicone/Yellow PTFE	40	1.0	C4000-41	1000
9mm Open Top Cap, 6mm hole	Blue	Polypropylene	Soft septum, PTFE/Blue Silicone	30	1.0	13266409	100
	Blue	Polypropylene	Soft septum, PTFE/Blue Silicone, Pre-slit	30	1.0	13276409	100
	Black	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	15216553	100
	Blue	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	13296389	100
	Green	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	15226553	100
	Red	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	15236553	100
	Yellow	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	15246553	100
	Pink	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	15256553	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	15266553	100
	Blue	Polypropylene	Red PTFE/White Silicone/Red PTFE	50	1.0	13206399	100
	Green	Polypropylene	Red PTFE/White Silicone/Red PTFE	50	1.0	15276553	100
	Red	Polypropylene	Red PTFE/White Silicone/Red PTFE	50	1.0	15286553	100
	Yellow	Polypropylene	Red PTFE/White Silicone/Red PTFE	50	1.0	15296553	100
	Yellow	Polypropylene	Yellow PTFE/White Silicone/Yellow PTFE	40	1.0	C5000-53YY	100
	Green	Polypropylene	Yellow PTFE/White Silicone/Yellow PTFE	40	1.0	C5000-53GY	100
	Black	Polypropylene	Red PTFE/White Silicone	55	1.0	15216563	100
	Blue	Polypropylene	Red PTFE/White Silicone	55	1.0	13486129	100
	Green	Polypropylene	Red PTFE/White Silicone	55	1.0	15226563	100
Red	Polypropylene	Red PTFE/White Silicone	55	1.0	15181889	100	
Yellow	Polypropylene	Red PTFE/White Silicone	55	1.0	15171889	100	
Pink	Polypropylene	Red PTFE/White Silicone	55	1.0	15236563	100	
Yellow	Polypropylene	Yellow PTFE/White Silicone	40	1.0	C5000-54YY	100	
Green	Polypropylene	Yellow PTFE/White Silicone	40	1.0	C5000-54GY	100	
Red	Polypropylene	Yellow PTFE/White Silicone	40	1.0	C5000-54RY	100	
Blue	Polypropylene	Yellow PTFE/White Silicone	40	1.0	C5000-54BY	100	
Black	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	15246563	100	
Blue	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	13226399	100	
Green	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	15256563	100	
Red	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	15266563	100	
Yellow	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	15276563	100	
Pink	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	15286563	100	
Blue	Polypropylene	Ivory PTFE/Red Rubber, Pre-slit	45	1.0	15206573	100	
Green	Polypropylene	Ivory PTFE/Red Rubber, Pre-slit	45	1.0	15296563	100	
9mm Cap with Integral PP Membrane	Clear	Polypropylene	Polypropylene	N/A	N/A	13246409	100
	Blue	Polypropylene	Polypropylene	N/A	N/A	13256409	100
9mm Solid Top Cap	Blue	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	13236409	100
9mm Open Top Cap, 6mm hole	Black	Polypropylene	Bonded Red PTFE/White Silicone	45	1.0	15368026	100
	Gray	Polypropylene	Bonded Red PTFE/White Silicone, Pre-slit	45	1.0	15338036	100
	Blue	Polypropylene	Bonded Natural PTFE/Clear Silicone	45	1.3	15318026	100
Magnetic 9mm Open Top Cap, 6mm hole	Blue	Polypropylene	Soft septum, PTFE/Blue Silicone	30	1.0	15216573	100
	Blue	Polypropylene	Soft septum, PTFE/Blue Silicone, Pre-slit	30	1.0	15226573	100
9mm Open Top Cap, 6mm hole	Blue	Polypropylene	Solid Aluminum Disk with Silicone sealing ring		0.06	15236573	100
	Blue	Polypropylene	Solid PTFE Disk with Silicone sealing ring	53	0.25	15246573	100

National 9mm Screw Thread Vials Convenience Kits

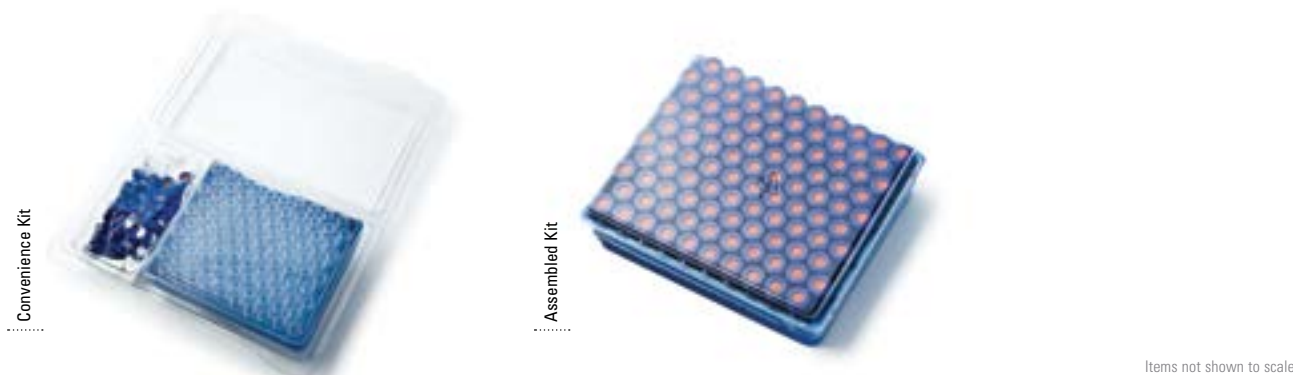
- Save time during sample preparation
- Reduce the risk of contamination

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



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	14839810	13296389	14869810	100
	Clear	Yes	Blue	Ivory PTFE/Red Rubber	14849810	13296389	14859810	100
	Clear	No	Blue	Red PTFE/White Silicone	14839810	13486129	14889810	100
	Clear	Yes	Blue	Red PTFE/White Silicone	14849810	13486129	14899810	100
	Clear	Yes	Blue	Red PTFE/White Silicone/Red PTFE	14849810	13206399	14829820	100
	Clear	Yes	Blue	Blue PTFE/White Silicone, Pre-slit	14849810	13226399	14809820	100
AVCS Convenience Kit	Clear	No	Blue	Ivory PTFE/Red Rubber	11975703	13296389	13236399	100
	Clear	Yes	Blue	Ivory PTFE/Red Rubber	11548240	13296389	13246399	100
	Amber	Yes	Pink	Ivory PTFE/Red Rubber	11921523	15256553	15256573	100
	Amber	Yes	Blue	Ivory PTFE/Red Rubber	11921523	13296389	15266573	100
	Clear	Yes	Blue	Ivory PTFE/Red Rubber, Pre-slit	11548240	15206573	15276573	100
	Clear	No	Blue	Red PTFE/White Silicone/Red PTFE	11975703	13206399	15286573	100
	Clear	Yes	Blue	Red PTFE/White Silicone/Red PTFE	11548240	13206399	13276399	100
	Amber	Yes	Blue	Red PTFE/White Silicone/Red PTFE	11921523	13206399	15296573	100
	Polypropylene	No	Blue	Red PTFE/White Silicone	11925703	13486129	15206583	100
	Clear	Yes	Black	Red PTFE/White Silicone	11548240	15216563	15216583	100
	Clear	No	Blue	Red PTFE/White Silicone	11975703	13486129	13256399	100
	Clear	No	Pink	Red PTFE/White Silicone	11975703	15236563	15226583	100
	Clear	Yes	Blue	Red PTFE/White Silicone	11548240	13486129	13266399	100
	Amber	Yes	Blue	Red PTFE/White Silicone	11921523	13486129	15246583	100
	Clear	No	Blue	Blue PTFE/White Silicone, Pre-slit	11975703	13226399	15256583	100
	Clear	Yes	Blue	Blue PTFE/White Silicone, Pre-slit	11548240	13226399	13286399	100
	Clear	No	Blue	Blue PTFE/White Silicone, Pre-slit	12443568	13226399	15266583	100
	Polypropylene	No	Blue	Blue PTFE/White Silicone, Pre-slit	11925703	13226399	15276583	100
Convenience Kit	Clear	Yes	Black	Bonded Red PTFE/White Silicone	11548240	15368026	15302365	100
	Clear	Yes	Gray	Bonded Red PTFE/White Silicone, Pre-slit	11548240	15338036	15394686	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	11548240	15246553	C5000-80WY	100
	Clear	Yes	Yellow	Yellow PTFE/White Silicone	11548240	15171889Y	C5000-92WY	100
	Clear	Yes	Yellow	Yellow PTFE/White Silicone/ Yellow PTFE	11548240	15296553Y	C5000-86WY	100
	Amber	Yes	Yellow	Yellow PTFE/White Silicone	11921523	15171889Y	C5000-94WY	100
Assembled AVCS Kit	Clear	No	Blue	Ivory PTFE/Red Rubber	11975703	13296389	13296399	100
	Clear	Yes	Blue	Ivory PTFE/Red Rubber	11548240	13296389	13206409	100
	Amber	Yes	Blue	Ivory PTFE/Red Rubber	11921523	13296389	15286583	100
	Clear	Yes	Blue	Ivory PTFE/Red Rubber, Pre-slit	11548240	15206573	15296583	100
	Amber	Yes	Blue	Ivory PTFE/Red Rubber, Pre-slit	11921523	15206573	15206593	100
	Clear	No	Blue	Red PTFE/White Silicone/Red PTFE	11975703	13206399	15216593	100
	Clear	Yes	Blue	Red PTFE/White Silicone/Red PTFE	11548240	13206399	13216409	100
	Clear	Yes	Red	Red PTFE/White Silicone/Red PTFE	11548240	15286553	15226593	100
	Amber	Yes	Blue	Red PTFE/White Silicone/Red PTFE	11921523	13206399	15246593	100
	Clear	Yes	Yellow	Yellow PTFE/White Silicone/ Yellow PTFE	11548240	15296553Y	C5000-186WY	100
	Clear	No	Blue	Red PTFE/White Silicone	11975703	13486129	15256593	100
	Clear	Yes	Blue	Red PTFE/White Silicone	11548240	13486129	13226409	100
	Amber	Yes	Blue	Red PTFE/White Silicone	11921523	13486129	15266593	100
	Clear	Yes	Blue	Blue PTFE/White Silicone, Pre-slit	11548240	13226399	15276593	100
	Amber	Yes	Blue	Blue PTFE/White Silicone, Pre-slit	11921523	13226399	15286593	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	14839810	13206399	15250379	1
	Clear	Yes	Blue	Red PTFE/White Silicone/Red PTFE	14849810	13206399	15260379	1
	Clear	No	Blue	Red PTFE/White Silicone	14839810	13486129	15270379	1
6 Drawer Mini-Storeroom – Cabinet Only	–	–	–	–	–	–	12423578	1
9 Drawer Storeroom, Full Size – Cabinet Only	–	–	–	–	–	–	12440328	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

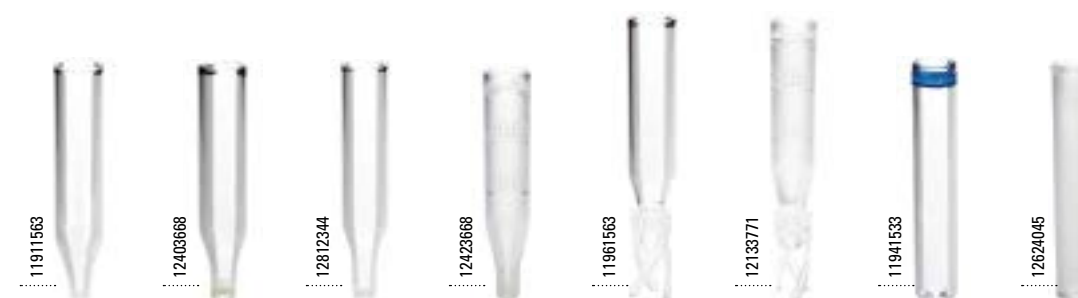
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National 10mm Wide Opening Screw Thread Vials and Inserts

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	10171962	100
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	12443638	100
	Amber	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	13181683	100
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	12413648	100
10-425 Screw Thread MacroVial 350µL, Fused Insert	Clear	No	12x32	Insert Vial	450µL	350µL	<2	11917318	100
	Amber	No	12x32	Insert Vial	450µL	350µL	<2	12453708	100
10-425 Screw Thread Micro-V 1.5mL Tapered MicroVial with 150µL reservoir	Clear	No	12x32	Tapered Base	1.5mL	1.1mL	<4	12433718	100
10-425 Screw Thread Vial, silanized*	Clear	No	12x32	Flat Bottom	2.0mL	1.5mL	<170	12463708	100
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	12201162	100
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	12483708	100
10-425 Screw Thread Vial	Polypropylene	No	12x32	Conical	600µL	400µL	<6	10122388	100
	Polypropylene	No	12x32	Reservoir Base	750µL	550µL	<70	11943426	100

* For information about silanized products visit 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	11911563	100
300µL Insert	Clear	-	6x29	Conical	375µL	300µL	<1	12403668	100
350µL Insert	Clear	-	6x31	Precision Point	400µL	350µL	<2	12812344	100
300µL Insert, Graduation Marks	Polypropylene	-	6x30	Conical	325µL	250µL	<2	12423668	100
300µL Polyspring Insert	Clear	-	6x29	Conical	375µL	300µL	<1	11961563	100
	Polypropylene	-	6x30	Conical	325µL	250µL	<2	12133771	100
400µL MicroSert Insert	Clear	-	6x31	Flat Bottom	500µL	450µL	<25	11941533	500
	Polypropylene	-	6x31	Flat Bottom	500µL	450µL	<25	12624045	500
300µL Insert, silanized*	Clear	-	6x29	Conical	375µL	300µL	<1	12493708	100
300µL Polyspring Insert, silanized*	Clear	-	6x29	Conical	375µL	300µL	<1	12403718	100
400µL MicroSert Insert, silanized*	Clear	-	6x31	Flat Bottom	500µL	450µL	<25	12410078	500
300µL Polyspring Insert, Kimshield*	Clear	-	6x29	Conical	375µL	300µL	<1	12443708	100

* For information about silanized products visit www.thermoscientific.com/chromexpert

Search thousands of applications at our chromatography resource center.

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	–	–	–	10488848	100
	White	Polypropylene	–	–	–	12413708	100
	Black	Polypropylene	–	–	–	12483698	100
Septum for 10-425 Screw Caps	–	–	White Virgin PTFE, 0.01" Septum	53	0.25	10256613	1000
	–	–	Red PTFE/White Silicone, Soft Septum	50	1.3	12443648	100
	–	–	Red PTFE/White Silicone/Red PTFE Septum	45	1.3	12473648	100
	–	–	Blue PTFE/White Silicone, Pre-slit Septum	55	1.5	12483648	100
	–	–	Red PTFE/White Silicone Septum	45	1.3	12631270	100
10mm Open Top Cap, 8.5mm hole	Black	Polypropylene	Tan PTFE/White Silicone	40	1.5	C4010-62BLK	100
	Black	Polypropylene	Tan PTFE/White Silicone, Pre-slit	40	1.5	C4010-63BLK	100
	Light Blue	Polypropylene	Ivory PTFE/Red Rubber	45	1.0	12433648	100
	Black	Polypropylene	Red PTFE/White Silicone, Soft	45	1.3	12453648	100
	White	Polypropylene	Red PTFE/White Silicone, Soft	45	1.3	12463648	100
	Light Blue	Polypropylene	Red PTFE/White Silicone/Red PTFE	45	1.0	11987298	100
	Light Blue	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.5	12201172	100
	Black	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.5	12493648	100
	Light Blue	Polypropylene	Red PTFE/White Silicone	50	1.3	11953426	100
	Red	Polypropylene	Red PTFE/White Silicone	50	1.3	12463658	1000
	White	Polypropylene	Red PTFE/White Silicone	50	1.3	12473658	1000
	Black	Polypropylene	Red PTFE/White Silicone	50	1.3	12493658	100
	Light Blue	Polypropylene	Red PTFE/White Silicone, Star-slit	50	1.5	12463668	100
10mm Solid Top Cap	White	Polyurethane	PTFE/PE Foam Liner	–	1.3	12433708	100
10mm Cap with integral PP Membrane	Clear	Polypropylene	Polypropylene	N/A	N/A	12443658	100

National 10mm Wide Opening Screw Thread Vials Convenience Kits

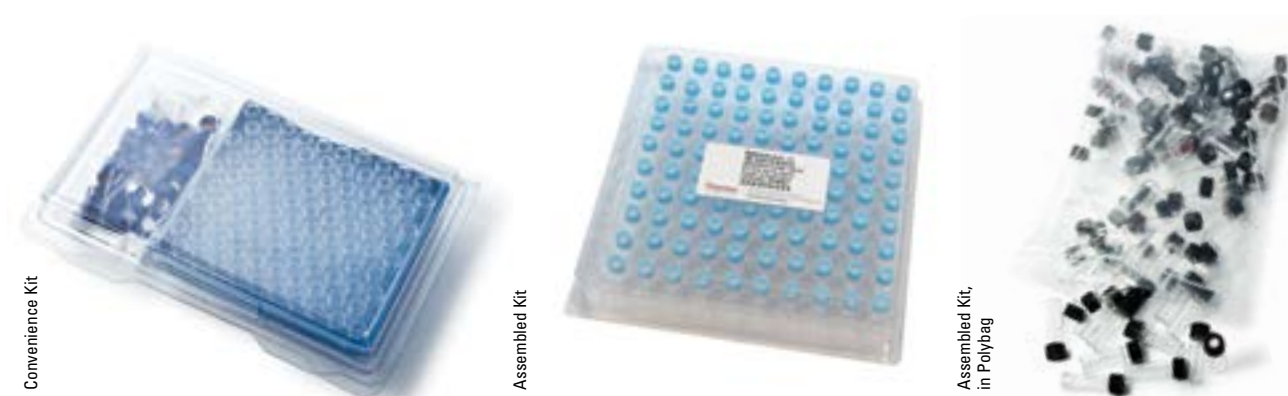
- Save time during sample preparation
- Reduce the risk of contamination

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	10171962	11953426	12463678	100
	Amber	Yes	Light Blue	Red PTFE/White Silicone	12413648	11953426	12483678	100
	Clear	Yes	Light Blue	Red PTFE/White Silicone	12443638	11953426	12403688	100
	Clear	No	White	Red PTFE/White Silicone, Soft	10171962	12463648	12423698	100
	Clear	Yes	White	Red PTFE/White Silicone, Soft	12443638	12463648	12453698	100
	Clear	Yes	Black	Blue PTFE/White Silicone, Pre-slit	12443638	12493648	12473698	100
Assembled Kit	Clear	No	Light Blue	Red PTFE/White Silicone	10171962	11953426	11311660	100
	Clear	Yes	Light Blue	Red PTFE/White Silicone	12443638	11953426	12473628	100
	Clear	No	Light Blue	White Virgin PTFE, 0.01"	10171962	10488848/ 10256613	11993489	100
	Clear	No	White	Red PTFE/White Silicone, Soft	10171962	12463648	12403658	100
	Amber	No	White	Red PTFE/White Silicone, Soft	13181683	12463648	12413658	100
	Amber	Yes	White	Red PTFE/White Silicone, Soft	12413648	12463648	12423658	100
	Clear	Yes	White	Red PTFE/White Silicone, Soft	12443638	12463648	12433658	100
	Clear	No	Black	Red PTFE/White Silicone, Soft	10171962	12453648	12473668	100
	Amber	No	Black	Red PTFE/White Silicone, Soft	13181683	12453648	12483668	100
	Amber	Yes	Black	Red PTFE/White Silicone, Soft	12413648	12453648	12493668	100
	Clear	Yes	Black	Red PTFE/White Silicone, Soft	12443638	12453648	12403678	100
	Clear	No	Black	Tan PTFE/White Silicone, Pre-slit	10171962	C4010-63BKL	C4010-59	100
	Assembled Kit, in Polybag	Amber	Yes	Light Blue	Red PTFE/White Silicone	12413648	11953426	12443608
Clear		Yes	Light Blue	Red PTFE/White Silicone	12443638	11953426	12453608	100
Clear		No	Light Blue	Red PTFE/White Silicone/Red PTFE	10171962	11987298	12473608	100

National 11mm Crimp Top Vials

2mL, 12x32, crimp top vials and inserts

- 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

Recommended for most brands...

For autosampler compatibility visit
www.thermoscientific.com/chromexpert



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	13171703	100
	Clear	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	12410088	100
	Amber	No	12x32	Flat Bottom	2mL	1.5mL	<170	10424363	100
	Amber	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	12430088	100
11mm Standard Opening Crimp /Snap Top Vial 150µL Clear Solid Glass Microvial	Clear	No	12x32	Narrow Conical	425µL	200µL	<2	12480078	12
11mm – Crimp/Snap Glastic Glass Insert/TPX Vial	Clear	No	12x32	Insert Vial	475µL	350µL	<4	12400088	100
200µL MicroSert Insert	Clear	–	5x31	Flat Bottom	250µL	200µL	<12	10119084	500
150µL Polyspring Insert	Clear	–	5x29	Pulled point	200µL	175µL	<1	10538215	100
150µL Insert	Clear	–	5x29	Pulled point	200µL	175µL	<3	12440088	100
200µL Insert	Clear	–	5x31	Pulled point	200µL	170µL	<2	12450088	100
125µL Polyspring Insert	Polypropylene	–	5x29	Precision point	175µL	125µL	<2	12470088	100
150µL Polyspring Insert, silanized*	Clear	–	5x29	Pulled point	200µL	175µL	<1	12450098	100

* For information about silanized products visit 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	11915713	100
	Clear	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	11981513	100
	Amber	No	12x32	Flat Bottom	2mL	1.5mL	<170	12443728	100
	Amber	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	11911523	100
11mm Crimp Top ColorBand Vial, Wide Opening	Clear	Blue*	12x32	Flat Bottom	2mL	1.5mL	<170	12163771	100
	Clear	Green*	12x32	Flat Bottom	2mL	1.5mL	<170	12173771	100
	Clear	Red*	12x32	Flat Bottom	2mL	1.5mL	<170	12183771	100
	Clear	Yellow*	12x32	Flat Bottom	2mL	1.5mL	<170	12193771	100
11mm Crimp/Snap MacroVial 250µL, Fused Insert	Clear	No	12x32	Fused Conical	500µL	350µL	<2	12410068	100

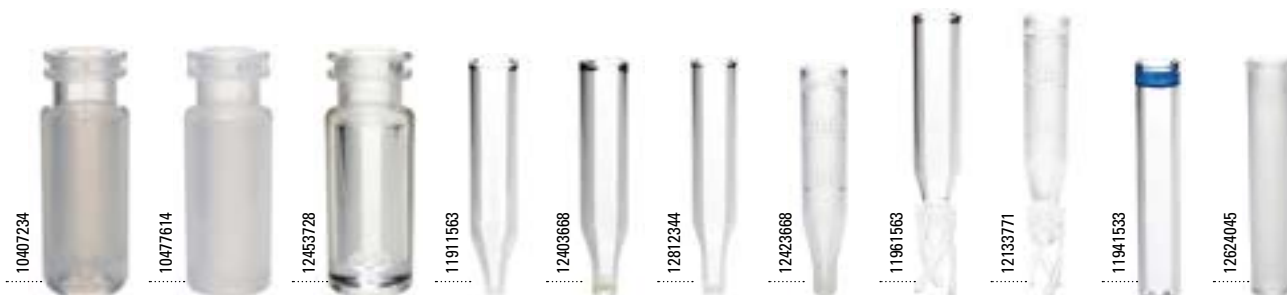
* ColorBand vials are designed to provide full sample color coding for autosamplers with optical vial detection. Use the optimum cap for your instrument without sacrificing your color coding scheme.



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	10332825	100
11mm Crimp/Snap MacroVial 250µL, Fused Insert	Amber	No	12x32	Fused Conical	500µL	350µL	<2	12420068	100
11mm Crimp Top MacroVial 250µL, Fused Insert	Amber	Yes	12x32	Fused Conical	500µL	350µL	<2	10556765	100
11mm Crimp Top Solid Glass MicroVials	Clear	No	12x32	Conical Base	650µL	500µL	<5	12453718	12
11mm Crimp Top Micro-V Microsampling Vial, 15µL Reservoir	Clear	No	12x32	High Recovery	1.5mL	1.1mL	<4	10008574	100
11mm Crimp Top 1.5mL High Recovery MicroVial	Clear	No	12x32	High Recovery	1.7mL	1.3mL	<4	12420048	100
11mm Crimp Top, Wide Opening, silanized*	Clear	No	12x32	Flat Bottom	2mL	1.5mL	<170	12440068	100
	Clear	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	12450068	100
	Amber	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	12460068	100
11mm Crimp/Snap 250µL MicroVial	Polypropylene	No	12x32	Conical Base	475µL	300µL	<2	11588240	100
11mm Crimp/Snap 600µL MicroVial	Polypropylene	No	12x32	Conical Base	600µL	400µL	<4	10211585	100
11mm Crimp/Snap 800µL MicroVial	Polypropylene	No	12x32	Conical Base	800µL	600µL	<6	10139334	100

* For information about silanized products visit 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	10407234	1000
11mm Crimp/Snap 1mL Vial	Polypropylene	No	12x32	Flat Bottom	1000μL	800μL	<80	10477614	100
11mm Crimp/Snap 1mL TPX High Recovery Vial	TPX	No	12x32	High Recovery	1000μL	750μL	<8	12453728	100
350μL Insert	Clear	–	6x31	Pulled Point	400μL	350μL	<4	11911563	100
300μL Insert	Clear	–	6x29	Conical	375μL	300μL	<1	12403668	100
350μL Insert	Clear	–	6x31	Precision Point	400μL	350μL	<2	12812344	100
300μL Insert, Graduation Marks	Polypropylene	–	6x30	Conical	325μL	250μL	<2	12423668	100
300μL Polyspring Insert	Clear	–	6x29	Conical	375μL	300μL	<1	11961563	100
	Polypropylene	–	6x30	Conical	325μL	250μL	<2	12133771	100
400μL MicroSert Insert	Clear	–	6x31	Flat Bottom	500μL	450μL	<25	11941533	500
	Polypropylene	–	6x31	Flat Bottom	500μL	450μL	<25	12624045	500
300μL Insert, silanized*	Clear	–	6x29	Conical	375μL	300μL	<1	12493708	100
300μL Polyspring Insert, silanized*	Clear	–	6x29	Conical	375μL	300μL	<1	12403718	100
400μL MicroSert Insert, silanized*	Clear	–	6x31	Flat Bottom	500μL	450μL	<25	12410078	500
300μL Polyspring Insert, Kimshield*	Clear	–	6x29	Conical	375μL	300μL	<1	12443708	100

* For information about silanized products visit www.thermoscientific.com/chromexpert

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Visit **PAGE 4-005**



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	10734556	100
	Silver	Aluminum	Clear PTFE/Natural Red Rubber	60	1.0	11971533	1000
	Blue	Aluminum	Clear PTFE/Natural Red Rubber	60	1.0	12450058	100
	Green	Aluminum	Clear PTFE/Natural Red Rubber	60	1.0	12460058	100
	Red	Aluminum	Clear PTFE/Natural Red Rubber	60	1.0	12470058	100
	Yellow	Aluminum	Clear PTFE/Natural Red Rubber	60	1.0	12480058	100
	Silver	Aluminum	Red PTFE/White Silicone/Red PTFE	45	1.0	11991523	100
	Silver	Aluminum	Red PTFE/White Silicone	45	1.3	11971523	100
	Blue	Aluminum	Red PTFE/White Silicone	45	1.3	12413738	100
	Green	Aluminum	Red PTFE/White Silicone	45	1.3	12423738	100
	Red	Aluminum	Red PTFE/White Silicone	45	1.3	12433738	100
	Silver	Aluminum	Solid PTFE Disk with Silicone sealing ring	53	0.25	15290369	100
	Silver	Aluminum	Solid PTFE Disk	53	0.25	10343515	1000
	Silver	Aluminum	PTFE/Synthetic Red Rubber	35	1.0	12143771	100
	Blue	Aluminum	PTFE/Synthetic Red Rubber	35	1.0	10571713	1000
	Green	Aluminum	PTFE/Synthetic Red Rubber	35	1.0	12483798	1000
	Red	Aluminum	PTFE/Synthetic Red Rubber	35	1.0	10458083	1000
	Yellow	Aluminum	PTFE/Synthetic Red Rubber	35	1.0	12413808	1000
11mm Crimp Cap, 5.5mm hole, Mixed Color, 200 each	Silver, Blue, Green, Red, Yellow	Aluminum	PTFE/Synthetic Red Rubber	35	1.0	12493798	1000
11mm Crimp Cap, 5.5mm hole	Silver	Aluminum	Solid Aluminum Disk with Silicone sealing ring		0.06	15280369	100

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	10429454	1
Decapping Pliers	Removes 11mm aluminum crimp seals; protective gloves recommended	12054907	1
Manual Decrimper	Removes 11mm aluminum crimp seals	10488084	1
Manual stainless steel Cleanroom Crimper	Attaches 11mm crimp seals	15200379	1
Manual stainless steel Cleanroom Decrimper	Removes 11mm crimp seals without vial damage	15267298	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	13171703	11971533HP	12400098	500
	Amber	No	Silver	Clear PTFE/Red Rubber	10424363	11971533HP	12410098	500
Convenience Kit, Wide Opening Crimp Top Vial	Clear	No	Silver	Clear PTFE/Red Rubber	11915713	10734556	12443808	100
	Clear	Yes	Silver	Clear PTFE/Red Rubber	11981513	10734556	10547815	100
	Amber	Yes	Silver	Clear PTFE/Red Rubber	11911523	10734556	10597815	100
	Clear	No	Silver	Clear PTFE/Red Rubber	11915713	10734556	12473808	500
	Clear	Yes	Silver	Clear PTFE/Red Rubber	11981513	10734556	12403818	500
Clear	No	Silver	PTFE/Synthetic Red Rubber	11915713	12143771	12413818	100	
Kit includes Polyspring Tapered Insert for small sample volumes	Clear	No	Silver	Clear PTFE/Red Rubber	11915713/ 11961563	10734556	12420058	100
Assembled Kit, Wide Opening Crimp Top Vial, Nitrogen purged	Clear	No	Silver	Clear PTFE/Red Rubber	11915713	10734556	12423728	100
Assembled Kit, Nitrogen purged	Amber	Yes	Silver	Clear PTFE/Red Rubber	1191523	10734556	11991533	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	11981513	10734556	12413788	1
6 Drawer Mini-Storeroom – Cabinet Only	–	–	–	–	–	–	12423578	1
9 Drawer Storeroom – Cabinet Only	–	–	–	–	–	–	12440328	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	10775506	1
Polypropylene storage rack for 12x32mm vials, no lid, reusable	50 vials, 5x10	10221035	1

National 11mm Wide Opening Snap-It Vials

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

- 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

Recommended for most brands of instruments:

For autosampler compatibility visit
www.thermoscientific.com/chromexpert



National 11mm Wide Opening Snap-It Vials and Inserts

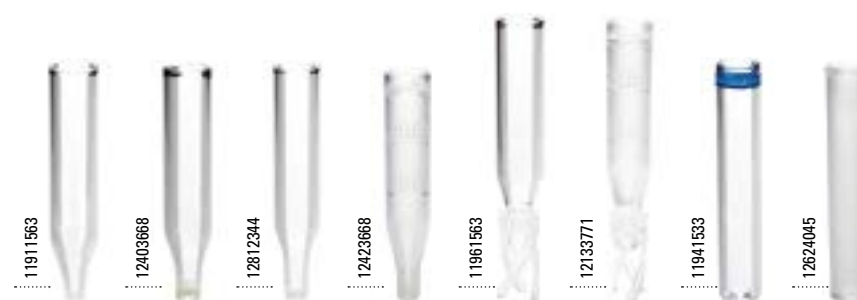
Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
11mm Snap-It Vial	Clear	No	12x32	Flat Bottom	2mL	1.5mL	<170	11893722	100
	Clear	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	10599375	100
	Amber	No	12x32	Flat Bottom	2mL	1.5mL	<170	12433778	100
	Amber	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	10679775	100
11mm Snap-It MacroVial 250µL, Fused Insert	Clear	No	12x32	Fused Conical	500µL	350µL	<2	12410068	100
	Amber	No	12x32	Fused Conical	500µL	350µL	<2	12420068	100
11mm Snap-It High Recovery MicroVial, 1.5mL	Clear	No	12x32	High Recovery	1.7mL	1.3mL	<4	10189184	100
11mm Snap-It Vial, silanized*	Clear	No	12x32	Flat Bottom	2mL	1.5mL	<170	13131703	100
	Clear	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	12400078	100
	Amber	Yes	12x32	Flat Bottom	2mL	1.5mL	<170	11945703	100
	Clear	No	12x32	High Recovery	1.5mL	1.1mL	<4	12470068	100
11mm Snap-It Vial, Total Recovery with 10µL Reservoir	Clear	No	12x32	Deep Well Base	1.5mL	1.2mL	<1	11387371	100
11mm Snap-It 250µL MicroVial	Polypropylene	No	12x32	Conical Base	475µL	300µL	<2	11588240	100

* For information about silanized products visit 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	10211585	100
11mm Snap-It 800µL MicroVial	Polypropylene	No	12x32	Conical Base	800µL	600µL	<6	10139334	100
11mm Snap-It 850µL AP-2000 MaxVial	Polypropylene	No	12x32	High Recovery	825µL	650µL	<8	10407234	1000
11mm Snap-It 1mL Vial	Polypropylene	No	12x32	Flat Bottom	1000µL	800µL	<80	10477614	100
11mm Snap-It 1mL TPX High Recovery Vial	TPX	No	12x32	High Recovery	1000µL	750µL	<8	12453728	100
11mm Snap-It Glastic Glass Insert/TPX Vial	Clear	No	12x32	Insert Vial	475µL	350µL	<4	12400088	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	11911563	100
300µL Insert	Clear	–	6x29	Conical	375µL	300µL	<1	12403668	100
350µL Insert	Clear	–	6x31	Precision Point	400µL	350µL	<2	12812344	100
300µL Insert, Graduation Marks	Polypropylene	–	6x30	Conical	325µL	250µL	<2	12423668	100
300µL Polyspring Insert	Clear	–	6x29	Conical	375µL	300µL	<1	11961563	100
	Polypropylene	–	6x30	Conical	325µL	250µL	<2	12133771	100
400µL MicroSert Insert	Clear	–	6x31	Flat Bottom	500µL	450µL	<25	11941533	500
	Polypropylene	–	6x31	Flat Bottom	500µL	450µL	<25	12624045	500
300µL Insert, silanized*	Clear	–	6x29	Conical	375µL	300µL	<1	12493708	100
300µL Polyspring Insert, silanized*	Clear	–	6x29	Conical	375µL	300µL	<1	12403718	100
400µL MicroSert Insert, silanized*	Clear	–	6x31	Flat Bottom	500µL	450µL	<25	12410078	500
300µL Polyspring Insert, Kimshield*	Clear	–	6x29	Conical	375µL	300µL	<1	12443708	100

* For information about silanized products visit 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	—	—	11598240	100
	Blue	Polyethylene	Integral Molded In Polyethylene	—	—	12463738	100
	Green	Polyethylene	Integral Molded In Polyethylene	—	—	12473738	100
	Red	Polyethylene	Integral Molded In Polyethylene	—	—	12483738	100
11mm Snap-It Cap, 6mm hole	Clear	Polyethylene	Clear PTFE/Synthetic Red Rubber	60	1.0	11921563	100
	Blue	Polyethylene	Clear PTFE/Synthetic Red Rubber	60	1.0	11901583	100
	Black	Polyethylene	Clear PTFE/Synthetic Red Rubber	60	1.0	12403748	100
	Green	Polyethylene	Clear PTFE/Synthetic Red Rubber	60	1.0	10406122	100
	Red	Polyethylene	Clear PTFE/Synthetic Red Rubber	60	1.0	12644045	100
	Clear	Polyethylene	White Virgin PTFE, 0.01"	53	0.25	12443748	100
	Blue	Polyethylene	White Virgin PTFE, 0.01"	53	0.25	10221145	100
	Green	Polyethylene	White Virgin PTFE, 0.01"	53	0.25	12463748	100
	Red	Polyethylene	White Virgin PTFE, 0.01"	53	0.25	12473748	100
	Yellow	Polyethylene	White Virgin PTFE, 0.01"	53	0.25	12483748	100
	Orange	Polyethylene	White Virgin PTFE, 0.01"	53	0.25	C4011-520R	1000
	Orange	Polyethylene	Ivory PTFE/Red Rubber	45	1.0	C4011-510R	100
	Orange	Polyethylene	Ivory PTFE/Red Rubber	45	1.0	C4011-5100R	1000
	Clear	Polyethylene	Red PTFE/White Silicone/Red PTFE	45	1.0	12493748	100
	Blue	Polyethylene	Red PTFE/White Silicone/Red PTFE	45	1.0	10179614	100
	Red	Polyethylene	Red PTFE/White Silicone/Red PTFE	45	1.0	13160963	100
	Yellow	Polyethylene	Red PTFE/White Silicone/Red PTFE	45	1.0	13170963	100
	Orange	Polyethylene	Red PTFE/White Silicone/Red PTFE	45	1.0	C4011-530R	100
	Orange	Polyethylene	Red PTFE/White Silicone/Red PTFE	45	1.0	C4011-5300R	1000
	Clear	Polyethylene	Red PTFE/White Silicone	50	1.0	12443758	100
Blue	Polyethylene	Red PTFE/White Silicone	50	1.0	10547445	100	
Black	Polyethylene	Red PTFE/White Silicone	50	1.0	13190963	100	
Green	Polyethylene	Red PTFE/White Silicone	50	1.0	12473758	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	12483758	100
	Yellow	Polyethylene	Red PTFE/White Silicone	50	1.0	12493758	100
	Orange	Polyethylene	Red PTFE/White Silicone	55	1.0	C4011-540R	100
	Orange	Polyethylene	Red PTFE/White Silicone	55	1.0	C4011-5400R	1000
	Clear	Polyethylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	13287579	100
	Blue	Polyethylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	10027634	100
	Black	Polyethylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	12433768	100
	Green	Polyethylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	12443768	100
	Red	Polyethylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	12613775	100
	Yellow	Polyethylene	Blue PTFE/White Silicone, Pre-slit	55	1.0	12463768	100
	Clear	Polyethylene	Red PTFE/White Silicone, Star-slit	45	1.3	10538785	100
	Pink	Polyethylene	Red PTFE/White Silicone, Y-cut	45	1.3	15257298	100
	Orange	Polyethylene	Red PTFE/White Silicone, Star-slit	55	1.0	C4011-590R	100
	Orange	Polyethylene	Red PTFE/White Silicone, Star-slit	55	1.0	C4011-5900R	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



Items not shown to scale

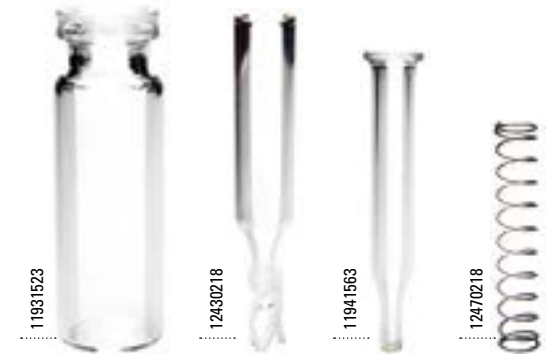
National 11mm Wide Opening Snap-It Cap Convenience Kits

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	11893722	11921563	12453788	100
	Amber	Yes	Clear	Clear PTFE/Red Rubber	10679775	11921563	10680066	100
	Clear	No	Clear	Red PTFE/White Silicone	11893722	12443758	12483788	100
	Clear	Yes	Clear	Red PTFE/White Silicone	10599375	12443758	10221585	100
	Clear	No	Pink	Red PTFE/White Silicone	11893722	12443758P	12671096	100
	Clear	Yes	Orange	Red PTFE/White Silicone	10599375	12443758OR	C4011-730RW	100
	Clear	Yes	Orange	Ivory PTFE/Red Rubber	10599375	11921563OR	C4011-720RW	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



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	11931523	100
800µL Polyspring Conical Insert	Clear	–	8x38	Pulled Point	950µL	800µL	<9µL	12430218	100
350µL Conical Insert	Clear	–	6x40	Pulled Point	375µL	300µL	<8µL	11941563	100
Metal spring for glass inserts in 4mL vials	–	–	–	–	–	–	–	12470218	100

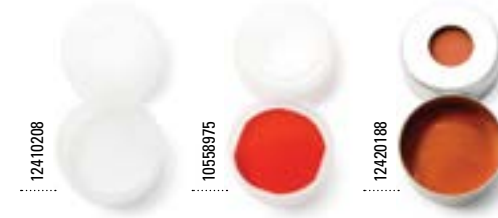
Recommended for the following instruments:

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

For autosampler compatibility visit www.thermoscientific.com/chromexpert

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	12410208	100
	Clear	Polypropylene	Red PTFE/White Silicone	45	1.3	10558975	100
13mm Crimp Cap, 6mm hole	Silver	Aluminum	Clear PTFE/Synthetic Red Rubber	65	1.3	12420188	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	10566765	1
Decapping Pliers	Removes 13mm aluminum crimp seals, Protective gloves recommended	10299454	1
Manual Decrimper	Removes 13mm aluminum crimp seals	10240535	1
Manual stainless steel Cleanroom Crimper	Attaches 13mm crimp seals	1527298	1
Manual stainless steel Cleanroom Decrimper	Removes 13mm crimp seals without vial damage	15210379	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



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	12400178	100
	Clear	Yes	15x45	Flat Bottom	4mL	4mL	<800	11991513	100
	Amber	No	15x45	Flat Bottom	4mL	4mL	<800	12440188	100
	Amber	Yes	15x45	Flat Bottom	4mL	4mL	<800	10342485	100
13-425 Screw Thread AP2000 High Recovery Vial	Clear	No	15.25x45	Tapered Base	3.5mL	3.5mL	<15	10291525	100
	Polypropylene	No	15x45	Tapered Base	2.5mL	2mL	<15	12440178	100
13-425 Screw Thread Vial, silanized*	Clear	No	15x45	Flat Bottom	4mL	4mL	<800	12400258	100
800µL Polyspring Conical Insert	Clear	–	8x38	Pulled Point	950µL	800µL	<9	12430218	100
350µL Conical Insert	Clear	–	6x40	Pulled Point	375µL	300µL	<8	11941563	100
Metal spring for glass inserts in 4mL vials	–	–	–	–	–	–	–	12470218	100

* For information about silanized products visit www.thermoscientific.com/chromexpert

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

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	–	–	–	12410188	100
	White	Polypropylene	–	–	–	12430188	100
	Black	Phenol	–	–	–	12400228	1000
Septum for 13-425 Screw Caps	–	–	White Virgin PTFE, 0.01"	53	0.25	12410178	1000
	–	–	Ivory PTFE/Red Rubber	35	1.5	12490188	100
	–	–	Red PTFE/White Silicone/Red PTFE	55	1.25	12400198	100
	–	–	Red PTFE/White Silicone, Soft	45	1.5	12430198	100
	–	–	Red PTFE/White Silicone	50	1.5	12400218	100
	–	–	Ivory PTFE/White Silicone	45	1.5	12410218	1000
13mm Open Top Screw Cap, 13-425 thread, 8.5mm hole	Black	Polypropylene	Ivory PTFE/Red Rubber	35	1.5	12075540	100
	Black	Polypropylene	Red PTFE/White Silicone/Red PTFE	55	1.25	12410198	100
	White	Polypropylene	Red PTFE/White Silicone, Soft	40	1.5	10476854	100
	Black	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.5	12470208	100
	White	Polypropylene	Blue PTFE/White Silicone, Pre-slit	55	1.5	10497234	100
	Black	Polypropylene	Red PTFE/White Silicone	60	1.5	10027684	100
	White	Polypropylene	Red PTFE/White Silicone	60	1.5	12460228	100
13mm Single Piece Screw Cap, 13-425 thread	Natural	Polypropylene	Integral Molded Polypropylene	–	0.25	12490208	100
13mm Open Top Screw Cap, 13-425 thread, 8.5mm hole	Black	Phenol	Red PTFE/White Silicone	60	1.5	12410228	100
13mm Solid Top Storage Cap, 13-425 thread	White	Urea	PTFE/PE Foam Liner	–	1.25	11538250	100
13mm Open Top Screw Cap, 13-425 thread, 8.5mm hole	Black	Polypropylene	Bonded Red PTFE/White Silicone	45	1.5	12420228	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

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 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	12400178	10027684	10027364	100
	Amber	Yes	Black	Red PTFE/White Silicone	10342485	10027684	12400238	100
Assembled Kit	Clear	No	Black	White Virgin PTFE, 0.01"	12400178	12410188/12410178	11903499	100
	Clear	No	Black	Red PTFE/White Silicone	12400178	10027684	12470178	100
	Amber	No	Black	Red PTFE/White Silicone	12440188	10027684	12480178	100
	Amber	Yes	Black	Red PTFE/White Silicone	10342485	10027684	12490178	100
	Clear	Yes	Black	Red PTFE/White Silicone	11991513	10027684	12400188	100
Assembled Kit, in Polybag	Clear	No	Black	PTFE/Red Rubber	12400178	12400228/73816T-13P	12460198	100
	Amber	No	Black	Red PTFE/White Silicone	12440188	10027684	12440168	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



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	10620526	1
Polypropylene storage rack for 15x45mm vials, no lid, reusable	50 vials, 5x10	11538240	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



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	11901523	200
	Amber	No	8x40	Flat Bottom	1.25mL	1mL	<80	11951523	200
	Polypropylene	No	8x40	Flat Bottom	1.25mL	1mL	<80	10407244	250
250µL Polyspring Conical Insert	Clear	–	5x34	Pulled Point	250µL	210µL	<3	12480238	100
300µL Polyspring Conical Insert	Polypropylene	–	5x29	Precision Point	275µL	250µL	<3	12410248	100
0.7mL Accuform Shell Vial with SepCap	Polypropylene	No	8x40	Tapered Base	0.90mL	0.7mL	<8	12460238	1000
2mL Shell Vial with SepCap	Clear	No	12x32	Flat Bottom	2.4mL	1.8mL	<200	11995693	200
	Polypropylene	No	12x32	Flat Bottom	2.4mL	1.8mL	<200	12463798	1000
4mL Shell Vial with SepCap	Clear	No	15x45	Flat Bottom	5.5mL	4mL	<800	11905346	100
	Polypropylene	No	15x45	Flat Bottom	5.5mL	4mL	<800	12440198	100
800µL Polyspring Conical Insert	Clear	–	6x38	Pulled Point	950µL	800µL	<9	12430218	100
3mL Accuform Shell Vial with SepCap	Polypropylene	No	15x45	Tapered Base	3.75mL	2.9mL	<8	15207308	1000
Positive Displacement Vial for Alcott with PE Plug Cap	Clear	No	8x35	Flat Bottom	1mL	900µL	–	12473588	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



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	10098374	1000
	Clear	22x38	Square Rim	Flat Bottom	9	6	12440298	1000
	Clear	23x46	Beveled Edge	Flat Bottom	12.5	10	11991563	100
	Clear	23x46	Beveled Edge	Round Bottom	12.5	10	11965703	100
	Clear	23x46	Square Rim	Flat Bottom	12.5	10	10623633	1000
	Clear	23x75	Beveled Edge	Flat Bottom	21.5	20	11905713	100
	Clear	23x75	Beveled Edge	Round Bottom	21.5	20	10776635	100
	Clear	23x75	Square Rim	Flat Bottom	21.5	20	12450268	1000
	Clear	30x60	Beveled Edge	Flat Bottom	27	25	12460268	1000
	18mm Screw Top Headspace Vial	Clear	22.5x46	Screw Thread	Round Bottom	12	10	15159976
Clear		22.5x76	Screw Thread	Round Bottom	21	20	11911533	125

Recommended for most brands of instruments.

For autosampler compatibility visit www.thermoscientific.com/chromexpert

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	–	–	–	10446502	1000
20mm Tear-off Crimp Cap	Silver	Aluminum	–	–	–	11311613	1000
20mm Pressure Release Crimp Cap, 7.5mm hole	Silver	Aluminum-PR	–	–	–	12460298	1000
Septum for 20mm Crimp Caps	–	–	20mm Gray Bromobutyl Stopper	37	–	12470268	1000
	–	–	20mm Tan PTFE/White Silicone	45	3.2	12490268	100
	–	–	20mm Gray PTFE/Red Rubber	50	3.0	12450278	100
	–	–	20mm Gray PTFE/Black Butyl Molded	50	3.0	12490278	100
	–	–	Unfaced Black Rubber	55	3.0	10141442	100
20mm Crimp Cap, 9.5mm hole	Silver	Aluminum	Gray PTFE/Red Rubber	50	3.0	10540373	100
20mm Pressure Release Crimp Cap, 8mm hole	Silver	Aluminum-PR	Gray PTFE/Red Rubber	50	3.0	12480278	100
20mm Crimp Cap, 9.5mm hole	Silver	Aluminum	Clear PTFE/Gray Butyl Rubber	50	3.0	11925713	100
20mm Pressure Release Crimp Cap, 8mm hole	Silver	Aluminum-PR	Clear PTFE/Gray Butyl Rubber	50	3.0	12410298	100
20mm Crimp Cap, 9.5mm hole	Silver	Aluminum	Gray PTFE/Gray Butyl Rubber, Pharmafix	50	3.0	12400288	100
20mm Pressure Release Crimp Cap, 8mm hole	Silver	Aluminum-PR	Gray PTFE/Gray Butyl Rubber, Pharmafix	50	3.0	10360885	100
20mm Crimp Cap, 9.5mm hole	Silver	Aluminum	Tan PTFE/White Silicone	45	3.2	12410278	100
20mm Pressure Release Crimp Cap, 8mm hole	Silver	Aluminum-PR	Tan PTFE/White Silicone	45	3.2	10518785	100
20mm Magnetic Crimp Cap, 5mm hole	Gold	Tin-plated	Clear PTFE/Translucent Blue Silicone	45	3.0	10158034	100
20mm Magnetic Crimp Cap, 8mm hole	Gold	Tin-plated	Clear PTFE/Translucent Blue Silicone	45	3.0	10076164	100
20mm Pressure Release Crimp Cap, 7.5mm hole	Silver	Aluminum-PR	Clear PTFE/Translucent Blue Silicone	45	3.0	12490288	100
18mm Magnetic Screw Cap, 8mm hole	Silver	Steel	18mm Blue Silicone/Natural PTFE	45	2.0	15230379	125
18mm Magnetic Screw Cap, 8mm hole, SPME	Silver	Steel	18mm Blue Silicone/PTFE, not prefitted	30	1.0	11951533	125

Trying to decide what septum is right for you?

Use our selection guide visit 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	10776635	10360885	12420268	100
	Clear	Silver	Tan PTFE/White Silicone	10776635	10518785	12400278	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	12400268	1
Decapping Pliers	Removes 20mm crimp seals, Protective gloves recommended	10066164	1
Manual Decrimper	Removes 20mm crimp seals	10279364	1
Manual stainless steel Cleanroom Crimper	Attaches 20mm crimp seals	15217308	1
Manual stainless steel Cleanroom Decrimper	Removes 20mm crimp seals without vial damage	15220379	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



National Sample Storage Screw Thread Vials

Images shown are 70% to scale

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	12488676	100
13-425 Screw Vial	Clear	No	15x45	Flat Bottom	4	1	11971583	100
15-425 Screw Vial	Clear	No	17x60	Flat Bottom	8	2	11905627	200
15-425 Screw Vial	Clear	No	19x65	Flat Bottom	12	3	12005097	200
18-400 Screw Vial	Clear	No	21x70	Flat Bottom	16	4	11508250	200
20-400 Screw Vial	Clear	No	23x85	Flat Bottom	22	6	12438686	200
24-400 Screw Vial	Clear	No	28x95	Flat Bottom	40	8	12201182	100
8-425 Screw Vial	Amber	No	12x32	Flat Bottom	2	0.5	13121673	100
13-425 Screw Vial	Amber	No	15x45	Flat Bottom	4	1	11528250	100
15-425 Screw Vial	Amber	No	17x60	Flat Bottom	8	2	13141673	200
15-425 Screw Vial	Amber	No	19x65	Flat Bottom	12	3	12498676	200
18-400 Screw Vial	Amber	No	21x70	Flat Bottom	16	4	11518250	200
24-400 Screw Vial	Amber	No	28x95	Flat Bottom	40	8	12458686	100



National Sample Storage Screw Thread Caps and Septa

Images shown are 70% to scale

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	12458636	100
13-425 Screw Cap	White	Urethane	PTFE/PE Foam Liner	75	1.3	11538250	100
15-425 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	75	1.3	11995617	100
18-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	75	1.3	11548250	100
20-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	75	1.3	12438636	100
24-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	75	1.3	12670356	100
Septum for 8-425 Screw Cap	-	-	0.01" White PTFE/0.05" Clear Silicone	50	1.5	12478676	100
Septum for 13-425 Screw Cap	-	-	0.01" White PTFE/0.05" Clear Silicone	50	1.5	12418676	100
Septum for 15-425 Screw Cap	-	-	0.01" White PTFE/0.09" Clear Silicone	50	2.6	12428676	100
Septum for 18-400 Screw Cap	-	-	0.01" White PTFE/0.05" Clear Silicone	50	1.5	12438676	100
Septum for 20-400 Screw Cap	-	-	0.01" White PTFE/0.05" Clear Silicone	50	1.5	12448676	100
Septum for 24-400 Screw Cap	-	-	0.01" White PTFE/0.09" Clear Silicone	50	2.6	12458676	100
Septum for 24-400 Screw Cap	-	-	0.013" White PTFE/0.120" Clear Silicone	50	3.3	12468676	100
Open top 8-425 Screw Cap	Black	Polypropylene	-	-	-	12623735	100
Open top 13-425 Screw Cap	Black	Polypropylene	-	-	-	13171663	100
Open top 15-425 Screw Cap	Black	Polypropylene	-	-	-	13110993	100
Open top 18-400 Screw Cap	Black	Polypropylene	-	-	-	12458626	100
Open top 20-400 Screw Cap	Black	Polypropylene	-	-	-	12468626	100
Open top 24-400 Screw Cap	White	Polypropylene	-	-	-	12478626	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



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	12488676	12458636	10439524	100	
	Clear	4	White	Urethane		11971583	11538250	10560116	100	
	Clear	8	White	Polypropylene		11905627	11995617	10077434	200	
	Clear	12	White	Polypropylene		12005097	11995617	12458606	200	
	Clear	16	White	Polypropylene		11508250	11548250	12448616	200	
	Clear	22	White	Polypropylene		12438686	12438636	12478616	200	
	Clear	40	White	Polypropylene		12201182	12670356	10260795	100	
	Amber	2	White	Urethane		13121673	12458636	12478606	100	
	Amber	4	White	Urethane		11528250	11538250	12418616	100	
	Amber	8	White	Polypropylene		13141673	11995617	12438616	200	
Screw Vial Assembled Kit, Solid-top Cap	Amber	12	White	Polypropylene	12498676	11995617	12468606	200		
	Amber	16	White	Polypropylene	11518250	11548250	12095540	200		
	Amber	40	White	Polypropylene	12458686	12670356	12498616	100		
	Clear	20	White	Polypropylene	10332645-VO	12670356	11911583	100		
	Amber	20	White	Polypropylene	12418646-VO	12670356	12498606	100		
	Screw Vial Convenience Kit, Open top Cap	Clear	2	Black	Polypropylene	0.01" White PTFE/ 0.05" Clear Silicone	12488676	12623735/12478676	12488656	100
		Clear	4	Black	Polypropylene		11971583	13171663/12418676	12428666	100
		Clear	8	Black	Polypropylene		11905627	13110993/12428676	12448666	200
		Clear	12	Black	Polypropylene		12005097	13110993/12428676	12498656	200
		Clear	16	Black	Polypropylene		11508250	12458626/12438676	12468666	200
Clear		22	Black	Polypropylene	12438686		12468626/12448676	12488666	200	
Clear		40	White	Polypropylene	12201182		12478626/12458676	12498666	100	
Amber		2	Black	Polypropylene	13121673		12623735/12478676	12418666	100	
Amber		4	Black	Polypropylene	11528250		13171663/12418676	12438666	100	
Amber		12	Black	Polypropylene	12498676		13110993/12428676	12408666	200	
Amber	40	White	Polypropylene	12458686	12478626/12458676	12408676	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"



1032645

National EPA Screw Vial Convenience Kits

Items not shown to scale

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	12488646	100
EPA Screw Vial Assembled Kit	Clear	40	28x95	0.01" White PTFE/0.09" Clear Silicone	10703406	100
	Amber	40	28x95	0.01" White PTFE/0.09" Clear Silicone	10200855	100
	Clear	20	28x57	0.01" White PTFE/0.09" Clear Silicone	10332645	100
	Amber	20	28x57	0.01" White PTFE/0.09" Clear Silicone	12418646	100



12418656

12468656



12458646

12458676

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	—	12418656	100
	Amber	—	28x95	40	—	12468656	100
24-400 EPA Screw Cap	—	White	—	—	Polypropylene	12458646	100
Septum for 24-400 Screw Cap	—	—	—	—	0.01" White PTFE/0.09" Clear Silicone	12458676	100

National Vial Reference Chart

*Drawing is valid for: 10529375, 10251765, 10118894, 10428204
Images shown are 80% to scale

8mm Crimp Top Vials

Part No.	12423588	12433598	10712846	11921533	10169154	12453598	10097124	10661006
Dimensions	8x30	7x30	6x32	6x32	7x40	7x40	7x40	7x40
Common Description	0.8mL	0.5mL	0.2mL	0.3mL	0.7mL	0.7mL	0.7mL	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

Part No.	11999197	10466844	11995703	13424016	12460098	12410108
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

Part No.	14839810	14849810	15240379	14879810	11975703	11548240	11921523	11568240	15146463	11925703
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

Part No.	11317381	12656907	10322185	15227298	15270369	12443568	10578965	12463568	10429264	12680356
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: 12163771, 12173771, 12183771, 12193771
Images shown are 80% to scale

Part No.	11961563	12133771	11911563	12812344	11941533	12624045	12403668	12423668
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

Part No.	10171962	12443638	13181683	12413648	11917318	12453708	10122388	11943426	12433718
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

Part No.	11915713	11981513	12443728	11911523	12420048	12453718	10008574	10332825	10556765
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	Amber
Composition	Glass	Glass	Amber	Amber	Glass	Glass	Glass	Glass	Amber

11mm Standard-Opening Crimp Vials 12x32mm

Part No.	13171703	12410088	10424363	12430088	12480078
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

Part No.	12440088	12450088	10538215	10119084	12470088
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

Part No.	11893722	10599375	12433778	10679775	12453728	12410068	12420068	10139334	10477614	10189184
Common Description	2mL	2mL	2mL	2mL	700µL	350µL	350µL	800µL	3700µL	1.5mL
Approx. Total Capacity	2mL	2mL	2mL	2mL	1000µL	500µL	500µL	600µL	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

Part No.	11588240	10211585	10407234	12400088	11387371
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

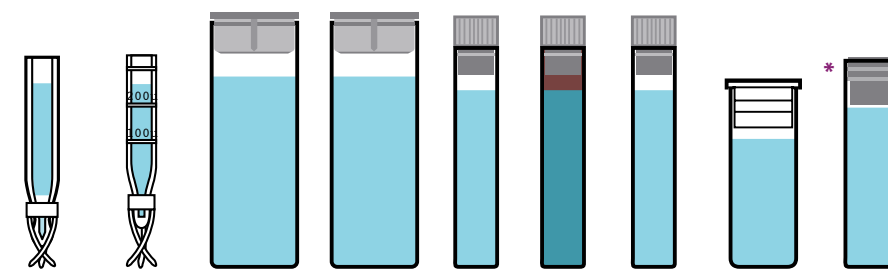
Part No.	12440298	10098374	12460268
Common Description	6mL	6mL	27mL
Approx. Total Capacity	9mL	9mL	27mL
Composition	Glass	Glass	Glass

Headspace Vials

Part No.	15159976	11911533	11905713	11991563	10776635	11965703	12450268	10623633
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



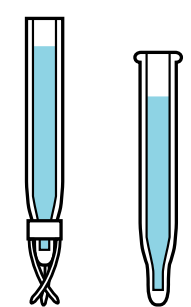
Part No.	12480238	12410248	11905346	12440198	11901523	11951523	10407244	11995693	12473588
Dimensions	5x34mm	5x29mm	—	—	—	—	—	—	8x35mm
Common Description	250µL	275µL	4mL	4mL	1mL	1mL	1mL	2mL	1mL
Approx. Total Capacity	375µL	375µL	5.5mL	5.5mL	1.25mL	1.25mL	1.25mL	2.4mL	1mL
Rec. Usable Volume	210µL	250µL	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.	12400178	11991513	12440188	10342485	10291525	12440178
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.	12430218	11941563
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 ₂	B ₂ O ₃	Al ₂ O ₃	CaO	MgO	Na ₂ O	K ₂ 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



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	11553760	500
0.2mL Sci-Vi Crimp Top Vial – GOLD Grade Glass	Clear	No	6x32	Conical	250	200	<5	11543760	500
0.2mL Sci-Vi Crimp Top Vial	Amber	No	6x32	Conical	250	200	<5	10414312	500
0.1mL Sci-Vi Crimp Top Vial – GOLD Grade Glass	Clear	No	6x32	Round Bottom	125	80	<1	11573760	500
1.2mL Crimp Top Vial	Clear	No	8x40	Flat Bottom	1300	1200	<75	11513760	500
1mL Crimp Top Tapered Vial	Clear	No	8x40	Conical	1180	1000	<5	10268960	500
0.8mL Crimp Top Vial	Clear	No	8x30	Flat Bottom	1000	800	<80	11583750	500
	Clear	No	7x40	Flat Bottom	775	650	<70	11573750	500
	Amber	No	7x32	Round Bottom	700	600	<30	11563780	500
0.7mL Crimp Top Tapered Vial	Clear	No	7x40	Conical	575	450	<5	11563750	500
	Amber	No	7x40	Conical	575	450	<5	11583770	500



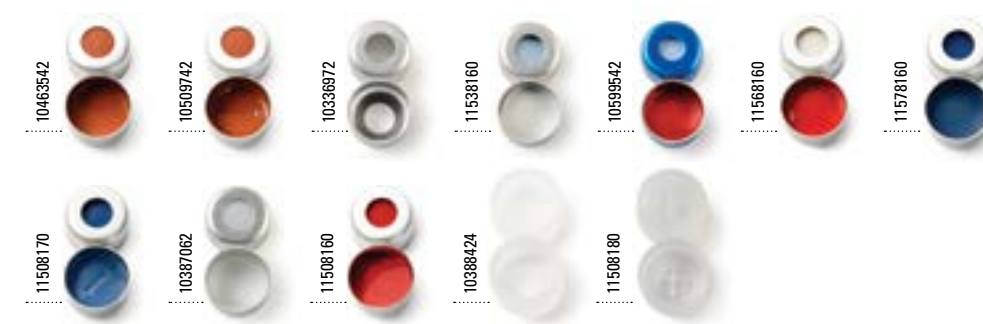
Chromacol 8mm Crimp Top Vials

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	11931573	500
0.5mL Crimp Top Tapered Vial	Amber	No	7x30	Conical	500	450	<5	11553780	500
PTFE Vial Support Sleeve for 6x32mm vials, fits most autosamplers	PTFE	No	12x31	Flat Bottom	–	–	–	11568200	50
PTFE Vial Support Sleeve for 6x32mm vials, fits robotic autosamplers	PTFE	No	12x32	Flat Bottom	–	–	–	11508210	25
Glass Vial Support Sleeve for 6x32mm vials, fits robotic autosamplers	Clear	Yes	12x32	Flat Bottom	–	–	–	11538210	25
PTFE Vial Support Sleeve for 7x32mm vials, fits most autosamplers	PTFE	No	12x32	Flat Bottom	–	–	–	10438574	40

Sleeves adapt 6x32mm vials for use in autosamplers designed for 12x32mm vials. Use sleeve 11568200 for autosamplers that do not lift the vial from the tray. Use 11508210 or 11538210 for autosamplers that move the vial during sampling. Use 10438574 for 11931573 and 11563780.

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

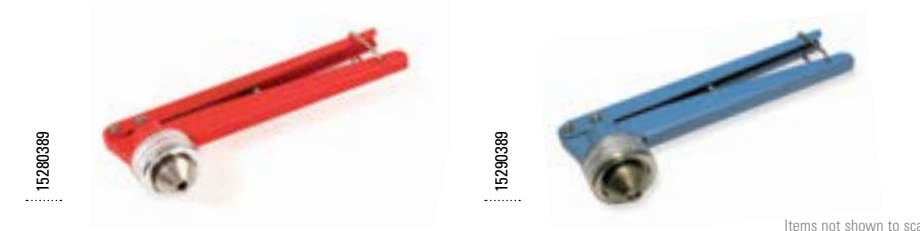


Chromacol 8mm Crimp Top Closures

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	10463542	1000
	Blue	Aluminum	Red Natural Rubber/Clear PTFE	38	1.0	10113462	1000
	Red	Aluminum	Red Natural Rubber/Clear PTFE	38	1.0	10123462	1000
8mm Crimp Cap, 4mm hole, Type 7 Rubber/PTFE Liner	Silver	Aluminum	Red Natural Rubber/Clear PTFE	60	1.0	10509742	1000
	8mm Crimp Cap, 4mm hole	Silver	Aluminum	–	–	10336972	1000
8mm Snap Cap, Thinned penetration area	Silver	Aluminum	Gray Chlorobutyl Rubber/Clear PTFE	52	1.0	11538160	500
	Blue	Aluminum	Blue Silicone/Red PTFE	20	1.4	10599542	500
	Silver	Aluminum	White Silicone/Red PTFE	50	1.3	11568160	500
	Silver	Aluminum	Blue Silicone/PTFE	30	1.0	11578160	500
	Silver	Aluminum	Blue Silicone/PTFE, Pre-slit	30	1.0	11508170	500
	Silver	Aluminum	White Virgin PTFE, 0.01"	53	0.2	10387062	1000
	Silver	Aluminum	Red PTFE/White Silicone/Red PTFE	57	1.0	11508160	500
8mm Snap Cap, Thinned penetration area	Clear	Polyethylene	Integral Molded In Polyethylene	–	–	10388424	1000
	Clear	Polyethylene	Integral Molded In Polyethylene, Pre-cut	–	–	11508180	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	15280389	1
Manual Decrimper	Removes 8mm aluminum crimp seals without vial damage	15290389	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



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	11513680	500
	Amber	Yes	12x32	Flat Bottom	2.0	1.5	<170	11503690	500
8-425 Screw Thread Vial – GOLD Grade Glass	Clear	No	12x32	Flat Bottom	2.0	1.5	<170	11543680	500
8-425 Screw Thread 1.1mL Vial – GOLD Grade Glass	Clear	No	12x32	Conical	1.2	1.1	<5	11503680	500
8-425 Screw Thread 0.3mL Vial	Polypropylene	No	12x32	Insert Vial	0.3	250µL	<3	10125862	500
200µL Insert	Clear Glass	No	5x31	Flat Bottom	250µL	200µL	<12	10227672	1000
	Clear Glass	No	5x30	Conical	200µL	160µL	<4	10728544	1000
Self-centering support device for tapered glass inserts	Polyethylene	–	–	–	–	–	–	10185482	500
Support Sleeve for 11503680	PTFE	–	–	–	–	–	–	11598180	50

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

Recommended for the following instruments:

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

For autosampler compatibility visit www.thermoscientific.com/chromexpert

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	–	–	–	11583690	500
	Red	Polypropylene	–	–	–	11573700	500
	White	Polypropylene	–	–	–	11513710	500
8mm Open Top Screw Cap with flange, 8-425 thread, 5mm hole	Black	Polypropylene	–	–	–	11503720	500
	White	Polypropylene	–	–	–	11971503	500
Septum for 8-425 Screw Caps	–	–	Red Natural Rubber/Clear PTFE	38	1.0	10593703	1000
	–	–	White Silicone/Red PTFE	45	1.3	11513700	500
	–	–	Blue Silicone/PTFE	50	1.2	10554283	500
	–	–	Blue Silicone/PTFE, Pre-slit	50	1.2	10195762	500
	–	–	White Silicone/PTFE	20	1.4	11543700	500
	–	–	Blue Silicone/PTFE	30	1.0	10443292	500
	–	–	Red PTFE/White Silicone/Red PTFE	57	1.0	11533700	500
	–	–	White Virgin PTFE, 0.01"	53	0.3	10165192	1000
–	–	Blue Silicone/Red PTFE	20	1.4	10701004	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	11533720	500
8mm Open Top Screw Cap, 8-425 thread, 5mm hole	Black	Polypropylene	White Silicone/Red PTFE	45	1.3	11583710	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



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	11513680	11971503 + 10443292	10071862	100
IS Kit, Standard Opening Screw Vial for Shimadzu LC Autosamplers	Clear	Yes	White, flanged	Blue Silicone/PTFE	11513680	11971503 + 10443292	10277612	100
IS Kit, Standard Opening Screw Vial for Thermo Scientific LC Autosamplers	Clear	Yes	Black	White Silicone/Red PTFE	11513680	11583710	13121813	100

Trying to decide what septum is right for you?

Use our selection guide at 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



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	15232670	100
9mm SureStop Screw Thread Vial (AVCS)	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	14849820	100
9mm Screw Thread Vial	Clear	No	15x46	Flat Bottom	4.0mL	3.5mL	<500	11533680	500
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	11563690	500
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	11573690	500
9mm Screw Thread Vial, High Recovery with 30µL Reservoir	Clear	No	12x32	Tapered Base	1.5mL	1.3mL	<4	11593780	100
9mm Screw Thread Vial, Ultra High Recovery with 10µL Reservoir	Clear	No	12x32	Mandrel Base	1.2mL	1.0mL	<2	12085540	100
9mm Screw Thread Vial 300µL, Fused Insert	Clear	Yes	12x32	Insert Vial	0.3mL	250µL	<3	11573680	500
	Amber	Yes	12x32	Insert Vial	0.3mL	250µL	<3	11583680	500
9mm Screw Thread Vial 200µL, Fused Insert-GOLD grade glass	Clear	Yes	12x32	Insert Vial	0.2mL	180µL	<2	12631505	500
	Clear	–	6x31	Flat Bottom	300µL	200µL	<12	10237672	1000
200µL Insert – GOLD Grade Glass	Clear	–	6x30	Pulled Point	200µL	160µL	<4	10570303	1000
Self-centering support device for tapered glass inserts	Polyethylene	–	–	–	–	–	–	10185482	500
9mm Screw Thread Vial	Polypropylene	No	12x32	Insert Vial, Mandrel	300µL	200µL	<4	11915592	500

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

Chromacol 9mm Screw Thread Closures

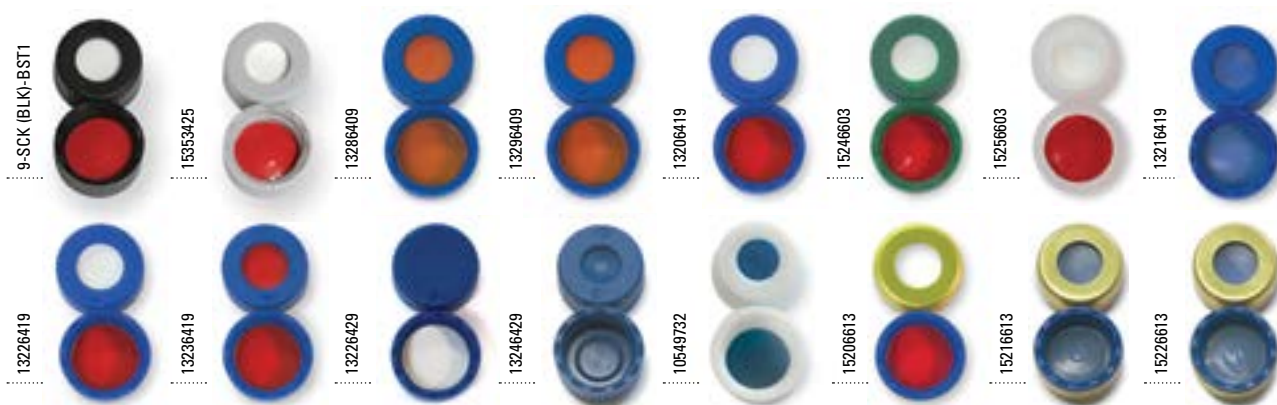


K-Series closures featuring AVCS technology (Advanced Vial Closure System)

- 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	9-SCK (BLK)-BST1	500
	Gray	Polypropylene	Bonded Red PTFE/White Silicone, Pre-slit	45	1.2	15353425	500
9mm Open Top Short Screw AVCS Cap, 6mm hole	Blue	Polypropylene	Red Rubber/Clear PTFE	58	1.0	13296409	500
	Blue	Polypropylene	Red Rubber/Clear PTFE, Pre-slit	58	1.0	13296409	500
	Blue	Polypropylene	White Silicone/Red PTFE	57	1.0	13206419	500
	Green	Polypropylene	White Silicone/Red PTFE	57	1.0	15246603	500
	Clear	Polypropylene	White Silicone/Red PTFE	57	1.0	15256603	500
	Blue	Polypropylene	Blue Silicone/PTFE	30	1.0	13216419	500
	Blue	Polypropylene	White Silicone/Red PTFE, Y-Pre-slit	57	1.0	13226419	500
	Blue	Polypropylene	Red PTFE/White Silicone/Red PTFE	57	1.0	13236419	500
9mm Solid Top Short Screw AVCS Cap	Blue	Polypropylene	Red Natural Rubber/Beige PTFE	58	1.0	13226429	500
9mm Short Screw AVCS Cap with Integral PP-Membrane	Blue	Polypropylene				13246429	500
9mm Open Top Short Screw Cap with flange, 6mm hole	White	HDPE	Blue Silicone/PTFE	30	1.0	10549732	500
9mm Open Top Short Screw AVCS Cap, 6mm hole, magnetic	Blue/Gold	PP/Steel	White Silicone/Red PTFE	57	1.0	15206613	100
	Blue/Gold	PP/Steel	Soft septum, Blue Silicone/PTFE	30	1.0	15216613	100
	Blue/Gold	PP/Steel	Soft septum, Blue Silicone/PTFE, Pre-slit	30	1.0	15226613	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



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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	15232670	13286409	15242670	100
	Clear	Yes	Blue	White Silicone/Red PTFE	15232670	13206419	15262670	100
SureStop Convenience Kit	Amber	Yes	Blue	Red Natural Rubber/Clear PTFE	14849820	13286409	14859820	100
	Amber	Yes	Blue	White Silicone/Red PTFE	14849820	13206419	2-SVWK(A)ST-CPK	100
SureStop IS Kit, GOLD Grade, for Thermo GC Autosampler	Clear	Yes	Blue	Blue Silicone/PTFE	15232670	13216419	15252670	100
AVCS Convenience Kit	Clear	Yes	Blue	Red Natural Rubber/Clear PTFE	11563690	13286409	13466119	100
	Clear	Yes	Blue	White Silicone/Red PTFE	11563690	13206419	13246419	100
	Amber	Yes	Blue	Red Natural Rubber/Clear PTFE	11573690	13286409	13476119	100
	Amber	Yes	Blue	White Silicone/Red PTFE	11573690	13206419	13276419	100
AVCS IS Kit, for Agilent LC Autosampler	Clear	Yes	Blue	Red Natural Rubber/Clear PTFE	11563690	13286409	13286419	100
AVCS IS Kit, for Thermo GC Autosampler	Clear	Yes	Blue	Blue Silicone/PTFE	11563690	13216419	13206429	100
AVCS Convenience Kit, for Varian GC Autosampler	Clear	Yes	Blue	White Silicone/Red PTFE	11563690	13206419	13296419	100
AVCS IS Kit, for Varian LC Autosampler	Clear	Yes	Blue	White Silicone/Red PTFE	11563690	13206419	13216429	100
AVCS IS Kit, for Waters Alliance® LC Autosampler	Clear	Yes	Blue	White Silicone/Red PTFE	11563690	13206419	13236429	100
AVCS IS Kit, for PerkinElmer LC Autosampler	Clear	Yes	Green	White Silicone/Red PTFE, Pre-slit	11563690	9-SCK(G)-ST1X	15236613	100
AVCS IS Kit, for Waters Alliance LC Autosampler	Clear	Yes	Black	Bonded Red PTFE/White Silicone	11563690	15343425	15383425	100
Convenience Kit	Clear	Yes	Gray	Bonded Red PTFE/White Silicone, Pre-slit	11563690	15353425	2-SVWBSTX-CPK	100
	Amber	Yes	Gray	Bonded Red PTFE/White Silicone, Pre-slit	11573690	15353425	2-SVW(A)BSTX-CPK	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



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	11563760	500
	Clear	Glass	12x40	Flat Bottom	2.5mL	2.0mL	<170	11523780	500
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	10207234	500
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	10739285	500
11mm Crimp Top Vial, Wide Opening – GOLD Grade Glass	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	11533760	500
11mm Crimp Top Vial, Wide Opening	Clear	Yes	12x32	Round Bottom	2.0mL	1.5mL	<170	12089143	500
11mm Crimp Top 1.5mL High Recovery Vial	Clear	No	12x32	High Recovery	1.5mL	1.3mL	<4µL	10500303	100

Compatible with:

Most HPLC and GC autosamplers

For autosampler compatibility visit

www.thermoscientific.com/chromexpert



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	11503760	500
11mm Crimp Top 1.1mL Vial, Wide Opening	Amber	No	12x32	Conical	1.4mL	1.1mL	<5	10245762	500
11mm Crimp Top 0.9mL Vial, Wide Opening	Clear	No	10x32	Conical	1.0mL	850µL	<5	10360951	500
	Clear	No	12x32	Insert Vial	0.9mL	830µL	<3	11543780	500
11mm Crimp Top 0.3mL Vial, Fused Insert	Clear	Yes	12x32	Insert Vial	0.3mL	250µL	<3	10798345	500
	Amber	Yes	12x32	Insert Vial	0.3mL	250µL	<3	10003264	500
11mm Crimp Top 0.2mL Vial, Fused Insert – GOLD Grade Glass	Clear	Yes	12x32	Insert Vial	0.2mL	180µL	<2	12611505	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	10237672	1000
200µL Insert – GOLD Grade Glass	Clear	–	6x30	Pulled Point	200µL	160µL	<4	10570303	1000
Self-centering vial support device for tapered glass inserts	Polyethylene	–	–	–	–	–	–	10185482	500
PTFE Vial Support 11503760	PTFE	–	–	–	–	–	–	11598180	50
Plastic Vial Support Sleeve for 10360951 Only	Polyethylene	–	–	–	–	–	–	11538190	100

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

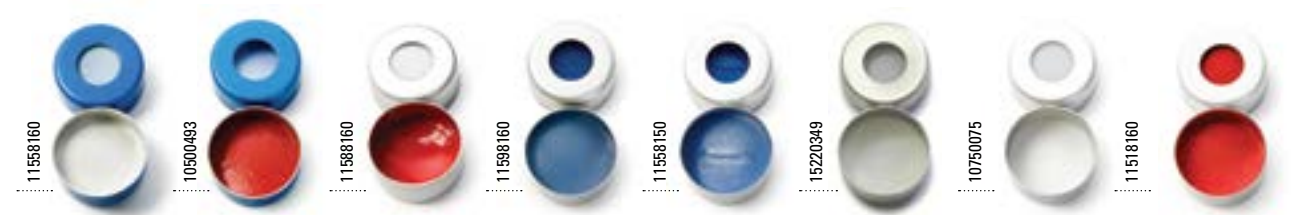
Chromacol 11mm Crimp Top Closures

- 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	12346838	100
11mm Crimp Cap, 6mm hole	Silver	Aluminum	Solid Aluminum Disk with Silicone sealing ring	–	0.06	15210349	100
11mm Crimp Cap, 6mm center hole	Silver	Aluminum	–	–	–	11518170	500
11mm Crimp Cap, 6mm center hole, Type 6 Rubber/PTFE	Silver	Aluminum	Red Chlorobutyl Rubber/Clear PTFE,	40	1.0	11568150	500
	Red	Aluminum	Sulphur free	40	1.0	11588150	500
11mm Crimp Cap, 6mm center hole, Type 7 Rubber/PTFE	Silver	Aluminum	Red Natural Rubber/Clear PTFE	60	1.0	11578150	500
	Blue	Aluminum	–	60	1.0	11941573	500
	Red	Aluminum	–	60	1.0	11971573	500
	Green	Aluminum	–	60	1.0	11951573	500
	Gold	Aluminum	–	60	1.0	11961573	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	11558160	500
	Blue	Aluminum	Blue Silicone/Red PTFE	20	1.4	10500493	500
11mm Crimp Cap, 6mm center hole, Type 6 Rubber/PTFE	Silver	Aluminum	White Silicone/Red PTFE	50	1.3	11588160	500
	Silver	Aluminum	Blue Silicone/PTFE	30	1.0	11598160	500
11mm Crimp Cap, 6mm center hole, Type 7 Rubber/PTFE	Silver	Aluminum	Blue Silicone/PTFE, Pre-slit	30	1.0	11558150	500
	Silver	Aluminum	White Virgin PTFE, 0.01" with clear Silicone sealing ring	53	0.25	15220349	1000
11mm Snap Cap for Crimp Vials	Silver	Aluminum	White Virgin PTFE, 0.01"	–	0.25	10750075	1000
11mm Snap Cap for Crimp Vials, Pre cut	Silver	Aluminum	Red PTFE/White Silicone/Red PTFE	57	1.0	11518160	500

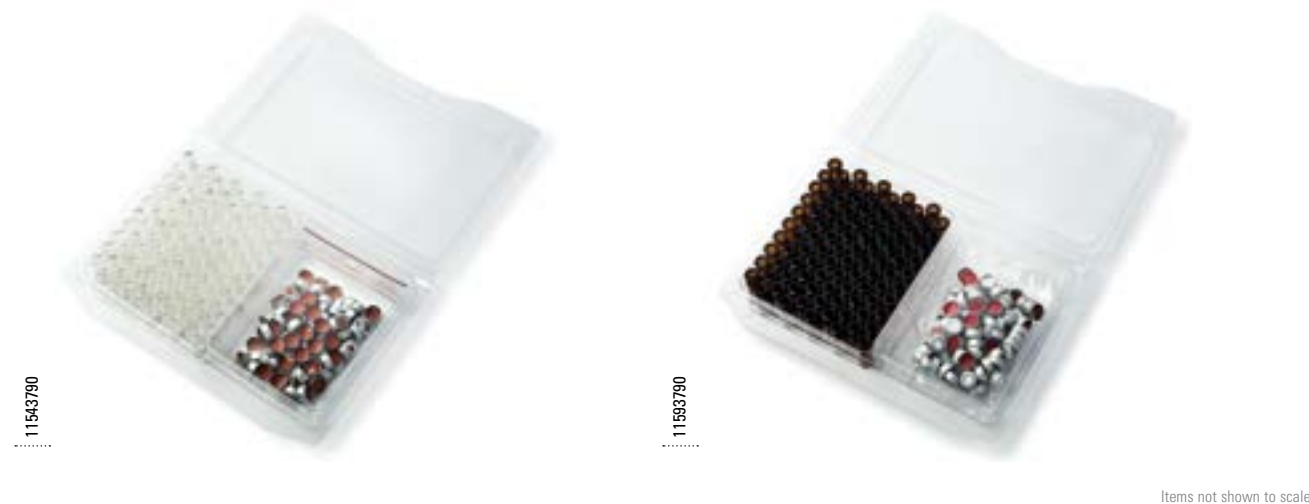


Chromacol 11mm Crimp Top Closures (Continued)

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	12376838	500
11mm Crimp Cap, magnetic, Type 8 Rubber/PTFE	Silver	Steel	Red Natural Rubber/Clear PTFE	38	1.0	12719296	500
11mm Crimp Cap, magnetic	Silver	Steel	Blue Silicone/PTFE	30	1.0	12366838	500
11mm Snap Cap for Crimp Vials	Clear	Polyethylene	–	–	–	11598170	1000
11mm Snap Cap for Crimp Vials, Pre cut	Clear	Polyethylene	–	–	–	11528180	1000
11mm Snap Cap for Crimp Vials	Clear	Polyethylene	White Silicone/Red PTFE	57	1.0	11776483	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	10207234	11578150	11543790	100
	Clear	Yes	Silver	White Silicone/Red PTFE	10207234	11588160	10316782	100
	Amber	Yes	Silver	Red Natural Rubber/Clear PTFE, Type 7	10739285	11578150	11553790	100
	Amber	Yes	Silver	White Silicone/Red PTFE	10739285	11588160	11593790	100
IS Kit, Wide Opening Crimp Top Vial for Agilent GC Autosampler	Clear	Yes	Silver	Red Natural Rubber/Clear PTFE, Type 7	10207234	11578150	11508220	100
IS Kit, Wide Opening Crimp Top Vial for Agilent LC Autosampler	Clear	Yes	Silver	Red Natural Rubber/Clear PTFE, Type 7	10207234	11578150	10676003	100
IS Kit, Wide Opening Crimp Top Vial for VWR(Merck)-Hitachi LC Autosampler	Clear	Yes	Silver	Blue Silicone/PTFE-Pre-Cut	10207234	11558150	10513523	100
IS Kit, Wide Opening Crimp Top Vial for PerkinElmer GC Autosampler	Clear	Yes	Silver	Red Natural Rubber/Clear PTFE, Sulphur free, Type 6	10207234	11568150	10472902	100
IS Kit, Wide Opening Crimp Top Vial for Shimadzu LC Autosampler	Clear	Yes	Silver	Blue Silicone/PTFE	10207234	11598160	10514663	100
IS Kit, Wide Opening Crimp Top Vial for Thermo Scientific GC Autosamplers	Clear	Yes	Silver	Blue Silicone/Red PTFE	10207234	11-AC(N)-ST144	10389342	100
IS Kit, Wide Opening Crimp Top Vial for Thermo LC Autosampler	Clear	Yes	Silver	White Silicone/Red PTFE	10207234	11588160	10413662	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	14860742	1
Decapping Pliers	Removes 11mm aluminum crimp seals, Protective gloves recommended	10530303	1
Manual Decrimper	Removes 11mm aluminum crimp seals without vial damage	15198784	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



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	11543730	500
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	11553730	500
11mm Snap Cap 1.5mL Vial	Clear	No	12x32	High Recovery	1.5mL	1.3mL	<4	10616633	100
11mm Snap Cap 1.5mL Vial, silanized*	Clear	No	12x32	High Recovery	1.5mL	1.3mL	<4	10583703	100
11mm Snap Cap Vial, Ultra High Recovery with 10µL Reservoir	Clear	No	12x32	Mandrel Base	1.2mL	1mL	<2	12396818	100
11mm Snap Cap 300µL Vial, Fused Insert	Clear	Yes	12x32	Fused Conical	300µL	250µL	<3	11553690	500
	Amber	Yes	12x32	Fused Conical	300µL	250µL	<3	10402972	500
11mm Snap Cap 200µL Vial, Fused Insert – GOLD grade glass	Clear	Yes	12x32	Fused Conical	200µL	180µL	<2	12306808	500
300µL Insert	Clear	–	6x31	Flat Bottom	300µL	200µL	<12	10237672	1000
200µL Insert – GOLD Grade Glass	Clear	–	6x30	Pulled Point	200µL	160µL	<4	10570303	1000
Self-centering support device for tapered glass inserts	Polyethylene	–	–	–	–	–	–	10185482	500

* For information about silanized products visit 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	–	–	11558180	500
11mm Snap Cap, 6mm hole	Blue	Polyethylene	Red Natural Rubber/Clear PTFE	58	1.0	11518180	500
	Blue	Polyethylene	White Silicone/Red PTFE	57	1.0	11548180	500
	Blue	Polyethylene	Blue Silicone/PTFE	30	1.0	11588180	500
	Blue	Polyethylene	White Silicone/Blue PTFE, Pre-slit	57	1.0	11578180	500
	Blue	Polyethylene	Red PTFE/White Silicone/Red PTFE	57	1.0	10675283	500
	Red	Polyethylene	White Virgin PTFE, 0.01"	53	0.3	10064052	500
	Blue	Polyethylene	White Virgin PTFE, 0.01"	53	0.3	11538180	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



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Items not shown to scale

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	11543730	11548180	1072774	100
	Clear	Yes	Blue	Red Natural Rubber/Clear PTFE	11543730	11518180	10306352	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



11563680

11553680

11523680

11513690

10256002

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

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	11563680	125
	Clear	No	13x65	Round Bottom	5.0	4.5	<500	11553680	125
	Clear	No	15x46	Flat Bottom	4.0	4.0	<800	11523680	500
	Amber	No	15x46	Flat Bottom	4.0	4.0	<800	11513690	500
13-425 Screw Thread 3.5mL High Recovery Vial	Clear	No	15.25x46	High Recovery	3.5	3.0	<12	10256002	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	–	–	–	11593690	500
	White	Polypropylene	–	–	–	11523710	500
	Red	Polypropylene	–	–	–	11583700	500
	Yellow	Polypropylene	–	–	–	11503710	500
13mm Solid Top Cap, 13-425 thread	Black	Polypropylene	–	–	–	11573710	500
PTFE Lined Solid Top Storage Cap for 13-425 Thread	White	Urea	PTFE/PE Foam Liner	–	–	10514673	100
Septum for 13-425 Screw Caps	–	–	Red Natural Rubber/Clear PTFE	38	1.0	11563700	500
	–	–	White Silicone/Red PTFE	57	2.0	11523700	500
	–	–	Blue Silicone/PTFE	57	1.8	10145722	500
	–	–	Blue Silicone/PTFE	30	1.0	10248152	500
	–	–	White Virgin PTFE, 0.01"	53	0.25	10533903	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	10295712	500
	Black	Polypropylene	Red Natural Rubber/Clear PTFE	58	1.0	11553710	500
	Black	Polypropylene	White Silicone/Red PTFE	57	2.0	11563710	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



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	10492750	500
1mL Neckless/Shell Vial with PE-Cap	Clear	No	8x40	Flat Bottom	1.25	1.0	<80	11548210	200
1mL Neckless/Shell Vial with PE-Cap	Amber	No	8x40	Flat Bottom	1.25	1.0	<81	11558210	200
2mL Neckless/Shell Vial	Clear	No	12x32	Flat Bottom	2.5	2.0	<175	12777887	500
4mL Neckless/Shell Vial with PE-Cap	Clear	No	15x46	Flat Bottom	5.5	4.0	<350	11568210	100
8mm PE-Cap/Plug for 1mL Shell-Vial	Polyethylene	–	–	–	–	–	–	11588210	1000
12mm Polyethylene Plug for 2mL Shell-Vial	Polyethylene	–	–	–	–	–	–	12376858	1000

Recommended for the following instruments:

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

For autosampler compatibility visit www.thermoscientific.com/chromexpert

Trying to decide what glass quality is right for you?

Use our selection guide at 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	10163072	100
	Clear	No	23x75	Beveled Edge	Round Bottom	22	20	11553770	125
	Clear	No	22.5x75	Beveled Edge	Round Bottom	21	20	10104424	125
	Amber	No	22.5x75	Beveled Edge	Round Bottom	21	20	11543770	125
	Clear	No	18x65	Beveled Edge	Round Bottom	12	10	11921573	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	10337824	125
	Amber	No	22.5x46	Beveled Edge	Round Bottom	12	10	11513770	125
	Clear	No	18x50	Beveled Edge	Round Bottom	10	9	11593760	100
	Clear	No	22x38	Beveled Edge	Round Bottom	8	6	11583760	125
18mm Screw Top Headspace Vial	Clear	No	22.5x76	Screw Thread	Round Bottom	21	20	10718503	125
	Clear	No	22.5x46	Screw Thread	Round Bottom	12	10	11981523	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	13488988	1
Decapping Pliers	Removes 20mm crimp seals, Protective gloves recommended	10143362	1
Manual Decrimper	Removes 20mm crimp seals without vial damage	15188784	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	–	–	–	11588190	500
20mm Magnetic Crimp Cap, 6mm hole	Silver	Tinplate	–	–	–	11578190	500
20mm Composite Magnetic Crimp Cap, 8mm hole	Blue	Alu/Tinplate	–	–	–	11588190	500
	Red	Alu/Tinplate	–	–	–	10338822	500
18mm Magnetic Screw Cap, 8mm hole	Silver	Steel	–	–	–	10248252	125
Septum for 20mm Crimp Caps	–	–	20mm Gray Bromobutyl Stopper	55	3.0	11598190	500
	–	–	20mm Gray Butyl Freezer Bung	55	3.0	10258012	2000
	–	–	20mm Molded Gray Chlorobutyl	52	3.0	10472722	1000
	–	–	20mm Molded Gray Bromobutyl/Gray PTFE	52	3.0	10207682	1000
	–	–	20mm Molded Black Bromobutyl/Gray PTFE, Bellows Type	52	3.0	10513333	1000
	–	–	20mm Red Silicone/Aluminum Face Seal 3mm Thick, for >170°C.	45	3.0	10455012	100
	–	–	20mm White Silicone/Aluminum Face Seal 3mm Thick, for <170°C.	45	3.0	11528200	100
	–	–	20mm Silicone/PTFE for liquid – liquid extraction	–	0.25	10574083	100
	–	–	20mm Blue Silicone/Natural PTFE	45	3.0	11508200	500
	–	–	20mm Red Silicone/Natural PTFE, high temperature	45	3.1	10720614	100
	–	–	20mm Blue Silicone/Red PTFE Seal 1.5mm Thick	20	1.5	10759843	500
	–	–	20mm Blue Silicone/PTFE	30	1.0	11518200	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	12386888	125
20mm Composite Magnetic Crimp Cap, 8mm hole	Blue	Alu/Tinplate	20mm Blue Silicone/Natural PTFE	45	3.0	10185232	500
	Red	Alu/Tinplate	20mm Molded Gray Chlorobutyl	52	3.0	20-MCBC(R)-CBT3	500
	Red	Alu/Tinplate	20mm Blue Silicone/Natural PTFE	45	3.0	10348822	500
20mm Magnetic Tinplate Crimp Cap	Silver	Tinplate	20mm Blue Silicone/Natural PTFE	45	3.0	10339062	500
20mm Crimp Cap, 9mm hole	Silver	Aluminum	20mm Molded Gray/Bromobutyl/Gray PTFE	52	3.0	11548200	500
	Silver	Aluminum	20mm Blue Silicone/Natural PTFE	45	3.0	11558200	500
18mm Magnetic Screw Cap, 8mm hole	Silver	Steel	18mm Molded Blue Chlorobutyl/Gray PTFE	52	3.0	10014012	125
	Silver	Steel	18mm Blue Silicone/PTFE, not prefitted	30	1.0	12054078	125
	Silver	Steel	18mm Blue Silicone/Natural PTFE	45	2.0	15204037	125
20mm Plug	Natural	Polyethylene	PE Membrane	–	–	11588170	250
20mm Composite Magnetic Crimp Cap, 8mm hole	Natural	Alu/Tinplate	20mm Red Silicone/Natural PTFE, high temperature (250°C)	45	3.1	15260349	500
20mm Magnetic Tinplate Crimp Cap	Silver	Tinplate	20mm Red Silicone/Natural PTFE, high temperature (300°C)	45	3.1	15270349	500
18mm Magnetic Screw Cap, 8mm hole	Silver	Steel	18mm Red Silicone/Natural PTFE, high temperature (250°C)	45	3.1	15250349	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



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	10718503	15204037	15134649	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	10104424	11548200	11588230	125
Convenience Kit, 20mL Headspace Crimp Vial, Beveled Edge, Round Bottom, Al Crimp Cap, 8mm hole	Clear	No	Silver	20mm Blue Silicone/ Natural PTFE	10104424	11558200	11598230	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	11583740	100
	Amber	No	28x95	Flat Bottom	40	8	11593740	100
20-400 Screw Vial	Clear	No	23x85	Flat Bottom	22	6	11563740	200
	Amber	No	21x70	Flat Bottom	16	4	11553740	200
18-400 Screw Vial	Clear	No	21x70	Flat Bottom	16	4	11543740	200
	Amber	No	21x70	Flat Bottom	16	4	11553740	200
15-425 Screw Vial	Clear	No	19x65	Flat Bottom	12	3	10296774	200
	Amber	No	19x65	Flat Bottom	12	3	11533740	200
	Clear	No	17x60	Flat Bottom	8	2	11513740	200
	Amber	No	17x60	Flat Bottom	8	2	11523740	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	10445082	100
20-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	-	1.0	10001802	100
18-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	-	1.0	10462202	100
15-425 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	-	1.0	10356592	100
13-425 Screw Cap	White	Urea	PTFE/PE Foam Liner	-	1.0	10514673	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	10759114	5
Vial Tray	White	Polypropylene	195x103	10	22	No	10769304	1
Sci-Rack	Blue	Anodised Aluminum	85x85	25	12	No	11922585	1
	Silver	Anodised Aluminum	210x134	28	22	No	10235812	5
	Silver	Anodised Aluminum	210x134	55	15	Yes	10162882	5
	Red	Anodised Aluminum	210x134	104	12	Yes	10494302	5
Vial Tray	Black	Foam	210x134	105	12	No	10122932	5
	Black	Foam	210x134	200	8	No	10529922	5
SBS/ANSI standard footprint Vial Rack	Silver	Anodised Aluminum	127,8x85,5	54	12	No	60180-1232	1
	Silver	Anodised Aluminum	127,8x85,5	96	6	No	60180-0632	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/	12344807	100
	Clear	28x95	40	Level 200 Pre-cleaned	0.09" Clear Silicone	10004152	72
	Clear	28x95	40	Level 300 Pre-cleaned		10405002	72
	Amber	28x95	40	Level 100		12354807	100
	Amber	28x95	40	Level 200 Pre-cleaned		10125192	72
	Clear	28x57	20	Level 100		12386918	100
	Amber	28x57	20	Level 100		11543750	100
	Clear	28x140	60	Level 100		15217298	72

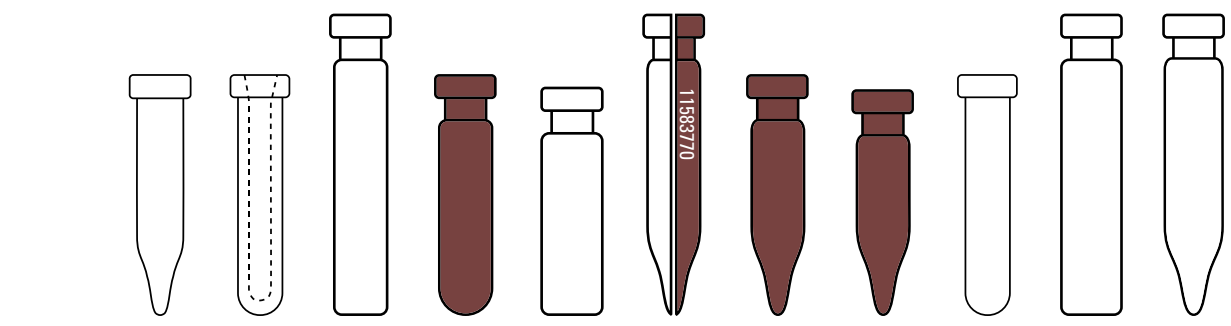
Chromacol TOC Vial Kits (Assembled)

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	10646003	72
TOC clear vial with cap bonded cover, open top cap TOC 20ppb	Clear	28x96	40	White	Polypropylene	Beige PTFE/White Silicone	10709663	72

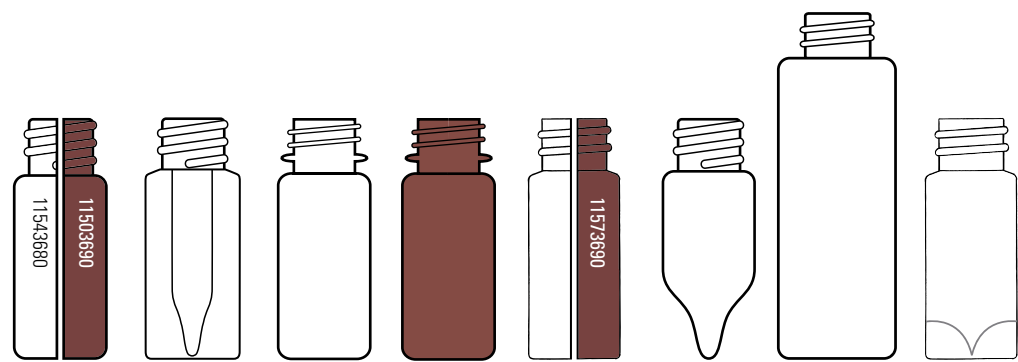
Chromacol Scintillation Vial Kit

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	11357371	500

Chromacol Vial Comparison Chart



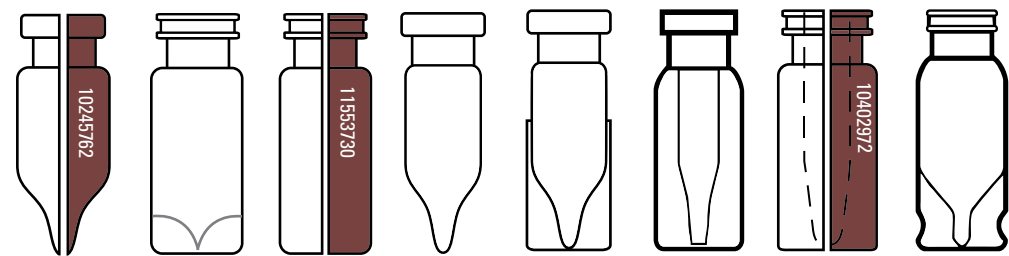
Part No.	11543760	11573760	11573750	11563780	11583750	11563750	11931573	11553780	11553760	11513760	10268960
Dimensions	6x32mm	6x32mm	7x40mm	7x32mm	8x30mm	7x40mm	7x32mm	7x30mm	6x32mm	8x40mm	8x40mm



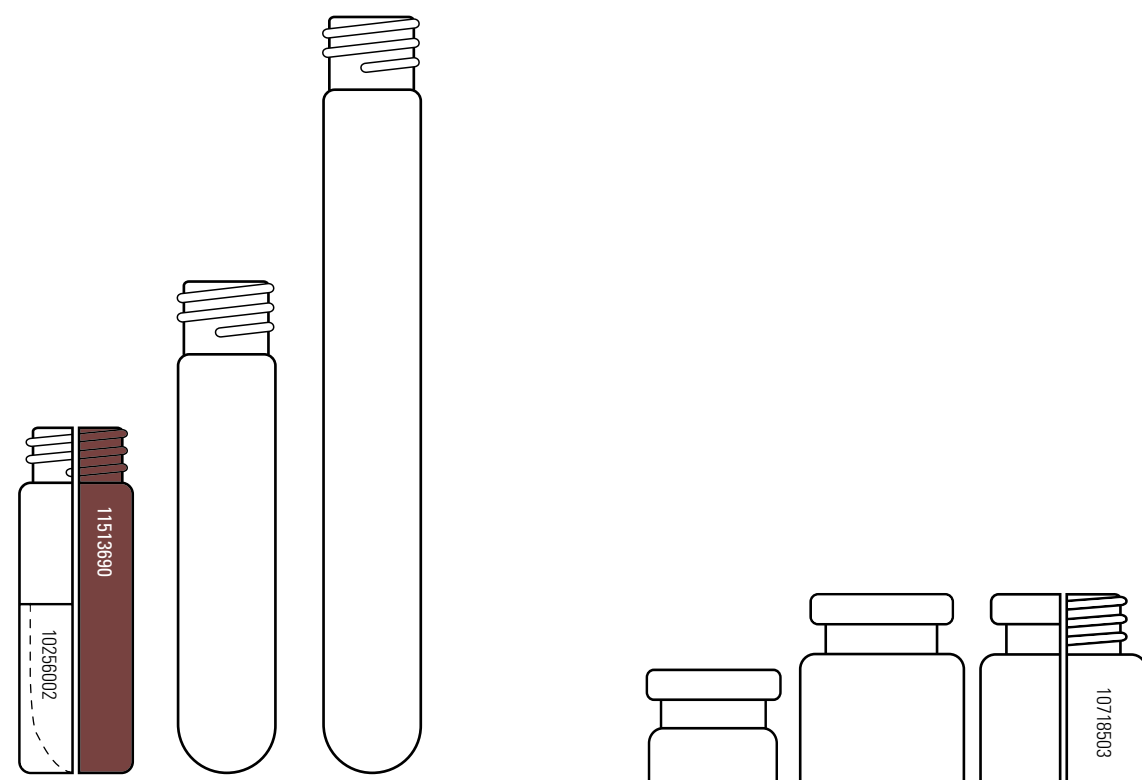
Part No.	11513680	10125862	15232670	14849820	11563690	11503680	11533680	11593780
Dimensions	12x32mm	12x32mm	12x32mm	12x32mm	12x32mm	12x32mm	15x46mm	12x32mm



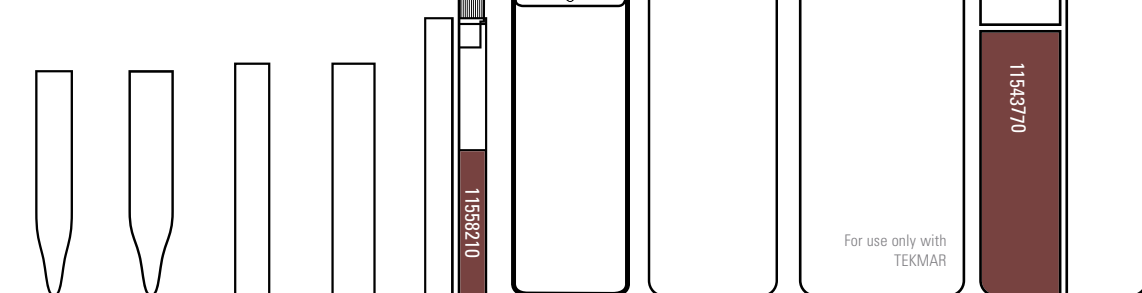
Part No.	10798345	11573680	12085540	12631505	11523780	11563760	10207234	12089143
Dimensions	12x32mm	12x32mm	12x32mm	12x32mm	12x40mm	15x46mm	12x32mm	12x32mm



Part No.	11503760	10616633	11543730	10360951	11543780	12611505	11553690	12396818
Dimensions	12x32mm	12x32mm	12x32mm	10x32mm	12x32mm	12x32mm	12x32mm	12x32mm



Part No.	11523680	11553680	11563680
Dimensions	15x46mm	13x65mm	13x100mm



Part No.	10728544	10570303	10227672	10237672	10492750	11568210	110207234	210207234	10104424/10718503
Dimensions	5x30mm	6x30mm	5x31mm	6x31mm	8x40mm	15x46mm	18x65mm	22x75mm	22x75mm



Part No.	11593760	11583760	11357371	10163072	10337824 / 11981523
Dimensions	18x50mm	22x38mm	27x57mm	30x60mm	22x45mm

Chromacol Caps and Septa Comparison Chart

Part No. Dimensions	*10463542 8x5mm	10509742 8x5mm	10336972 8x5mm	11538160 8x5mm	11568160 8x5mm	11578160 8x5mm	11508170 8x5mm	10599542 8x5mm	
Part No. Dimensions	10387062 8x5mm	11508160 8x5mm	10388424 8x5mm	11508180 8x5mm	*11583690 8x9mm	*11503720 8x9mm	11533720 8x9mm	11583710 8x9mm	
Part No. Dimensions	10554283 8x1.4mm	10195762 8x1.4mm	11543700 8x1.5mm	10701004 8x1.4mm	10593703 8x1mm	10443292 8x1mm	10165192 8x0.25mm	11533700 8x1mm	11513700 8x1.5mm
Part No. Dimensions	15206613 9x6.5mm	*13286409 9x6.5mm	13216419 9x6.5mm	*13206419 9x6.5mm	13236419 9x6.5mm	9-SCSK-8RT1 9x6.5mm	10549732 12.9x7.9mm	*11568150 11x6mm	
Part No. Dimensions	*11578150 11x6mm	11518170 11x6mm	11558160 11x6mm	11598160 11x6mm	11558150 11x6mm	10500493 11x6mm	11588160 11x6mm	10750075 11x6mm	
Part No. Dimensions	11518160 11x6mm	12346838 11x3mm	11598170 11x6mm	11528180 11x6mm	11776483 11x7mm	12376838	12719296	12366838	

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

Alternative Colors

10463542	13286409	13206419	11568150	11578150
■ 10123462	■ 15206603	■ 15246603	■ 11588150	■ 11971573
■ 10113462	□ 15226603	□ 15256603		■ 11961573
11583690	■ 13296409	■ 13226419		■ 11951573
■ 11573700		■ 10061792		■ 11941573
□ 11513710		■ 11533730		
11503720				
□ 11971503				

Part No. Dimensions	11558180 11x6.5mm	11588180 11x6.5mm	*11538180 11x6.5mm	10675283 11x6.5mm	11518180 11x6.5mm	*11578180 11x6.5mm	11548180 11x6.5mm
Part No. Dimensions	*11593690 12x10mm	11573710 12x10mm	11563710 12x10mm	11553710 12x10mm	10295712 12x10mm	10514673 12x10mm	
Part No. Dimensions	11523700 12x2mm	10145722 12x1.8mm	11563700 12x1mm	10248152 12x1mm	10533903 12x0.25mm	11588210 8x9mm	12376858 12x7mm
Part No. Dimensions	10248252 18x13mm	10014012 18x13mm	15204037 18x13mm	11568190 20x7mm	11578190 20x7mm	*11588190 20x7mm	
Part No. Dimensions	20-MCBC(R)-CBT3	*10185232 20x7mm	11548200 20x7mm	11558200 20x7mm	10472722 20x3mm	10207682 20x3mm	
Part No. Dimensions	10513333 20x3mm	10455012 20x1.5mm	10574083 20x3mm	11508200 20x3mm	10720614 20x3.1mm	10759843 20x1.5mm	
Part No. Dimensions	11518200 20x1mm	110443292 18x1mm	11598190 20x9mm	10258012 20x13.4mm	11588170 20x10mm		

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

Alternative Colors

11538180	11593690	11588190	10185232
■ 11-PSN(R)-T02	■ 11583700	■ 10338822	■ 10348822
11578180	□ 11523710		□ 11538200
■ 10790994	■ 11503710		

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	12601935	1
Electronic Hand-held Crimper for 11mm Crimp Caps, Generation 3	11678398	1
Electronic Hand-held Crimper for 13mm Crimp Caps, Generation 3	12631935	1
Electronic Hand-held Crimper for 20mm Crimp Caps, Generation 3	11912925	1
Electronic Hand-held Decrimper for 11mm Crimp Caps, Generation 3	12621935	1
Electronic Hand-held Decrimper for 13mm Crimp Caps, Generation 3	12641935	1
Electronic Hand-held Decrimper for 20mm Crimp Caps, Generation 3	11952091	1
Replacement Battery, 6.4V Lithium Ion, For Generation 3 Electronic Crimpers and Decrimper	11912101	1
Table/Wall Holder for Electronic Hand-held Crimper	ECR-HOLDER	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



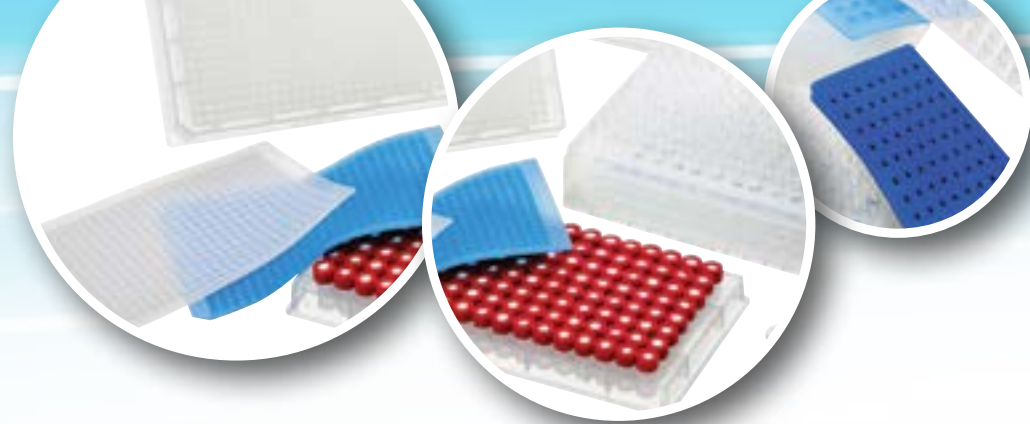
Programmable Electronic High Power Crimp Station

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>	15227318	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>	13278333	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>	15217318	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 x 25.4 x 17.7cm</i>	15237318	1
8mm Crimper Jaw Set	15207318	1
11mm Crimper Jaw Set	15257308	1
11mm Decrimper Jaw Set	15227308	1
13mm Crimper Jaw Set	15267308	1
13mm Decrimper Jaw Set	15237308	1
13mm Flip-Off Crimper Jaw Set (for circular rim flip caps)	15277308	1
20mm Crimper Jaw Set	15287308	1
20mm Decrimper Jaw Set	15247308	1
20mm Flip-Off Crimper Jaw Set (for circular rim flip caps)	15297308	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

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°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 (μL)	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	15102699	20
	PP	14.4	V-Shape, 8mm dia	450	10-400	15112699	120
	PP	14.5	U-Shape, 8mm dia	500	20-450	15132699	10
	PP	14.5	U-Shape, 8mm dia	500	20-450	15122699	120
96 Well Plates, round well	PP	31.6	U-Shape, 8mm dia	1300	50-1000	15142699	5
	PP	31.6	U-Shape, 8mm dia	1300	50-1000	15152699	50
	PP	44.0	U-Shape, 8mm dia	2000	50-1900	15162699	5
	PP	44.0	U-Shape, 8mm dia	2000	50-1900	15172699	60
96-Well Square Well Microplate (-196°C to $+121^{\circ}\text{C}$)	PP	44.0	V-Shape, square	2000	50-1900	15182699	5
	PP	44.0	V-Shape, square	2000	50-1900	15192699	50
384-Shallow Well Standard Height Microplate	PP	14.4	U-Shape, square	58	2-35	15102709	25
	PP	14.4	U-Shape, square	58	2-35	15112709	100
384-Well Microplate	PP	22.0	U-Shape, square	252	5-240	15122709	5
	PP	22.0	U-Shape, square	252	5-240	15132709	60
	PP	14.4	U-Shape, square	120	10-100	15142709	20
	PP	14.4	U-Shape, square	120	10-100	15152709	120
	PP	14.4	V-Shape, square	145	4-120	15162709	10
	PP	14.4	V-Shape, square	145	4-120	15172709	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. 15172719)



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	15182709	10
WebSeal Mats (Alcohol Resistant)	Clear	EVA	96 Round Well, 8mm Diameter	No	15192709	5
	Clear	EVA	96 Round Well, 8mm Diameter	No	60180-M171	50
WebSeal CLR Silicone Mat	Clear	Silicone	96 Round Well – Flat Base, 8mm Diameter, Large Penetration Area	No	60180-M134	5
	Clear	Silicone	96 Round Well – Flat Base, 8mm Diameter, Large Penetration Area	Yes	60180-M183	5
WebSeal Mats (Solvent Resistant)	Blue	Silicone/PTFE	96 Round Well – Flat Base, 8mm Diameter, Large Penetration Area	No	15102719	5
	Blue	Silicone/PTFE	96 Round Well – Flat Base, 8mm Diameter, Large Penetration Area	Yes	15112719	5
WebSeal CLR Silicone Mat	Clear	Silicone	96 Square Well – Flat Base, 8mm Diameter, Large Penetration Area	No	15182739	5
	Clear	Silicone	96 Square Well – Flat Base, 8mm Diameter, Large Penetration Area	Yes	15172739	5
WebSeal CLR Silicone Mat	Clear	Silicone	384 Square Well	No	15192739	5
	Clear	Silicone	384 Square Well	Yes	15102749	5
Sealing Tape, -40°C - 90°C	Clear	PE/Silicone	N/A	No	15122719	100
Sealing Tape, -70°C - 100°C	Clear	PES/Silicone	N/A	No	15132719	100
Sealing Tape, -80°C - 120°C	Silver	Aluminum/Silicone	N/A	No	15142719	100
Sealing Tape with SRA (Synthetic Rubber Adhesive)	Clear	Polyolefin/Rubber	N/A	No	15152719	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	15162719	100 Pack
	Clear	PET/Silicone/PET	N/A	Yes	60180-M176	25 Pack
WebSeal Mats (Alcohol Resistant)	Clear	EVA	96 Square Well - Flat Base	No	60180-M177	5 Pack
	Clear	EVA	96 Square Well - Flat Base	No	60180-M178	50 Pack
Hand held Sealing Tape Applicator	Gold	N/A	N/A	N/A	15172719	2 Pack
Hand Held Mat Applicator	Black	N/A	N/A	N/A	15182719	1 Each
WebSeal Cutter for Vial Removal	Silver	N/A	N/A	N/A	60180-M975	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	15102729	10
	PP	14.7	Flat bottom, 7mm dia	350	10-300	15192719	100
	PP	14.7	U-Shape, 7mm dia	270	10-250	15122729	10
	PP	14.7	U-Shape, 7mm dia	270	10-250	15112729	100
	PP	14.7	V-Shape, 7mm dia	220	10-190	15142729	10
	PP	14.7	V-Shape, 7mm dia	220	10-190	15132729	100
96 Well Plates, round well	PP	41.6	U-Shape, 7mm dia	1000	50-900	15162729	5
	PP	41.6	U-Shape, 7mm dia	1000	50-900	15152729	50
96-Well Square Well Plate	PP	44.4	V-Shape, 8mm dia	2000	50-1900	15182729	5
	PP	44.4	V-Shape, 8mm dia	2000	50-1900	15172729	50
384-Well Microplate	PP	14.4	U-Shape, square	58	2-35	15102739	10
	PP	14.4	U-Shape, square	58	2-35	15192729	60
	PP	30.2	V-Shape, square	300	5-240	15122739	6
	PP	30.2	V-Shape, square	300	5-240	15112739	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	60180-M179	100	
WebSeal CLR Silicone Mat	Clear	Silicone	96 Round Well – Flat Base, 7mm Diameter, Large Penetration Area	No	15332165	5	
	Clear	Silicone	96 Round Well – Flat Base, 7mm Diameter, Large Penetration Area	Yes	15152739	5	
	Clear	Silicone	96 Round Well – 7mm, Step, Small Penetration Area	No	15142739	5	
	Clear	Silicone	96 Round Well – 7mm, Step, Small Penetration Area	Yes	15162739	5	
	Clear	Silicone	96 Square Well – Flat Base - 8mm, Large Penetration Area	No	15182739	5	
	Clear	Silicone	96 Square well – Flat Base - 8mm, Large Penetration Area	Yes	15172739	5	
	Clear	Silicone	384 Square Well	No	15192739	5	
	Clear	Silicone	384 Square Well	Yes	15102749	5	
	WebSeal Mat	Blue	Silicone/PTFE	96 Round Well – Flat Base, Step, 7mm Diameter	No	15122749	5
		Blue	Silicone/PTFE	96 Round Well – Flat Base, Step, 7mm Diameter	Yes	15132749	5
Blue		Silicone/PTFE	96 Square Well – Flat Base - 8mm, Large Penetration Area	No	15152749	5	
Blue		Silicone/PTFE	96 Square Well – Flat Base - 8mm, Large Penetration Area	Yes	15162749	5	
Blue		Silicone/PTFE	384 Square Well	No	15172749	5	
Blue		Silicone/PTFE	384 Square Well	Yes	15182749	5	
WebSeal Mat for Plate+	Blue	Silicone/PTFE	96 Round well – Dome Base, 7.2mm Diameter	No	15112749	5	
	Blue	Silicone/PTFE	96 Round well – Dome Base, 7.2mm Diameter	Yes	15142749	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	15192749	10
	Glass coated PP	14.6	V-Shape, 7mm dia	220µL	190µL	15112759	10
	Glass coated PP	14.6	Flat Bottom, 7mm dia	370µL	300µL	15132759	10
96 Deep Well Plate, round well	Glass coated PP	41.5	U-Shape, 7mm dia	1.2mL	1.0mL	15152759	10
96-Well Square Well Plate	Glass coated PP	44	V-Shape, 8mm dia	2.4mL	2.0mL	15162759	10
384 Well Microplate	Glass coated PP	14.4	Square-Rounded, flat	120µL	90µL	15192759	10
	Glass coated PP	22	Square-Rounded, U-Shape	240µL	180µL	15112769	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

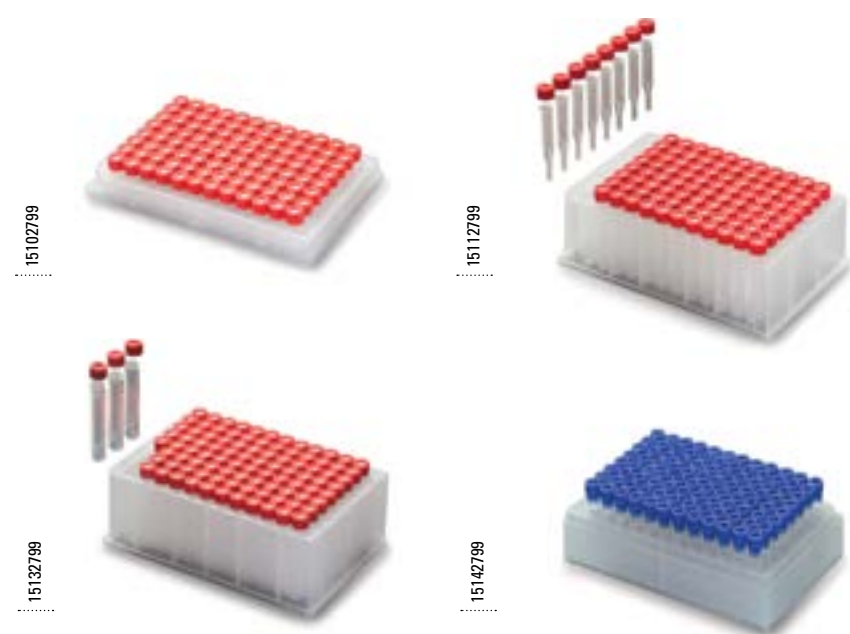
Kit Type	Vial Material	Total Volume (µL)	Vial Dimension (mm)	Profile	Mat material	Total Height (mm)	Vial Cat. No.	Mat Cat. No.	Kit Cat. No.	Pack of
96 Well Small Volume Microplate with Sealing Mat	Clear glass	500	6.5 x 31	taper	Silicone/PTFE	32	15122779	15192779	15132769	5
96 Well Small Volume Microplate with Sealing Mat and Cutting Tool	Clear glass	700	6.5 x 41.4	taper	Silicone/PTFE	44	15132779	15192779	15142769	5
96 Well Small Volume Microplate with Sealing Mat and Cutting Tool	PTFE	700	6.5 x 41.4	round	Silicone/PTFE	44	15142779	15192779	15152769	1
96 Well Microplate with Sealing Mat and Cutting Tool	Clear glass	1100	7.45 x 38.5	round	Silicone/PTFE	41.5	15152779	15112789	15162769	5
96 Well Microplate with Crimp Top Vials, pre-inserted	Clear glass	1100	7.45 x 45	round	N/A	47	15162779	N/A	15172769	5
96 Deep Well Plate with Sealing Mat	Clear glass	1500	7.25 x 60.5	round	Silicone/PTFE	64.5	15172779	15112789	15182769	5
96 Square Well Plate with Sealing Mat	Clear glass	1000	7.6 x 45	constricted	Silicone/PTFE	47.3	15182779	15132789	15192769	1
96 Square Well Plate with Sealing Mat - Pre-cut	Clear glass	1000	7.6 x 45	constricted	Silicone/PTFE	47.3	15182779	15142789	15102779	1
96 Square Well Plate with Sealing Mat - solid plug	Clear glass	1000	7.6 x 45	constricted	Silicone/PTFE	47.3	15182779	15152789	15112779	1

WebSeal Kit Accessories



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°	15152799	15192799	15102799	1
96 Deep Well Plate	Clear glass	350	6x42.5	taper	Silicone/PTFE, Pre-slit, 45°	15162799	15192799	15112799	1
96 Square Well Plate	Clear glass	1000	7.6x45.9	round	Silicone/PTFE, 45°	15172799	60180-C102	15122799	1
	Clear glass	1000	7.6x45.9	round	Silicone/PTFE, Pre-slit, 45°	15172799	15192799	15132799	1
96 Micro-Tube-Rack-System	Clear glass	800	7.6x40	round	PE Plug	15182799	15102809	15142799	1

WebSeal Kit Accessories

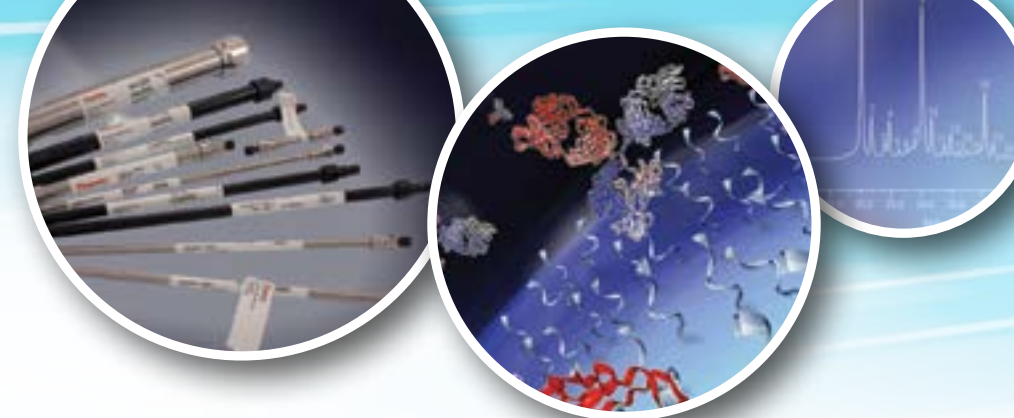


WebSeal Kit Accessories

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	15152799	960
Deep Well Plate Vial for 96 Wells	Clear glass	350	6x42.5	taper	N/A	N/A	15162799	960
Square Well Vial for 96 Wells	Clear glass	1000	7.6x45.9	round	N/A	N/A	15172799	960
MTRS Vial for 96 Wells	Clear glass	800	7.6x40	round	N/A	N/A	15182799	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	15192799	96
8mm PE Plug, blue, for 15142799	N/A	N/A	N/A	N/A	PE Plug	N/A	15102809	96
MT-Plate, PP, 96 Positions	N/A	350	N/A	Flat Bottom, 7mm dia	N/A	14.3	15112809	10
DW-Block, PP, 96 Positions	N/A	1200	N/A	U-Shape	N/A	40.0	15122809	10
SQW-Block, PP, 96 Positions	N/A	2000	N/A	U-Shape	N/A	44.3	15132809	10
Micro-Tube-Rack-System, PP, 96 Positions	N/A	N/A	N/A	N/A	N/A		15142809	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



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

Section Contents

BioLC Columns Line	3-004	ProPac HPLC Columns	3-018
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pH Gradient Buffers	3-010	Nano, Capillary and Micro LC Columns	3-038
GlycanPac HPLC and UHPLC Columns	3-016		

BioLC Columns

Technical Resources

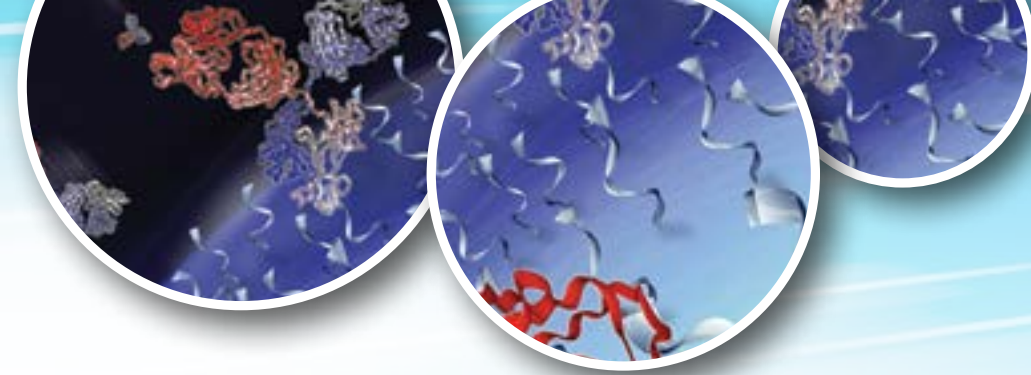

visit www.thermoscientific.com/chromexpert to access the following information:

- 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

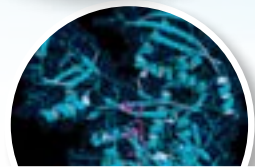
- Accucore Amide-HILIC
- GlycanPac AXH-1
- GlycanPac AXR-1



Nucleic Acids

DNAPac

- DNAPac PA100
- DNAPac PA200
- DNAPac RP



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



pH Gradient Buffers

WebSeal Well Plates and Mats

Associated products



SOLAµ SPE Plates

SMART Digest Kit

Viper Fingertight Fittings

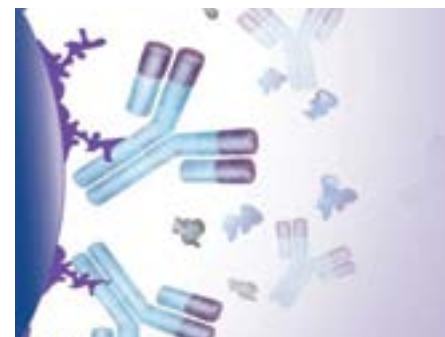
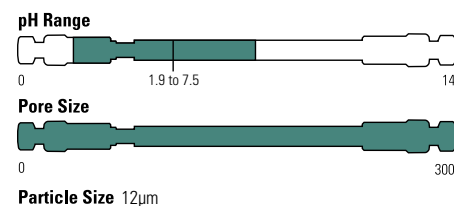
MABPac HPLC and UHPLC Columns

MABPac Protein A

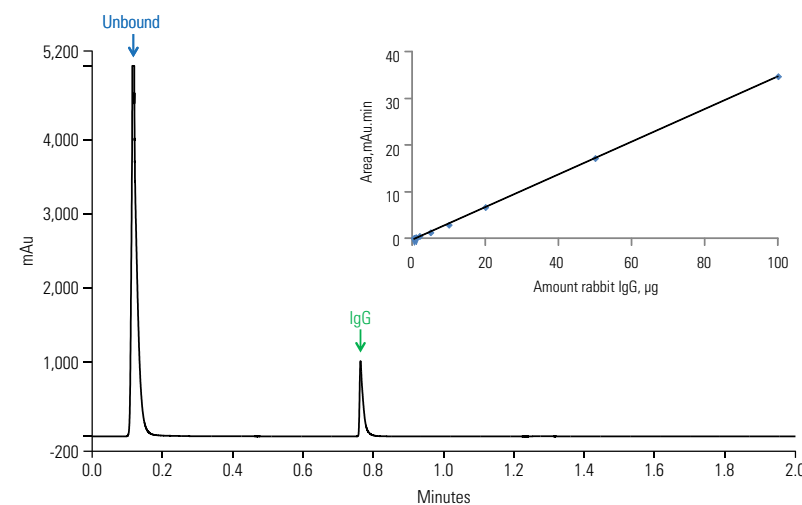
Fast mAb titer analysis

- 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

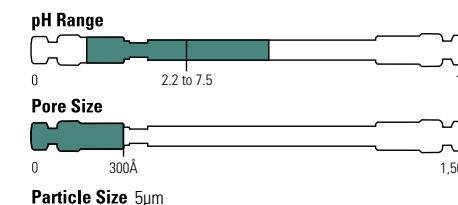
MABPac Protein A

Particle Size (µm)	Format	Length (mm)	4.0mm ID
12	HPLC Column	35	15156844



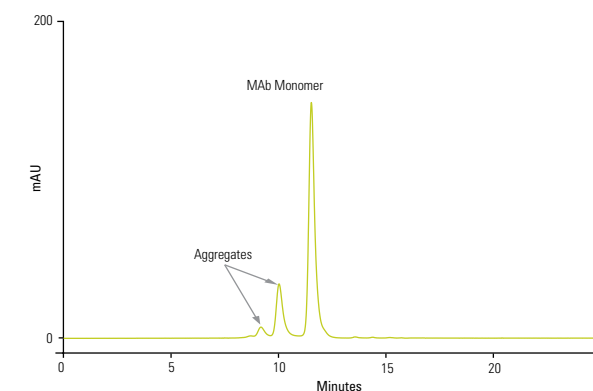
MABPac SEC-1

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

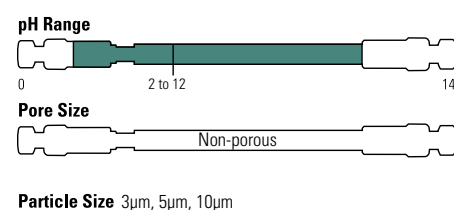
Particle Size (µm)	Format	Length (mm)	2.1mm ID	4.0mm ID	7.8mm ID
5	Guard Column	50	—	11312073	—
	HPLC Column	150	088790	11392073	—
		300	088789	11302073	15320421



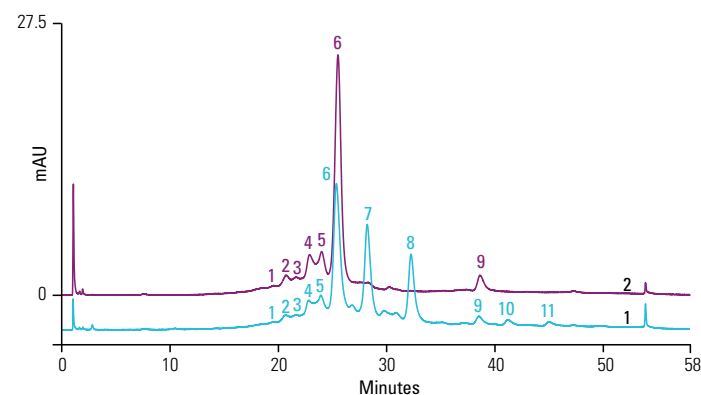
MABPac SCX-10

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



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	–	12663085	–
		150	–	15124725	–
		250	–	12683085	–
10	Guard Column	50	088242	11362063	–
		150	–	11342083	–
	HPLC Column	50	–	11332083	–
		150	–	11332083	–
		250	11391993	11372063	088784

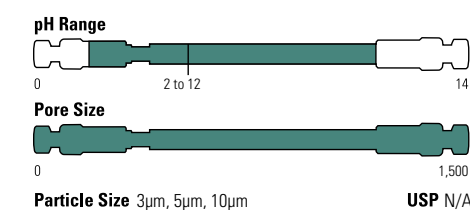


MABPac SCX-10 RS

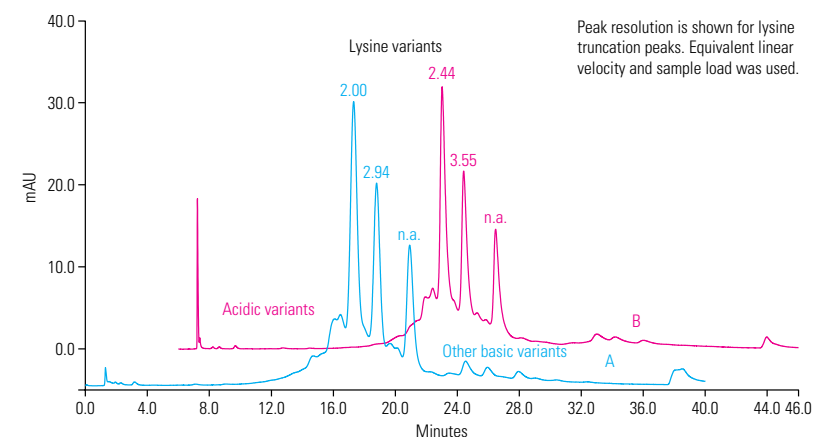
BioRS (Rapid Separation), strong cation exchange column designed for monoclonal antibodies and associated charged variants

- 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 NaCl
 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	15491334	15134725
		150	088242	15154725
		250	082515	15144725



pH Gradient Buffers

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

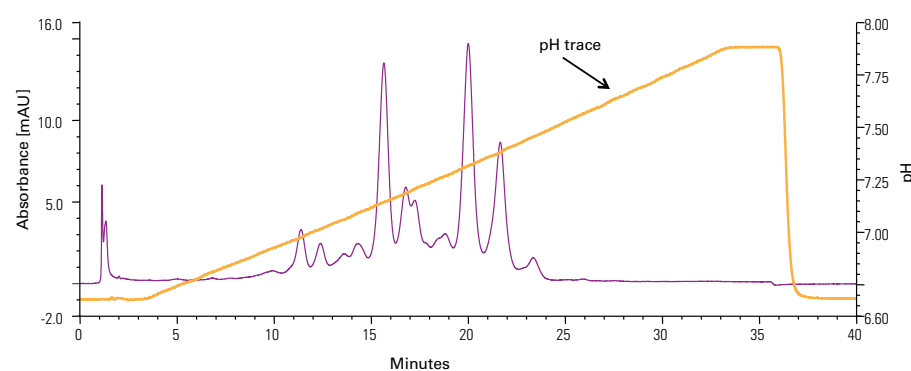
The Thermo Scientific pH gradient platform accelerates method development and facilitates method transfer to QA/QC for a wide range of protein and mAb charge variants through a generic LC-based approach to charge variant characterization.

- 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	
	125mL	250mL
Buffer		
CX-1 pH Gradient Buffer A (pH 5.6)	083273	085346
CX-1 pH Gradient Buffer B (pH 10.2)	083275	085348

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

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 11301743)
- MABPac SCX-10 Analytical column, 4 × 250mm (P/N 11372063)

MAB Charge Variants Kit

Description	Cat. No.
MAB Charge Variant Analysis IEX Column Kit	12719805

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 11372063)
- MABPac SEC-1 Analytical column, 4 × 300mm (P/N 11302073)

MAB Analysis Kit

Description	Cat. No.
MAB Analysis IEX and SEC Column Kit	12729805



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 cysteine-conjugated ADC while MABPac HIC-10 and MABPac HIC-20 have proven useful for several cysteine proprietary ADC molecules, as shown below.

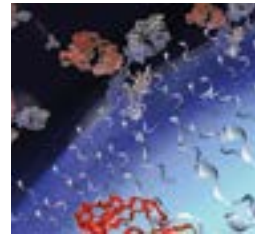
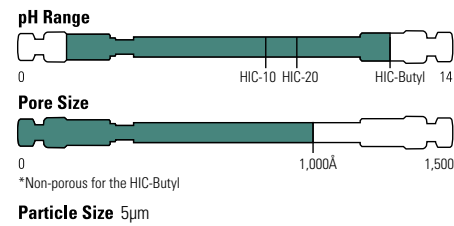
MABPac HIC Selection Guide

Column	MABPac HIC-10	MABPac HIC-20	MABPac HIC-Butyl
Intact mAbs/proteins	++++	+++	++
mAb aggregates	++++	+++	++
mAb fragments (F _{ab} and F _c)	+++	++++	+++
Oxidized mAbs	+++	++++	+++
Antibody Drug Conjugates (ADCs)	+++	+++	++++
Bispecific mAbs	+++	++++	++

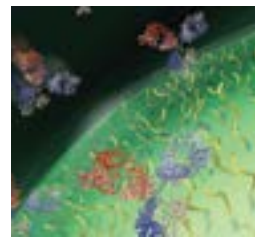
Greater number of ++++ denotes greater suitability

MABPac HIC Family

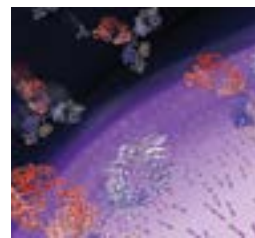
Description	Particle Size (µm)	Format	Length (mm)	4.6mm ID
MABPac HIC-10	5	Guard Cartridges (2/pk)	10	15300421
		HPLC Column	100	15360411
			250	15380411
MABPac HIC-20	5	Guard Cartridges (2/pk)	10	15334695
		HPLC Column	100	15314695
			250	15324695
MABPac HIC-Butyl	5	Guard Cartridges (2/pk)	10	15354695
		HPLC Column	100	15344695
Guard Cartridge Holder				11311733



MABPac HIC-10

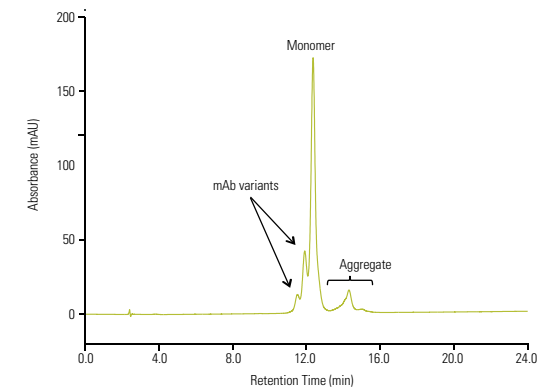


MABPac HIC-20



MABPac HIC-Butyl

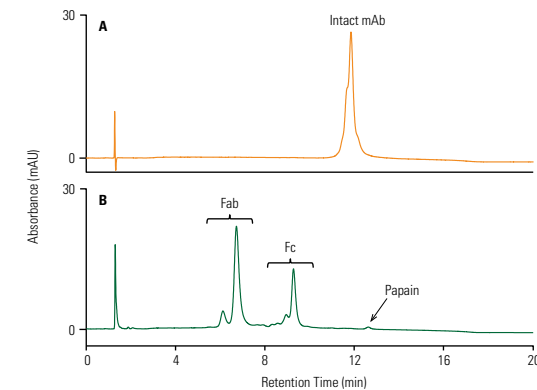
Separation of mAb Aggregates



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)	

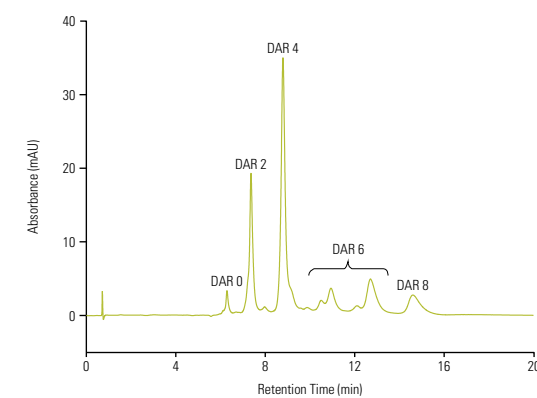
Separation of mAb Fragments



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

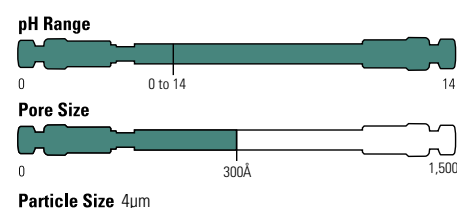
Mobile Phase A:	1.5 M ammonium sulfate, 50mM sodium phosphate, pH 7.0/ isopropanol (95:5 v/v)	
Mobile Phase B:	50mM sodium phosphate, pH 7.0/ isopropanol (80:20 v/v)	
Gradient:	Time (min)	%A %B
	-5.0	100 0
	0.0	100 0
	1.0	100 0
	15.0	0 100
	20.0	0 100
Temperature:	25°C	
Flow Rate:	1.0mL/min	
Injection Volume:	5µL	
Detection:	UV, 280nm	
Sample:	Cys-conjugated ADC mimic (5mg/mL)	

MABPac RP

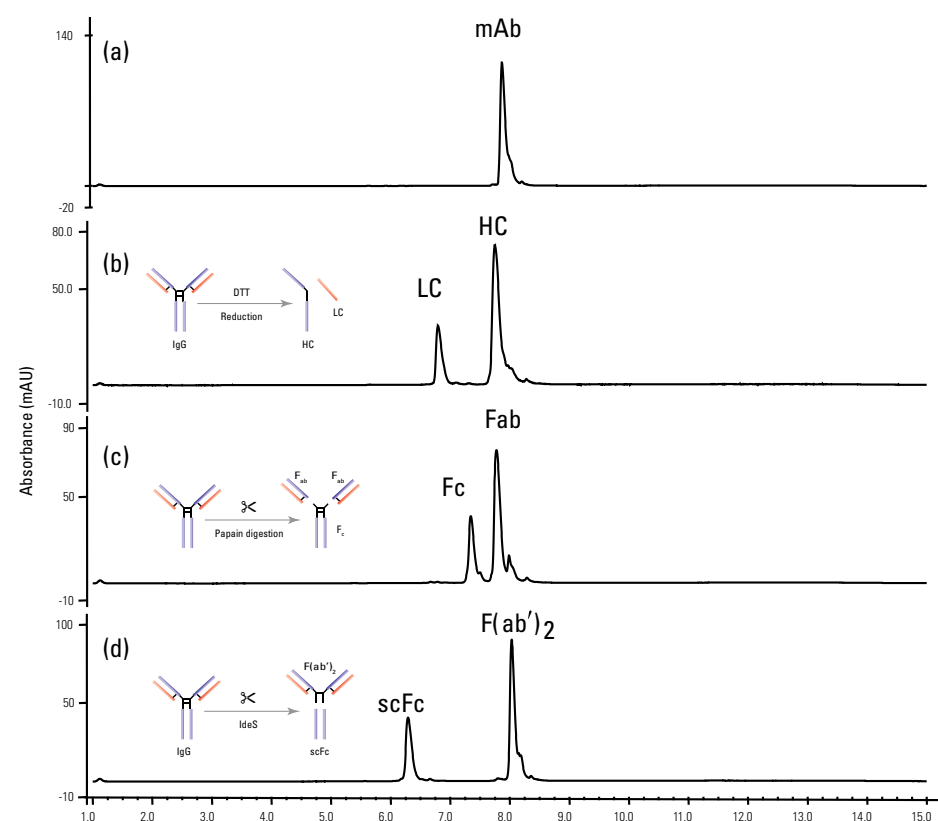
High resolution accurate mass determination of monoclonal antibody variants, antibody drug conjugates (ADC) and proteins

- 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')₂ 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, 4 μm, 50 x 3.0mm

Mobile Phase A: H₂O/FA/TFA (99.88 : 0.1:0.02 v/v/v)
 Mobile Phase B: MeCN/ H₂O/FA/TFA (90: 9.88 :0.1:0.02 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

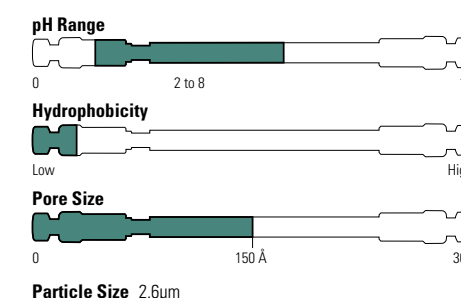
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID
4	Guard Cartridges (2/pk)	10	15447162	15427162
	HPLC Column	50	15487190	15417162
		100	15308539	15407162
	Guard Cartridge Holder		11311733	11311733

Accucore 150-Amide-HILIC

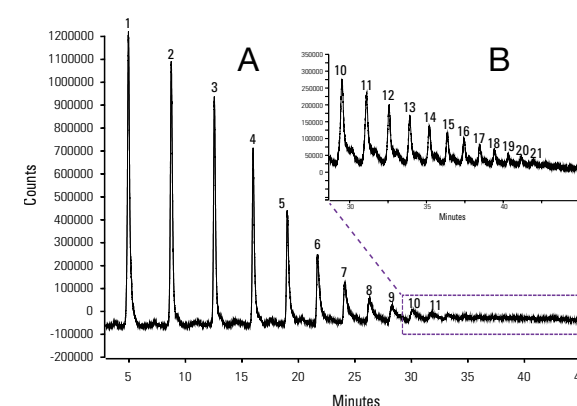
HPLC column for neutral glycan analysis

- 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



Accucore 150-Amide-HILIC, 2.6 μm, 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: 500 μL/min
 Backpressure at Starting Conditions: 110 bar
 Injection Volume: 2 μL to 5 μL 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

(A) 2 μL injection of sample, where 11 glycans were separated.
 (B) 5 μL injection of sample, zoomed-in to the later part of the gradient rise. A further 10 glycans were detected.

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)	10	13415699	15230349	15240349
		50	13445689	13425689	13465689
	HPLC Column	100	13419748	13455689	13435689
		150	13405699	13485689	13475689
		250	13495689	-	-
	Guard Cartridge Holder		10776714	10776714	10602864

For our range of nanoLC columns refer to page 3-043

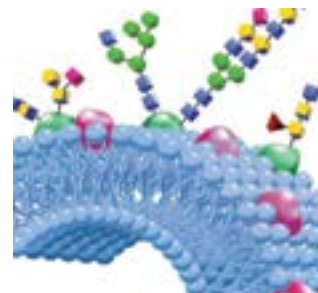
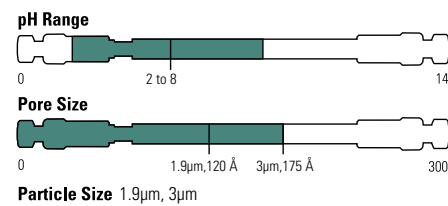
GlycanPac HPLC and UHPLC Columns

GlycanPac AXH-1

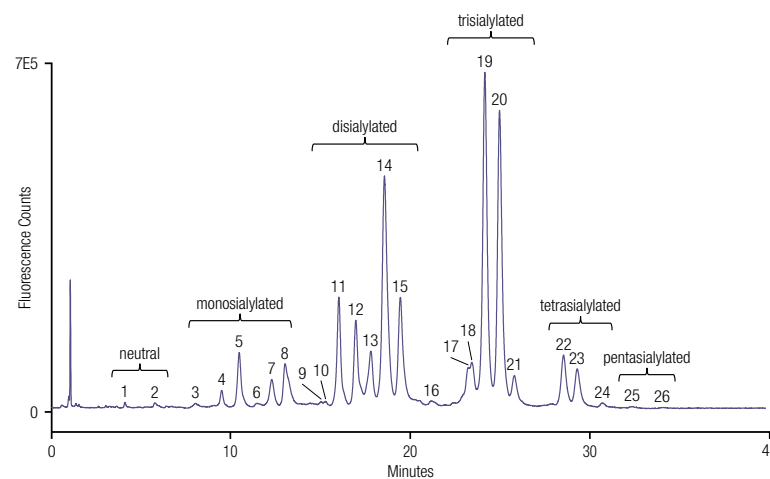
High-resolution columns for neutral and charged glycan analysis

- 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

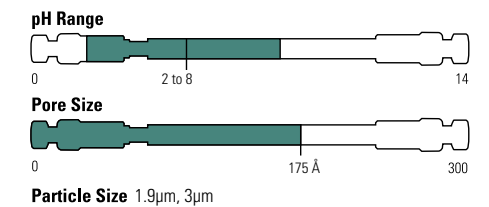
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
1.9	UHPLC Column	100	13446889	-	-
		150	13406889	-	-
		250	13426889	-	-
3	Guard Cartridges (2/pk)	10	13476889	13466889	13456889
	HPLC Column	150	13436889	13416889	13496879
	Guard Cartridge Holder		11311733	11311733	11311733

GlycanPac AXR-1

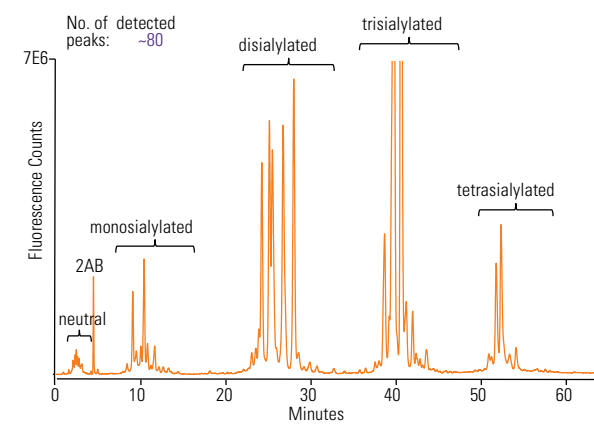
Ultra-high resolution columns for neutral, charged and glycan isomer analysis

- 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	15202735	-	-
		250	15292725	-	-
3	Guard Cartridges (2/pk)	10	15232735	15222735	15212735
	HPLC Column	150	15282725	15262725	15272725
	Guard Cartridge Holder		11311733	11311733	11311733

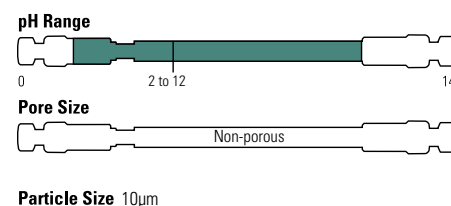
ProPac HPLC Columns

ProPac WCX-10 and SCX-10

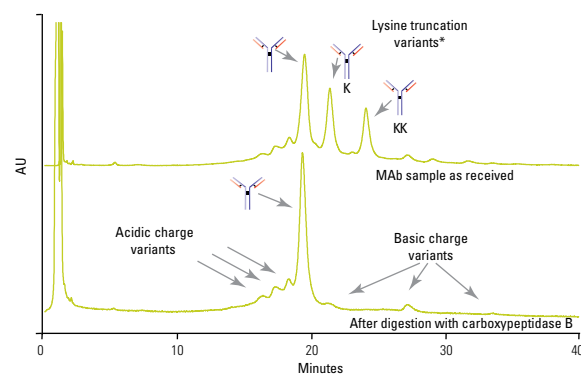
Weak and strong cation exchange columns with exceptionally high resolution and efficiency for separations of protein variants

- 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.



MAB lysine truncation variants



ProPac WCX-10, 10µm, 250 x 4.0mm

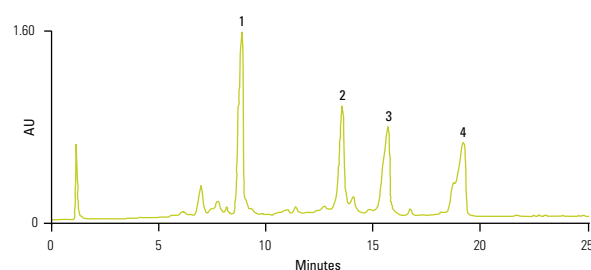
Mobile Phase A: 20mM MES+ 115mM NaCl + 1mM EDTA, pH 5.5
 Mobile Phase B: 20mM MES+ 145mM NaCl + 1mM EDTA, pH 5.5

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	11371853	11311743	-	-
	HPLC Column	50	-	11342063	-	-
		100	-	088778	-	-
		150	-	088778	-	-
		250	11351853	11301743	11361853	088766

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	11321853	13447707	-	-
	HPLC Column	250	11311853	10350725	11371863	088769

ProPac Kits

Part Number	Phase Description	Set Contents	Column Dimensions
088776	ProPac WAX-10 Lot Select Column Set	3 columns from 1 lot of resin	250 x 4.0mm
088777	ProPac WAX-10 Lot Select Column Set	3 lots of resin, 1 column from each lot	250 x 4.0mm
088774	ProPac SAX-10 Lot Select Column Set	3 columns from 1 lot of resin	250 x 4.0mm
088775	ProPac SAX-10 Lot Select Column Set	3 lots of resin, 1 column from each lot	250 x 4.0mm
088767	ProPac WCX-10 Lot Select Column Set	3 columns from 1 lot of resin	250 x 4.0mm
088768	ProPac WCX-10 Lot Select Column Set	3 lots of resin, 1 column from each lot	250 x 4.0mm
088772	ProPac SCX-10 Lot Select Column Set	3 columns from 1 lot of resin	250 x 4.0mm
088773	ProPac SCX-10 Lot Select Column Set	3 lots of resin, 1 column from each lot	250 x 4.0mm

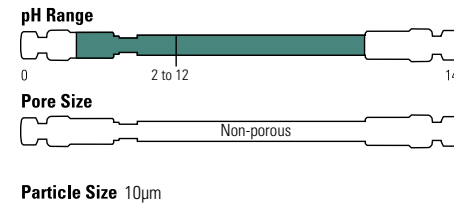


ProPac SCX-20

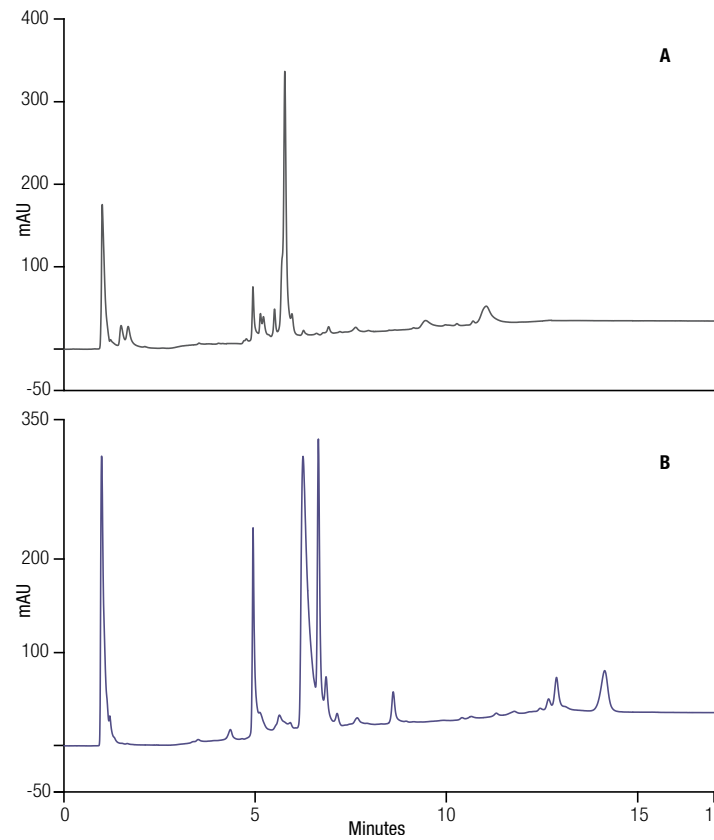
Strong cation-exchange column for high-resolution protein separations

- 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

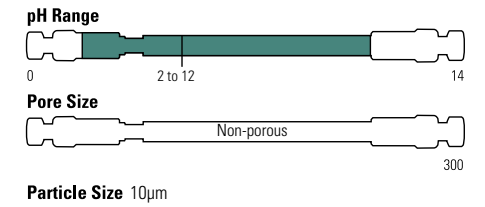
ProPac SCX-20

Particle Size (µm)	Description	Length (mm)	4.0mm ID
10	Guard Column	50	12759795
	HPLC Column	250	12749795

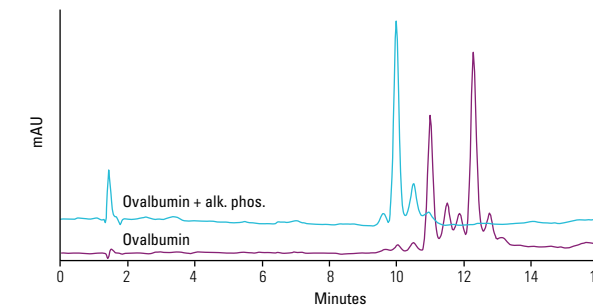
ProPac WAX-10 and SAX-10

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

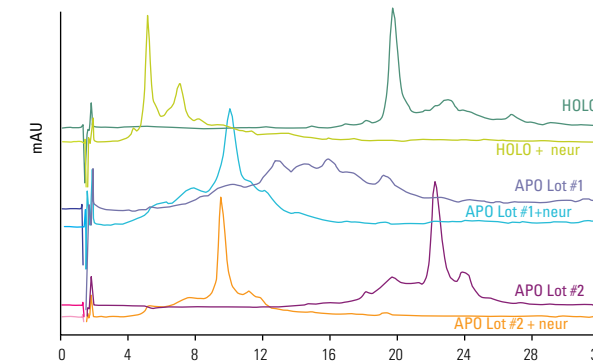


Resolution of phosphorylation variants of ovalbumin



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	11341853	11381743	-	-
	HPLC Column	250	11331853	11361743	11301873	088771

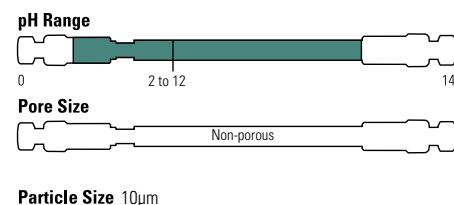
ProPac SAX-10

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	11301853	11351743	-	-	-
	HPLC Column	250	11391843	11341743	11381863	088770	13457376

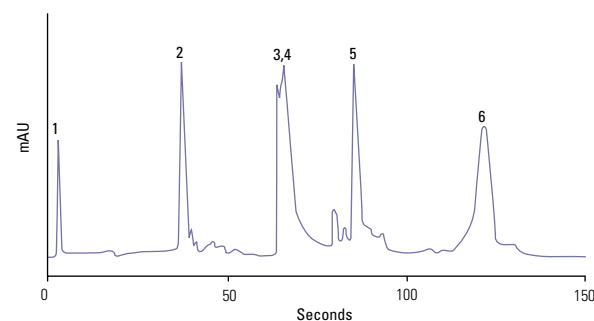
ProPac PA1

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



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



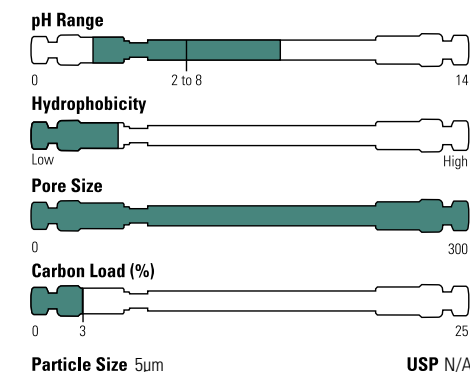
ProPac PA1

Particle Size (µm)	Format	Length (mm)	4.0mm ID	9.0mm ID
10	Guard Column	50	11321713	-
	HPLC Column	250	11311713	11341713

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



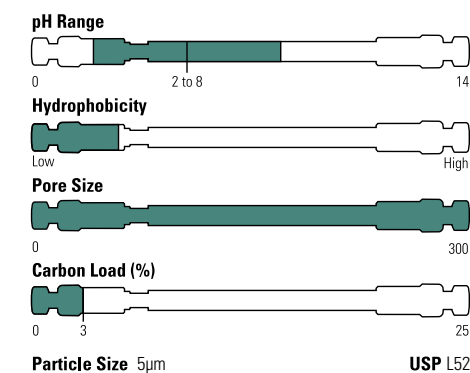
BioBasic AX

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.6mm ID
5	Drop-in Guard (4/pk)	10	11578330	11588330	10659675	11598330
		50	10552465	10682284	10446644	10304183
	HPLC Column	100	10519945	10314183	10477244	10513415
		150	10170703	10671324	10221005	10630754
		250	10047694	10048762	-	10253603
UNIGUARD Guard Cartridge Holder			10762567	10776714	10776714	10602864

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

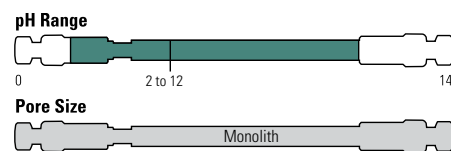
Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.6mm ID
5	Drop-in Guard (4/pk)	10	10331115	11528340	10545625	11538340
		50	10270715	10344423	10150943	10725564
	HPLC Column	100	10323105	10562455	10271275	10354133
		150	10538205	10602294	10699993	10181123
		250	10496654	10612294	-	10572265
UNIGUARD Guard Cartridge Holder			10762567	10776714	10776714	10602864

ProSwift IEX

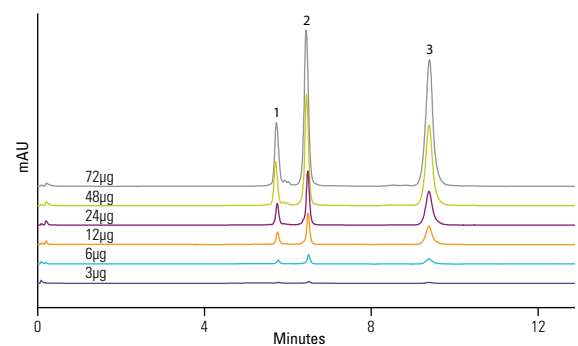
Monolith IEX columns for high-resolution and fast protein analysis

- 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.

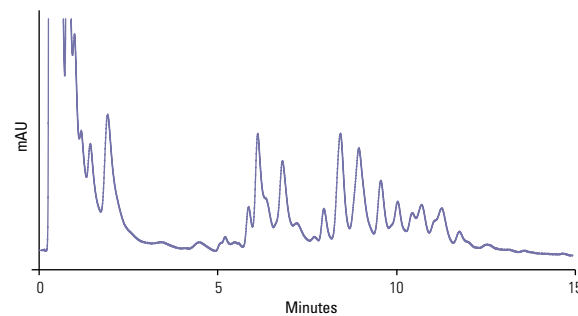


Dynamic protein loading capacity of ProSwift WCX-1S 50 x 1.0mm



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 *E. coli* protein



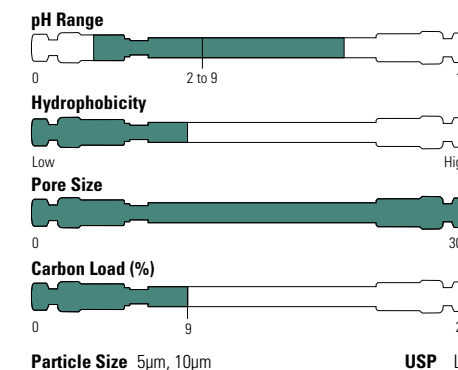
ProSwift IEX

Functional Group	Length (mm)	1.0mm ID	4.6mm ID
WAX-1S	50	11341893	11351873
WCX-1S	50	11351893	11361873
SAX-1S	50	11361903	11341873
SCX-1S	50	11351973	11361893

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



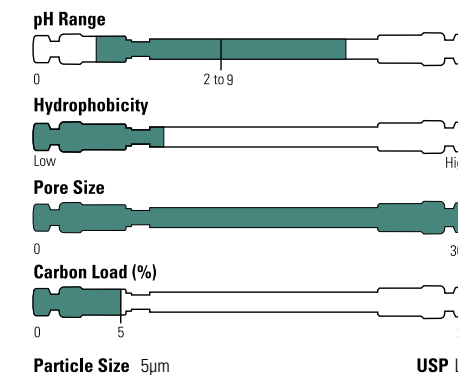
BioBasic 18

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.6mm ID
5	Drop-in Guard (4/pk)	10	10448674	11548310	10209424	11558310
	HPLC Column	50	10435553	10475173	-	-
		100	10160703	10293113	10230805	10171113
		150	10097534	10181113	-	10502645
		250	10735706	10151213	-	10434773
	UNIGUARD Guard Cartridge Holder		10762567	10776714	10776714	10602864

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

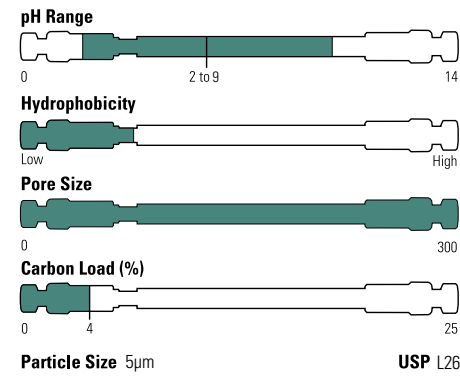


BioBasic 8

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.6mm ID
5	Drop-in Guard (4/pk)	10	10311505	11548320	10006274	11558320
	HPLC Column	50	10283273	10161213	-	-
		100	10445553	10424393	10047844	10434393
		150	10362595	10293353	-	10253313
		250	10793416	12062929	-	10756173
	UNIGUARD Guard Cartridge Holder		10762567	10776714	10776714	10602864

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



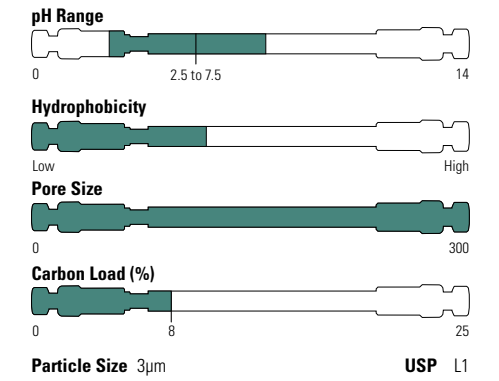
BioBasic 4

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	10554685	11598320	10361215	11508330
	HPLC Column	50	10583995	10263313	-	-
		100	10395003	10581105	10008284	10692854
		150	10649585	10110693	-	10384513
		250	10282105	10344563	-	10541305
	UNIGUARD Guard Cartridge Holder		10762567	10776714	10776714	10602864

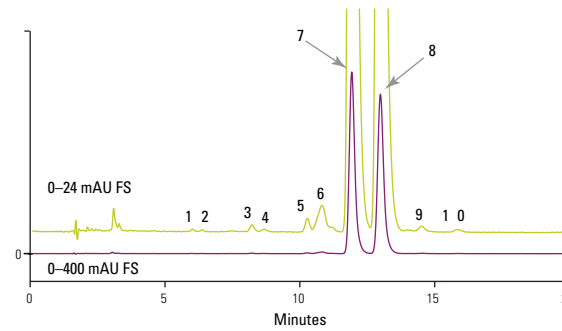
Acclaim 300 C18

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	11361793	-	11391793
		150	11371793	11341863	11381793
5	Guard Cartridges (2/pk)	10	11351733	11342003	11321923

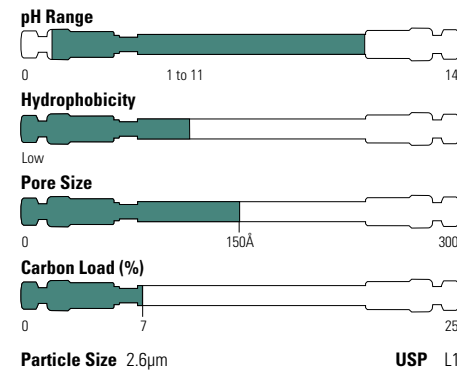
Acclaim Guard Holder

Description	Cat. No.
Acclaim SST Guard Cartridge Holder V-2	11311733
Acclaim Guard Kit (Holder and Coupler) V-2	11321933
Guard to Analytical Column Coupler V-2	11332043

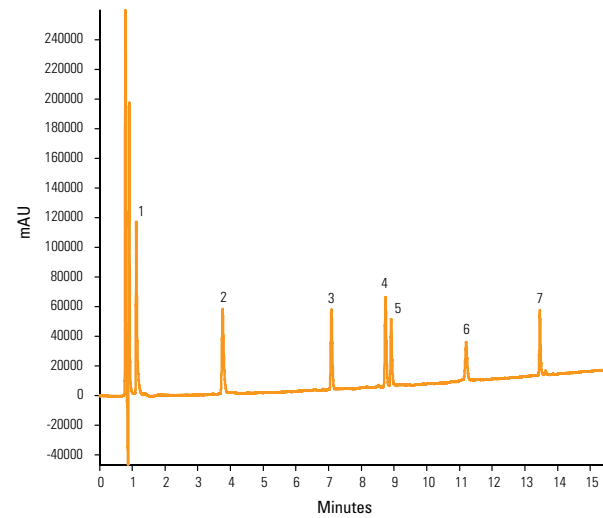
Accucore 150-C18

- 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, 2.6µm, 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:	300µL/min
Injection Volume:	5µL
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

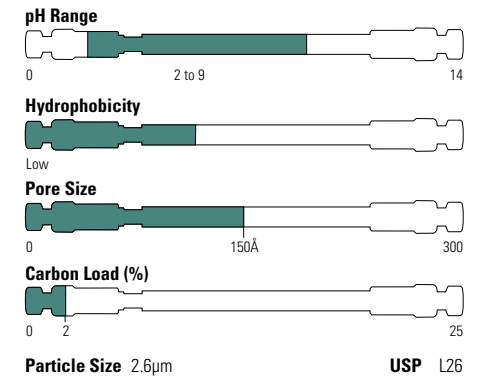
Accucore 150-C18

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Drop-in Guard (4/pk)	10	12655695	12665695	12675695
	HPLC Column	30	12635685	12665685	12645685
		50	12675685	12655685	12685685
		100	12605695	12695685	12615695
		150	12625695	12635695	12645695
	UNIGUARD Guard Cartridge Holder	10	10776714	10776714	10602864

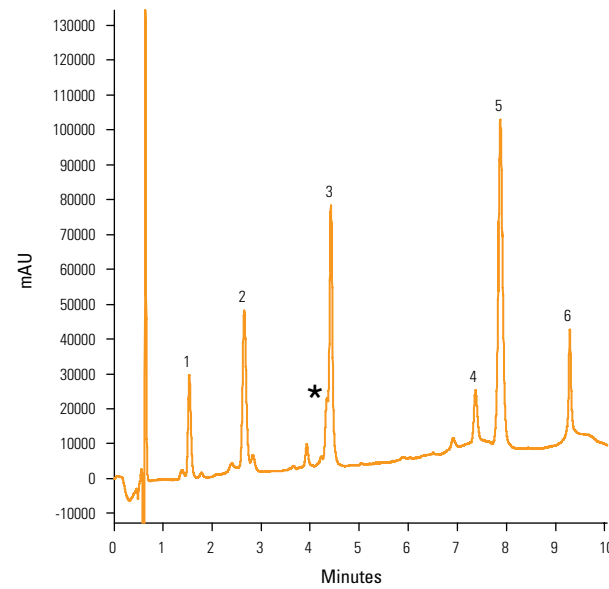
Accucore 150-C4

- 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 <math><2\mu\text{m}</math> 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

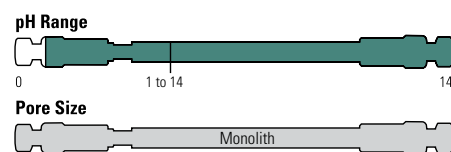
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Drop-in Guard (4/pk)	10	12605715	12615715	12625715
	HPLC Column	30	12685695	12695695	12605705
		50	12615705	12625705	12635705
		100	12645705	12655705	12665705
		150	12685705	12675705	12695705
	UNIGUARD Guard Cartridge Holder	10	10776714	10776714	10602864

ProSwift RP

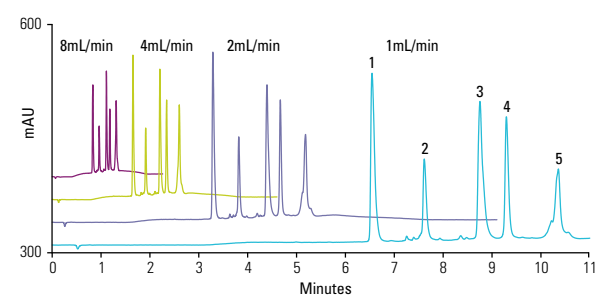
Reversed-phase monolith columns that uniquely provide the advantages of high resolution at exceptionally high flow rates for fast protein separations and analysis

- 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.

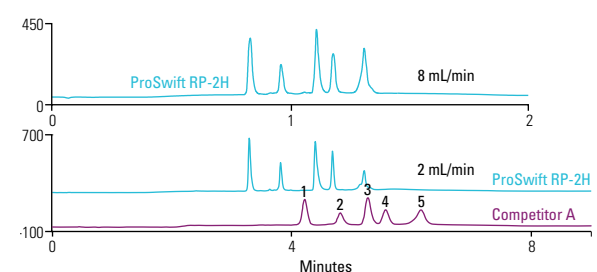


Proteins



ProSwift RP-2H, 50 x 4.6mm
 Mobile Phase A: DI H₂O/CH₃CN (95:5; V/V) + 0.1% TFA
 Mobile Phase B: DI H₂O/CH₃CN (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 H₂O/CH₃CN (95:5; V/V) + 0.1% TFA
 Mobile Phase B: DI H₂O/CH₃CN (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

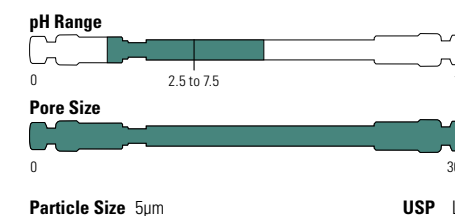
ProSwift RP

Functional Group	Length (mm)	1.0mm ID	4.6mm ID
RP-1S	50	—	11381873
RP-2H	50	—	11371873
RP-3U	50	—	11391873
RP-4H	50	11301733	—
RP-10R	50	11322273	—
RP-4H	250	11331893	—

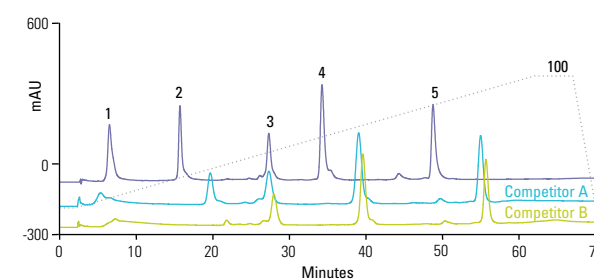
ProPac HIC-10

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

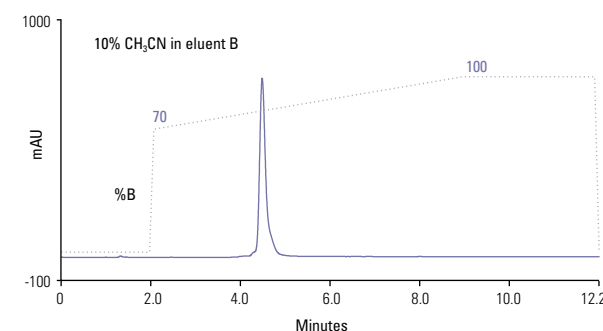


ProPac HIC-10, 5µm, 75 x 7.8mm

Competitors A and B, 75 x 7.5mm

Mobile Phase A: 2 M (NH₄)₂SO₄ in 0.1 M NaH₂PO₄ (pH 7.0)
 Mobile Phase B: 0.1 M NaH₂PO₄ (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 (NH₄)₂SO₄ in 0.1M NaH₂PO₄ (pH 7.0)
 Mobile Phase B: 0.1 M NaH₂PO₄ (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

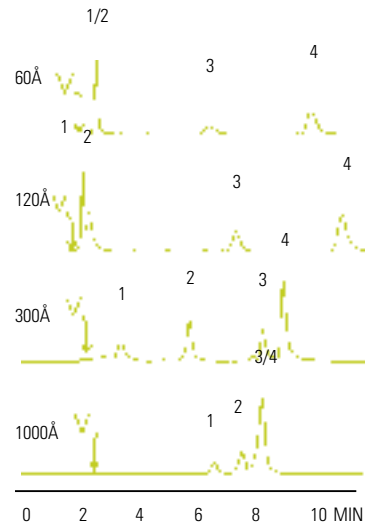
ProPac HIC-10

Particle Size (µm)	Format	Length (mm)	2.1mm ID	4.6mm ID	7.8mm ID
5	HPLC Column	75	—	—	11321863
		100	11301863	11311863	—
		250	—	11342043	—

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

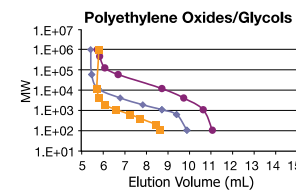
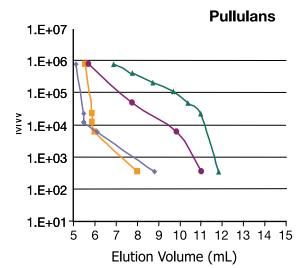
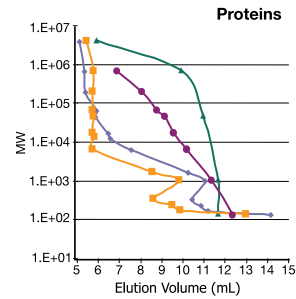
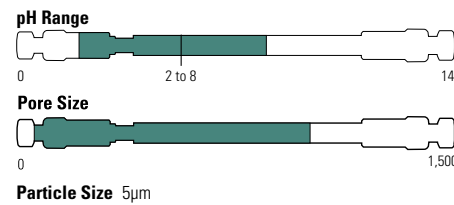


BioBasic SEC, 5µm, 300 x 7.8mm
 Mobile Phase: 0.1M KH₂PO₄, pH 7
 Flow Rate: 1.0mL/min
 Injection Volume: 20µL
 Detection: UV, 254nm
 Analytes:
 1. Thyroglobulin (MW669,00)
 2. Ovalbumin (MW 45,000)
 3. Angiotensin II (MW 1,046)
 4. PABA (V₂) (MW 137)

Effect of pore size on SEC resolution

BioBasic SEC

Pore Size (Å)	Description	ID (mm)	Length (mm)	Cat. No.
BioBasic SEC 60				
60	Guard Column	7.8	30	10669295
	HPLC Column	7.8	150	10785526
	HPLC Column	7.8	300	10354613
BioBasic SEC 120				
120	Guard Column	7.8	30	10756615
	HPLC Column	7.8	150	10497604
	HPLC Column	7.8	300	10140793
BioBasic SEC 300				
300	Guard Column	7.8	30	10301365
	HPLC Column	7.8	150	10119134
	HPLC Column	7.8	300	10434413
BioBasic SEC 1000				
1000	Guard Column	7.8	30	10488674
	HPLC Column	7.8	150	10201285
	HPLC Column	7.8	300	10707294



BioBasic SEC,
 60Å 300Å
 120Å 1000Å

Molecular weight calibration curves

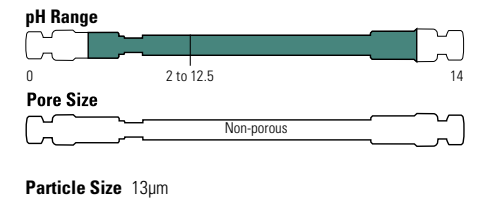
DNAPac HPLC and UHPLC Columns

DNAPac PA100

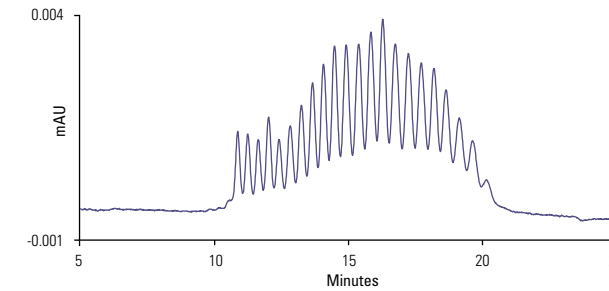
A strong anion exchange column developed to provide high-resolution analysis and purification of synthetic oligonucleotides

- 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)₄₀₋₅₀

DNAPac PA100

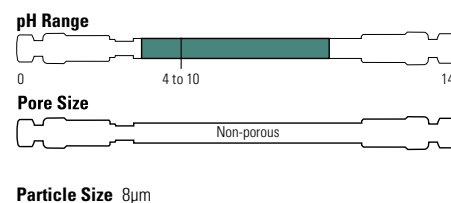
Particle Size (µm)	Format	Length (mm)	2.0mm ID	4.0mm ID	9.0mm ID	22.0mm ID
13	Guard Column	50	088761	11381723	088764	088765
	HPLC Column	250	088760	11361723	11371723	088759

DNAPac PA200

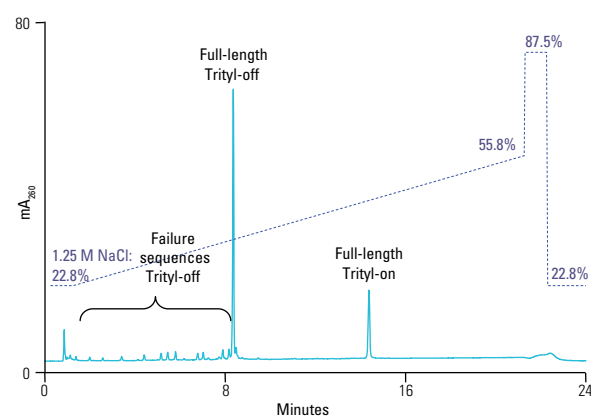
A strong anion exchange column developed to provide the best resolution for analysis and purification of synthetic oligonucleotides

- 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

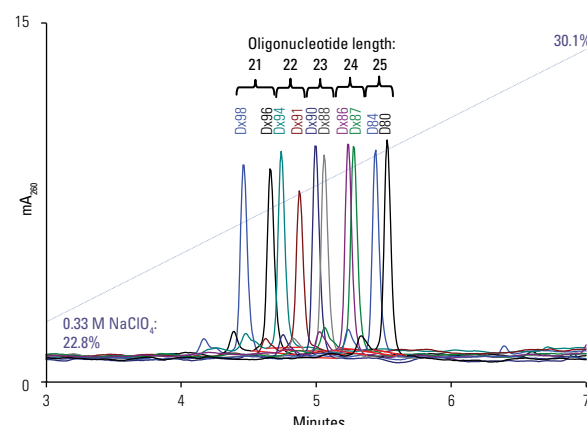
The DNAPac PA200 is packed with a pellicular anion-exchange resin composed of an 8µm diameter nonporous polymeric substrate to which quaternary amine-functionalized Dionex MicroBeads are bound. The rapid mass transport characteristics of this resin result in high-resolution oligonucleotide separations. 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: NaClO₄, pH 6.5 with 20% CH₃CN
 Flow Rate: 1.2mL/min
 Injection Volume: 8µL
 Detection: UV, 260nm

DNAPac PA200

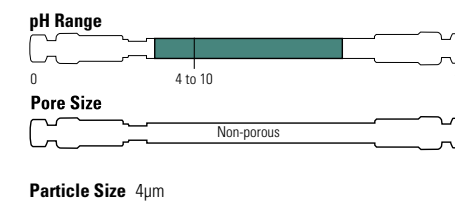
Particle Size (µm)	Format	Length (mm)	2.0mm ID	4.0mm ID	9.0mm ID	22.0mm ID
8	Guard Column	50	11371843	11331813	11351843	088780
	HPLC Column	250	11381843	11341813	11361843	088781

DNAPac PA200 RS

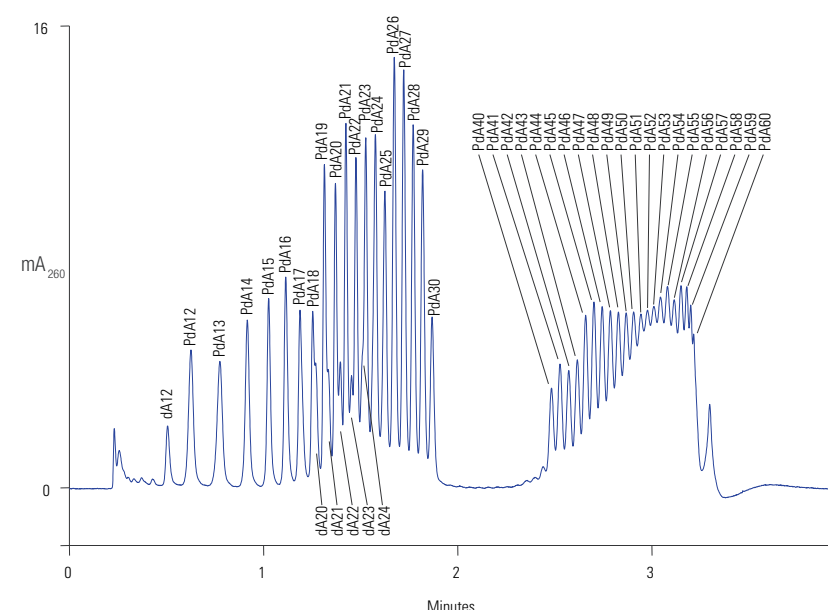
UHPLC Solutions for nucleic acid analysis

- 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.



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

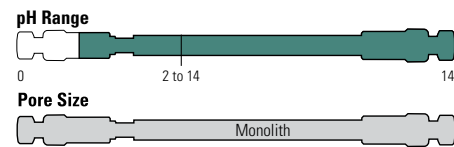
Particle Size (µm)	Format	Length (mm)	4.6mm ID
4	BioRS column	50	15149673
		150	15159673
		250	15139673

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.

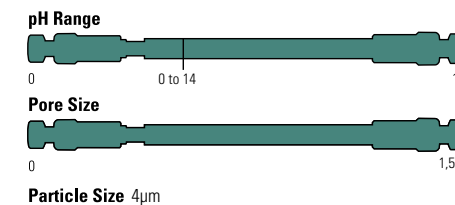


DNAPac RP

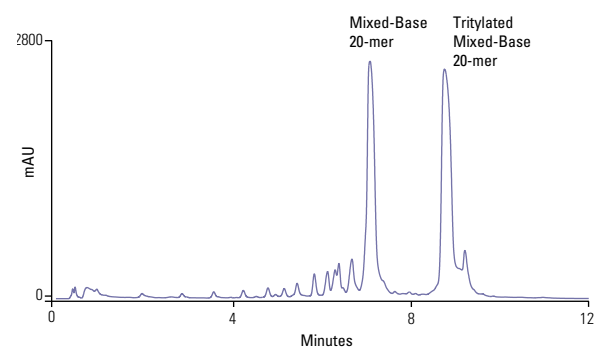
Reverse phase (RP) column specifically for analysis of oligonucleotides and double stranded (ds) DNA and RNA fragments.

- 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.



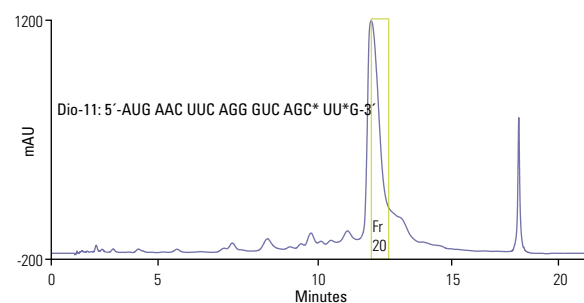
Tritylated oligonucleotide



DNASwift SAX-1S, 150 x 5.0mm

Mobile Phase A:	15mM Tris, pH 8
Mobile Phase 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



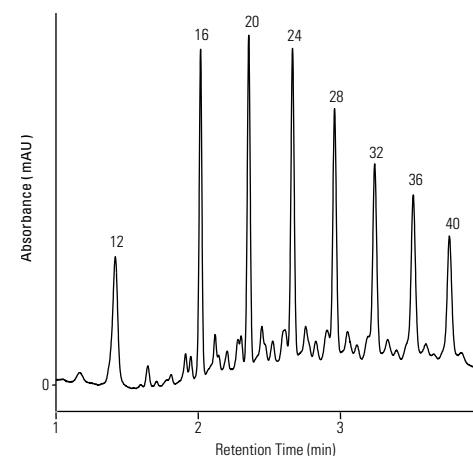
DNASwift SAX-1S, 150 x 5.0mm

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	11371893

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	088925	088921
	HPLC Column	50	088924	088920
		100	088923	088919
Guard Cartridge Holder			11311733	11311733

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

NanoLC Technical Resources



visit 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	12896016	ES804
	250	–	13284749
	500	–	13294749
	750	–	ES805
3	150	–	12886016

Acclaim PepMap C18 300Å

Particle size (µm)	Length (mm)	50µm ID	75µm ID
5	150	–	15106874

PepSwift

Length (mm)	200µm ID
250	15166864



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)	15176864
EASY-Spray Emitter, microflow (Emitter ID 20µm, Transfer line ID 75µm, Transfer line length 500mm)	15196864

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	-	13423288	13453288	13483288	13463318	13433328
150	13413288*	13433288	13463288	13493288	13473318	13443328
250	-	-	-	13413318	13483318	13453328
350	-	12301713	13423308	13423318	13493318	13463328
450	-	-	-	-	13403328	13473328
550	-	13413298	13433308	13433318	13413328	13483328
650	-	13423298	13443308	13443318	15299268	-
750	-	12351713	15426140	12331713	13423328	13493328
850	-	-	-	15289268	-	-
950	-	13443288	13473288	13403298	-	-
1100	-	-	-	13403318	-	-

*180mm Length

Trap Column Cartridges Holders with nanoViper Fittings

Description	Cartridge Length (mm)	Fitting ID (µm)	Cat. No.
µ-Pre-column holder for trap cartridges with 2 x 100mm length nanoViper fittings	5	30	13264509
	15	75	13406836

Sample Loops with nanoViper Fittings

Volume (µL)	Cat. No.	Quantity
1	13472108	1 Each
5	13482108	1 Each
10	13492108	1 Each
20	10493048	1 Each
50	13412118	1 Each
125	13402118	1 Each

Find out more about how SMART Digest Kits can benefit your workflow at:
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	13403728
Direct Injection capillary LC Kit	Y	Y	–	Y	13413728
Preconcentration nano LC kit	Y	Y	Y	Y	13423728
Preconcentration capillary LC kit	Y	Y	Y	Y	13433728
Preconcentration monolithic LC kit	Y	Y	Y	Y	13443728
2D salt plugs kit	Y	Y	Y	Y	13453728
Automated off line SCX-RP peptides kit	Y	Y	Y	Y	13463728
Automated off line RP-RP peptides kit	Y	Y	Y	Y	13483728
Tandem nano LC kit	Y	Y	Y	Y	13473728
FLM nanoViper tubing kit (All tubing for nano LC preconcentration)	Y	–	–	–	13403288
MS connection kit	Y	–	–	–	13493728
EASY-Spray connection kit (Supports direct injection as well as preconcentration)	Y	Y	Y	–	13423738



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	11342023	11392253	11332023	164454	–
	150	11352023	11342013	11372013	13486836	164769
	250	13436836	11362013	–	–	164734
	500	13456836	11382013	–	–	164738
3	50	13476836	11342263	13451208	13461208	–
	150	13466836	11352263	11392263	11302273	164738
	250	13496836	11362263	–	–	–
	500	13406846	11372263	–	–	164739
5	750	–	–	–	–	15572920
	50	–	–	15142428	15122428	–
	150	–	–	15152428	15132428	–

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	–	13426836	13416846	13426846

Acclaim PepMap C4 300Å

Particle size (µm)	Length (mm)	nanoViper Column			
		50µm ID	75µm ID	300µm ID	1000µm ID
5	150	–	13446836	13491208	13401218

Acclaim PepMap C18 300 Å

Particle size (µm)	Length (mm)	nanoViper Column			
		50µm ID	75µm ID	300µm ID	1000µm ID
5	150	–	164708	13471208	13481208

Accucore NanoLC Columns

Accucore 150-C18

		nanoViper Column
Particle size (µm)	Length (mm)	75µm ID
2.6	150	12635715
	500	12645715

Accucore 150-C4

		nanoViper Column
Particle size (µm)	Length (mm)	75µm ID
2.6	150	12655715
	500	12665715

Accucore 150-Amide-HILIC

		nanoViper Column
Particle size (µm)	Length (mm)	75µm ID
2.6	150	13425699



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	15335879
Cartridge Holder	11311733

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	–	11322023	–
50	11382263	11312023	11312273
250	11302023	11392013	–

ProSwift RP-4H

Length (mm)	ProSwift		
	100µm ID	200µm ID	500µm ID
100	–	–	15363775
250	15204848	15376073	–
500	15310475	–	–

ProSwift C4 RP-5H

Length (mm)	ProSwift		
	100µm ID	200µm ID	500µm ID
100	–	–	15356168
250	15326168	15346168	15366168
500	15316168	–	–



Trap columns – nano trap design

Acclaim PepMap C18 100Å

Type	Part number	Particle Size	ID	Bed Length (mm)	Total Length	Quantity
nanoViper Column	11352013	3	75	20	150	2 Pack
	12749835	3	75	20	70	2 Pack
	11312263	5	100	20	150	2 Pack
Classic Column	11382243	5	100	10	150	2 Pack
	11392243	5	100	20	150	2 Pack
	11332253	5	200	20	150	2 Pack

Note: 12749835 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	11362113	11312113
15	–	11322113

Acclaim PepMap C8 100Å

Length (mm)	300µm ID
5	11372163

Acclaim PepMap C4 300Å

Length (mm)	300µm ID
5	11352223

Acclaim PepMap C18 300Å

Length (mm)	300µm ID
5	11342223

Accucore 150-C18

Length (mm)	300µm ID
5	15207478

Accucore 150-C4

Length (mm)	300µm ID
5	15217478

Accucore 150-Amide-HILIC

Length (mm)	300µm ID
5	15227478

µ-Precolumn™ holder, 5mm, with 30µm ID connecting tubing, nanoViper fittings

Length (mm)	300µm ID
5	13264509

1st dimension columns for 2D separations

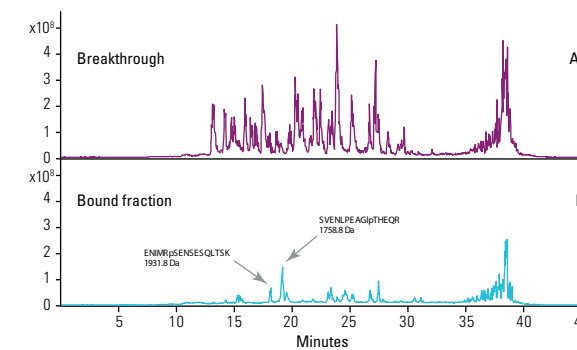
Improving separation efficiency with multidimensional analysis.

There are dedicated application kits which utilize either SCX or RP as the first dimension. A TiO₂ trapping column can be added to the application for phosphopeptide analysis.

1st dimension columns

Chemistry	Part Number	Description	Application
SCX	11322263	300µm ID x 10cm, packed with Poros 10 S, nanoViper column	2D Salt plugs
	11332263	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	13481198	300µm ID x 15cm, packed with Acclaim PA2, nanoViper column	Automated off-line 2D LC, Cap RP (basic) x Nan RP (acidic)
TiO ₂	11302253	100µm ID x 1cm packed with TiO ₂	Phosphopeptide analysis
	11352253	200µm ID x 1cm packed with TiO ₂	Phosphopeptide analysis

Isolation of two synthetic phosphopeptides from a BSA tryptic digest

Trap Column: 200µm ID x 1cm, packed with TiO₂, 5µm
100µm ID x 1cm, packed with Acclaim PepMap C18, 5µm

Separation Column:	Acclaim PepMap C18, 3µm, 75µm x 15cm
Loading Solvent:	0.05% HFBA in DI H ₂ O
Wash Solvent:	0.01% HFBA in DI H ₂ O
Mobile Phase A:	0.05% TFA in DI H ₂ O
Mobile Phase B:	0.04% TFA in acetonitrile/DI H ₂ O (80:20 v/v)
TiO ₂ Trap	
Mobile Phase:	250mM NH ₄ HCO ₃ in DI H ₂ 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)	10312400	3 Pack
EASY-Column, 10cm, ID 75µm, 3µm, C18-A2 (Analytical column)	11551174	1 Each
EASY-Column, 10cm, ID 75µm, 3µm, C18-A2 (Analytical column)	10450520	3 Pack
HPLC-to-Column Connector kit Zero-dead-volume union (1/32in OD tubing), 10x 11875372	11302150	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 (10x11875372).	11571174	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 11875372	11322150	1 Each
Sleeves (2cm, 1/32in OD) for 360µm OD fused silica	11875372	30 Pack

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



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

Section Contents

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Acclaim HPLC and UHPLC Columns	4-034	LC Accessories	4-078
Application Specific HPLC Columns	4-048	LC Reagents	4-098
Hypercarb HPLC Columns	4-059	LC and LC-MS Instruments	4-108

LC Columns

Technical Resources






visit www.thermoscientific.com/chromexpert to access the following information:

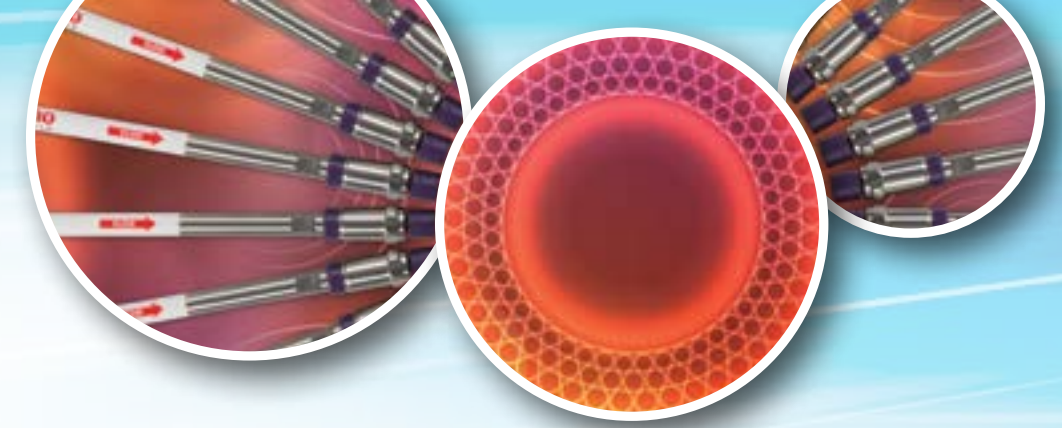
- HPLC Column Selection
- HPLC Column Selection by US Pharmacopeia Specifications
- Thermo Scientific HPLC Phases
- HPLC Column Selection by Manufacturer
- Method Transfer
- Scaling a Method Up or Down
- HPLC Troubleshooting
- HPLC Definitions and Equations
- Selecting the Correct Buffer
- Preparation 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	Accucore Columns Page 4-005 	Ultimate Performance	<ul style="list-style-type: none"> 1.5, 2.6 and 4µm solid core silica particles Core Enhanced Technology
	Hypersil GOLD Columns Page 4-020 	Selectivity & Peak Shape	<ul style="list-style-type: none"> 1.9, 3, 5 and 12µm ultra-high purity silica particles Wide range of conventional phases
Medium/High	Acclaim Columns Page 4-034 	Traditional, Speciality & Application Specific Phases	<ul style="list-style-type: none"> 2.2, 3 and 5µm ultra-pure silica particles Innovative and unique bonded phases
High	Synchronis Columns Page 4-062 	Ruggedness & Reproducibility	<ul style="list-style-type: none"> 1.7, 3 and 5µm high surface area silica particles Dense bonding, double endcapping, rigorous testing
Very High	Hypercarb Columns Page 4-059 	Extended Separation Capabilities	<ul style="list-style-type: none"> 3 and 5µm 100% porous graphitic carbon particles Polar retention effect on graphite (PREG)



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-2µm 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

Accucore Vanquish

Powerful separations are our core performance

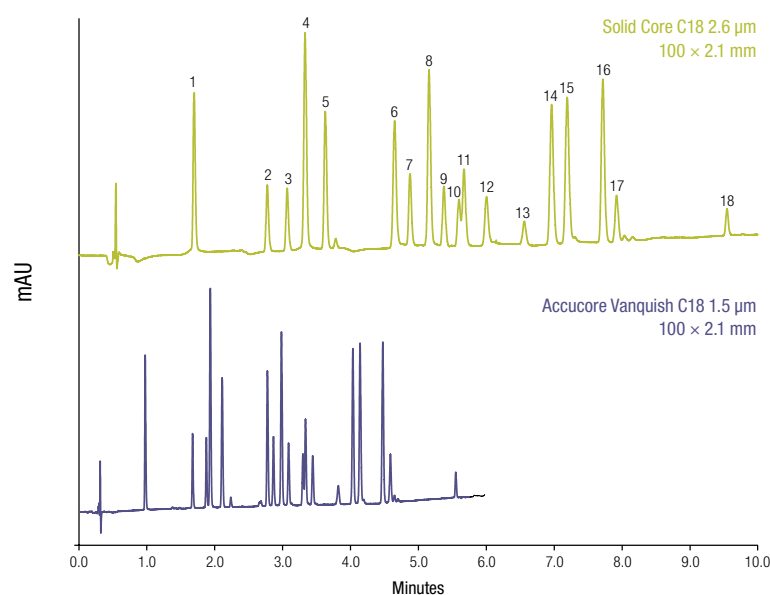
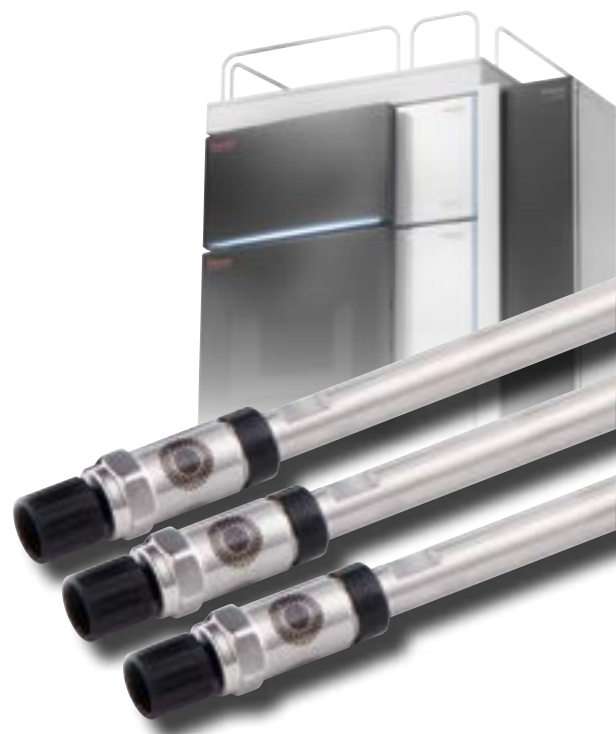
Thermo Scientific™ Accucore™ Vanquish™ UHPLC columns provide a robust chromatography solution to enhance laboratory workflows and productivity. These columns, in combination with Vanquish UHPLC systems, deliver powerful separations to solve your analytical challenges faster and more effectively.

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.

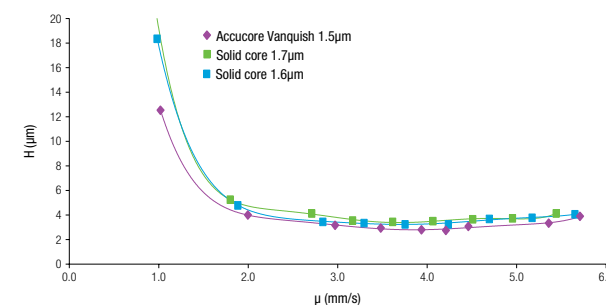


Comparison of separation of 18 pesticides using Accucore Vanquish 1.5µm column to a larger particle size solid core column

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

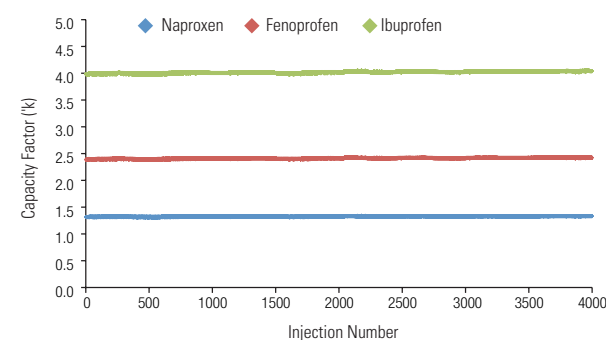
High efficiency is maintained even at high flow rates enabling fast reproducible separations.



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™ Chromeleon™ 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	15509640
		100	2.1	15418060
		150	2.1	15428060

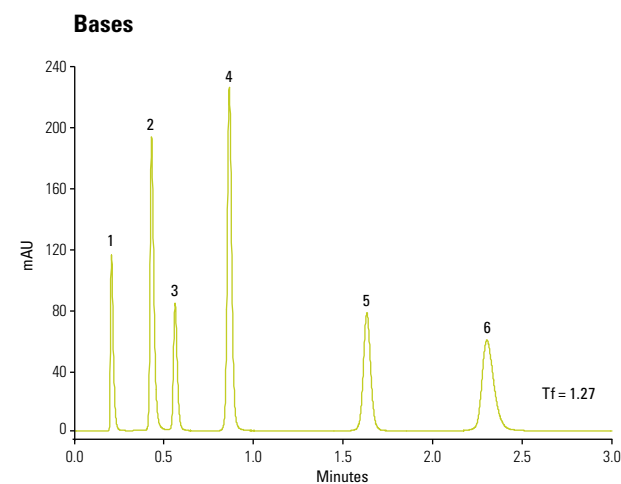
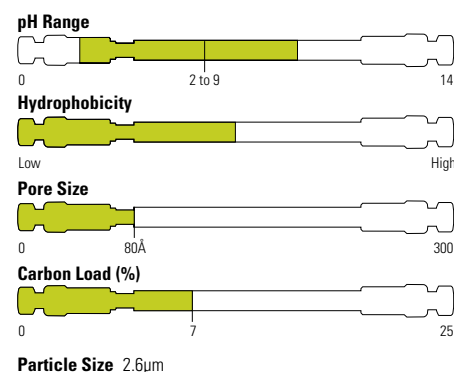
Accucore RP-MS

- 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 2.6 μm, 50mm x 2.1mm

Mobile Phase:	65% Methanol / 35% 25mM Potassium Phosphate pH7.0
Temperature:	30°C
Flow Rate:	500 μL/min
Injection Volume:	1 μL
Backpressure:	232 bar
Detection:	UV, 215nm
Analytes:	1. Uracil 2. Propranolol 3. Butylparaben 4. Naphthalene 5. Acenaphthene 6. Amitriptyline

Accucore RP-MS

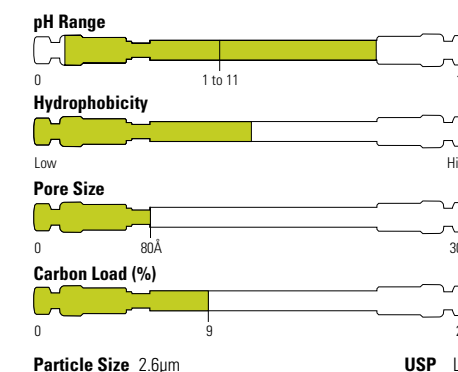
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	17626-012105	11687701	11367521
		HPLC Column	30	11377521	-
	HPLC Column	50	11307531	11317531	11327531
		100	11337531	11347531	11357531
		150	11367531	11377531	11387531
	UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864

Accucore C18

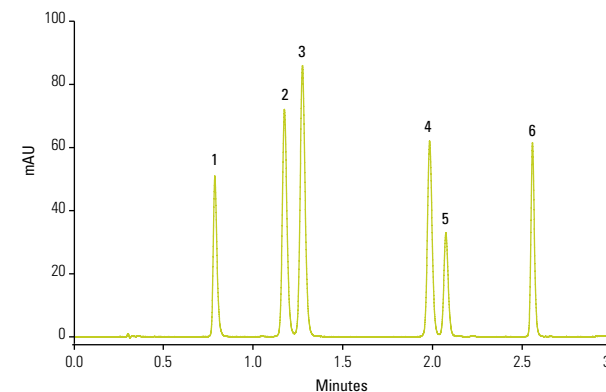
- Optimum retention of non-polar compounds
- Hydrophobic interaction mechanism
- Separates a broad range of analytes

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 2.6 μm, 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:	600 μL/min
Injection Volume:	2 μL
Backpressure:	298 bar
Detection:	UV, 280nm
Analytes:	1. Simazine 2. Simetryn 3. Atrazine 4. Ametryn 5. Propazine 6. Prometryn

Accucore C18

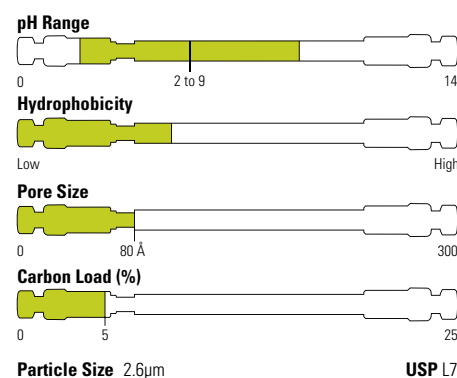
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	11647701	11657701	11667701
		HPLC Column	30	11357461	-
	HPLC Column	50	11377461	11307471	11397461
		100	11317471	11337471	11347471
		150	11357471	11377471	11307481
4	Drop-in Guard (4/pk)	10	12870753	12880753	12890753
		HPLC Column	50	12880743	12890743
	HPLC Column	100	12860743	12870743	12800753
		150	12810753	12820753	12830753
		250	12840753	12860753	12850753
	UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864

Accucore C8

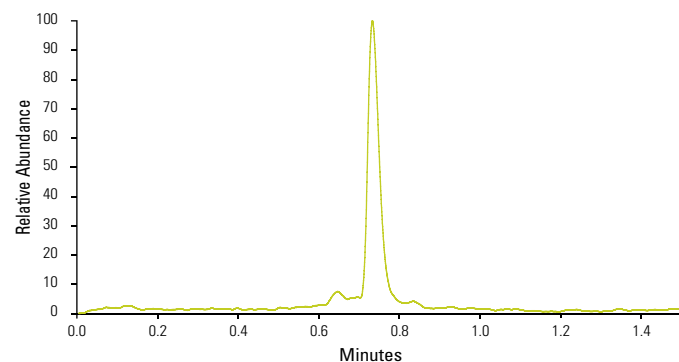
- Lower hydrophobic retention
- Complementary steric selectivity to C18
- Low levels of secondary interactions
- Recommended for moderately polar analytes

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

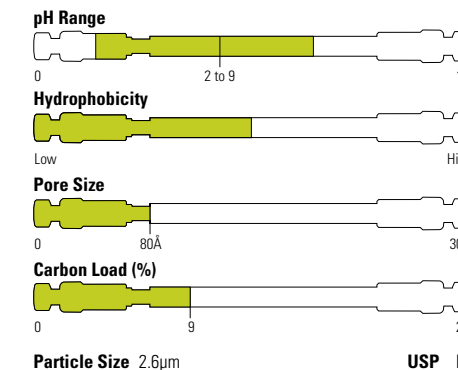
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	12586289	12596289	12506299
		30	12566279	-	-
	HPLC Column	50	12596279	12506289	12516289
		100	12526289	12536289	12546289
		150	12556289	12566289	12576289
4	Drop-in Guard (4/pk)	10	12870773	12880773	12890773
		HPLC Column	50	12800763	12810763
	100		12820763	12840763	12800773
	150		12810773	12820773	12840773
	250		12830773	12850773	12860773
	UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864

Accucore aQ

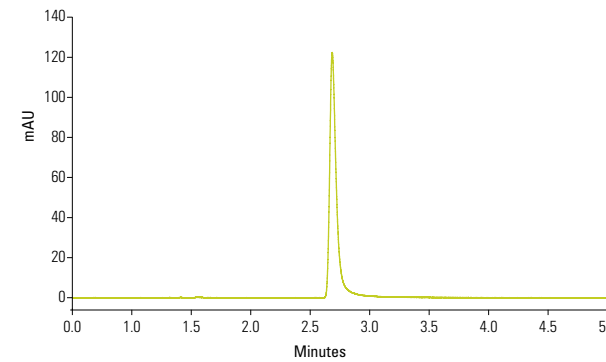
- Retention and resolution of polar analytes
- Polar endcapped C18 stationary phase for alternative selectivity
- Ideal for highly aqueous mobile phases

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: 0.00
 %RSD Peak area: 1.72
 (%RSD calculated from 6 replicate injections)
 USP acceptance criteria: % RSD (t, Peak Area) <2.0

Accucore aQ

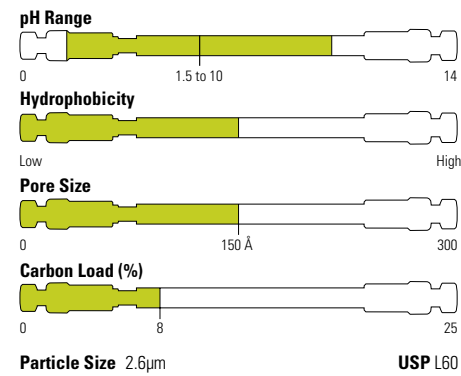
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	17326-012105	11617711	11627711
		HPLC Column	30	11327481	-
	50		11347481	11367481	11377481
	100		11387481	11397481	11307491
	150		11317491	11327491	11337491
	UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864

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.

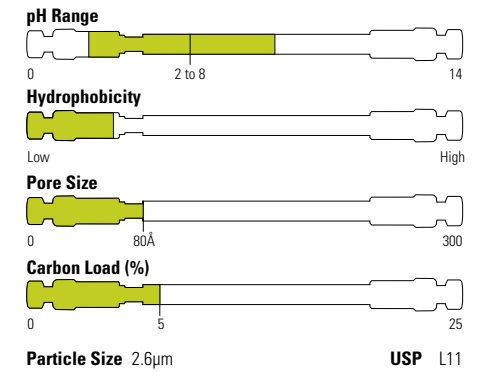


Accucore Phenyl-Hexyl

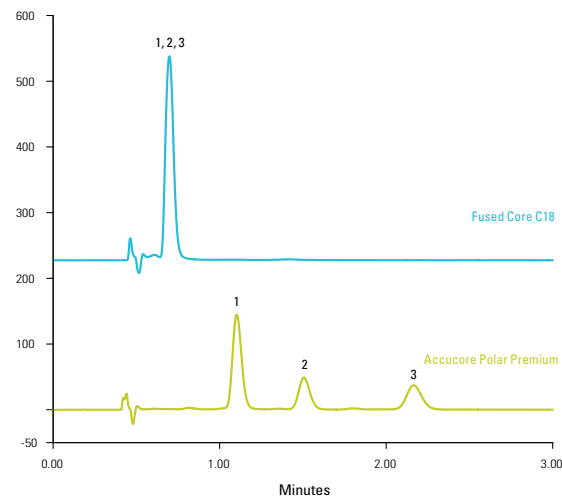
- Mixed-mode selectivity for aromatic and moderately polar analytes
- Enhanced pi-pi interactions with aromatics
- Moderate hydrophobicity

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.



Curcuminoids (Turmeric)



Accucore Polar Premium 2.6µm, 100 x 3.0mm Fused Core C18, 100 x 3.0mm

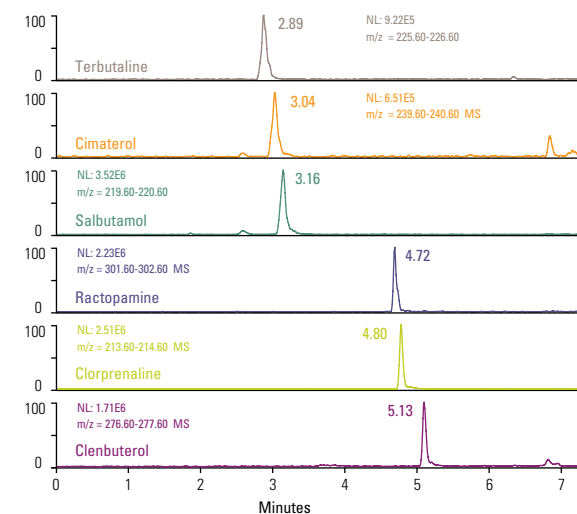
Mobile Phase:	Methanol : 10mM Phosphoric Acid, 80 : 20
Temperature:	40°C
Flow Rate:	800µL/min
Injection Volume:	6µL
Detection:	UV, 428nm
Analytes:	1. Curcumin 2. Desmethoxycurcumin 3. Bis-desmethoxycurcumin

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	28026-012105	-	-
		50	13448739	13425649	13445649
		100	13469738	13455649	13435649
		150	13465649	13475649	13485649
	250	13438739	-	-	
	UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864

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	11637711	11647711	11657711
		30	11327541	-	-
	HPLC Column	50	11357541	11367541	11377541
		100	11387541	11397541	11307551
		150	11317551	11327551	11337551
		UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714

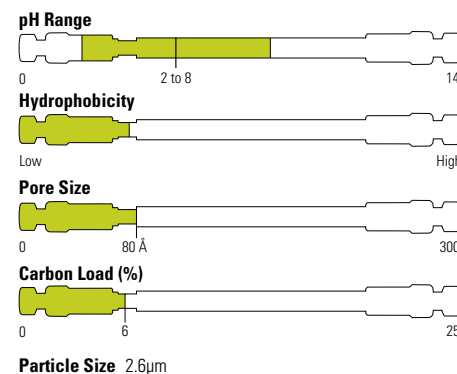
Accucore Phenyl-X

- Unique reversed-phase shape selectivity
- Enhanced selectivity for aromatic compounds
- Compatible with highly aqueous mobile phases
- Robust, high-efficiency, low column bleed

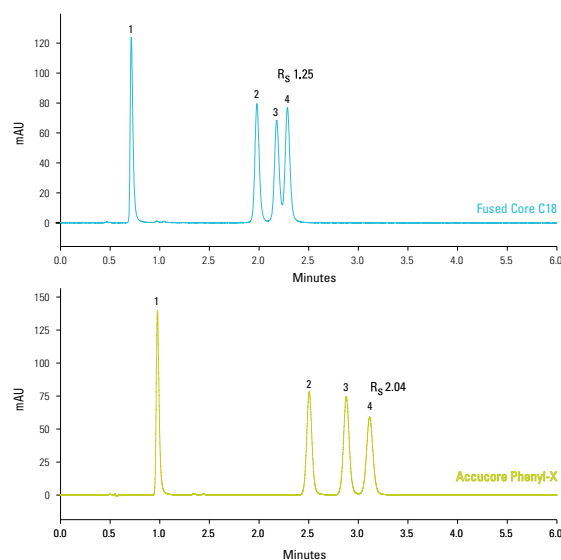
The proprietary Accucore Phenyl-X alkyl aromatic bonded phase provides a unique selectivity when compared to other reversed phase materials such as C18 or Phenyl.

The advanced design of the bonded phase makes it compatible with highly aqueous mobile phases and robust, demonstrating very low bleed.

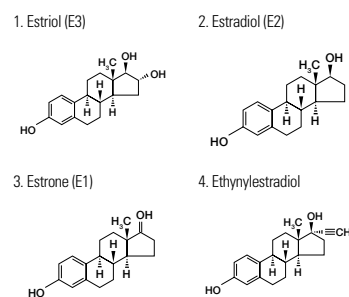
Phenyl-X exhibits particularly high aromatic selectivity.



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



Accucore Phenyl-X

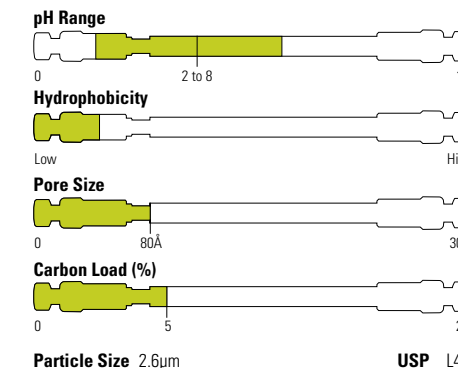
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	13415669	-	-
		HPLC Column	50	13415659	13425659
		100	13489738	13445659	27926-104630
		150	13495659	13475659	13485659
		250	13405669	-	-
	UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864

Accucore PFP

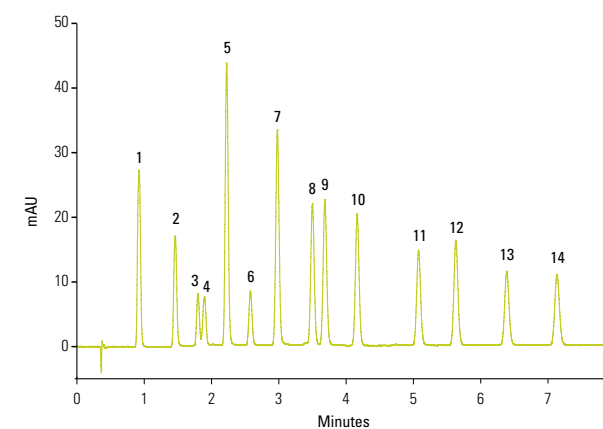
- Alternative selectivity to C18
- Extra retention for halogenated species
- Unique selectivity for non-halogenated polar compounds

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

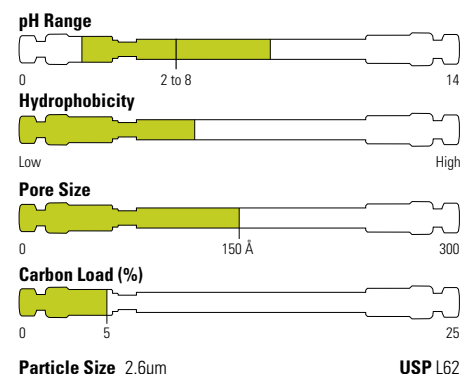
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	11667711	11677711	11687711
		HPLC Column	30	11377491	-
		50	11307501	11317501	11327501
		100	11337501	11347501	11357501
		150	11367501	11377501	11387501
	UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864

Accucore C30

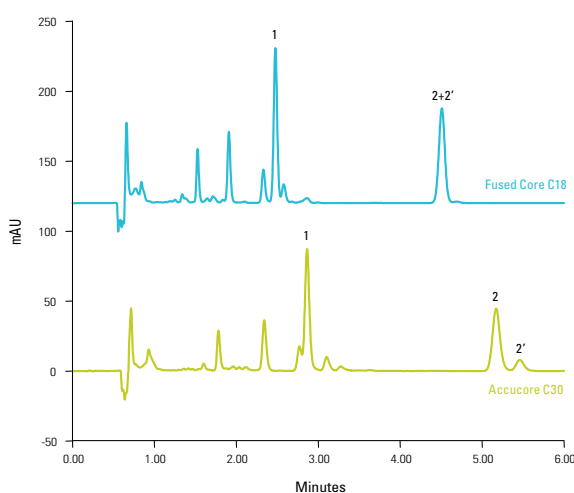
- Ideal for separation of hydrophobic, long alkyl chain compounds
- High shape selectivity for structurally related isomers
- Excellent aqueous-compatibility

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	27826-012105	-	-
	HPLC Column	50	13425679	13435679	13445679
		100	13499738	13455679	13465679
		150	27826-152130	13475679	13495679
		250	13405689	-	-
UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864	

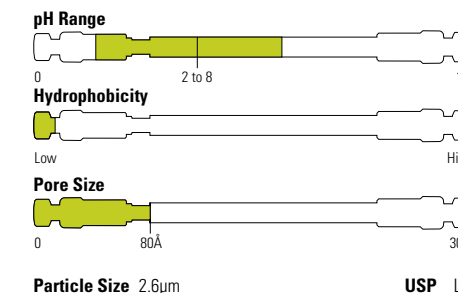
Accucore HILIC

- Enhanced retention of polar and hydrophilic analytes
- Alternative selectivity to C18 without ion-pair or derivatization

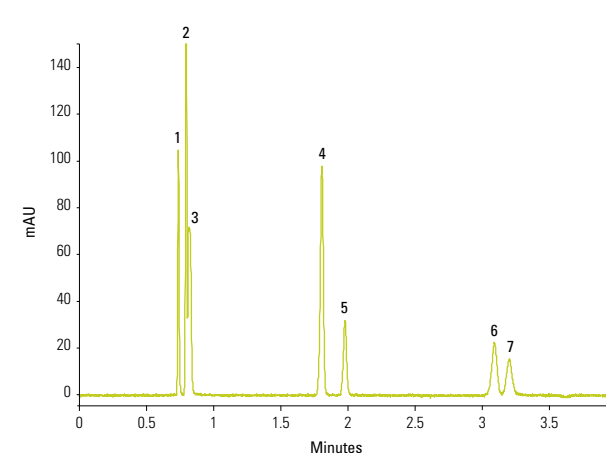
In HILIC mode the separation occurs through two mechanisms. The primary mechanism is a partitioning effect due to the enriched water layer around the polar or charged substrate material. The secondary mechanism involves interaction between the analyte and the active surface moiety.

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

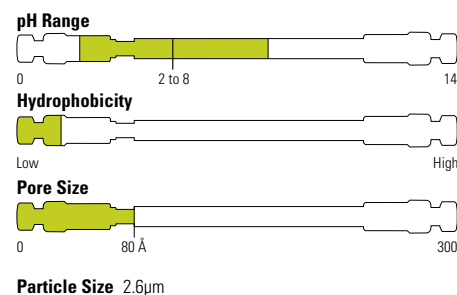
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	17526-012105	11607721	11617721
		30	11327511	-	-
	HPLC Column	50	11357511	11367511	11377511
		100	11387511	11397511	11307521
		150	11317521	11327521	11337521
		UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714

Accucore Urea-HILIC

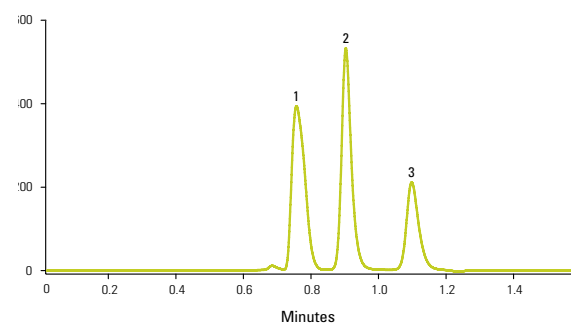
- Bonded hydrophilic stationary phase
- Unique selectivity compared to other HILIC phases
- Low ion exchange activity

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

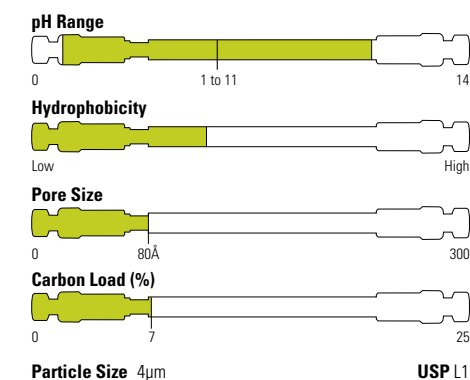
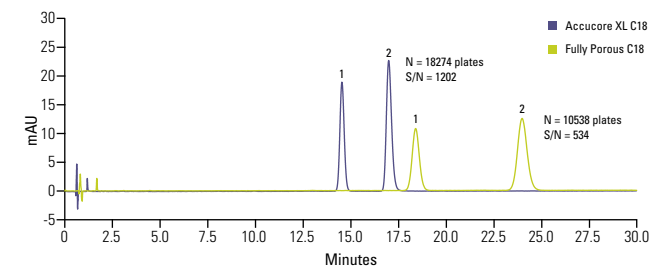
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	13485669	-	-
	HPLC Column	50	13435669	13425669	13445669
		100	13409748	13455669	13465669
		150	13475669	13495669	13405679
		250	13415679	-	-
	UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864

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)



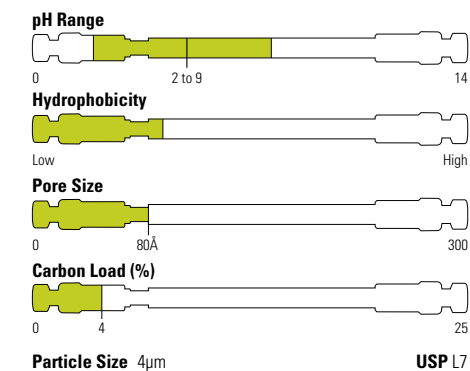
Accucore XL C18 4μm, 150 x 4.6mm Fully porous C18 5μm, 150 x 4.6mm

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

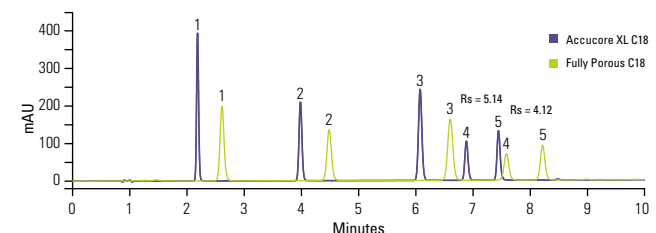
Accucore XL C8 is recommended for analytes with moderate hydrophobicity, or when a less hydrophobic phase provides optimum retention.



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

Endocrine Disruptors



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	12870753	12880753	12890753
			50	12880743	12890743	12850743
			100	12860743	12870743	12800753
			150	12810753	12820753	12830753
			250	12840753	12860753	12850753
	HPLC Column	C8	10	12870773	12880773	12890773
			50	12800763	12810763	12830763
			100	12820763	12840763	12800773
			150	12810773	12820773	12840773
			250	12830773	12850773	12860773



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

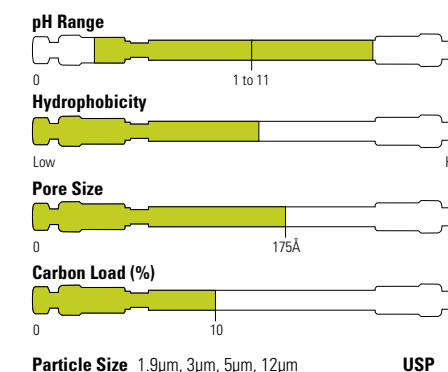


The Hypersil GOLD web page contains the latest news, applications and downloads for the Hypersil GOLD HPLC column range. Visit www.thermoscientific.com/hypersilgold

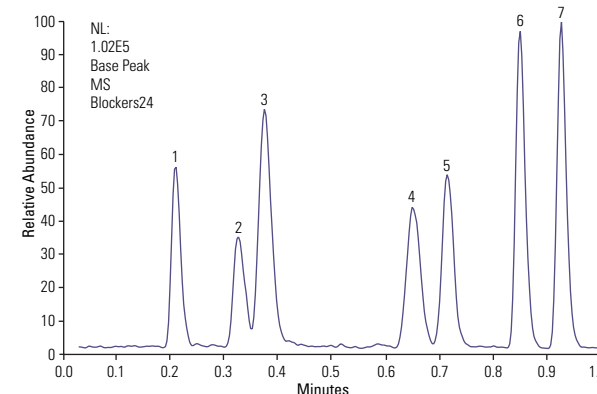
Hypersil GOLD

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: H₂O+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	-	10464613	-	-	-
		30	10305063	10049142	-	-	-
		50	10020213	10474783	10345203	-	10169344
		100	10715004	10734604	10582465	-	-
		150	-	10630204	-	-	-
		200	-	25002-202130	-	-	-
3	Drop-in Guard (4/pk)	10	10608705	11518270	10481365	11528270	11528270
		30	-	10394463	-	-	10764984
	HPLC Column	50	-	10424413	10293183	10658825	10089282
		100	10281225	10632864	10304923	10794546	10384323
		150	10704556	25003-152130	10131383	10456844	25003-154630
5	Drop-in Guard (4/pk)	10	-	11538270	10544085	11548270	11548270
		30	-	10475163	10668825	-	10008862
	HPLC Column	50	-	10611334	10191523	-	10611524
		100	-	10140743	10384723	-	10121033
		150	-	10131033	10795316	10313065	10501695
		250	-	10009102	10352775	10506365	10543035
UNIGUARD Drop-in Guard Cartridge Holder	10	10762567	10776714	10776714	10602864	10602864	

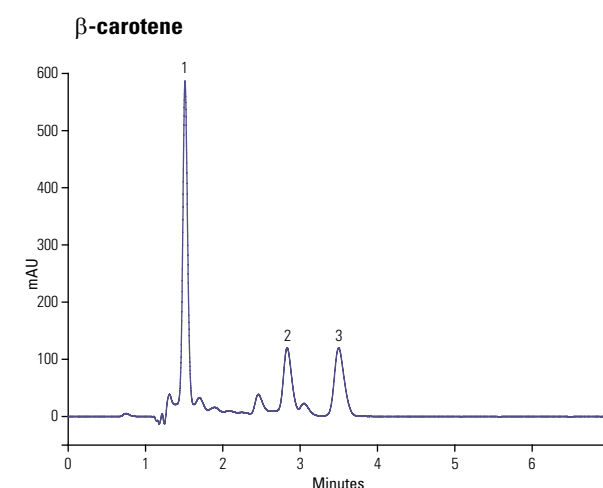
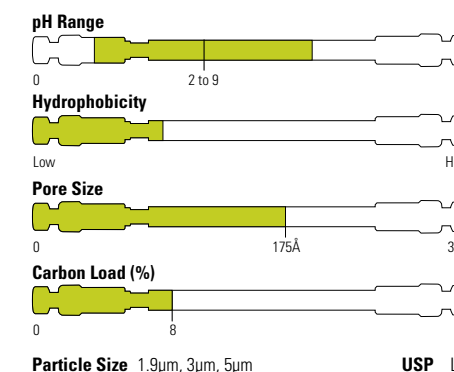
Hypersil GOLD Preparative

Particle Size (µm)	Format	Length (mm)	10mm ID	20mm ID	21mm ID	30mm ID	50mm ID
5	Preparative Guard Cartridge (3/pk)	10	25005-019023	25005-019223	-	-	-
	Preparative HPLC Column	50	10322725	-	-	10037444	10517825
		100	10312405	-	10077404	10793216	10087404
		150	10281195	-	10437634	10027174	10352975
		250	10723996	-	10467634	10724186	10372545
12	Preparative Guard Cartridge (3/pk)	10	10076344	15240718	-	-	-
	Preparative HPLC Column	50	10578035	-	10078424	10743426	10699775
		100	10392785	-	10272055	10698825	10382405
		150	-	-	10508615	10008524	10639405
		250	10363465	-	10609595	11508690	10713046
	Preparative Guard Cartridge Holder	10	11523960	15260718	-	-	-

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

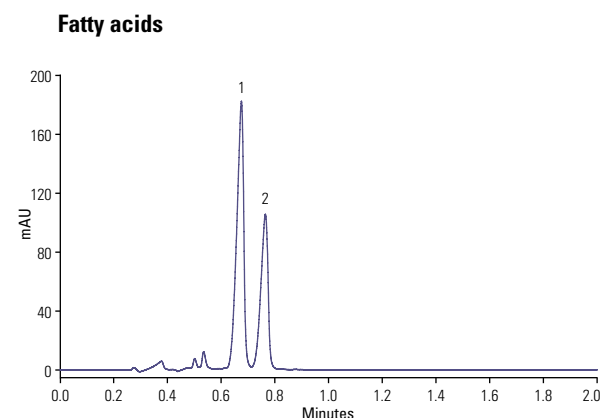
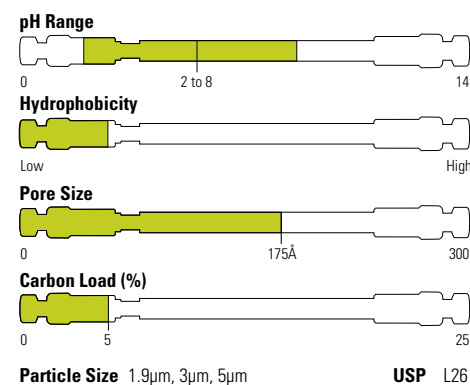
Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.9	UHPLC Column	20	-	10658895	-	-	-
		30	-	10044264	-	-	-
		50	-	10664945	10556845	-	10096024
		100	10329884	10074694	10442195	-	-
		150	-	10234864	-	-	-
3	Drop-in Guard (4/pk)	10	10714817	11598270	10075814	10487694	10487694
	HPLC Column	50	-	10553035	10558585	10715126	10543995
		100	10027464	10018912	10619395	10202105	10774414
5	HPLC Column	150	-	10078952	10312745	10734766	10736144
		10	-	10535445	10259644	11508280	11508280
		50	-	10293413	10764356	-	10690564
		100	-	10503235	10261915	-	10690754
	150	-	10203663	10108874	10149494	10755783	
UNIGUARD Drop-in Guard Cartridge Holder	10	10762567	10776714	10776714	10602864	10602864	



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



Hypersil GOLD C4 1.9µm, 100 x 2.1mm
 Mobile Phase: H₂O / MeCN (20:80)
 Temperature: 30°C
 Flow Rate: 0.55mL/min
 Injection Volume: 1µL
 Detection: 200 nm
 Analytes: 1. Linolenic acid
 2. Linoleic acid

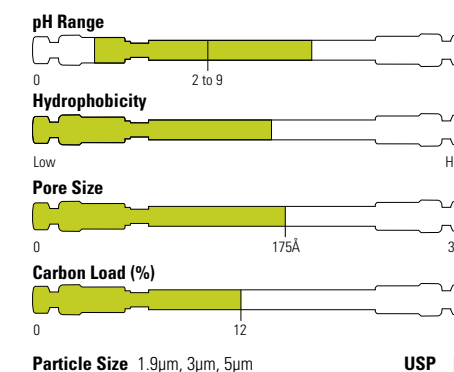
Hypersil GOLD C4

Particle Size (µm)	Format	Length (mm)	1.0mm ID	2.1mm ID	3.0mm ID	4.6mm ID
1.9	UHPLC Column	50	-	10127614	-	-
		100	-	10691396	-	-
		150	-	10391585	-	-
		200	-	-	-	-
3	Drop-in Guard (4/pk)	10	10147884	10447534	10157884	10610626
		30	-	-	-	-
	HPLC Column	50	-	10159534	-	-
		100	-	10037254	10027504	10732826
5	Drop-in Guard (4/pk)	10	-	10076694	10514475	10670046
		30	-	-	-	-
	HPLC Column	50	-	10609585	-	10699385
		100	-	10382865	10322355	10699755
		150	-	10609765	-	10486854
		250	-	10067684	10548415	10312635
UNIGUARD Drop-in Guard Cartridge Holder	10	10762567	10776714	10776714	10602864	

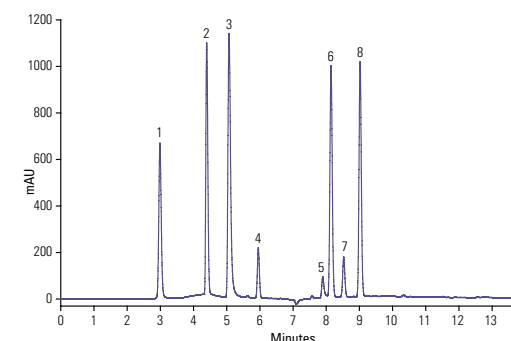
Hypersil GOLD aQ

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 KH₂PO₄, 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	-	10375203	-	-	-
		30	-	10324223	-	-	-
		50	10101723	10572635	10111723	-	10119574
		100	10621344	10582635	10631344	-	-
		150	-	10736734	-	-	-
		200	-	10486693	-	-	-
3	Drop-in Guard (4/pk)	10	10360905	11548280	11558280	11568280	11568280
		30	-	10715793	10466664	-	-
	HPLC Column	50	-	10513795	10251235	10629955	10541105
		100	10129514	10190873	10074313	10139514	10364603
		150	10210655	10572255	10268944	10509355	10008902
		200	-	-	-	-	-
5	Drop-in Guard (4/pk)	10	-	10783497	10370905	11578280	11578280
		30	-	-	-	-	-
	HPLC Column	50	-	10776153	10508405	-	10662474
		100	-	10140593	10557435	-	10150593
		150	-	10718063	10497414	-	10019382
		250	-	10161023	-	10056134	10582065
UNIGUARD Drop-in Guard Cartridge Holder	10	10762567	10776714	10776714	10602864	10602864	

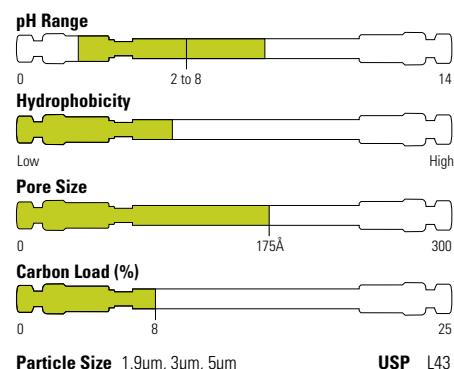
Hypersil GOLD aQ Preparative

Particle Size (µm)	Format	Length (mm)	10mm ID	20mm ID	21mm ID	30mm ID	50mm ID
5	Preparative Guard Cartridge (3/pk)	10	10117664	25305-019223	-	-	-
		50	10392955	-	10659945	10017874	10538395
	Preparative HPLC Column	100	10018334	-	10649215	10448564	10362525
		150	10109374	-	10221325	10017824	10027824
		250	10231085	-	10241085	10527245	10446844

Hypersil GOLD PFP

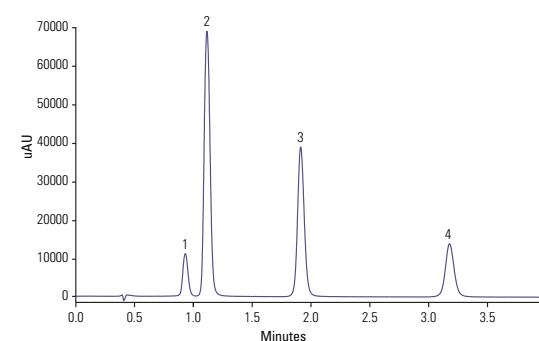
Introduction of a fluorine group into the stationary phase causes significant changes in solute-stationary phase interaction

- Fluorine atoms around the phenyl ring enhance pi-pi interactions with aromatic molecules
- Extra retention for halogenated species
- Selectivity for non-halogenated polar compounds



Particle Size 1.9µm, 3µm, 5µm USP L43

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	-	10670774	-	-	-
		30	-	10243553	-	-	-
		50	10465753	10661134	10435943	-	10269504
		100	10523435	10583025	10531135	-	-
		150	-	10706354	-	-	-
		200	-	10253193	-	-	-
3	Drop-in Guard (4/pk)	10	10486764	11528290	10734657	10270055	10270055
		30	-	10485533	10260995	-	10444973
	HPLC Column	50	-	10641904	11952458	10537255	10521305
		100	10250665	10304473	10473415	10608425	10642864
		150	10559365	10233223	10229944	-	10774984
5	Drop-in Guard (4/pk)	10	-	10619285	10535825	11538290	11538290
		50	-	10131223	10640536	-	-
	HPLC Column	100	-	10620564	10704756	-	10621524
		150	-	10724414	10220815	10418574	10068902
		250	-	10078902	-	10159194	10141033
		UNIGUARD Drop-in Guard Cartridge Holder	10	10762567	10776714	10776714	10602864

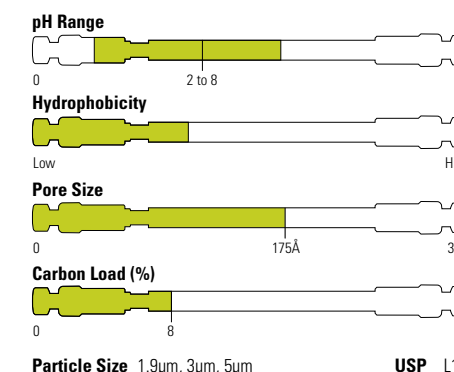
Hypersil GOLD PFP Preparative

Particle Size (µm)	Format	Length (mm)	10mm ID	20mm ID	21mm ID	30mm ID	50mm ID
5	Preparative Guard Cartridge (3/pk)	10	10371015	15395424	-	-	-
		50	11578700	-	11588700	11598700	11508710
	Preparative HPLC Column	100	10067364	-	10322885	10149344	10765526
		150	10231915	-	10291955	10579565	10589565
		250	10558035	-	10058424	10568035	10201825

Hypersil GOLD Phenyl

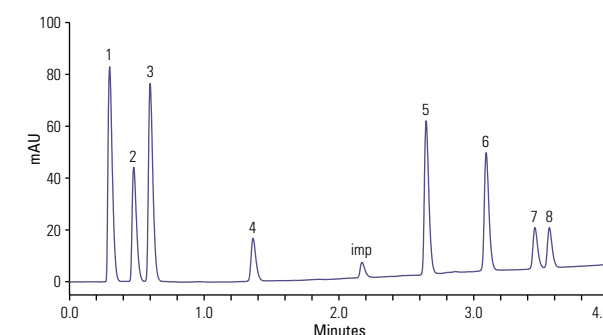
Contains a C4 linker which allows for superior alignment of the phenyl ring with aromatic molecules

- Enhanced pi-pi interactions with aromatics
- Moderate hydrophobicity
- Outstanding peak shape and sensitivity



Particle Size 1.9µm, 3µm, 5µm USP L11

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

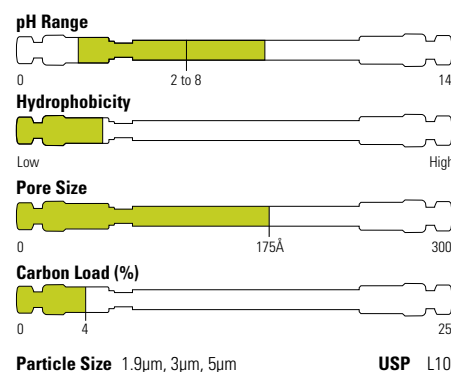
Hypersil GOLD Phenyl

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	-	10422015	-	-	-
		100	-	10207834	-	-	-
		150	-	10431825	-	-	-
		200	-	10595125	-	-	-
3	Drop-in Guard (4/pk)	10	10459054	10380915	10279654	10026124	10026124
		50	-	10208264	-	-	-
	HPLC Column	100	-	10056364	10437324	-	10690256
		150	10794627	-	10446984	-	10287924
		250	-	10025644	10525435	10351445	10351445
5	Drop-in Guard (4/pk)	10	-	10025644	10525435	10351445	10351445
		50	-	10675335	-	-	10762907
	HPLC Column	100	-	10753477	10127604	-	-
		150	-	-	-	-	10014574
		250	-	-	10594095	10005784	10442595
UNIGUARD Drop-in Guard Cartridge Holder	10	10762567	10776714	10776714	10602864	10602864	

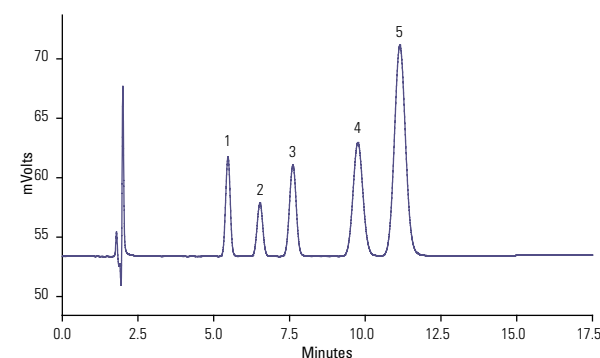
Hypersil GOLD CN

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 ₂ PO ₄ , 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

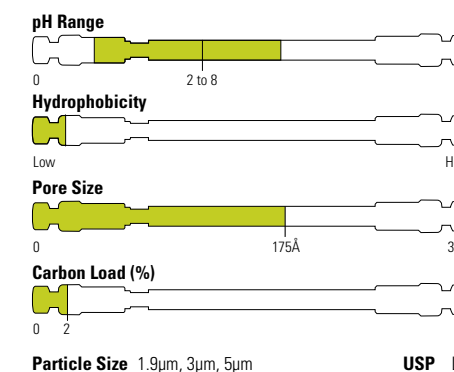
Hypersil GOLD CN

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	-	10319984	-	-	-
		100	-	10565885	-	-	-
		200	-	10675325	-	-	-
3	Drop-in Guard (4/pk)	10	10269954	11588290	10035844	11598290	11598290
		HPLC Column	30	-	10343993	-	-
	HPLC Column	50	-	10069142	-	-	-
		100	-	10553225	10417264	-	10746524
		150	-	10785716	10672864	10795716	-
5	Drop-in Guard (4/pk)	10	-	10361105	10341215	11508300	11508300
		HPLC Column	50	-	10600954	-	-
	HPLC Column	100	-	10662484	10231965	-	-
		150	-	10746144	-	-	10213663
		250	-	10474983	10027154	10538585	10273703
	UNIGUARD Drop-in Guard Cartridge Holder	10	10762567	10776714	10776714	10602864	10602864

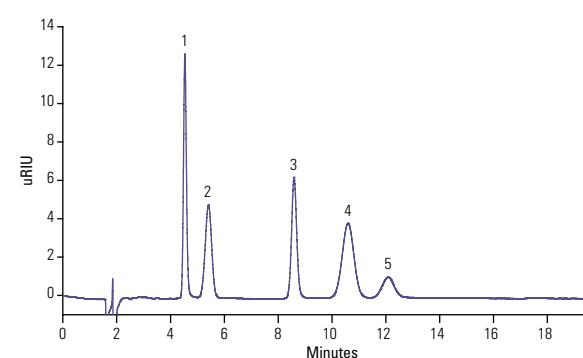
Hypersil GOLD Amino

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

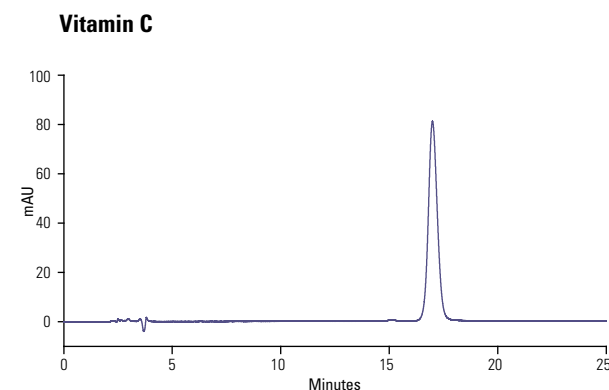
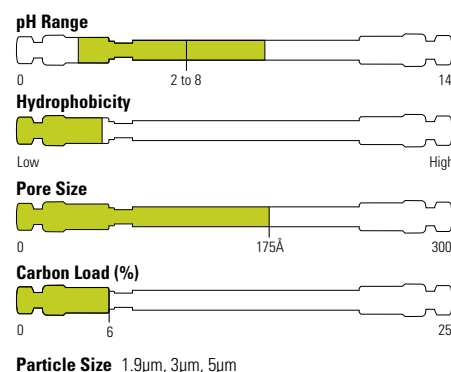
Hypersil GOLD Amino

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	-	10793097	-	-	-
		100	-	10177994	-	-	-
		150	-	10670246	-	-	-
		200	-	10732347	-	-	-
3	Drop-in Guard (4/pk)	10	10036304	10698515	10478664	10056114	10056114
		HPLC Column	30	-	10681196	-	-
	HPLC Column	50	-	10187654	-	-	-
		100	-	10742527	10689755	-	10289364
		150	-	10211095	10600826	10169564	-
5	Drop-in Guard (4/pk)	10	-	10659465	10525615	10259174	10259174
		HPLC Column	50	-	10427324	-	-
	HPLC Column	100	-	10391295	10169524	-	-
		150	-	-	-	-	10006074
		250	-	10554105	10517455	10322975	10752717
	UNIGUARD Drop-in Guard Cartridge Holder	10	10762567	10776714	10776714	10602864	10602864

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

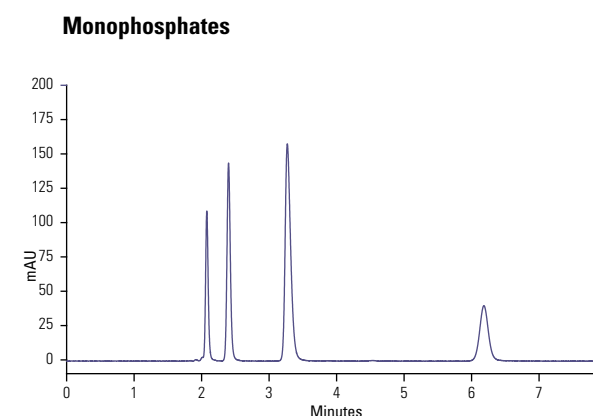
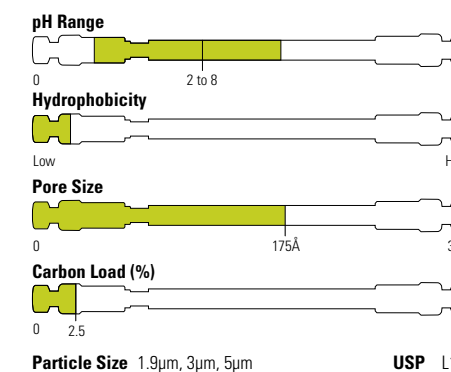


Hypersil GOLD AX 5µm, 100 x 4.6mm
 Mobile Phase: 100 mM Ammonium Acetate pH 6.8/ MeCN (30:70)
 Temperature: 30°C
 Flow Rate: 0.5mL/min
 Injection Volume: 50µL
 Detection: UV, 240nm

Hypersil GOLD 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



Hypersil GOLD SAX 5µm, 150 x 4.6mm
 Mobile Phase: Aqueous KH₂PO₄ (50 mM, pH 3)
 Temperature: 40°C
 Flow Rate: 1.0mL/min
 Injection Volume: 10µL
 Detection: UV, 254nm

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	-	10449644	-	-	-
		100	-	10601406	-	-	-
		150	-	10229564	-	-	-
		200	-	10611406	-	-	-
3	Drop-in Guard (4/pk)	10	10177644	10016414	10742137	10167734	10167734
		HPLC Column	30	-	10077194	-	-
	HPLC Column	50	-	10037824	-	-	-
		100	-	10097834	-	-	10467254
		150	10087344	10763606	10139184	-	10027654
5	Drop-in Guard (4/pk)	10	-	10469644	10536185	10734817	10734817
		HPLC Column	50	-	-	-	10547245
	HPLC Column	100	-	10302455	-	-	10231385
		150	-	10567455	-	-	10077364
		250	-	10332885	10734366	10648995	-
		UNIGUARD Drop-in Guard Cartridge Holder	10	10762567	10776714	10776714	10602864

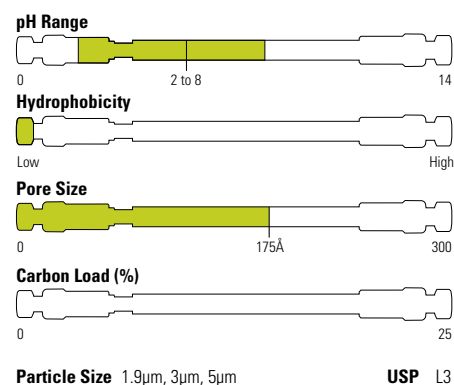
Hypersil GOLD SAX

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.9	UHPLC Column	100	10259514	-	-	-
		150	10754257	-	-	-
		3	Drop-in Guard (4/pk)	10	10620056	10056224
HPLC Column	50	10362645		-	-	-
3	HPLC Column	100	10609025	10487414	-	10569155
		150	-	10540126	-	10392475
		5	Drop-in Guard (4/pk)	10	10702337	10703697
HPLC Column	50	10417454		-	-	-
5	HPLC Column	100	10352525	10251185	-	10477414
		150	10598195	-	-	10629755
		250	10149084	10417624	10333065	10703786
	UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864	10602864

Hypersil GOLD Silica

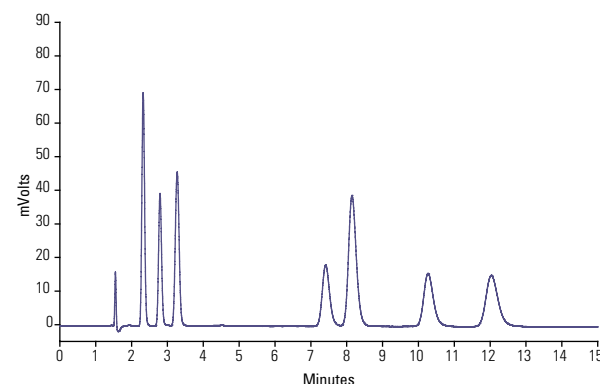
Unbonded, highly pure base deactivated silica media that is the backbone of the Hypersil GOLD range of columns

- Highly pure base deactivated silica media
- Outstanding peak shape and sensitivity



Particle Size 1.9µm, 3µm, 5µm USP L3

Steroids

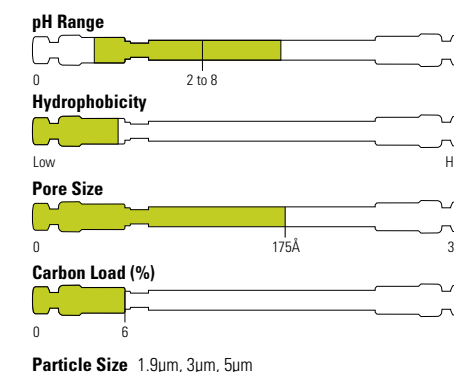


Hypersil GOLD Silica 5µm, 150 x 4.6mm
 Mobile Phase: 19:1 (v/v) n-C6H14/EtOH
 Temperature: 30°C
 Flow Rate: 1.5mL/min
 Injection volume: 5µL
 Detection: UV, 254nm
 Analytes: 1. Progesterone, 2. 21-Hydroxyprogesterone-21-acetate, 3. 17- α -Hydroxyprogesterone, 4. Cortisone, 5. 11- α -Hydroxyprogesterone, 6. Corticosterone, 7. Hydrocortisone

Hypersil GOLD HILIC

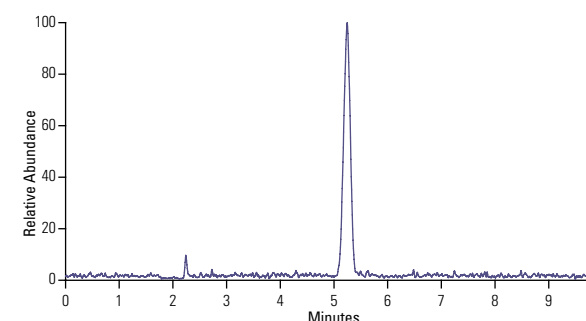
Retains and separates polar analytes that are problematic using reversed-phase columns

- Alternative selectivity to C18
- Improved sensitivity for MS detection
- Alternative to ion-pair or derivatization
- Outstanding peak shape and selectivity



Particle Size 1.9µm, 3µm, 5µm

Urea



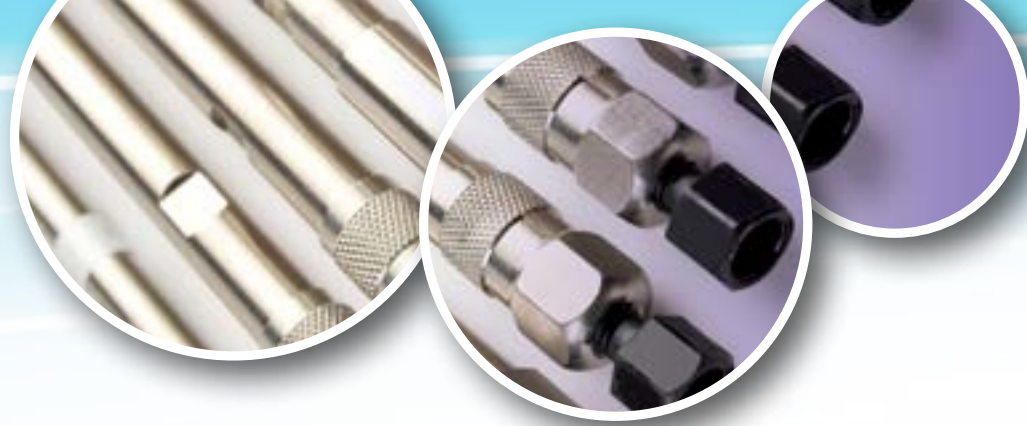
Hypersil GOLD HILIC 5µm, 150 x 4.6mm
 Mobile Phase: H₂O/MeCN (10:90) + 0.1% formic acid
 Temperature: 30°C
 Flow Rate: 0.6mL/min
 Injection Volume: 1µL
 Detection: +ESI
 Analytes: 1. Urea

Hypersil GOLD 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	-	10722157	-	-	-
		100	-	10065884	-	-	-
		150	-	10341165	-	-	-
		200	-	10498674	-	-	-
3	Drop-in Guard (4/pk)	10	10468664	10371105	10629865	10289124	10289124
		30	-	10524125	-	-	10076744
	HPLC Column	50	-	10187524	-	-	-
		100	-	10066264	10177954	-	-
		150	10763887	10764447	10127624	-	10157894
5	Drop-in Guard (4/pk)	10	-	10555425	10702147	10648905	10648905
		50	-	10311535	-	-	-
	HPLC Column	100	-	10311125	10418284	-	10290385
		150	-	10167474	-	-	10437534
		250	-	10556955	-	10774077	10360835
		UNIGUARD Drop-in Guard Cartridge Holder	10	10762567	10776714	10776714	10602864

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	-	11527931	-	-	-
		100	-	11567931	-	-	-
		150	-	10029259	-	-	-
3	Drop-in Guard (4/pk)	10	11738056	11748056	11758056	11768056	11768056
		30	-	11547941	-	-	-
	HPLC Column	50	-	11597941	-	-	-
		100	-	11547951	11557951	-	11577951
		150	11587951	11597951	11507961	-	11527961
5	Drop-in Guard (4/pk)	10	-	11708056	11718056	11728056	11728056
		50	-	11537971	-	-	11567971
	HPLC Column	100	-	11587971	11597971	-	-
		150	-	-	-	-	11567981
		250	-	11587981	11597981	11507991	11517991
		UNIGUARD Drop-in Guard Cartridge Holder	10	10762567	10776714	10776714	10602864

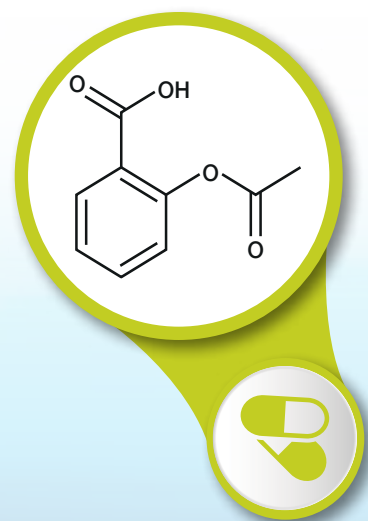


Acclaim HPLC and UHPLC Columns

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



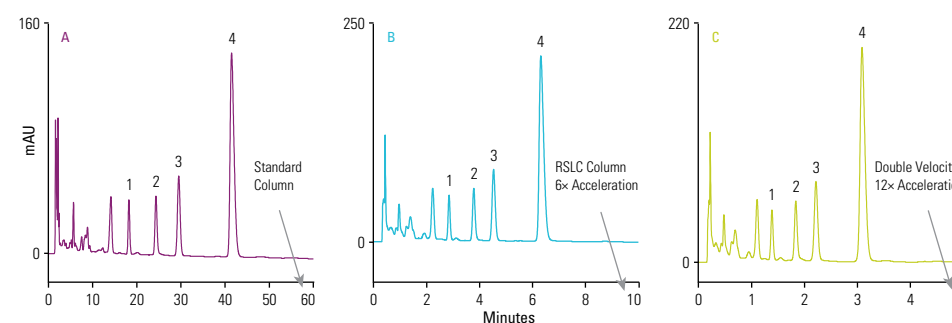
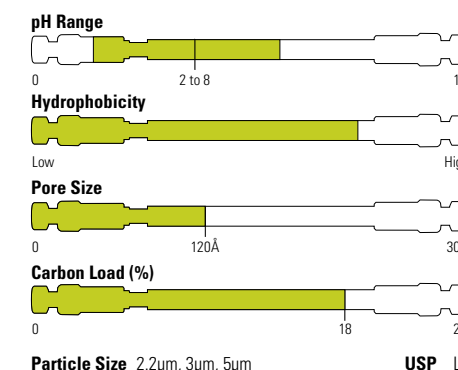
The Acclaim web page contains the latest news, applications and downloads for the Acclaim HPLC column range. Visit www.thermoscientific.com/acclaim

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	11351953	11311963	-
		50	11331913	11301963	-
		75	-	075699	-
		100	11341913	11391953	-
		150	11341953	-	-
		250	11352073	-	-
3	HPLC Column	33	-	11311893	-
		50	12606547	11301913	11371813
		75	-	11321893	-
		100	12709815	12646547	12719815
		150	11361813	063705	11381813
		250	12799805	070080	-
5	Guard Cartridge	10	11371733	11391973	11341923
	HPLC Column	150	-	-	11391813
		250	-	-	11301823

See page 4-037 for Acclaim Guard Holder Ordering Guide

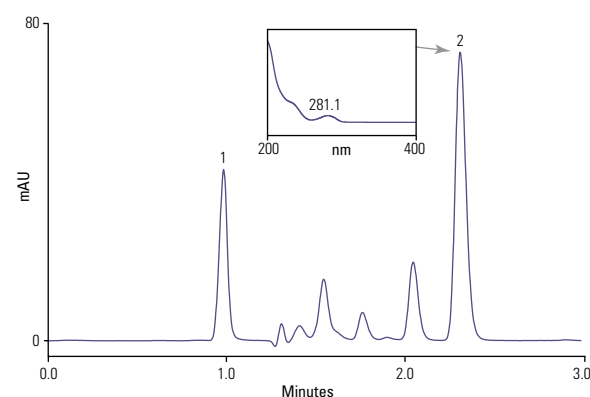
Acclaim 120 C8

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

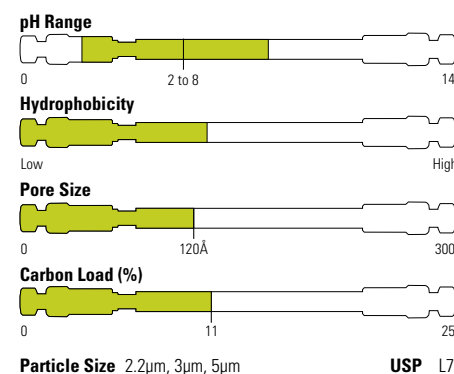


Column: Acclaim RSLC C8, 2.2µm, 50 x 2.1mm
 Mobile Phase: Isocratic, 15% buffer, (2mM Ammonium acetate pH5), 85% methanol (v/v)
 Temperature: 50°C
 Flow Rate: 0.2mL/min
 Injection Volume: 1.0µL
 Detection: Diode array detector, 281nm, 10Hz, 0.1 s resp. time and spectra 200–400 nm
 Analytes: 1. Saccharin
 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	-	11301993	-
		50	11371983	11311993	-
		100	11381983	11321993	-
		150	11391983	-	-
		250	11322073	-	-
3	HPLC Column	50	11351763	-	11381763
		100	11361763	-	11391763
		150	11371763	11371903	11301773
		250	12799795	-	-
		5	Guard Cartridge	10	11331733
5	HPLC Column	50	11371773	-	11311783
		100	-	-	11321783
		150	11391773	-	11331783
		250	-	-	11341783

See page 4-037 for Acclaim Guard Holder Ordering Guide



Acclaim Phenyl-1

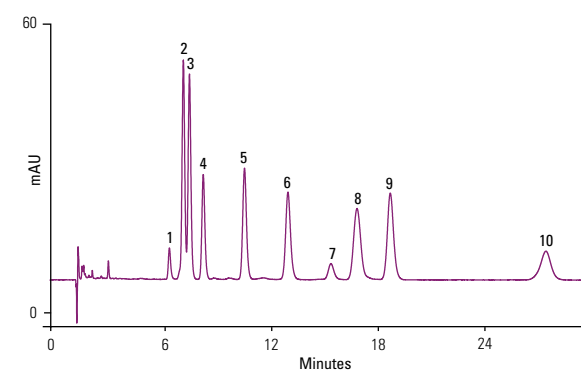
A unique reversed-phase column with high aromatic selectivity

- 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



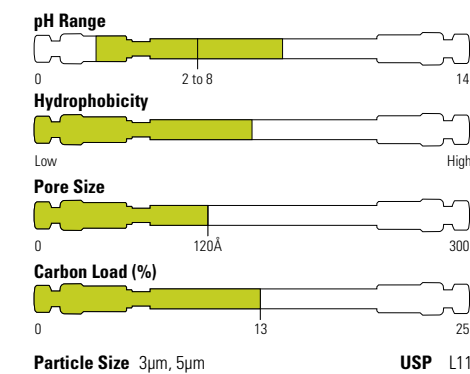
Acclaim Phenyl-1, 3µm, 150 x 3.0mm
 Mobile Phase: Methanol/water v/v 90/10
 Temperature: 30°C
 Flow Rate: 0.5mL/min
 Injection Volume: 2µL
 Detection: UV, 220nm
 Analytes: (100 ppm each)
 1. Retinol acetate (vitamin A acetate)
 2. Vitamin D2
 3. Vitamin D3
 4. delta-Tocopherol
 5. gamma-Tocopherol
 6. 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	15287468	11331973	11321973
	HPLC Column	150	11301973	11391963	11381963
5	HPLC Column	150	-	-	088016
		250	-	-	13473809

Acclaim Guard Holder

Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	11311733
Acclaim Guard Kit (Holder and Coupler) V-2	11321933
Guard to Analytical Column Coupler V-2	11332043

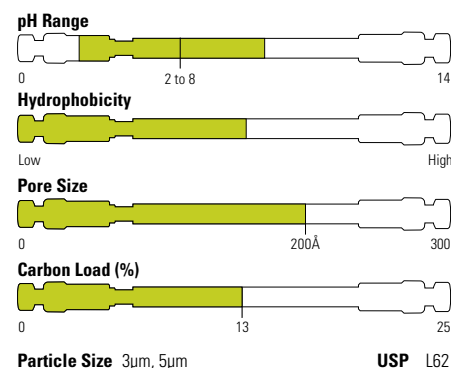


Acclaim C30

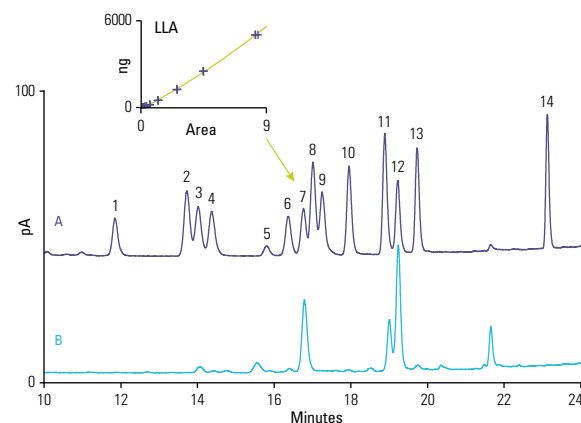
Columns for separating structurally related isomers

- 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	12729825	-	12779815
		100	12719825	-	-
		150	11362023	11372003	11362003
		250	12709825	11372023	-
5	Guard Cartridge	10	11352003	11342003	11332003
	HPLC Column	150	-	-	11322003
		250	-	-	11312003

Acclaim Guard Holder

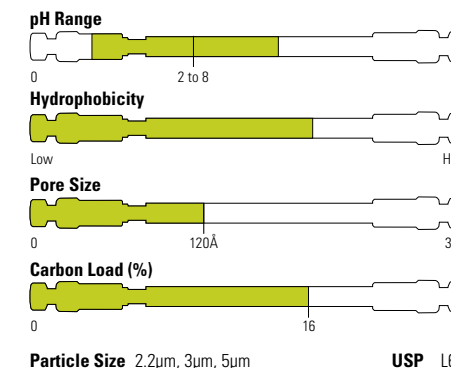
Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	11311733
Acclaim Guard Kit (Holder and Coupler) V-2	11321933
Guard to Analytical Column Coupler V-2	11332043

Acclaim PolarAdvantage

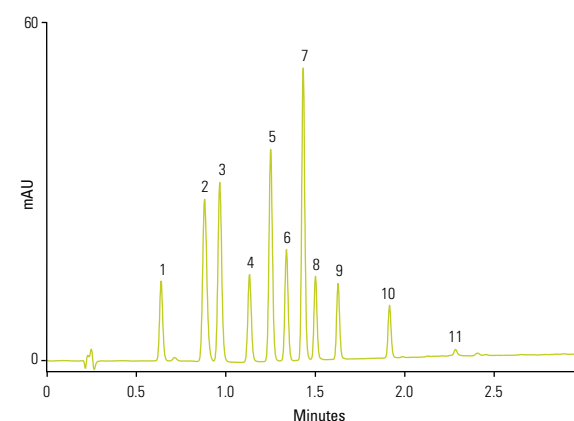
Novel polar-embedded reversed-phase columns with unique selectivity

- 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:	Time (min)	%A	%B
	-1.5	0.0	0.3
	0.0	0.3	2.6
	3.0	70	70
	10	30	90
	90	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	11341993	-	-
		75	-	075698	-
		100	11351993	11392023	-
		150	11361993	-	-
		250	11342073	-	-
3	HPLC Column	50	11351813	11391903	-
		100	11301803	12863323	-
		150	11311803	11361863	11321803
		250	-	11351933	-
5	Guard Cartridge	10	11361733	11381973	11331923
	HPLC Column	50	-	-	11331803
		150	-	-	11341803
		250	-	-	11351803

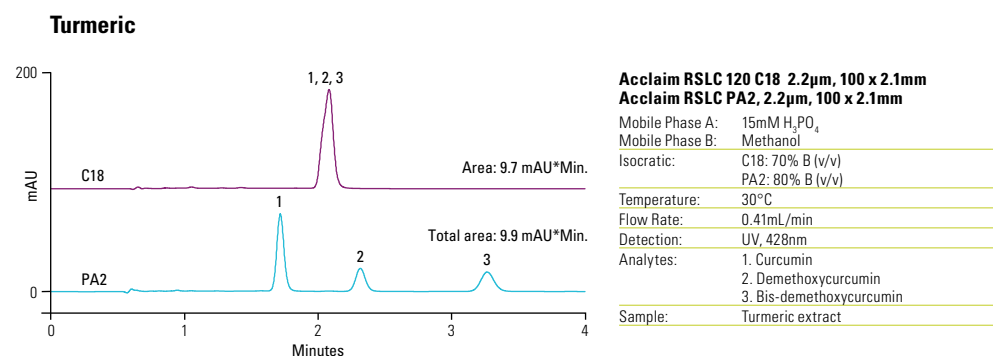
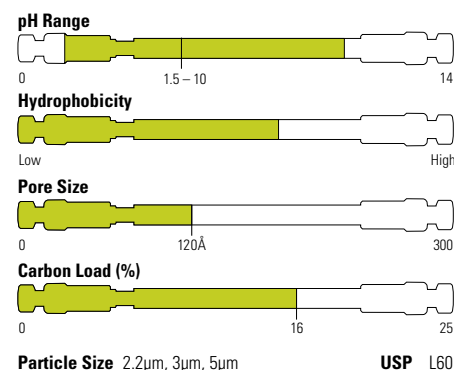
Acclaim PolarAdvantage II

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.



Acclaim PolarAdvantage II

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID	
2.2	RSLC Column	30	11351953	11311963	-	
		50	11331913	11301963	-	
		100	11341913	11391953	-	
		150	11341953	-	-	
		250	11352073	-	-	
3	HPLC Column	33	-	11311893	-	
		50	12606547	11301913	11371813	
		75	-	11321893	-	
		100	12709815	12646547	12719815	
		150	11361813	063705	11381813	
5	Guard Cartridge	10	11371733	11391973	11341923	
		HPLC Column	150	-	-	11391813
			250	-	-	11301823

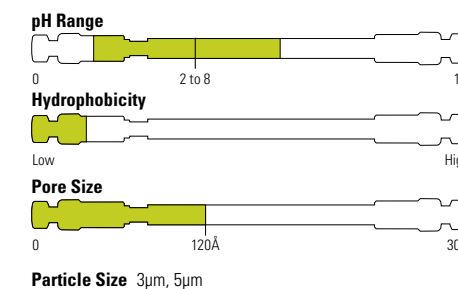
See page 4-037 for Acclaim Guard Holder Ordering Guide

Acclaim HILIC-10

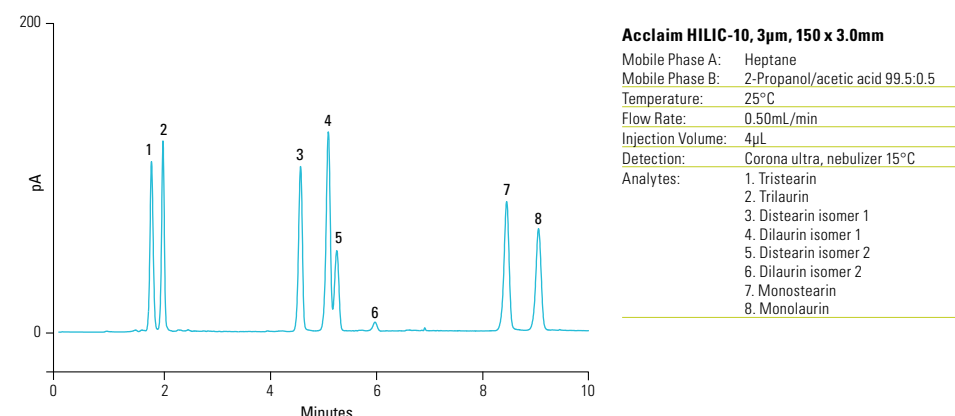
Designed with unique selectivity for hydrophilic molecules

- 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

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
3	HPLC Column	150	11392043	11382043	11372043
5	Guard Cartridge	10	11322053	11302053	11312053

Acclaim Guard Holder

Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	11311733
Acclaim Guard Kit (Holder and Coupler) V-2	11321933
Guard to Analytical Column Coupler V-2	11332043

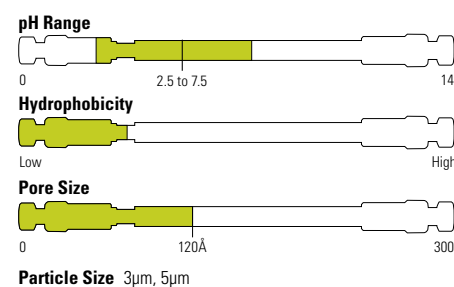
Acclaim Mixed-Mode HILIC-1

Uniquely designed for both reversed-phase and HILIC operations

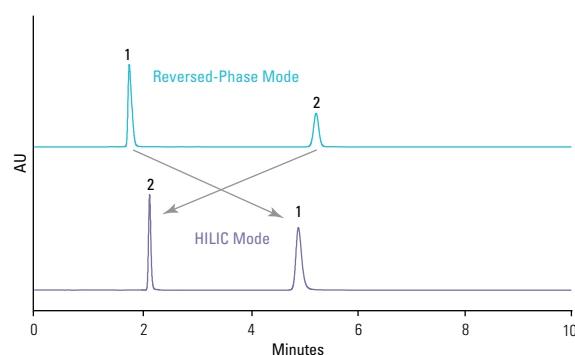
- Can operate in both RP and HILIC modes
- Retains highly polar molecules
- Unique selectivity complementary to RP columns
- Broader application range compared with conventional diol-based columns
- High-efficiency column for high-resolution separations

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, 5 μm, 150 x 4.6mm
 Mobile Phase: CH₃CN/0.1 M NH₄OAc, 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: 10 μL
 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	-	11361963	-
		150	11341823	11361943	-
5	Guard Cartridge	10	11391913	11371963	11311933
	HPLC Column	150	11301903	-	11381893
		250	-	-	11391893

Acclaim Guard Holder

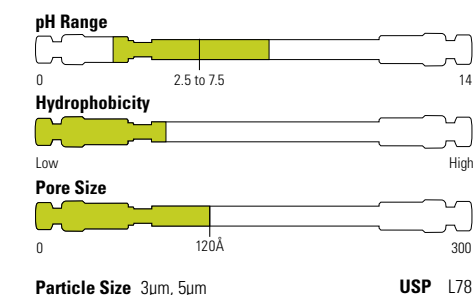
Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	11311733
Acclaim Guard Kit (Holder and Coupler) V-2	11321933
Guard to Analytical Column Coupler V-2	11332043

Acclaim Mixed-Mode WAX-1

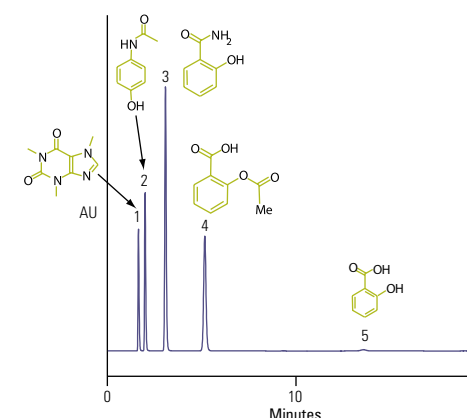
Designed for separating anionic molecules with powerful adjustable selectivity control

- 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, 5 μm, 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. H₂O,
 pH is adjusted to 6.0 with NaOH)
 Temperature: 30°C
 Flow Rate: 1mL/min
 Injection Volume: 1 μL
 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	-	11321963	-
		150	11351943	11341943	-
5	Guard Cartridge	10	11321733	11341963	11391923
	HPLC Column	150	11311903	-	11351883
		250	-	-	11361883

Acclaim Guard Holder

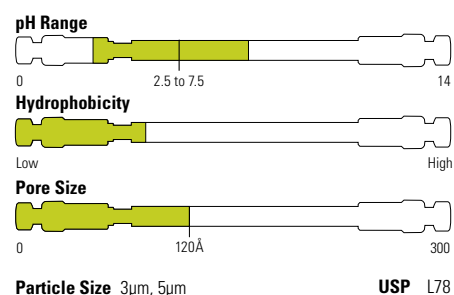
Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	11311733
Acclaim Guard Kit (Holder and Coupler) V-2	11321933
Guard to Analytical Column Coupler V-2	11332043

Acclaim Mixed-Mode WCX-1

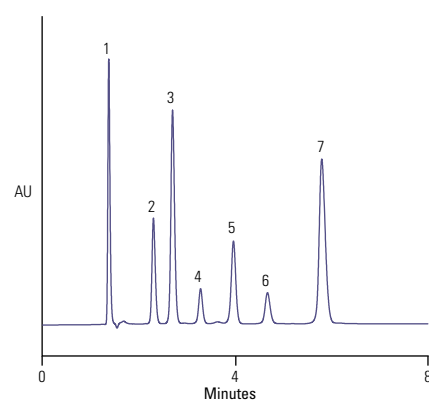
Designed for separating cationic molecules with adjustable selectivity control

- 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 CH₃CN/NH₄OAc, 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	-	11331963	-
		150	11361823	11351823	-
5	Guard Cartridge	10	085455	11351963	11301933
	HPLC Column	150	11351903	-	11341903
		250	-	-	11321903

Acclaim Guard Holder

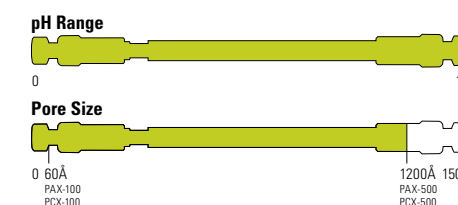
Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	11311733
Acclaim Guard Kit (Holder and Coupler) V-2	11321933
Guard to Analytical Column Coupler V-2	11332043

OmniPac

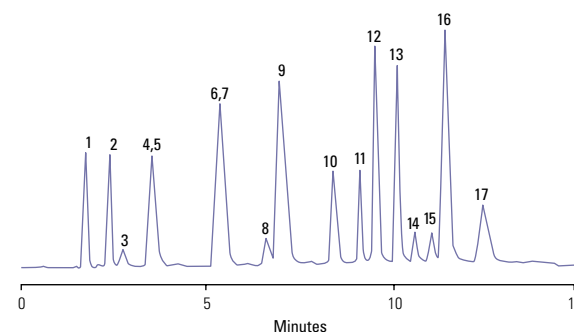
DVB polymer columns for combined ion exchange and reversed-phase separations

- 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	11391713
		250	11381713
PAX-500	Microporous	50	11311723
		250	11301723

OmniPac Cation Exchange

Description	Porosity	Length (mm)	4.0mm ID
PCX-100	Microporous	50	11341723
		250	11321723
PCX-500	Microporous	50	11351723
		250	11331723



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

Acclaim AmG C18

Designed to provide rugged and reproducible reversed-phase chromatography of aminoglycoside antibiotics.

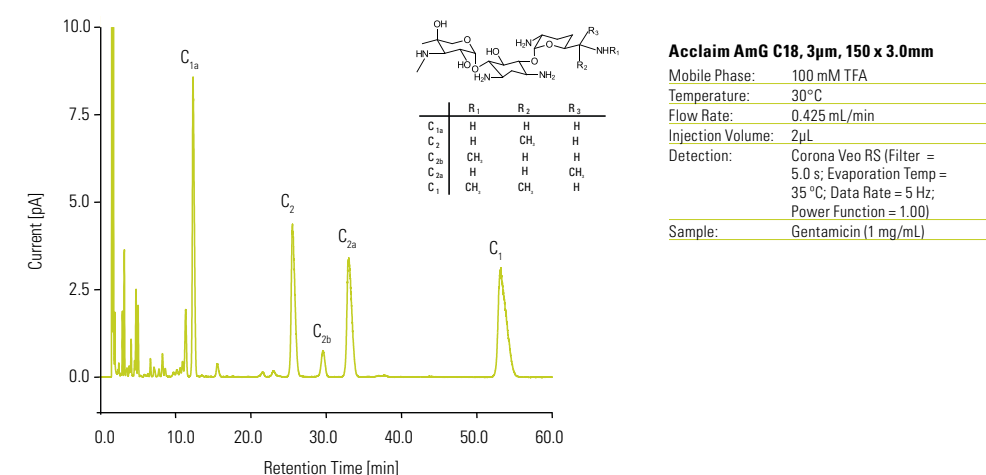
- Rugged and reproducible
- Excellent selectivity for the HPLC of aminoglycosides
- Superior resistance to acidic conditions for long column lifetime
- Easy to use with only aqueous mobile phase; TFA only, or TFA/HFBA or PFPA is needed
- Compatible with simple rugged methods; no solvents are required
- 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)

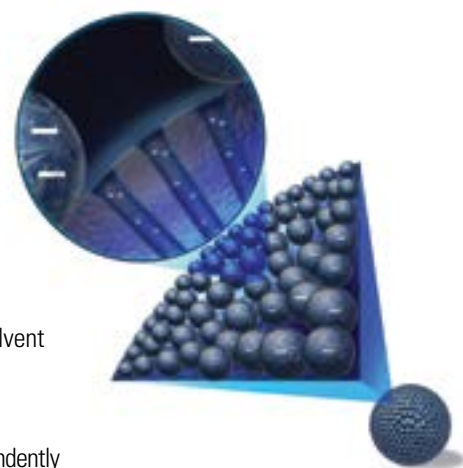
Acclaim AmG C18

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
3	Guard Cartridges (2/pk)	10	15592920	15512930	15532930
	HPLC Column	150	15582920	15502930	15522930
Guard Cartridge Holder			11311733	11311733	11311733

Acclaim Trinity P1

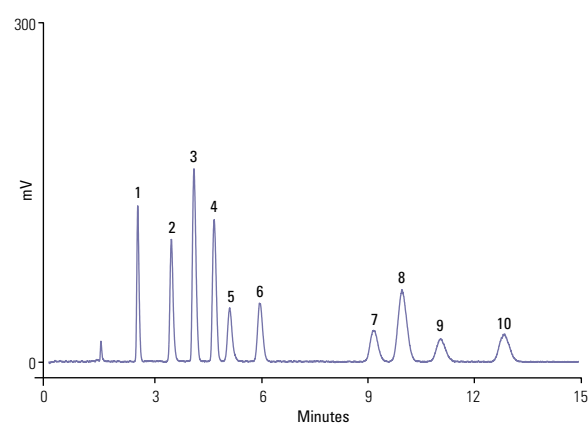
Mixed mode column technology combining reversed-phase, anion exchange and cation exchange functionality on a single support

- 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 CH₃CN/20mM (total) NH₄OAc, 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	11321953	11301953
		HPLC Column	11382073	11381943
	50	11391943	11371943	
	100	11372073	11362073	

Acclaim Guard Holder

Format	Cat. No.
Acclaim SST Guard Cartridge Holder V-2	11311733
Acclaim Guard Kit (Holder and coupler) V-2	11321933
Guard to Analytical Column Coupler V-2	11332043

Acclaim Trinity P2

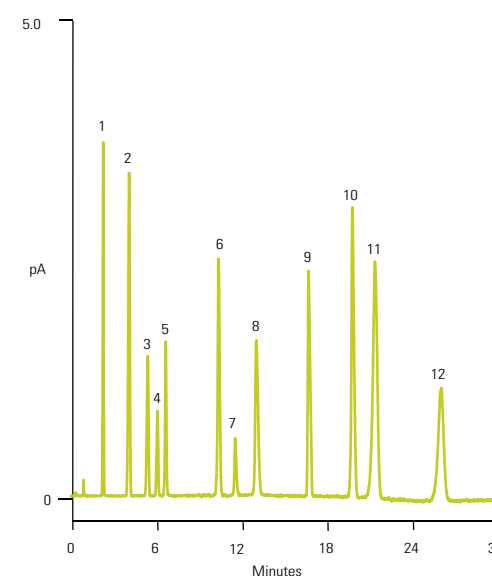
Mixed-mode column technology; hydrophilic interaction combining HILIC, anion exchange and cation exchange functionalities

- 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 NH₄OAc, 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 ₂ 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	15162909	15152909
		HPLC Column	15132909	15142909
	100	15112909	15122909	

Acclaim Guard Holder

Format	Cat. No.
Acclaim Guard Cartridge Holder V-2	11311733
Acclaim Guard Kit (Holder and coupler) V-2	11321933
Guard to Analytical Column Coupler V-2	11332043

Acclaim Organic Acid

Optimized and application-tested for the analysis of hydrophilic organic acids

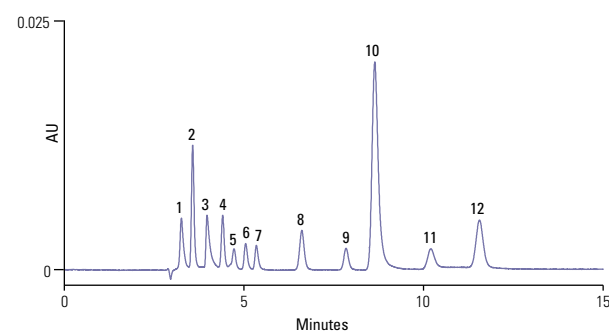
- Tested to guarantee consistent hydrophilic organic acid separations
- Compatible with 100% aqueous mobile phases
- Hydrolytic stability at low-pH conditions
- Ideal selectivity for separating a wide spectrum of organic acids
- Excellent column efficiency and peak shapes for organic acids



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 x 250mm

Mobile Phase: 100mM Na₂SO₄, pH 2.65
(adjusted with methanesulfonic acid)

Temperature: 30°C

Flow Rate: 0.6mL/min

Injection Volume: 5µL

Detection: UV, 210nm

Analytes:

1. Oxalic acid 15mg/L (ppm)
2. Tartaric acid 120
3. Formic acid 180
4. Malic acid 120
5. iso-Citric acid 120
6. Lactic acid 180
7. Acetic acid 120
8. Citric acid 120
9. Succinic acid 120
10. Fumaric acid 7
11. cis-Aconitic acid *
12. trans-Aconitic acid *

* 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	11331943	11321943	–
5	Guard Cartridges (2/pk)	10	–	11301983	11351923
	HPLC Column	150	–	–	11381803
		250	–	–	11371803

Acclaim Guard Holder

Format	Cat. No.
Acclaim SST Guard Cartridge Holder V-2	11311733
Acclaim Guard Kit (Holder and coupler) V-2	11321933
Guard to Analytical Column Coupler V-2	11332043

Acclaim Surfactant

Excellent performance for separating a broad range of surfactants

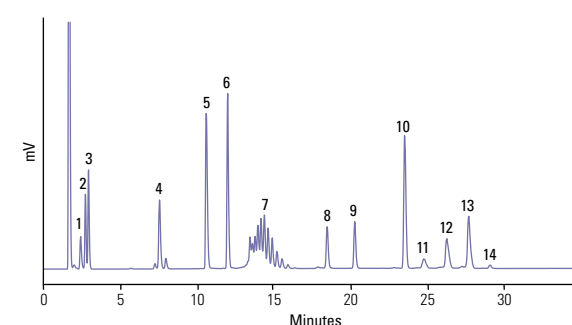
- Ideal selectivity for separation of anionic, nonionic, cationic and amphoteric surfactants
- Excellent peak shapes, especially for cationic surfactants
- Compatible with highly aqueous mobile phases
- Improved resolution for ethoxylated surfactants
- Rugged separations under a variety of conditions



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: CH₃CN

Mobile Phase B: 0.1 M NH₄OAc, 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. C₁₀-LAS
12. C₁₁-LAS
13. C₁₂-LAS
14. C₁₃-LAS

Acclaim Surfactant

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
3	HPLC Column	150	11311943	11301943	–
5	Guard Cartridges (2/pk)	10	11381913	11321983	11361923
	HPLC Column	150	11331903	–	11311823
		250	–	–	11321823

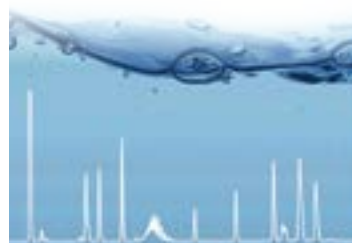
Acclaim Guard Holder

Description	Cat. No.
Acclaim SST Guard Cartridge Holder V-2	11311733
Acclaim Guard Kit (Holder and coupler) V-2	11321933
Guard to Analytical Column Coupler V-2	11332043

Acclaim Surfactant Plus

Column of choice for surfactant analysis using higher sensitivity detection: performance, versatility, throughput

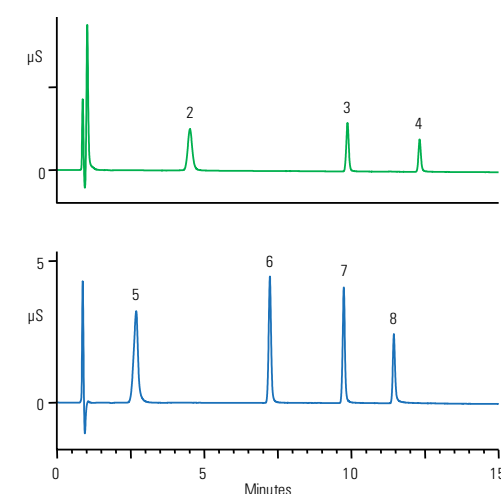
- Ideal selectivity for simultaneous separation of anionic, nonionic, cationic, and amphoteric surfactants
- Compatible with multiple detectors including MS, CAD, ELSD and UV
- Well suited for the determination of cationic surfactants
- High efficiency and fast analysis
- Rugged separations under a variety 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:																					
	<table border="1"> <tr> <th>Time (min)</th> <th>%A</th> <th>%B</th> <th>%C</th> </tr> <tr> <td>-12</td> <td>5</td> <td>5</td> <td>90</td> </tr> <tr> <td>0</td> <td>5</td> <td>5</td> <td>90</td> </tr> <tr> <td>12</td> <td>40</td> <td>5</td> <td>55</td> </tr> <tr> <td>20</td> <td>40</td> <td>5</td> <td>55</td> </tr> </table>	Time (min)	%A	%B	%C	-12	5	5	90	0	5	5	90	12	40	5	55	20	40	5	55
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	078955	078952	–	–	
		150	078954	078951	078950	–	
		250	078953	–	–	–	
5	Guard Cartridges (2/pk)	10	078960	078959	082773	–	
		HPLC Column	250	–	–	082767	–
		HPLC Column	150	–	–	082768	078956

Acclaim Guard Holder

Description	Cat. No.
Acclaim SST Guard Cartridge Holder V-2	11311733
Acclaim Guard Kit (Holder and coupler) V-2	11321933
Guard to Analytical Column Coupler V-2	11332043

Acclaim Explosives E2

The best solution for explosives analysis (EPA Method 8330)

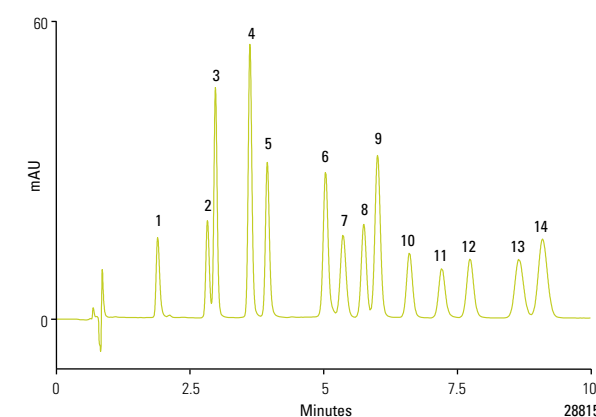
- Acclaim E2 columns provide baseline resolution of all 14 compounds targeted by EPA Method 8330
- Columns available in 2.2, 3 and 5µm particle size
- Simple isocratic elution conditions
- Rugged columns with good lot-to-lot reproducibility



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	076225	076227	–
		150	076226	–	–
3	HPLC Column	150	070083	070082	–
		250	–	070081	–
5	Guard Cartridges (2/pk)	10	–	071989	069703
		HPLC Column	250	–	–

See page 4-054 for Acclaim Guard Holder Ordering Guide

Acclaim Trinity Q1

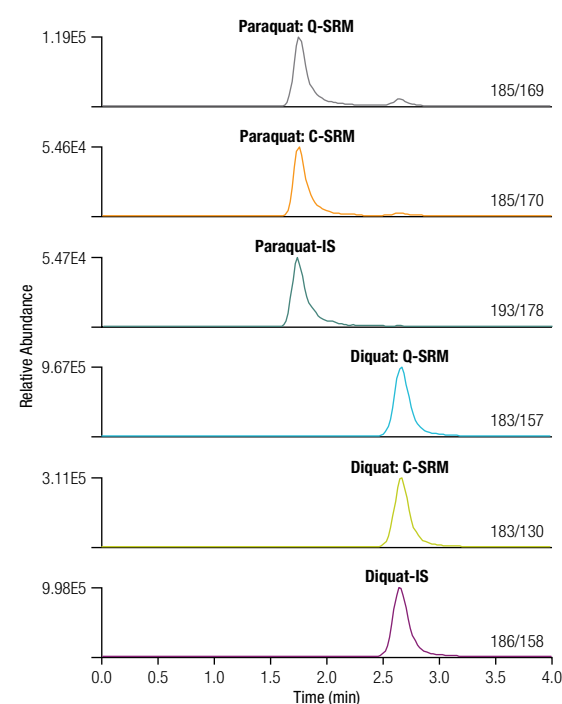
For trace analysis of diquat and paraquat

- 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 ₆	193	178(17)	
Diquat	183	157(22)	130(31)
Diquat-d ₃	186	158(22)	

Acclaim Trinity Q1

Particle Size	Length (mm)	2.1mm ID	3.0mm ID
3	HPLC Column 50	083242	083241
	100	079717	079715
5	Guard Cartridges (2/pk) 10	083244	079719

Acclaim Carbamate

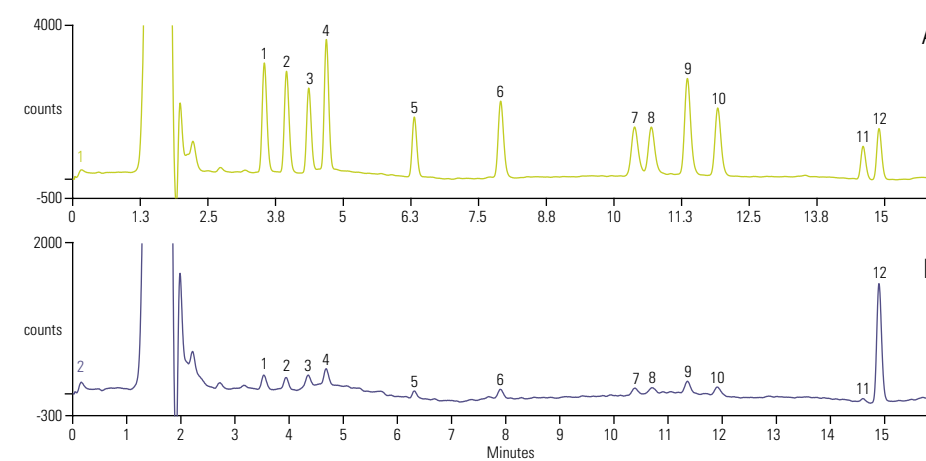
Designed for baseline separation of carbamate pesticides specified in US EPA Method 531.2

- 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-H₂O

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	075597	-	-
		150	075596	-	-
3	Guard Cartridges (2/pk)	10	072930	072929	072928
	HPLC Column	150	072927	072926	072925
5	HPLC Column	250	-	-	072924

Acclaim Guard Holder

Description	Cat. No.
Acclaim SST Guard Cartridge Holder V-2	11311733
Acclaim Guard Kit (Holder and coupler) V-2	11321933
Guard to Analytical Column Coupler V-2	11332043

Acclaim Carbonyl C18

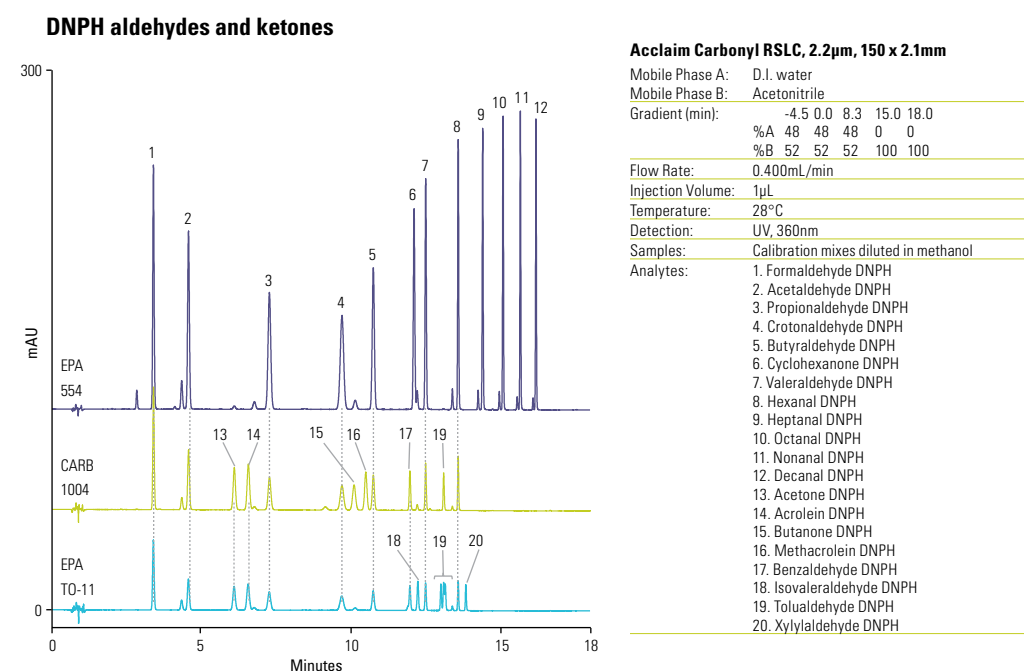
A silica-based, reversed-phase column designed specifically for separating DNPH derivatives of aldehydes and ketones

- 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.



Acclaim Carbonyl C18

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.2	RSLC Column	100	12366543	12366553	—
		150	12396543	—	—
3	HPLC Column	150	15257468	15247468	—
		250	—	15237468	—
5	Guard Cartridge (2/pk)	10	15123707	15267468	15277468
	HPLC Column	150	—	—	15227468
		250	—	—	15220339



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.

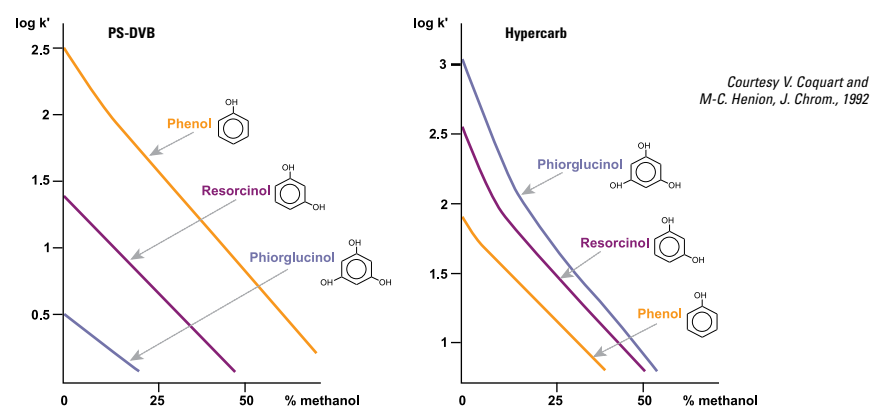
- **Exceptional Retention of Very Polar Analytes**
Ideal for complex separations
- **Separates Structurally Related Substances**
More effective than silica-based columns
- **pH Stable from 0 to 14**
Extended temperature and pressure capabilities



The Hypercarb web page contains the latest news, applications and downloads for the Hypercarb HPLC column range. Visit www.thermoscientific.com/hypercarb

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.

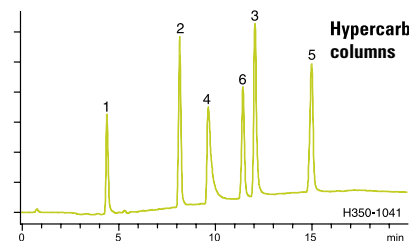
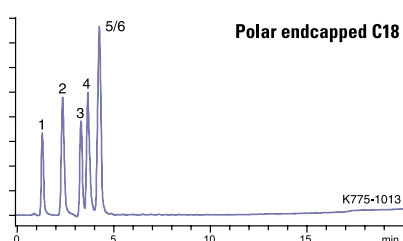


Retention on Hypercarb columns increases as polarity of the analyte increases, which is the opposite of typical reversed phase materials such as PS-DVB

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

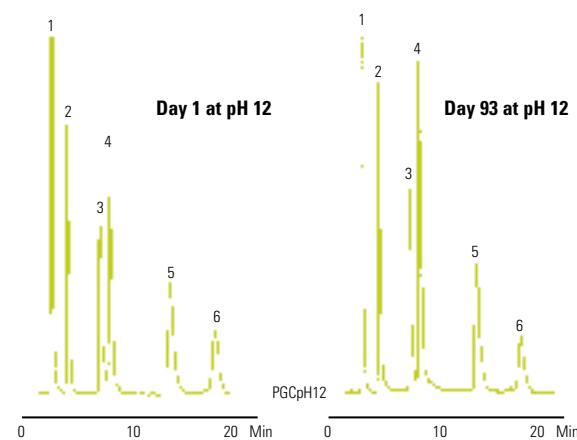
with typical silica-based columns. Hypercarb columns offer more choice in buffer selection while handling both high temperature and high pressure.



Hypercarb, 5µm, 100 x 0.32mm

Mobile Phase A:	H ₂ 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

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 4.6mm

Mobile Phase:	MeOH:H ₂ 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	11538300	
			3.0	11548300	
			4.6	11558300	
			1.0	10087874	
	HPLC Column	30	50	3.0	10057484
				2.1	10641514
				3.0	10437263
			100	4.6	10130593
				2.1	10384603
				3.0	10682854
		150	30	4.6	10223313
				2.1	10569925
				3.0	10518215
			50	4.6	10017394
				2.1	10704386
				2.1	10354873
	100	4.6	10131913		
		2.1	10191333		
		3.0	10333025		
	5	Drop-in Guard (4/pk)	10	4.6	10744624
2.1				11568300	
3.0				11578300	
4.6				11588300	
HPLC Column		30	50	2.1	10753406
				3.0	10640716
				4.6	10763406
			100	2.1	10738043
				3.0	10191163
				4.6	10631134
		150	30	2.1	10334273
				3.0	10745983
				4.6	10543985
			50	2.1	10084453
				3.0	10188904
				4.6	10548205
High Temperature HPLC Column		30	2.1	10753616	
			4.6	10429534	
			2.1	10293763	
		50	4.6	10203053	
	2.1		10121533		
	4.6		10089832		
Javelin HTS Column	20	2.1	11518720		
	Preparative HPLC Column	100	10	10270855	
			21.2	10169284	
	30	10271285			
150	10	10095984			
	21.2	35005-159270			

Format	Length (mm)	ID (mm)	Cat. No.
UNIGUARD Guard Cartridge Holder	10	1.0	10762567
		2.1	10776714
		3.0	10776714
		4.6	10602864



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

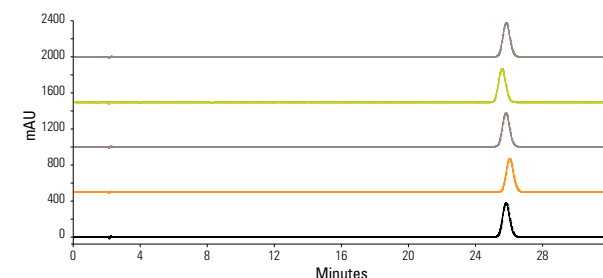
Synchronis C18

Synchronis C18 columns deliver remarkable separations, time after time

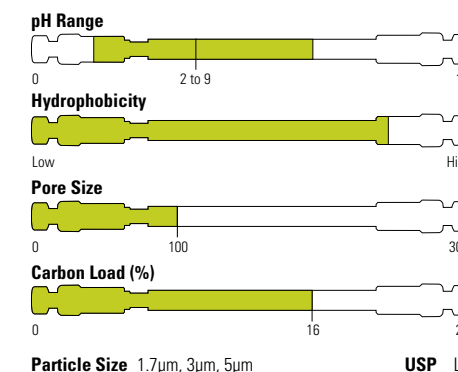
- Highly pure, high surface area silica
- High carbon load for increased retention
- Double endcapped for extra surface coverage
- Highly inert towards basic compounds
- Rigorously tested to ensure quality

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



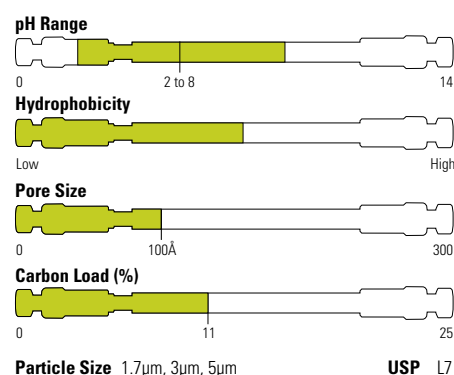
Synchronis C18

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
1.7	UHPLC Column	30	11859272	-	-
		50	11501184	-	-
		100	11521184	-	-
3	HPLC Column	30	13463949	-	-
		50	13459738	-	13479738
		100	13439738	13423959	13429738
		150	13449738	-	13419738
5	Drop-in Guard (4/pk)	10	11564555	11574555	11584555
	HPLC Column	30	11819282	-	-
		50	11859282	11869282	11889282
		100	11899282	11723037	11819292
		150	11829292	11839292	11859292
		250	11869292	11879292	11899292
UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864	

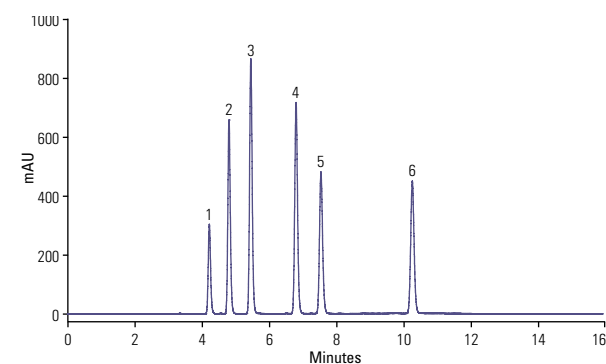
Synchronis C8

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

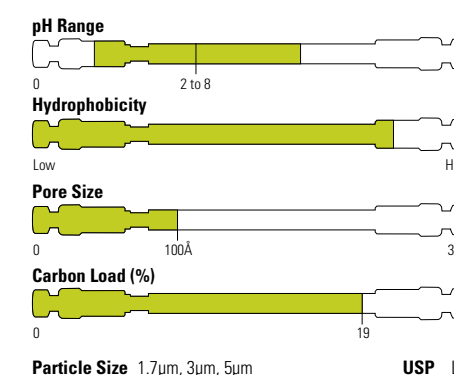
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
1.7	UHPLC Column	50	11591174	-	-
		100	11511184	-	-
3	HPLC Column	50	13463959	-	-
		100	-	13473959	13483959
		150	-	-	13493959
5	Drop-in Guard (4/pk)	10	11594575	11504585	11514585
		30	11859302	-	-
	HPLC Column	50	11899302	11809312	11829312
		100	11839312	11849312	11869312
		150	11879312	11889312	11809322
		250	-	11829322	11849322
UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864	

Synchronis aQ

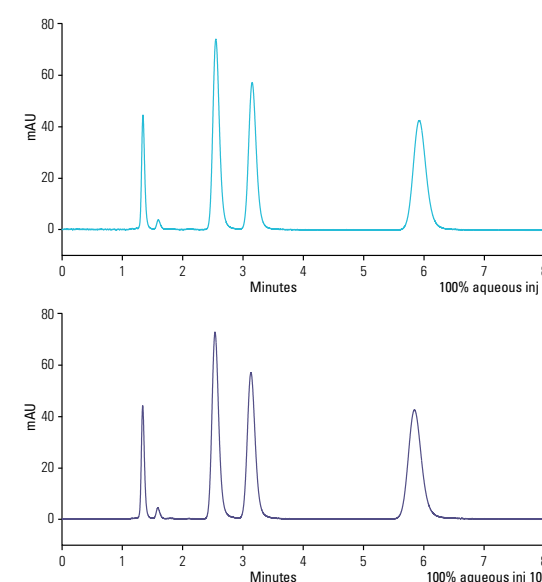
Polar endcapped Synchronis aQ columns provide a controlled interaction mechanism that retains and resolves polar analytes

- 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 K₂HPO₄ (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

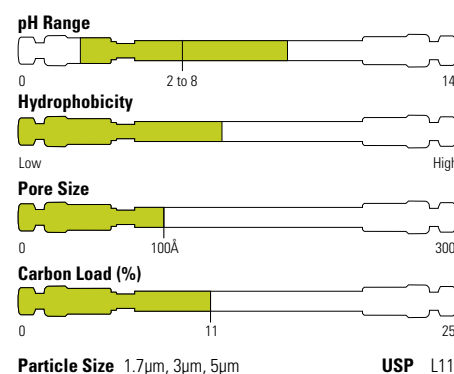
Synchronis aQ

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.7	UHPLC Column	50	12622745	-	-	11879322
		100	11889322	11899322	-	-
3	HPLC Column	50	13403969	-	-	-
		100	-	13413969	-	13423969
		150	-	-	-	13433969
5	Drop-in Guard (4/pk)	10	11524605	11534605	11544605	11544605
		50	11849332	11859332	-	11879332
	HPLC Column	100	11889332	-	-	11819342
		150	11829342	11839342	11849342	11859342
		250	-	11879342	11889342	11899342
		UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864

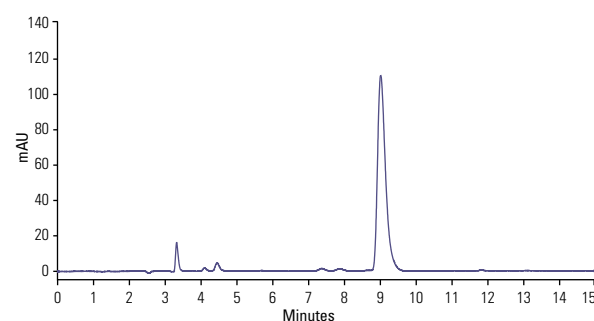
Synchronis Phenyl

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)

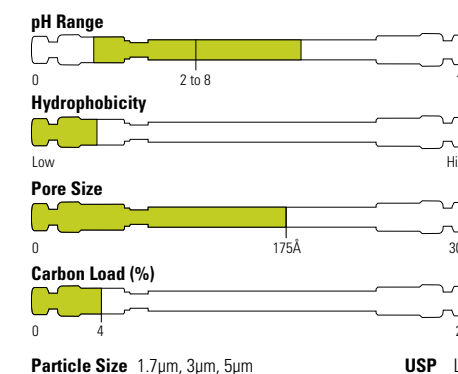
Synchronis Phenyl

Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
1.7	UHPLC Column	50	11879392	-	-
		100	11809402	-	-
3	HPLC Column	50	13413979	-	-
		100	-	-	13423979
		150	-	-	13433979
5	Drop-in Guard (4/pk)	10	11514675	11524675	11534675
	HPLC Column	50	-	11879402	11899402
		100	-	11819412	11839412
		150	11849412	-	11879412
		250	-	-	11819422
		UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714

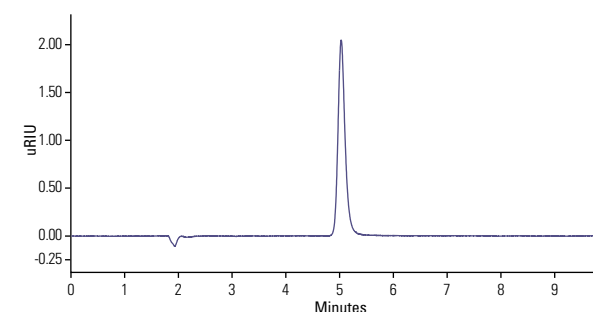
Synchronis Amino

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

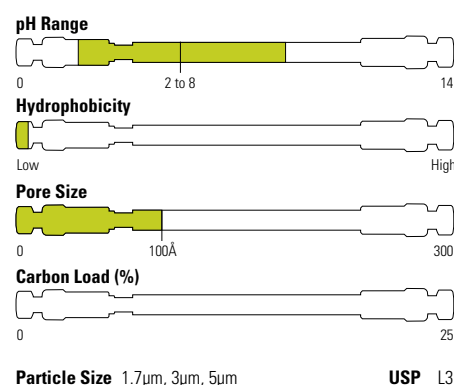
Synchronis Amino

Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.7	UHPLC Column	50	11819372	-	-	-
		100	11849372	-	-	-
3	HPLC Column	50	13483969	-	-	-
5	Drop-in Guard (4/pk)	10	11584645	11594645	11504655	11504655
		HPLC Column	30	11869372	-	-
	HPLC Column	50	11809382	-	-	11839382
		150	11889382	11899382	11809392	11819392
		250	-	11839392	11849392	11859392
UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864	10602864	

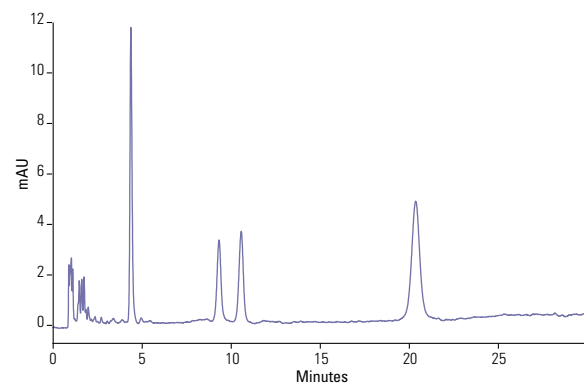
Synchronis Silica

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 5µm, 150 x 4.6mm
 Mobile Phase: Hexane +0.2% propan-2-ol (IPA)
 Temperature: 40°C
 Flow Rate: 2.0mL/min
 Injection Volume: 10µL
 Detection: UV, 254nm
 Analytes: α-tocopherol
 β-tocopherol
 γ-tocopherol
 δ-tocopherol

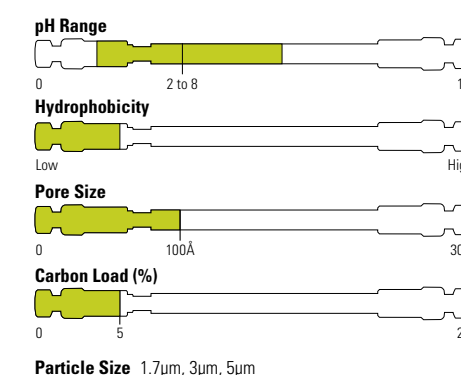
Synchronis Silica

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.0mm ID	4.6mm ID
1.7	UHPLC Column	50	11809252	-	-	-
		100	11839252	-	-	-
3	HPLC Column	50	13433949	-	-	-
		100	-	-	-	-
5	Drop-in Guard (4/pk)	10	11537991	11547991	11557991	11557991
		50	11899252	-	-	-
	HPLC Column	100	11839262	-	-	-
		150	11879262	11889262	11899262	11809272
		250	-	11829272	11839272	11849272
UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864	10602864	

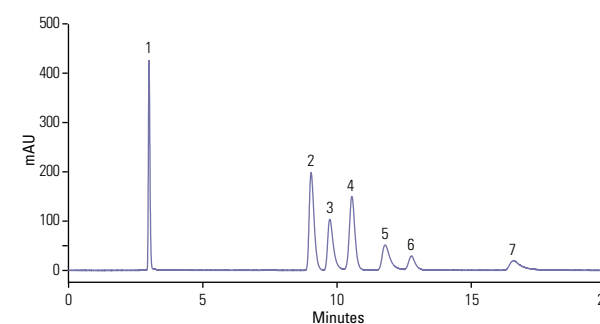
Synchronis HILIC

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



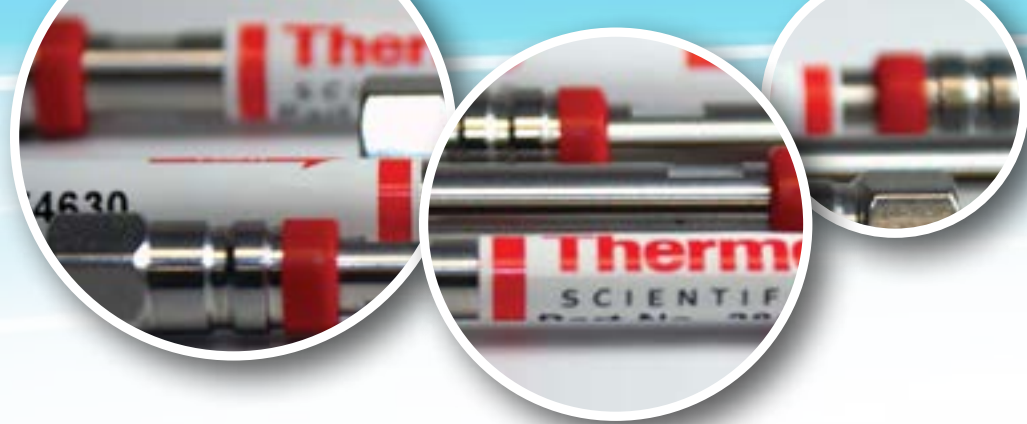
Catecholamines



Synchronis HILIC, 5µm, 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: 5µL
 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	12345683	-	12315693
		100	12375683	-	-
3	HPLC Column	50	13443969	-	-
		100	-	-	13453969
		150	-	-	13473969
5	Drop-in Guard (4/pk)	10	11554625	11564625	11574625
		50	11849352	-	11879352
	HPLC Column	100	11889352	-	11819362
		150	11829362	11839362	11859362
		250	-	-	11899362
UNIGUARD Drop-in Guard Cartridge Holder	10	10776714	10776714	10602864	



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

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	11919098	11919108	-	-		
			4.0/4.6	11969098	11969108	-	-		
		50	2.1	10621416	10343105	-	-		
			4.6	10279864	-	-	-		
		100	2.1	10066694	10239914	-	-		
			4.6	10075964	10137604	-	-		
	150	4.6	-	10584285	-	-			
	3	Drop-in Guard (4/pk)	10	2.1	10455733	10610764	-	-	
				3.0	10734414	10747883	-	-	
				4.0/4.6	10424983	10512065	28903-014001	10464403	
			HPLC Column	30	2.1	10511695	-	-	-
					50	2.1	10495163	10600364	-
3.0					10478754	-	-	-	
100		2.1		10243703	-	-	-		
		3.0		10666604	-	-	-		
		4.0		10723657	-	-	-		
150		4.6	10374183	10533215	-	-			
		2.1	10099332	-	-	-			
		3.0	10558025	10332675	-	-			
		4.0	10027314	-	-	-			
		4.6	10203183	10099132	10511885	10098992			
		5	Drop-in Guard (4/pk)	10	2.1	10601144	10100883	-	-
3.0					10764047	10662854	-	-	
4.0/4.6					10100943	10354653	10101083	10464973	
HPLC Column				50	2.1	10662674	10672854	-	-
					3.0	10670136	10448184	-	-
					4.6	10079192	10394173	-	-
			100	2.1	10203423	10582255	-	-	
				3.0	10488004	-	-	-	
				4.0	10610156	-	-	-	
125			4.6	10110513	10354223	-	-		
	3.0		10389543	-	-	-			
	4.0		10097544	-	-	-			
	4.6		10217423	-	-	-			
	150		2.1	10484983	-	-	-		
			3.0	10616185	-	-	-		
4.0			10403475	10763016	-	-			
250	4.6		10283703	10786153	10384183	10494593			
	2.1		10503425	-	-	-			
	3.0		10494435	-	-	-			
	4.0		10468054	10476664	10261095	-			
	4.6		10344413	10364653	10263233	10304043			

Format	Length (mm)	ID (mm)	Cat. No.
UNIGUARD Guard Cartridge Holder	10	1.0	10762567
		2.1	10776714
		3.0	10776714
		4.0/4.6	10602864

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	10551105		
			3.0	10016024		
			4.0/4.6	10581295		
			4.6	10610944		
	HPLC Column	50	50	3.0	10477824	
				4.6	10610944	
				2.1	10582445	
				3.0	10126383	
		100	100	100	4.0	10767655
					4.6	10611134
					4.0	10668334
					4.6	10418613
5	Drop-in Guard (4/pk)	10	2.1	10543795		
			3.0	10650246		
			4.0/4.6	10414593		
			4.6	10723995		
	HPLC Column	50	50	3.0	10678825	
				4.6	10728063	
				2.1	10434593	
				3.0	10159014	
		100	100	100	4.0	10381795
					4.6	10243313
					3.0	10689965
					4.0	10572275
125	125	125	4.6	10783805		
			2.1	10263553		
			3.0	10763616		
			4.0	10429344		
150	150	150	4.6	10019192		
			2.1	10527494		
			4.0	10498944		
			4.6	10456854		
200	200	200	2.1	10140693		
			3.0	10097384		
			4.0	10640584		
			4.6	10099282		

Hypersil ODS-2

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
3	Drop-in Guard (4/pk)	10	4.0/4.6	10640056
		50	4.6	10097354
	HPLC Column	100	4.0	10007514
		150	4.6	10677893
5	Drop-in Guard (4/pk)	10	4.0/4.6	10361155
		50	4.6	10211155
	HPLC Column	100	4.6	10130793
		150	4.6	10745374
		250	4.0	10678913
		250	4.6	10552075

Hypersil MOS (C8)

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
5	Drop-in Guard (4/pk)	10	4.0/4.6	10374373
		50	4.6	10322545
	HPLC Column	100	4.6	10048952
		150	4.6	10120793
		250	4.0	10552855
			4.6	10353993

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	10562075
		150	4.6	10776334
	HPLC Column	250	4.0	10733026
				4.6

Hypersil SAS (C1)

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
5	Drop-in Guard (4/pk)	10	4.0/4.6	10371445
		150	4.6	10523425
	HPLC Column	250	4.6	10344223

Hypersil Phenyl

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
5	Drop-in Guard (4/pk)	10	4.0/4.6	10233603
		50	4.6	10599755
	HPLC Column	150	4.6	10243603
		250	4.0	10687745
				4.6

Hypersil Phenyl-2

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
5	Drop-in Guard (4/pk)	10	4.0/4.6	10359333
		150	4.6	10611144
	HPLC Column	250	4.6	10151033

Hypersil CPS

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
3	Drop-in Guard (4/pk)	10	4.0/4.6	10299414
	HPLC Column	150	4.6	10088942
5	Drop-in Guard (4/pk)	10	4.0/4.6	10120643
		150	4.6	10069232
	HPLC Column	250	4.0	10027694
				4.6

Hypersil CPS-2

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
5	Drop-in Guard (4/pk)	10	4.6	10669095
		HPLC Column	150	4.6
		250	4.6	10243753

Hypersil APS-2

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.	
3	Drop-in Guard (4/pk)	10	2.1	10774047	
			4.6	10269314	
	HPLC Column	50	4.6	10553045	
			100	2.1	10007174
			150	2.1	10495913
			4.6	10405923	
5	Drop-in Guard (4/pk)	10	3.0	10107894	
			4.0/4.6	10631514	
	HPLC Column	100	3.0	11563041	
			4.6	10039642	
			150	4.6	10414393
			250	4.0	10385443
		4.6	10755973		

Hypersil Silica

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.	
3	Drop-in Guard (4/pk)	10	2.1	10180843	
			3.0	10544665	
			4.0/4.6	10098762	
	HPLC Column	50	2.1	10354523	
			4.6	10334223	
			150	4.6	10273593
5	Drop-in Guard (4/pk)	10	3.0	10350865	
			4.0/4.6	10416883	
	HPLC Column	50	4.6	10417073	
			100	4.6	10762836
			150	4.6	10213313
			250	4.0	10713026
		4.6	10725973		

Hypersil Classical *continued*

Hypersil SAX

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
5	Drop-in Guard (4/pk)	10	3.0	10649675
			4.6	10522065
	HPLC Column	250	3.0	10458384
			4.6	10776893

Hypersil Green PAH

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
3	Guard Cartridge	10	2.1	10279084
			3.0	10620456
			4.6	10504135
	HPLC Column	100	2.1	10017884
			3.0	10179004
			4.6	10129574
HPLC Column	150	2.1	10271095	
		4.6	10230765	
		5	Guard Cartridge	10
HPLC Column	100			
			150	4.6
		250	4.6	10342975

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.

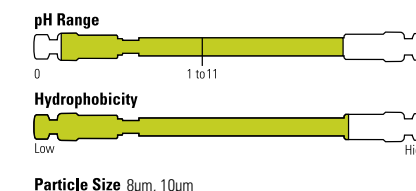
IonPac NS1 and NS2

Description	Particle Size (µm)	Format	Length (mm)	2.0mm ID	4.0mm ID
IonPac NS1	5	HPLC Column	150	—	11391703
	10	Guard Column	35	088763	11381703
		HPLC Column	250	088762	11391693
IonPac NS2	5	Guard Column	35	—	088788
		HPLC Column	150	—	088787
			250	—	088786

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	11517531
		Guard Column	50	7.7	11507531
		HPLC Column	300	7.7	10649453
HyperREZ XP Carbohydrate Ca ²⁺	8	Guard Cartridge (2/pk)	5	3.0	11567531
		Guard Column	50	7.7	11547531
		HPLC Column	300	7.7	11557531
HyperREZ XP Carbohydrate Pb ²⁺	8	Guard Cartridge (2/pk)	5	3.0	11537531
		Guard Column	50	7.7	11527531
		HPLC Column	300	7.7	10679855
HyperREZ XP Carbohydrate Na+	10	Guard Cartridge (2/pk)	5	3.0	11597531
		Guard Column	50	7.7	11577531
		HPLC Column	300	7.7	11587531
HyperREZ XP Organic Acids	8	Guard Cartridge (2/pk)	5	3.0	11517531
		HPLC Column	100	7.7	11507541
HyperREZ XP Sugar Alcohols	8	Guard Cartridge (2/pk)	5	3.0	11567531
		HPLC Column	250	4.0	69708-254080

Format	Length (mm)	ID (mm)	Cat. No.
HyperRez Guard Cartridge Holder	5	3	11517521

Retention Times of Common Saccharides (min)

Saccharide	H ⁺	Ca ²⁺	Pb ²⁺
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 Ca²⁺ 300 x 7.7mm
HyperREZ Carbohydrate Pb²⁺ 300 x 7.7mm
 Mobile Phase: H₂O
 Flow Rate: 0.6mL/min
 Detection: RI
 Temperature: 75°C (H⁺)
 85°C (Ca²⁺)
 80°C (Pb²⁺)
 Note: partial hydrolysis may occur with some saccharides using H⁺.

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

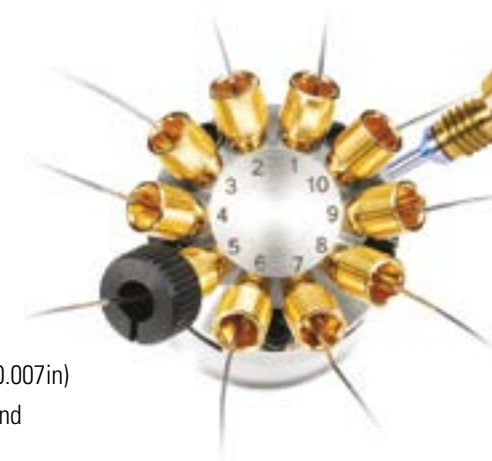


Learn more about LC Accessories.
 Visit www.thermoscientific.com/columns

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	15209268	11342453	11342463
150	15219268	11362453	11352463
250	15394625	11382453	11302473
350	13463208	11302463	11382463
450	15239268	11312463	11362463
550	13473208	11332453	11332463
650	13483208	11352453	11322473
750	-	11372453	11372463
850	-	11392453	11392463
950	-	11322463	11312473

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	-	6041.9075*	15219278	-	-	-
150	6041.5615	-	15239278	-	6041.5616	15229278
250	13463308	15209278	15249278	-	-	15219108
350	-	-	15248988	-	-	15229108
450	-	-	15259278	-	-	15239108
550	-	-	15279278	-	-	15269278
650	13473308	-	15249108	6042.2363	-	15259108
750	13483308	-	6042.2390	6042.2373	-	15289278
850	13493308	-	-	-	-	-
950	-	-	6042.2395	-	-	15299278

* 75mm length

Viper Accessories

Description	Cat. No.	Quantity
Plug, Biocompatible	13413218	1 Each
Union, SST	13423218	1 Each
Calibration Tool	13433218	1 Each
Inline Filter	6036.1045	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	11322453	11312453
Viper Capillary Kit for HPG pumps	15259268	15249268
Viper Capillary Kit for biocompatible RSLC systems	-	15217178
Online SPE Solution Kit for x2 Dual Standard or RSLC systems	11342473	11332473
Tandem Operation Solution Kit for x2 Dual Standard or RSLC systems	11362473	11352473
Application Switching Solution Kit for x2 Dual Standard or RSLC systems	11382473	11372473
Parallel Setup Solution Kit for x2 Dual Standard or RSLC systems	11322483	11312483
Inverse Gradient Kit for x2 Dual Standard or RSLC systems	13493218	13403228
Automated Method Scouting Solution Kit for Standard or RSLC systems	11302483	11392473
MS Connection Kit for MS-frontends with WPS autosampler, excluding UV detection	15299288	15219298
MS Connection Kit for MS-frontends with WPS autosampler, including UV detection	15209298	15299248
MS Connection Kit for MS-frontends with HPG-RS pump and OAS autosampler excluding UV detection	-	6720.0372
MS Connection Kit for MS-frontends with HPG-RS pump and OAS autosampler including UV detection	-	6720.0377

Description	XRS Systems
Viper Capillary Kit for standalone system with with WPS autosampler	13433378
Viper Capillary Kit for standalone system with with OAS autosampler	6845.2301A
MS Connection Kit for MS-frontends with WPS autosampler excluding UV detection	15229298
MS Connection Kit for MS-frontends with WPS autosampler including UV detection	15239298
MS Connection Kit for MS-frontends with LPG-XRS pump and OAS autosampler excluding UV detection	6720.0372
MS Connection Kit for MS-frontends with LPG-XRS pump and OAS autosampler including UV detection	6720.0377

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	11548680	11568680	11558680	4 Pack



ColumnSaver Precolumn Filters

Filter mesh size 2µm

ColumnSaver Precolumn Filters

Filter Mesh Size (µm)	Cat. No	Quantity
2	10544855	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	11538680	10743452	1 Each
Replacement Filter, 0.5µm	11508680	11528680	5 Pack
Replacement Tip, CPI, Standard	10468444	10468444	1 Each
Replacement Tip, Waters End-fitting	10610781	10610781	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	10775706	1 Each
2.1mm ID Replacement Filter Cartridge, 0.2µm	10127594	5 Pack
1.0mm ID Replacement Filter Cartridge, 0.2µm	11550944	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	10563605	1 Each



Solvent Filters

- Efficient draw
- 100% PTFE polymer, including 2µm filters
- Built-in helium sparge port and frit

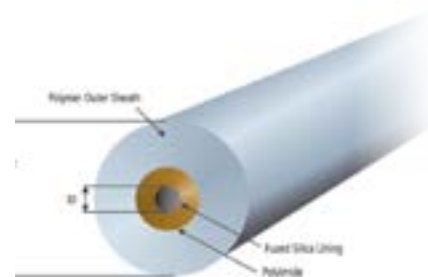
Solvent Filters

	Type	For Use with	Cat. No.	Quantity
	Stainless Steel	Fit 1/16in OD tube to 1/8in OD plastic tubing	10334573	1 Each
	Stainless Steel	Fit to 1/8in OD plastic tubing using 1/8in PP nut	10249464	1 Each
	Bottom-of-the-Bottle	3/16in OD plastic tubing	10651026	1 Each
	Bottom-of-the-Bottle	1/8in OD tubing	10371065	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	11503920	5 Pack
	20	10733697	5 Pack
	50	11523920	2 Pack
0.004	10	10699485	5 Pack
	20	10535475	5 Pack
	50	11533920	2 Pack
0.007	10	10690426	5 Pack
	20	10016654	5 Pack
	50	11553920	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	10372035	1 Each
0.010	Blue	10656824	1 Each
0.012	Natural	10220585	1 Each
0.015	Orange	10771654	1 Each
0.021	Natural	10611416	1 Each
0.030	Natural	10147574	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	
1/16in OD Precut Tubing					
0.005	5	Red	10531885	1 Each	
	10	Red	10253703	1 Each	
	20	Red	10756524	1 Each	
	30	Red	10150553	1 Each	
	50	Red	10446113	1 Each	
0.007	100	Red	10784604	1 Each	
	5	Black	10752337	1 Each	
	10	Black	10370965	1 Each	
	20	Black	10752527	1 Each	
	30	Black	10357214	1 Each	
0.010	50	Black	10289464	1 Each	
	100	Black	10025734	1 Each	
	5	Blue	10764994	1 Each	
	10	Blue	10582265	1 Each	
	20	Blue	10160603	1 Each	
0.010	30	Blue	10592265	1 Each	
	50	Blue	10521885	1 Each	
	100	Blue	10735374	1 Each	
	1/32in OD Precut Tubing with 1/16in Sleeves				
	0.005	10.5	Red	10630626	1 Each
15		Red	10308343	1 Each	
28		Red	10515045	1 Each	
40		Red	10368383	1 Each	
0.007	10.5	Yellow	10762517	1 Each	
	15	Yellow	10679665	1 Each	
	28	Yellow	10505425	1 Each	
	40	Yellow	10641396	1 Each	

1/16in 316 Stainless Steel Tubing, 5-Foot Coil

ID (in)	Cat. No.	Quantity
0.005	10712424	1 Each
0.007	10446754	1 Each
0.010	10488294	1 Each
0.020	10147714	1 Each
0.030	10107764	1 Each
0.040	10649865	1 Each

Terry Tool Tubing Cutters

Description	Cat. No.	Quantity
1/16in stainless steel tubing	10403685	1 Each
1/8in stainless steel tubing	10260765	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	10006604	1 Each
	10	Natural	10259914	1 Each
	20	Natural	10302185	1 Each
	30	Natural	10794267	1 Each
	50	Natural	10678515	1 Each
0.005	5	Red	10573225	1 Each
	10	Red	10552265	1 Each
	20	Red	10609993	1 Each
	30	Red	10069382	1 Each
	50	Red	10766524	1 Each
0.007	5	Yellow	10197374	1 Each
	10	Yellow	10688515	1 Each
	20	Yellow	10381485	1 Each
	30	Yellow	10594665	1 Each
	50	Yellow	10439244	1 Each
0.010	5	Blue	310008952-5	1 Each
	10	Blue	310008952-10	1 Each
	20	Blue	310008952-20	1 Each
	30	Blue	310008952-30	1 Each
	50	Blue	310008952-50	1 Each
0.020	5	Orange	310455163-5	1 Each
	10	Orange	310455163-10	1 Each
	20	Orange	310455163-20	1 Each
	30	Orange	310455163-30	1 Each
	50	Orange	310455163-50	1 Each

1/16in OD PEEK Tubing, 5-Foot Coil

ID (in)	Cat. No.	Quantity
0.003	10428114	1 Each
0.005	10421385	1 Each
0.007	11577691	1 Each
0.010	310008952	1 Each
0.020	310455163	1 Each
0.030	10197364	1 Each
0.040	10260535	1 Each

Polymer Tubing Cutter

Description	Cat. No.	Quantity
Polymeric Tubing Cutter	10344573	1 Each
Replacement blades	10759295	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	10639865	1 Each	Replacement PEEK Ferrules	F-192x	10 Pack
 Male hex nut	U-400x	10 Pack	Universal Ferrules, 0.625in	U-401x	10 Pack
 Valco male hex nut, 10-32 thread	U-320x	10 Pack	Valco ferrules, 0.625in	U-321x	10 Pack
 Male hex nut, Waters compatible	U-410x	10 Pack	Universal Ferrules, 0.625in	U-401x	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	10231575	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	F-120x	10 Pack
 One-Piece Long Fingertight Fitting, 1/16in, 0.37in head	F-130x	10 Pack
 One-Piece PEEK Fingertight Fitting, 1/32in, 0.25in head	15300078	1 Each
 Two-Piece Fingertight Wing Nut with Ferrule, 1/16in	F-300x	10 Pack
 Replacement PEEK Ferrules	F-142x	10 Pack
 Column End Plug, 1/16in, 10-32 coned, Delrin, Red	15319849	1 Each
 Column End Plug, 1/16in, 10-32 coned, Delrin, Black	15461073	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	10097214	1 Each
 Union, stainless steel, Upchurch Scientific/Parker fittings compatible, includes 2 stainless steel nuts and ferrules	0.020	0.134	10669365	1 Each
 Union, stainless steel, Upchurch Scientific/Parker fittings compatible, includes 2 stainless steel nuts and ferrules	0.050	0.836	10007224	1 Each
 Union, stainless steel, Upchurch Scientific/Parker fittings compatible, includes 2 stainless steel nuts and ferrules	0.062	~0.0	10189004	1 Each
 Union, stainless steel, Waters fittings compatible, includes 2 stainless steel nuts and ferrules	0.020	0.129	10046364	1 Each
 Union, stainless steel, Valco fittings compatible, includes 2 stainless steel nuts and ferrules	0.020	0.103	10107384	1 Each
 Tee, stainless steel, 10-32 fittings for use with 1/16in OD tubing	0.020	0.57	10715146	1 Each
 Cross, stainless steel, 10-32 fittings for use with 1/16in OD tubing	0.020	0.72	10302985	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	10716163	1 Each
 Union, PEEK polymer, includes two PEEK 2-piece fittings	0.020	0.28	10422155	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	10392975	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	10149534	1 Each

Rheodyne 10171033 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 1µL to 5mL with high accuracy and precision
- 7725i features a position sensing switch for a reproducible start signal

Rheodyne 10171033 and 7725i Sample Injectors

Model	Mode	Features	Cat. No.	Quantity
10171033	Dual	Continuous flow	10171033	1 Each
7725i	Dual	Continuous flow, position sensing switch	7725i	1 Each

Stainless Steel Sample Loops

Description	Volume	ID (mm / in)	Cat. No.	Quantity
Sample loops for 10171033 and 7725i injectors	5µL	0.18 / 0.007	10794794	1 Each
	10µL	0.30 / 0.012	10766714	1 Each
	20µL	0.30 / 0.012	10466113	1 Each
	50µL	0.51 / 0.020	10620184	1 Each

RheBuild Kits

For Use with Rheodyne Models	Cat. No.	Quantity
10171033/7725i	7725-999	1 Each

Rheodyne Stators

For Use with Rheodyne Models	Cat. No.	Quantity
10171033	7725-010	1 Each

Rheodyne 10762327 and 10762327i 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
- 10762327i features a position sensing switch for a reproducible start signal

Rheodyne 10762327 and 10762327i Sample Injectors

Model	Mode	Features	Cat. No.	Quantity
10762327	Dual	Continuous flow	10762327	1 Each
10762327i	Dual	Continuous flow, position sensing switch	9725i	1 Each

PEEK Sample Loops

Description	Volume	ID (mm / in)	Cat. No.	Quantity
Sample loops for 10762327 and 10762327i injectors	2µL	Internal	10344473	1 Each
	5µL	0.18 / 0.007	10269364	1 Each
	10µL	0.25 / 0.010	10219324	1 Each
	20µL	0.25 / 0.010	10555615	1 Each
	50µL	0.51 / 0.020	10311255	1 Each
	100µL	0.51 / 0.020	10229414	1 Each
	200µL	0.51 / 0.020	10651396	1 Each
	500µL	0.76 / 0.030	10774057	1 Each
	1mL	0.76 / 0.030	10321255	1 Each
5mL	0.76 / 0.030	10600636	1 Each	

Rheodyne Suction Needle Adapter

For Use with	Cat. No.	Quantity
Rheodyne Injector Models 10762327 and 10762327i	10589185	1 Each

Rheodyne 10505235 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 10505235 Low-Dispersion Microscale Injector

Model	Mode	Features	Cat. No.	Quantity
10505235	Dual	Continuous flow	10505235	1 Each

Stainless Steel Sample Loops

Description	Volume	ID (mm / in)	Cat. No.	Quantity
Sample loops for 10505235 injectors	5µL	0.20 / 0.008	10408104	1 Each
	10µL	0.20 / 0.008	10678715	1 Each
	20µL	0.25 / 0.010	10575625	1 Each
	50µL	0.30 / 0.012	10147854	1 Each

RheBuild Kits

For Use with Rheodyne Models	Cat. No.	Quantity
10505235	10754956	1 Each

Rheodyne Replacement Rotor Seals for Injectors

For Use with Rheodyne Models	Cat. No.	Quantity
Vespel Seals		
10505235/8126	10427534	1 Each
Tefzel Seals		
10505235	10510126	1 Each

Rheodyne Stators

For Use with Rheodyne Models	Cat. No.	Quantity
10505235/8126	10713406	1 Each

Rheodyne Stator Face Assemblies

For Use with Rheodyne Models	Cat. No.	Quantity
10505235	10342695	1 Each

Rheodyne 10008952 Sample Injector

Single-mode sample injector designed for the complete filling method



Rheodyne 10008952 Sample Injector

Model	Mode	Features	Cat. No.	Quantity
10008952	Single	Complete filling method	10008952	1 Each

Rheodyne Ports for Rheodyne Injectors

For Use with Rheodyne Model	Cat. No.	Quantity
10008952 Filler Port, Stainless Steel	10773026	1 Each

Stainless Steel Sample Loops

Description	Volume	ID (mm / in)	Cat. No.	Quantity
Sample loops for 10008952 and 7125 injectors	5µL	0.18 / 0.007	10455163	1 Each
	10µL	0.30 / 0.012	10621334	1 Each
	20µL	0.30 / 0.012	10591305	1 Each
	50µL	0.51 / 0.020	10582075	1 Each
	100µL	0.51 / 0.020	10100563	1 Each
	200µL	0.76 / 0.030	10776524	1 Each
	500µL	0.76 / 0.030	10682864	1 Each
	1mL	0.76 / 0.030	10543615	1 Each
	5mL	1.0 / 0.040	10465173	1 Each

RheBuild Kits

For Use with Rheodyne Models	Cat. No.	Quantity
10008952/7000	10512645	1 Each

Rheodyne Replacement Rotor Seals for Injectors

For Use with Rheodyne Models	Cat. No.	Quantity
Vespel Seals		
10008952	10161263	1 Each
Tefzel Seals		
10008952	10445163	1 Each

Compatible with:

Sample loop sizes 5µL to 20mL

Rheodyne 10594855 Sample Injector

Single-mode sample injector designed for the complete filling method

- Compatible with sample loop sizes 5µL to 10mL
- PEEK stator
- Position sensing switch provides a reproducible start signal

Rheodyne 10594855 Sample Injector

Model	Mode	Features	Cat. No.	Quantity
10594855	Single	Continuous flow, position sensing switch	10594855	1 Each

Rheodyne Ports for Rheodyne Injectors

For Use with Rheodyne Model	Cat. No.	Quantity
10594855 Filler Port, PEEK	10303075	1 Each
10594855 Needle Port, PEEK	10678445	1 Each

PEEK Sample Loops

Description	Volume	ID (mm / in)	Cat. No.	Quantity
Sample loops for 10594855 injectors	2µL	Internal	10344473	1 Each
	5µL	0.18 / 0.007	10269364	1 Each
	10µL	0.25 / 0.010	10219324	1 Each
	20µL	0.25 / 0.010	10555615	1 Each
	50µL	0.51 / 0.020	10311255	1 Each
	100µL	0.51 / 0.020	10229414	1 Each
	200µL	0.51 / 0.020	10651396	1 Each
	500µL	0.76 / 0.030	10774057	1 Each
	1mL	0.76 / 0.030	10321255	1 Each
	5mL	0.76 / 0.030	10600636	1 Each

Rheodyne Replacement Rotor Seals for Injectors

For Use with Rheodyne Models	Cat. No.	Quantity
Tefzel Seals		
10594855	10179464	1 Each

Rheodyne Stators

For Use with Rheodyne Models	Cat. No.	Quantity
10594855	10353055	1 Each









Rheodyne Stator Face Assemblies

For Use with Rheodyne Models	Cat. No.	Quantity
9125	10702157	1 Each

RheFlex High Pressure Fittings

Precision machined from 316 stainless steel

RheFlex High Pressure Fittings

Type	Cat. No.	Quantity
 Short Fittings Set	10016844	5 Pack
 Short Fittings Set	11577701	10 Pack
 Long Fittings Set	10249704	5 Pack
 Long Fittings Set	10269264	10 Pack
 Extra Long Fittings Set	11567701	5 Pack
 Extra Long Fittings Set	10197704	10 Pack
 1/16in Ferrule	10650816	5 Pack
 1/16in Ferrule	10299594	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



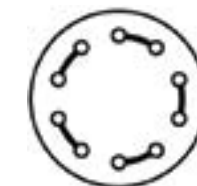
RheFlex Two-Piece PEEK Fittings

Type	Cat. No.	Quantity
Fitting set, standard length	11919234	5 Pack
Fitting set, short	10669865	5 Pack
Fitting set, X-long	11959214	1 Each
Replacement ferrules	11909234	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	10239614	1 Each
	10 ports	10417534	1 Each
Model C2 injector, N60 stainless stator, 5µL loop, microelectric actuator	6 ports	10437914	1 Each
	10 ports	10289274	1 Each
Sample injector loops, stainless steel	5µL	11593960	1 Each
	10µL	11553960	1 Each
	20µL	11583960	1 Each
	50µL	11503970	1 Each
	100µL	11563960	1 Each
Model C4 injector, PAEK stator, 5µL loop, microelectric actuator	6 ports	10056164	1 Each
Sample injector loops, PAEK	5µL	11543970	1 Each
	10µL	11523970	1 Each
	50µL	11533970	1 Each

Valco Injector Model 11543960

Description	Volume	Cat. No.	Quantity
Model 11543960 injector, six 0.016in ports, manual	20µL loop	11543960	1 Each
Model 11553970 injector, six 0.016in ports, microelectric actuator	20µL loop	11553970	1 Each
Replacement rotor	-	11523990	1 Each
Sample injector loop, stainless steel	2µL	11593980	1 Each
Sample injector loop, stainless steel	5µL	11513990	1 Each
Sample injector loop, stainless steel	10µL	11573980	1 Each
Sample injector loop, stainless steel	20µL	11583980	1 Each
Sample injector loop, stainless steel	50µL	11503990	1 Each
Sample injector loop, stainless steel	100µL	11563980	1 Each

Valco Accessories

Description	Volume	Cat. No.	Quantity
Valco syringe ports	22 ga. needles; 1/16in fittings	11573990	1 Each
Valco syringe ports	22 ga. 2in needles	11583990	1 Each
Valco Nuts and Ferrules	1/16in standard nut	11504000	10 Pack
Valco Nuts and Ferrules	1/16in long nut	L11504000	10 Pack
Valco Nuts and Ferrules	1/16in SS ferrule	11999214	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	10111033	1 Each	10111083	5 Pack
25	50	22	90° Blunt End	10552455	1 Each	10079142	5 Pack
50	50	22	90° Blunt End	10630564	1 Each	10079142	5 Pack
100	50	22	90° Blunt End	10523035	1 Each	10079142	5 Pack
500	50	22	90° Blunt End	10435923	1 Each	10079142	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	15244573	1 Each
25	50	22	90° Blunt End	15284573	1 Each
50	50	22	90° Blunt End	15294573	1 Each
100	50	22	90° Blunt End	15204583	1 Each
500	50	22	90° Blunt End	15214583	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	10324133	1 Each
10	50	22	90° Blunt End	10110743	1 Each
25	50	22	90° Blunt End	10715564	1 Each
50	50	22	90° Blunt End	10171073	1 Each
100	50	22	90° Blunt End	10160503	1 Each
250	50	22	90° Blunt End	10120553	1 Each
500	50	22	90° Blunt End	10631714	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	10782127	1 Each
500	50	22	LCQ	10341205	1 Each
250	–	–	AS1000, AS3000	10702917	1 Each
500	–	–	AS1000, AS3000	10321065	1 Each
2500	–	–	AS3000, AS3500	10197744	1 Each

Mass Spectrometry Replacement ESI Probe Needles

Instrument	Cat. No.	Quantity
LCQ, XP, DECA, Advantage	10631006	1 Each
LCQ MS	10027084	1 Each
LCQ XSQ	10331065	1 Each

Fixed Needle Syringes for CTC Instruments

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	50	22	–	13456856	1 Each
25	50	22	–	13496856	1 Each
50	50	22	–	13446866	1 Each
100	50	22	–	13496866	1 Each

PTFE Luer-Lok Syringes

Volume (mL)	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
1	10524655	1 Each	10035934	2 Pack
2.5	10409254	1 Each	10035934	2 Pack
5	10137854	1 Each	10035934	2 Pack
10	10585995	1 Each	10035934	2 Pack
25	10409444	1 Each	10035934	2 Pack

Syringes for Macro Volume Sampling

Volume (mL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
1	50	22s	Bevel	10025774	1 Each
2.5	50	22s	Bevel	15204603	1 Each
5	50	22s	Bevel	15224583	1 Each
10	50	22s	Bevel	15244583	1 Each

HOT POCKET and COOL POCKET Column Temperature Controllers

Wrap-around column temperature control systems

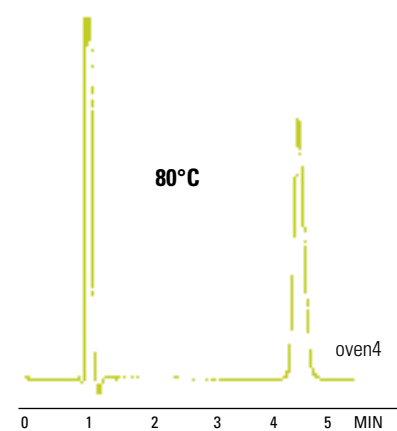
- Easy to install and use with a variety of column lengths
- Dual display of both actual and set point temperature
- HOT POCKET range from just above ambient to 85°C
- COOL POCKET range from 5°C to 55°C
- Explore sample selectivity and stability on both sides of ambient



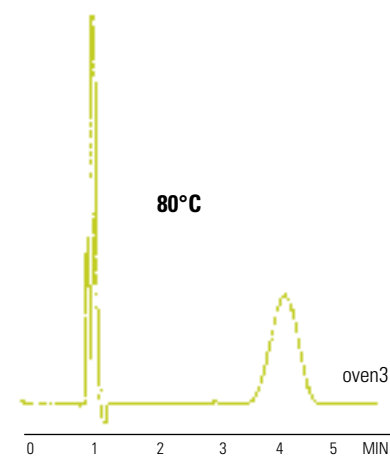
Product Specifications

	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	10006464	1 Each
HOT POCKET Column Heater – short version	10222105	1 Each
COOL POCKET Column Chiller	10479634	1 Each
Eluent Preheater/Precooler	10557835	1 Each

LC Reagents

Providing the selectivity needed for high-quality separation of charged compounds

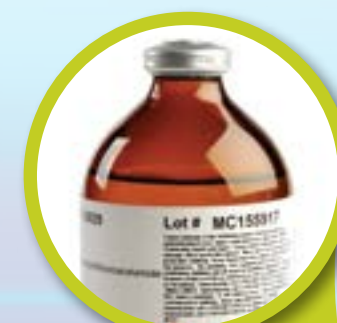
Control selectivity, resolve complex ionic mixtures and improve peak symmetry with the use of our LC reagents.

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



LC Reagents

Technical Resources



visit 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 10714767	1 Each
Heptafluorobutyric Acid, HPLC Grade	10 x 1mL ampules	11511104	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

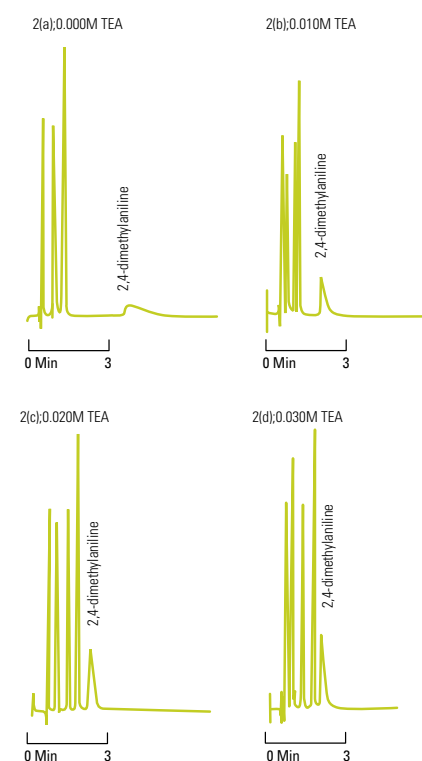
Properties of Triethylamine

- Alternate names TEA, Diethylethanamine
- Molecular formula $C_6H_{15}N$
- Molecular weight 101.19
- Density 0.726g/mL

Triethylamine (TEA)

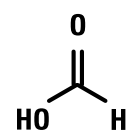
Description	Quantity	Cat. No.	Quantity
Triethylamine, Sequencing Grade	100g	X TS-25108	1 Each

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	TS-28905	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)

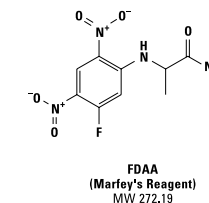
Description	Quantity	Cat. No.	Quantity
Trifluoroacetic Acid, Sequencing Grade	500mL	X 13416806	1 Each
Trifluoroacetic Acid, Sequencing Grade	100g	X 11511084	1 Each
Trifluoroacetic Acid, Sequencing Grade	10 x 1mL	X 11808223	1 Pack
Trifluoroacetic Acid, Sequencing Grade	1g	X 11501084	1 Each

X in the ordering table indicates that hazardous shipping charges apply.

FDAA, Marfey's Reagent

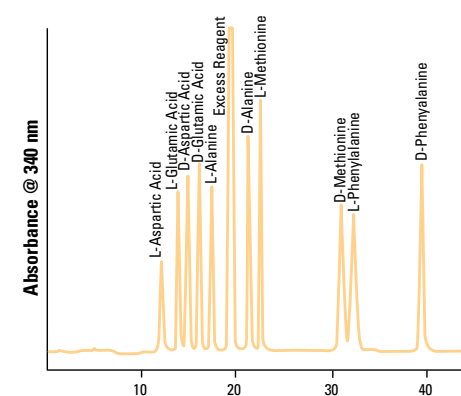
Makes separation and quantitation of optical isomers of amino acids by reversed-phase chromatography quick and easy

- 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

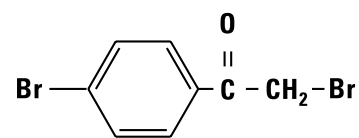
Description	Quantity	Cat. No.	Quantity
FDAA, Marfey's Reagent	50mg	11561094	1 Each



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	13426816	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 10421305	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	11541074	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 [(NH₄)₂SO₄], 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	13447076	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

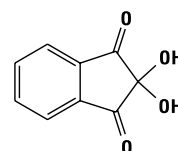
The reagent of choice for detection of amino acids

- 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	10441505	1 Each

Indefinitely stable. No refrigeration required. Keep bottle tightly sealed. Avoid exposure to direct sunlight and ammonia.



Ninhydrin
MW 178.14

High-Purity Pre-Column Derivatization Reagents

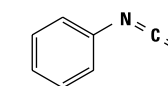
PITC (Phenylisothiocyanate)

High-purity reagent for pre-column quantitative derivatization of amino acids by reversed-phase HPLC

- Also known as Edman's Reagent
- Reacts readily with amino acids in 5 to 10 minutes at room temperature
- Resulting phenylthiocarbamyl 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 x 1mL	10044944	1 Pack



PITC
Edman's Reagent
MW 135.19

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

- HCON(CH₃)₂
- Purity (GC): ≥99%
- MW: 73.09
- Density: 0.944
- B.P. 153°C
- Water: 0.1%

Dimethylsulfoxide (DMSO), Sequencing Grade, Physical Properties

- C₂H₆OS
- Purity (GC): >99.5%
- MW: 78.13
- Density: 1.101
- Water: ≤0.2%

Pyridine, Physical Properties

- C₅H₅N
- 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 11581094	1 Each
Water	1L	11591094	1 Each
Dimethylformamide (DMF)	50mL	X 13457076	1 Each
Dimethylsulfoxide (DMSO)	950mL	X 10156644	1 Each
Pyridine	100g	X 10576135	1 Each

X in the ordering table indicates that hazardous shipping charges apply.

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	11501094	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	13446816	1 Each
Peptide Retention Time Calibration Mixture, 5pmol/μL	200μL	13476816	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



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



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



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



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 MSⁿ 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



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



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



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



GC Derivatization Reagents

Making the undetectable detectable. Thermo Scientific GC Derivatization reagents provide high levels of purity and reproducibility in analysis.

PAGE 5-080



Reacti-Therm Sample Derivatization System

Heating, stirring and evaporation in a single system, offering a complete solution for derivatization and other small-scale reactions.

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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	Silanzed 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

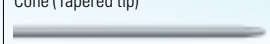
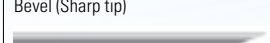

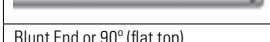

Injection Method	Injection Requirements	Liner Requirements
Split 	Enables rapid vaporization and effective mixing of sample	<ul style="list-style-type: none"> Typically open-ended Large surface area & volume Design to aid mixing Low activity
Splitless 	Sample focused onto column – minimizes sample contact with reactive metal components	<ul style="list-style-type: none"> Typically tapered Small volume to aid transfer Low activity
PTV 	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"> Small to aid sample transfer Good thermal properties for rapid heating & cooling Siltek coating provides highly inert surface

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
Cone (Tapered tip) 	Most versatile needle for autosampler use and resist coring of vial and inlet septa
Bevel (Sharp tip) 	Typically used for manual injections. The tip shape helps reduce septa coring
Side Hole (Dome tip with a side hole for sample exit) 	Usually used for headspace and large volume injections
Blunt End or 90° (flat top) 	Used for injectors that do not contain an inlet septa such as Merlin MicroSeal™
Dual Gauge 	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"> Easy-to-use stable seal Higher temperature limit Can be easily removed Can be re-used 	<ul style="list-style-type: none"> Not for MS or oxygen-sensitive detectors Soft, easily deformed or destroyed Possible system contamination
85% Vespel / 15% Graphite	MS and oxygen-sensitive detectors	<ul style="list-style-type: none"> Long lifetime High temperature limit MS compatible 	<ul style="list-style-type: none"> Cannot be re-used Must be re-tightened after initial temperature cycles
SilTite™ Metal	MS and oxygen-sensitive detectors	<ul style="list-style-type: none"> Long lifetime High temperature limit MS compatible 	<ul style="list-style-type: none"> Cannot be re-used

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 ₂ , N ₂ , AR, Air		21g H ₂ O	7.2g H ₂ O
Oxygen	Inert carrier, He, H ₂ , N ₂ , AR		3L O ₂	1L O ₂
Hydrocarbon	Inert carrier, He, H ₂ , N ₂ , AR, Air		36g (as n-butane)	24g (as n-butane)
Combi – Moisture, Oxygen	Inert carrier, He, H ₂ , N ₂ , AR		10g H ₂ O, 1.5L O ₂	–
Combi – Moisture, Hydrocarbons	Inert carrier, He, H ₂ , N ₂ , AR, Air		10g H ₂ O, 18g HCs (as n-butane)	3.5g H ₂ O, 12g HCs (as n-butane)
Triple – Moisture, Oxygen, Hydrocarbons	Inert carrier, He, H ₂ , N ₂ , AR		6g H ₂ O, 1L O ₂ , 12g HCs (as n-butane)	1.8g H ₂ O, 500mL O ₂ , 7g HCs (as n-butane)
Triple – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS	He		6g H ₂ O, 1L O ₂ , 12g HCs (as n-butane)	–
Indicating Triple – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS	He	Moisture: Yellow to Clear Oxygen: Green to Gray	0.1g H ₂ O, 100mL O ₂ , 0.07g HCs (as n-butane)	–

Click-On Inline Filters

Type	Cat No.	Quantity
Moisture Filter	10573605	1 Each
Oxygen Filter	10425923	1 Each
Hydrocarbon Filter	10088902	1 Each
Combi – Moisture, Oxygen	10203323	1 Each
Combi – Moisture, Hydrocarbons	10342825	1 Each
Triple – Moisture, Oxygen, Hydrocarbons	10213183	1 Each
Triple – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS	10137554	1 Each
Indicating Triple – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS	10301465	1 Each

Connectors and Accessories

Description	Cat No.	Quantity
Brass End Fitting, 0.125in.	10088952	2 Pack
Steel End Fitting, 0.125in.	10766334	2 Pack
Brass End Fitting, 0.25in.	10351345	2 Pack
Steel End Fitting, 0.25in.	10340925	2 Pack
Double Ended Connector to connect Filter to Indicator	10117844	1 Each
Replacement O-Rings	10095914	1 Each
Wall Mounting Clamp	10127844	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	10764067	1 Each
Indicating Oxygen Cartridge Filter	No	10341495	1 Each
Hydrocarbon Cartridge Filter	No	10457714	1 Each
Indicating Combi Filter – Moisture, Hydrocarbons	No	10279324	1 Each
Indicating Triple Filter – Moisture, Oxygen, Hydrocarbons	No	10213423	1 Each
Indicating Triple Filter – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC-MS	No	10019682	1 Each
Triple Filter – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC-MS	Yes	10344093	1 Each
Indicating Triple Filter – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC-MS	Yes	10120993	1 Each
3 Cartridge Pack – contains 1 x Triple Filter and 2 x Combi Filter (Moisture, Hydrocarbons)	No	10514485	1 Each
4 Cartridge Pack – contains 1 x Moisture Filter, 1 x O ₂ Filter and 2 x Hydrocarbon Filter	Yes	10269654	1 Each
3 Cartridge Pack – contains 1 x Triple Filter and 2 x Combi Filter (Moisture, Hydrocarbons)	Yes	10701947	1 Each
High Flow Pack of 2 x Hydrocarbon Filters for LC-MS – no Indicator	No	10428104	1 Each
High Flow Pack of 2 x Moisture Filters for LC-MS – with Indicator	No	10006064	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 ₂ in LC/MS, H ₂ O in H ₂ /air generators	Carrier, Make Up and Fuel

Super Clean Cartridge Filter Baseplates

Type	Cat. No.	Quantity
Single Base	10334093	1 Each
Dual Base	10544305	1 Each
Triple Base	10631016	1 Each
Four-position Base	10096114	1 Each
O-rings for Base Plates	11507781	20 Pack
Flush Cap	10280095	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	10752826	1 Each
eVol™ XCHANGE Syringe 5µL	10558995	1 Each
eVol XCHANGE Syringe 50µL	10488944	1 Each
eVol XCHANGE Syringe 100µL	15230369	1 Each
eVol XCHANGE Syringe 500µL	10302725	1 Each
eVol XCHANGE Syringe 1000µL	15240369	1 Each
Sample Dispensing System Kit*	11826224	1 Each
eVol Stand	10077944	1 Each
Charger for eVol System	12504356	1 Each
Charging Stand for eVol System	10338279	1 Each
Replacement Battery for eVol System	13466806	1 Each
Replacement Plunger for 5µL eVol Syringe	13456786	1 Each
Replacement Plunger for 50µL eVol Syringe	13497026	1 Each
Replacement Plunger for 100µL eVol Syringe	15250369	1 Each
Replacement Plunger for 500µL eVol Syringe	13407036	1 Each
Replacement Plunger for 1000µL eVol Syringe	15260369	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

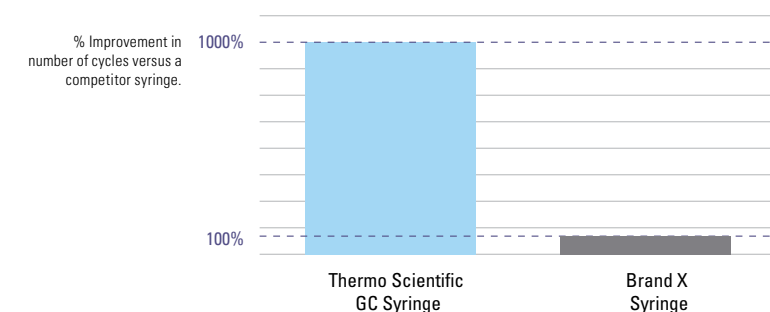
Providing durability, clarity and accuracy for your sample

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.

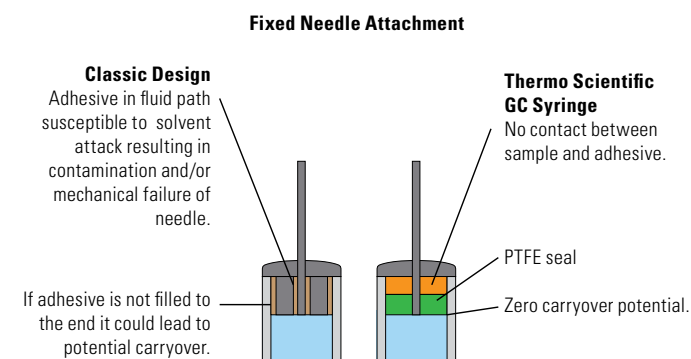


Accuracy in your GC Syringe

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	365A0241*	1 Each	365RN617	1 Each
1	57	23	Cone	Split	365B0251*	1 Each	365RN656	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	13476806	1 Each
	57	23s	Cone	Merlin Valve Injector: PTV and split	12886026*	1 Each
	85	26s	Cone	Splitless and OC	13456806	1 Each
	57	26s	Cone	Split and PTV	12896026*	1 Each
10	85	23s	Cone	Merlin Valve SSL Injector: Splitless	13416856	1 Each
	57	23s	Cone	Merlin Valve Injector: PTV and split	13406856*	1 Each
	85	26s	Cone	Splitless and OC	13446856	1 Each
	57	26s	Cone	Split and PTV	13414826*	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	13426856	1 Each
	57	23s	Cone	Merlin Valve Injector: PTV and split	12806036*	1 Each
	85	26s	Cone	Splitless and OC	13436856	1 Each
	57	26s	Cone	Split and PTV	12816036*	1 Each
25	85	23s	Cone	Merlin Valve SSL Injector: Splitless	13476856	1 Each
	57	23s	Cone	Merlin Valve Injector: PTV and split	12826036*	1 Each
	85	26s	Cone	Splitless and OC	13486856	1 Each
	57	26s	Cone	Split and PTV	12836036*	1 Each
50	57	23s	Cone	Merlin Valve SSL Injector: LV Splitless	12846036*	1 Each
	85	26s	Cone	LV OC	13436866	1 Each
	57	26s	Cone	LV Splitless	12856036*	1 Each
100	57	23s	Cone	Merlin Valve SSL Injector: LV Splitless	12866036*	1 Each
	85	26s	Cone	LV OC	13426866	1 Each
	57	26s	Cone	LV Splitless	12876036*	1 Each
	85	23	Side Hole	Variable depth LV PTV (w & w/o Merlin)	13466866	1 Each
	57	23	Side Hole	LV PTV (with or without Merlin valve)	13456866*	1 Each
250	85	26	Cone	LV OC	13426876	1 Each
	57	26	Cone	LV Splitless	13416876	1 Each
	85	23	Side Hole	Variable depth LV PTV (w & w/o Merlin)	13446876	1 Each
	57	23	Side Hole	LV PTV (with or without Merlin valve)	13436876	1 Each
500	85	26	Cone	LV OC	13486876	1 Each
	57	26	Cone	Sample Dilution	13476876	1 Each
	85	23	Side Hole	Variable depth LV PTV (w & w/o Merlin)	13416886	1 Each
	57	23	Side Hole	LV PTV (with or without Merlin valve)	13496876	1 Each
1000	65	23	Side Hole	Headspace	13456886	1 Each
	57	22	LC	Sample Dilution	13426886	1 Each
2500	65	23	Side Hole	Headspace	13446886	1 Each
5000	65	22	Side Hole	Headspace	13476886	1 Each
10000	57	19	LC	Sample Dilution	13436886	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	10524275	1 Each	10270095	2 Pack	
100	50	23	Side hole	See Note	10350925	1 Each	10219214	2 Pack	TriPlus, AS200/AS800
100	50	23	Cone	LV Splitless	10658525	1 Each	10055864	5 Pack	TriPlus, AS2000, AS200/AS800
250	80	26	Cone	LVOC	10641406	1 Each	10371005	5 Pack	TriPlus, AS2000
250	50	23	Side hole	See Note	10793877	1 Each	10219214	2 Pack	TriPlus, AS2000, AS200/AS800
1000	50	23	Bevel		10640626	1 Each	10733287	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	10702517	1 Each	10260095	2 Pack	
10	50	26	Cone		10785174	1 Each	10243033	2 Pack	AS3000, AS2000
10	50	23	Cone		10419054	1 Each	10351245	2 Pack	AS3000, AS2000, AS200/AS800
50	50	23	Cone	LV Splitless	10724847	1 Each	10055864	5 Pack	AS2000

Syringe 10793877 is to be used when performing PTV/LVI injections with a dedicated liner for thermal labile compounds (liner 10209964). 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		10781534	1 Each	AS2000
100	50	25	Bevel		10724457	1 Each	AS200/AS800
250	50	25	Bevel		10239214	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	10527694	1 Each	TriPlus
5	50	23	Cone		10364083	1 Each	AS3000, AS2000, AS200/AS800
5	50	26	Cone	Split/PTV	10512265	1 Each	AS3000, AS2000
5	80	26	Cone	Splitless and OC	10371195	1 Each	TriPlus
10	50	26	Cone		10206824	1 Each	AS3000, AS200, AS200/AS800
10	50	26	Cone		10029192	6 Pack	AS300, AS2000, AS200/AS800
10	50	25	Cone	Split/PTV	10374653	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	10746173	1 Each	TriPlus, AS300, AS2000, AS200/AS800
10	80	23	Cone	Merlin Valve SSL Splitless	10721724	1 Each	TriPlus, AS2000
10	50	23-26	Cone	OC in PTV Merlin Valve	10197854	1 Each	TriPlus, AS2000
10	80	26	Cone	OC and Splitless	10384653	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	10361505	1 Each	TriPlus, AS3000
0.5	75	31	Cone	Manual OC	10310975	1 Each	
0.5	80	26	Cone	Splitless and OC	10585245	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	10743867	6 Pack	10640816	2 Pack

Fixed Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	42	23-26	Cone	15214573	1 Each
		23-26	Cone	15284563	6 Pack

Fixed Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
5	42	23	Cone	10477314	1 Each
		23	Cone	10177654	6 pack
		23-26s	Cone	10299254	1 Each
		23-26s	Cone	10188044	6 pack
10	42	23	Cone	10371285	1 Each
		23	Cone	10085624	6 pack
		23-26s	Cone	10763464	1 Each
		23-26s	Cone	10187464	6 pack

Fixed Needle, Super-Elastic Plunger Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	42	23-26s	Cone	15204573	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	15274563	1 Each	365RN663	2 Pack
		23s	Cone	15264563	1 Each	365RN661	2 Pack
10	42	26s	Cone	15264573	1 Each	10137744	2 Pack
		23s	Cone	15274573	1 Each	10188024	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	10419054	1 Each	10351245	2 Pack
		26	Cone	10785174	1 Each	10243033	2 Pack

Fixed Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	50	23	Cone	10515995	6 Pack
		26	Cone	10478654	1 Each
		23	Cone	10781534	1 Each
25	50	23	Cone	10548395	1 Each
100	50	23	Cone	10241765	1 Each
250	50	26	Cone	10331485	1 Each
1000	50	26	Side Hole	10289784	1 Each
2500	50	26	Side Hole	10723287	1 Each

Fixed Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
5	50	23	Cone	10364083	1 Each
		26	Cone	10512265	1 Each
10	50	26	Cone	10206824	1 Each
		23	Cone	10746173	1 Each
		26	Cone	10029192	6 Pack
		23	Cone	10025744	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	15234573	1 Each	11772227	5 Pack
25	50	25	Bevel	10117714	1 Each	10351405	5 Pack
		22s	Blunt End	10552455	1 Each	10079142	5 Pack
50	50	22s	Blunt End	10630564	1 Each	10079142	5 Pack
500	50	25	Bevel	10127744	1 Each	10351405	5 Pack
		22s	Blunt End	10435923	1 Each	10079142	5 Pack
1000	50	23	Bevel	10640626	1 Each	10733287	5 Pack
		22s	Blunt End	11524070	1 Each	365RNL35	5 Pack
5000	50	22	Bevel	15224583	1 Each	365RN463	2 Pack
		22s	Blunt End	15224603	1 Each	365RN461	2 Pack
		22s	Side Hole	15234583	1 Each	365RN465	2 Pack
10000	50	22	Bevel	15244583	1 Each	365RN463	2 Pack
		22s	Blunt End	15254583	1 Each	365RN461	2 Pack
		22s	Side Hole	15274583	1 Each	365RN465	2 Pack

Removable Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
10	50	26	Bevel	10771937	1 Each	11772227	5 Pack
25	50	25	Bevel	10311005	1 Each	10351405	5 Pack
50	50	25	Bevel	10713287	1 Each	10351405	5 Pack

Fixed Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	50	26	Bevel	11537761	1 Each
		26s	Blunt End	15254573	1 Each
25	50	22s	Blunt End	15284573	1 Each
50	50	25	Bevel	10177754	1 Each
		22s	Blunt End	15294573	1 Each
100	50	25	Bevel	10724457	1 Each
		22s	Blunt End	15204583	1 Each
250	50	25	Bevel	10239214	1 Each
500	50	25	Bevel	10782317	1 Each
		22s	Blunt End	15214583	1 Each
1000	50	22	Bevel	10025774	1 Each

Fixed Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
5	50	26	Bevel	10219744	1 Each
		26	Bevel	365C0746	6 Pack
10	50	26	Bevel	10334133	1 Each
		26	Bevel	10531305	6 Pack
25	50	25	Bevel	10219274	1 Each
100	50	25	Bevel	10321005	1 Each

PTFE Luer-Lok, Gas Tight Syringes

Volume (µL)	Cat. No.	Quantity	Needle Cat. No.	Quantity
25	15264583	1 Each	10035934	2 Pack
50	15284583	1 Each	10035934	2 Pack
100	15294583	1 Each	10035934	2 Pack
250	15204593	1 Each	10035934	2 Pack
500	15214593	1 Each	10035934	2 Pack
1000	10524655	1 Each	10035934	2 Pack
2500	10409254	1 Each	10035934	2 Pack
5000	10137854	1 Each	10035934	2 Pack
10000	10585995	1 Each	10035934	2 Pack
25000	10409444	1 Each	10035934	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	15224593	1 Each
50	15234593	1 Each
100	15254593	1 Each
250	15244593	1 Each
500	15264593	1 Each
1000	15274593	1 Each
2500	15284593	1 Each
5000	15294593	1 Each
10000	15214603	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	15360431	50 Pack	10384563	50 Pack
BTO	11	15340431	50 Pack	12683166	50 Pack
BTO	11.5	15320431	50 Pack	10293553	50 Pack
BTO	12.7	15300431	48 Pack	10513035	50 Pack
BTO	17	15380421	48 Pack	10641324	50 Pack
TR-Green	9	15340441	50 Pack	11928419	50 Pack
TR-Green	11	15320441	50 Pack	11918419	50 Pack
TR-Green	12.7	15300441	48 Pack	11908419	50 Pack
TR-Green	17	15380431	48 Pack	11998409	50 Pack
Marathon	9	15320451	50 Pack	15224543	50 Pack
Marathon	11	15300451	50 Pack	15204543	50 Pack
Marathon	11.5	15380441	50 Pack	15214543	50 Pack
Marathon	17	15360441	48 Pack	15244543	50 Pack
TR-Blue	9	N/A	N/A	15254543	50 Pack
TR-Blue	11	N/A	N/A	15264543	50 Pack
TR-Blue	11.5	N/A	N/A	15274543	50 Pack
TR-Blue	17	N/A	N/A	15294543	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	10281665	10 Pack
Single Column Installation	0.8	10548605	2 Pack
Single Column Installation (Cross Version)	0.8	10371335	10 Pack
Single Column Installation (Cross Version)	0.8	10219174	2 Pack
Dual Column Installation	1.2	10558605	10 Pack
Dual Column Installation	1.2	10703996	2 Pack

Siltek Inlet Base Seals

For Use With	ID (mm)	Cat. No.	Quantity
Single Column Installation	0.8	10534655	10 Pack
Single Column Installation	0.8	10781947	2 Pack
Single Column Installation (Cross Version)	0.8	10417714	10 Pack
Single Column Installation (Cross Version)	0.8	10575425	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.

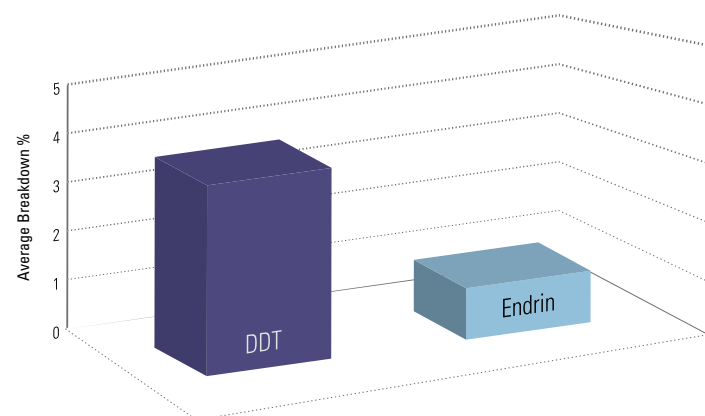


Figure 1: Endrin and DDT breakdown test results showing the lot-to-lot reproducibility and low levels of inertness of LinerGOLD

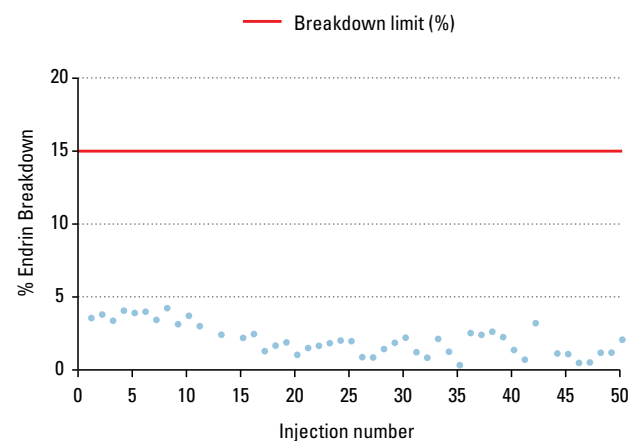
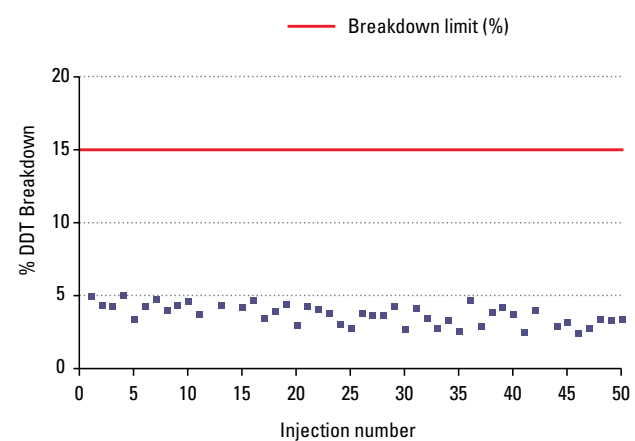


Figure 2: Compound degradation after 50 injections – LinerGOLD exhibits minimal breakdown

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	15447980	15457980	15467980
Split/Splitless Straight Liner	4 x 6.3	78.5	No	15477980	15487980	15497980
Splitless Liner with Single Taper	4 x 6.3	78.5	No	15407990	15417990	15427990
Splitless Liner with Single Taper	4 x 6.3	78.5	Quartz Wool	15437990	15447990	15457990
Splitless Liner with Double Taper	4 x 6.3	78.5	No	15467990	15477990	15487990
Precision Liner	4 x 6.3	78.5	Quartz Wool	15497990	15408000	15418000
Direct Straight Liner	1 x 6.3	78.5	No	15428000	15438000	15448000

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	15458000	15468000	15478000
Split Straight Liner	3 x 8	105	No	15488000	15498000	15408010
Splitless Liner	3 x 8	105	No	15418010	15428010	15438010
Splitless Liner	5 x 8	105	No	45351033-UI	15458010	15468010
Precision Liner	5 x 8	105	Quartz Wool	15478010	15488010	15498010
Splitless Precision Liner	5 x 8	105	Quartz Wool	15408020	15418020	15428020
Baffled PTV Liner	2 x 2.75	120	No	15438020	15448020	15458020






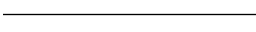



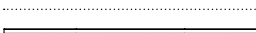

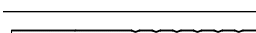
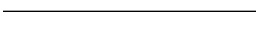
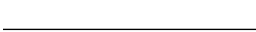
Injection Port Liners for Thermo Scientific Instruments

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	10639485	10289214
	Split Straight Liner	4 x 6.3	78.5	Quartz Wool	10415923	10239644
	Split Straight Liner	4 x 6.3	78.5	No	10533615	10279404
	Split/Splitless FocusLiner	4 x 6.3	78.5	Quartz Wool	10253753	10733667
	Split/Splitless FocusLiner with Single Taper	4 x 6.3	78.5	Quartz Wool	10545435	10479614
	Split/Splitless Liner with Single Taper	4 x 6.3	78.5	No	10140893	10722137
	Split/Splitless Liner with Double Taper	4 x 6.3	78.5	No	10555435	10732137
	Split/Splitless Liner w/ Recessed Gooseneck	4 x 6.3	78.5	Quartz Wool	10418484	N/A
	Splitless Liner with Single Taper	4 x 6.3	78.5	Quartz Wool	10100993	N/A
	Split/Splitless Mini-Lam Liner	4 x 6.3	78.5	No	15237498	N/A
	Split/Splitless Mixed Liner Sample Pack	Mixed	Mixed	Mixed	15247498	N/A





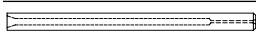



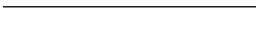
Liners for Thermo Scientific TRACE 1300 Series and TRACE ULTRA PTV Instruments

	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	N/A	11827290	N/A
	PTV Straight Liner	2 x 2.75	120	No	N/A	10651914	10690616
	PTV Straight Liner (deactivated)	2 x 2.75	120	No	10053004	N/A	N/A
	PTV Liner with Sintered Lining	1 x 2.75	120	No	N/A	10209964	N/A
	PTV Liner with Three Baffles	1 x 2.75	120	No	N/A	10714847	N/A
	PTV Siltek Metal Liner	1 x 2.75	120	No	10428854	N/A	N/A
	PTV Siltek Metal Liner	2 x 2.75	120	No	10299954	N/A	N/A
	PTV Siltek Metal Liner	2 x 2.75	120	Wool	10209174	N/A	N/A
	PTV Baffle Liner (Siltek)	2 x 2.75	120	No	N/A	10300875	N/A
	PTV Split Liner with Recessed Gooseneck	2 x 2.75	120	Quartz Wool	N/A	11527761	N/A
	PTV Silcosteel Liner for OC	1 x 2.75	120	No	11827310	N/A	N/A
	PTV Mixed Liner Sample Pack	Mixed	Mixed	Mixed	N/A	15257498	N/A

Liner Sealing Rings for Thermo Scientific Instruments

Description	Cat. No.	Quantity
Liner Sealing Ring for TRACE 1300 Series GC SSL Injector	13108315	1 Each
Liner Sealing Ring for TRACE 1300 Series GC PTV Injector	13415099	1 Each
Viton Liner Sealing Ring for TRACE 1300 Series GC	10638905	10 Pack
Liner sealing Ring for TRACE and FOCUS GC SSL Injector	10561115	10 Pack
Liner sealing Ring for TRACE PTV Injector	10594125	2 Pack
















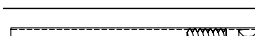
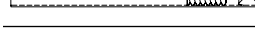
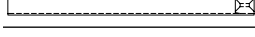
Liners for Thermo Scientific TRACE ULTRA and FOCUS SSL Instruments

	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	10651324	10732527
	Split Straight Liner	3 x 8	105	No	10572075	10732147
	Split Straight Liner	5 x 8	105	CarboFrit	10197594	N/A
	Splitless Straight Liner	3 x 8	105	No	10190553	10784437
	Splitless Straight Liner	5 x 8	105	No	10455173	11520964
	Splitless Straight Liner	5 x 8	105	CarboFrit	10390855	N/A
	Splitless Straight Liner (Siltek)	3 x 8	105	No	10594465	N/A
	Split FocusLiner for 50mm Needle	5 x 8	105	Quartz Wool	10416113	10764247
	Splitless FocusLiner for 50mm Needle	5 x 8	105	Quartz Wool	10751957	10761957
	Splitless FocusLiner for 70mm Needle	5 x 8	105	Quartz Wool	10314273	10489614
	Baffle Liner	2 x 8	105	No	10487514	N/A
	Split/Splitless Straight Liner	0.75 x 2.75	105	No	11877350	N/A



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	10639485	10289214
	Split Straight Liner	4 x 6.3	78.5	Quartz Wool	10415923	10239644
	Split Straight Liner	4 x 6.3	78.5	No	10533615	10279404
	Split/Splitless FocusLiner	4 x 6.3	78.5	Quartz Wool	10253753	10733667
	Split/Splitless FocusLiner with Single Taper	4 x 6.3	78.5	Quartz Wool	10545435	10479614
	Split/Splitless Liner with Single Taper	4 x 6.3	78.5	No	10140893	10722137
	Split/Splitless Liner with Double Taper	4 x 6.3	78.5	No	10555435	10732137
	Split/Splitless Liner w/ Recessed Gooseneck	4 x 6.3	78.5	Quartz Wool	10418484	N/A
	Split/Splitless FAST FocusLiner	2.3 x 6.3	78.5	Quartz Wool	10515435	10016064
	Split/Splitless FAST FocusLiner with Single Taper	2.3 x 6.3	78.5	Quartz Wool	10055694	10743667
	Splitless Liner with Single Taper	4 x 6.3	78.5	Quartz Wool	10100993	N/A
	Splitless Straight Liner	2.0 x 6.3	78.5	No	10525625	N/A
	Splitless Liner with Recessed Gooseneck	2.0 x 6.3	78.5	No	10611216	N/A
	Cyclo/Single Gooseneck (Deactivated Metal)	5.2 x 6.3	78.5	No	10301945	N/A
	Single Gooseneck (Deactivated Metal)	5.2 x 6.3	78.5	No	10269594	N/A
	Cyclosplitter Liner (Deactivated Metal)	5.2 x 6.3	78.5	No	10107514	N/A
	Split/Splitless Liner with Wool (Deactivated Metal)	5.2 x 6.3	78.5	No	10609675	N/A
	Split/Splitless Mixed Liner Sample Pack	Mixed	Mixed	No	10457044	N/A

Liner Sealing Rings for Agilent Instrument

Description	Cat. No.	Quantity
Graphite Liner Sealing Ring for Agilent Direct Straight Liners	10479234	10 Pack
Graphite Liner Sealing Ring for Agilent SSL Liners	10467894	10 Pack
Graphite Liner Sealing Ring for Agilent 2.0mm Liners	10259314	10 Pack
Viton Liner Sealing Ring for Agilent SSL Injector	10638905	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 (SilTite)	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.

SilTite Metal Ferrules



The SilTite 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, SilTite 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	SilTite
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	10756334	10 Pack	
		0.45-0.53	10672674	10 Pack	
	15% Graphite/85% Vespel	0.1-0.25	10120513	10 Pack	
		0.32	10774827	10 Pack	
		0.53	10394473	10 Pack	
Capillary Column Nut for injectors and non-MS Detectors	Stainless Steel		15125256	5 Pack	
Thermo Scientific TRACE Ultra SSL injectors and non-MS detectors	100 % Graphite	0.1-0.25	10756144	10 Pack	
		0.32	10110943	10 Pack	
		0.53	10444793	10 Pack	
		15% Graphite/85% Vespel	0.1-0.25	10478874	10 Pack
			0.32	10428874	10 Pack
	0.53		10660046	10 Pack	
	15% Graphite/85% Vespel (3.4mm length)	Packed Column 1/8" OD	10554125	10 Pack	
		Packed Column 1/4" OD	10595615	10 Pack	
		0.1-0.25	10649485	10 Pack*	
		0.32	10630826	10 Pack*	
	0.53	10640826	10 Pack*		
Capillary Column Nut for Graphite/Vespel Ferrules	Brass		10157514	2 Pack	
All Thermo Scientific PTV injectors	100 % Graphite	0.1-0.25	10756144	10 Pack	
		0.32	10110943	10 Pack	
		0.53	10444793	10 Pack	
Thermo Scientific MS detectors	15% Graphite/85% Vespel	0.1-0.25	10466744	10 Pack	
		0.32	10571115	10 Pack	
Capillary Column Nut for MS Detectors	Brass		11567761	5 Pack	
	Stainless Steel		11577761	5 Pack	
SilTite Kit for Thermo Scientific TRACE 1300/1310 GC SSL injectors	SilTite Metal	0.1-0.25	10792897	1 Each**	
		0.32	10661196	1 Each**	
		0.53	10086154	1 Each**	
SilTite Kit for Thermo Scientific ISQ GC-MS interface	SilTite Metal	0.1-0.25	10177904	1 Each**	
		0.32	10578405	1 Each**	
		0.53	10609965	1 Each**	
Replacement SilTite Ferrules for Thermo Scientific TRACE 1300/1310 SSL and ISQ GC-MS interface kits	SilTite Metal	0.1-0.25	10608515	10 Pack	
		0.32	10670616	10 Pack	
		0.53	10659275	10 Pack	
SilTite Nuts for MS interface			10724077	5 Pack	
SilTite Nuts for SSL injectors			10391145	5 Pack	
SilTite Kits for Thermo Scientific DSQ GC-MS interface	SilTite Metal	0.1-0.25	10007084	1 Each**	
		0.32	10097294	1 Each**	
		0.53	10724556	1 Each**	
		Replacement SilTite Nuts	10565625	5 Pack	
Replacement SilTite Ferrules for Thermo Scientific DSQ GC-MS interface kits	SilTite Metal	0.1-0.25	10698695	10 Pack	
		0.32	10713677	10 Pack	
		0.53	10321395	10 Pack	

* Vespel Ferrules must be used in conjunction with brass nut part number 10157514

** 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	10756334	10 Pack
		0.45-0.53	10672674	10 Pack
		Packed Column 1/8" OD	10311485	10 Pack
		Packed Column 1/4" OD	10409624	10 Pack
		15% Graphite/85% Vespel	0.1-0.25	10120513
	0.32		10774827	10 Pack
	0.53		10394473	10 Pack
	Packed Column 1/8" OD		10554125	10 Pack
	Packed Column 1/4" OD		10595615	10 Pack
	Capillary Column Nut for injectors and non-MS Detectors	Stainless Steel		15125256
Agilent MS detectors	15% Graphite/85% Vespel	0.1-0.25	10466744	10 Pack
		0.32	10571115	10 Pack
		0.53	10117644	10 Pack
SilTite Kits for Agilent SSL injectors	SilTite Metal	0.1-0.25	10792897	1 Each*
		0.32	10661196	1 Each*
		0.53	10086154	1 Each*
SilTite Nuts for MS interface			10724077	5 Pack
			10177904	1 Each**
SilTite Kit for Agilent MS detectors	SilTite Metal	0.1-0.25	10578405	1 Each**
		0.32	10609965	1 Each**
		0.53	10608515	10 Pack
Replacement SilTite Ferrules for all SilTite Kits	SilTite Metal	0.1-0.25	10670616	10 Pack
		0.32	10659275	10 Pack
		0.53	10391145	5 Pack
SilTite Nuts for SSL injectors			10035964	2 Pack
Replacement Baseplate Seals			10575225	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 μ -Union

The tiny connection for GC Columns

The SilTite μ -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 μ -Union kit contains the following:

- 5 x ferrules
- 2 x union fittings
- Installation jigs
- Installation instructions



SilTite μ -Union Kits, Ferrules and Replacement Unions

Column ID (mm)	2nd Column ID (mm)	SilTite μ -Union Kit Cat. No. (1 Each)	SilTite μ -Union Ferrules Cat. No. (10 Pack)	SilTite μ -Union Replacement Union Cat. No. (1 Each)
0.1 – 0.25	0.1-0.25	15284543	15244553	15204563
	0.32	15204553	15254553	15204563
	0.53	15214553	15274553	15234563
0.32	0.32	15224553	15284553	15204563
	0.53	15234553	15294553	15234563
0.53	0.53	15264553	15214563	15224563

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	10497514	12018049	10046604
0.32	0.32-0.53	10117864	10025844	10046604
0.53	0.45-0.53	10301055	11560964	10046604

* SilTite nuts must be used with SilTite ferrules

GC Capillary Connectors

Description	Cat. No.	Quantity
Universal Capillary Connector	11918107	1 Each
Y Capillary Connector	11568500	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	10301155	5 Pack
Split/Splitless and MS Starter Kit	10794827	1 Each
Split/Splitless and FID Starter Kit	10197494	1 Each
Split/Splitless Injector Base Seal	10137524	2 Pack
Ferrules for 0.1-0.25mm ID Columns	10015964	10 Pack
Ferrules for 0.32mm ID Columns	10055914	10 Pack

Finger Tite Connectors for TRACE GC Ultra and FOCUS GCs

Description	Cat. No.	Quantity
Female Nut	10584465	5 Pack
Split/Splitless and MS Starter Kit	10177804	1 Each
Split/Splitless and FID Starter Kit	10321485	1 Each
Split/Splitless and MS Starter Kit for ISQ	15287488	1 Each
Ferrules for 0.1-0.25mm ID Columns	10015964	10 Pack
Ferrules for 0.32mm ID Columns	10055914	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	10691206	1 Each	10311155	1 Each
Retention Gap Kit, 0.53mm ID, 2m	10772846	1 Each	10289074	1 Each
Retention Gap Kit, 0.53mm ID, 5m	10332575	1 Each	10289074	1 Each

Deactivated Silica Tubing

Description	Cat. No.	Quantity
Deactivated silica tubing, 0.32mm ID; 2m Length	10301165	1 Each
Deactivated silica tubing, 0.53mm ID; 2m Length	10341335	1 Each
Deactivated silica tubing, 0.25mm ID; 5m Length	10391435	1 Each
Deactivated silica tubing, 0.32mm ID; 5m Length	10006264	1 Each
Deactivated silica tubing, 0.53mm ID; 5m Length	10429244	1 Each
Deactivated silica tubing, 0.53mm ID; 1m Length (Siltek)	10506195	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	15237478	1 Each	15590302	1 Each
0.25	2	10448194	1 Each	15500312	1 Each
0.32	2	10139384	1 Each	15510312	1 Each
0.53	2	10752836	1 Each	15520312	1 Each
0.18	5	15247478	1 Each	15530312	1 Each
0.25	5	10537645	1 Each	15540312	1 Each
0.32	5	10221245	1 Each	15550312	1 Each
0.53	5	10497814	1 Each	15560312	1 Each
0.18	10	15257478	1 Each	15570312	1 Each
0.25	10	10428774	1 Each	15580312	1 Each
0.32	10	10438774	1 Each	15590312	1 Each
0.53	10	10119014	1 Each	15500322	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

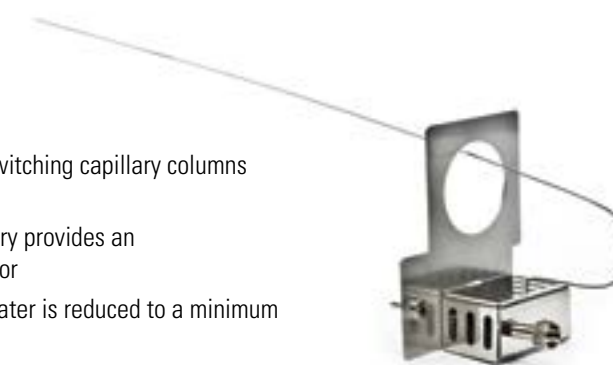
Description	Cat No.	Quantity
Capillary Column End Caps, Paired	11827210	10 Pack

SWAP-IT GC-MS Interface System

Easy to install for quick column changeovers

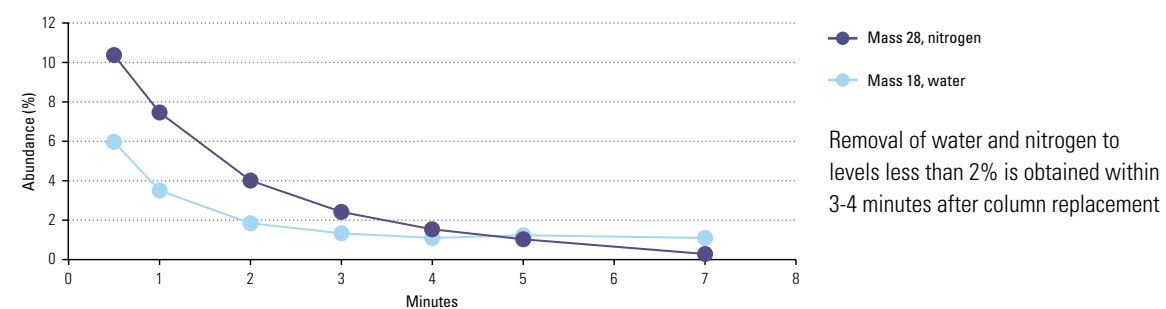
The SWAP-IT GC-MS Interface provides a powerful tool for switching capillary columns without the need to vent the MS

- 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
For Thermo Scientific Instruments (ISQ GC-MS, TSQ 8000 GC-MS/MS)		
SWAP-IT GC-MS Interface Kit: SWAP-IT GC-MS Interface, Nuts, Ferrules, Accessories	15237508	1 Each
For Thermo Scientific Instruments (DSQ GC-MS, DSQ II GC-MS, Polaris Q GC-MS, ITQ GC-MS only)		
SWAP-IT GC-MS Interface Kit: SWAP-IT GC-MS Interface, Nuts, Ferrules, Accessories	10230435	1 Each
SWAP-IT GC-MS Interface, SWAP-IT only	10075924	1 Each
Transfer Line Nut	10331055	1 Each
Graphite/Vespel Ferrule for Transfer Line	11717436	10 Pack
For Agilent Instruments		
SWAP-IT GC-MS Interface Kit: SWAP-IT GC-MS Interface, Nuts, Ferrules, Accessories	10702327	1 Each
SWAP-IT GC-MS Interface, SWAP-IT Only	10270005	1 Each
Transfer Line Nut	10117414	1 Each
Graphite/Vespel Ferrule for Transfer Line	10085644	10 Pack
SWAP-Tight Nut and Adaptor for S/SL Injector	10249504	1 Each
Accessories		
SWAP-Tight Nut	10351555	1 Each
SWAP-Tight Ferrules, Blank	10437704	10 Pack
SWAP-Tight Ferrules, 0.1 – 0.25mm	10279264	10 Pack
SWAP-Tight Ferrules, 0.32mm	10249794	10 Pack



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)	15297508	1 Each

3-Port SilFlow Replacement Parts

Description	Cat. No.	Quantity
SilFlow Fingertight Ferrules for 0.25mm ID Columns	15270339	10 Pack
SilFlow Fingertight Ferrules for 0.32mm ID Columns	15280339	10 Pack
SilFlow Fingertight Tool	15207518	1 Each
SilFlow Nuts	15277488	10 Pack
Blanking Ferrule	15297488	5 Pack
170µm Deactivated Tubing 0.363mm OD 60cm Length	15257508	1 Each
75µm Untreated Fused Silica Tubing 0.363mm OD 30cm Length	15267508	1 Each
170µm Deactivated Tubing 0.363mm OD 120cm Length	15277508	1 Each
75µm Untreated Fused Silica Tubing 0.363mm OD 80cm Length	15287508	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	15244603	1 Each
	1/4	0.19	50	15254603	1 Each
Stainless Steel	1/16	0.01	25	15264603	1 Each
		0.02	25	15274603	1 Each
		0.03	25	15284603	1 Each
		0.04	25	15294603	1 Each
	1/8	0.085	25	15204613	1 Each
	1/4	0.21	25	15214613	1 Each

GC Tools

Support GC applications

GC Tools

Description	Cat. No.	Quantity
Straight-Tipped Forceps	10169534	1 Each
Angle-Tipped Forceps	10037364	1 Each
Pin Vice	10610256	1 Each
Pick-Up Tool	10509385	1 Each
0.35mm Drill Bit	10468014	1 Each
0.45mm Drill Bit	10047494	1 Each
0.70mm Drill Bit	10392835	1 Each
Adjustable Spanner	10575995	1 Each
Tri-Scale Ruler	10249084	1 Each
Shortix Capillary Column Cutter	10200545	1 Each
Shortix Capillary Column Cutter Repair Kit	10548995	1 Each
Ceramic Column Cutter	10097724	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	10369587	1 Each
Capillary Tool Kit for Agilent GCs	13416956	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	10589165	1 Each

GLD Pro Gas Leak Detector

Aids in quickly locating and identifying gas leaks

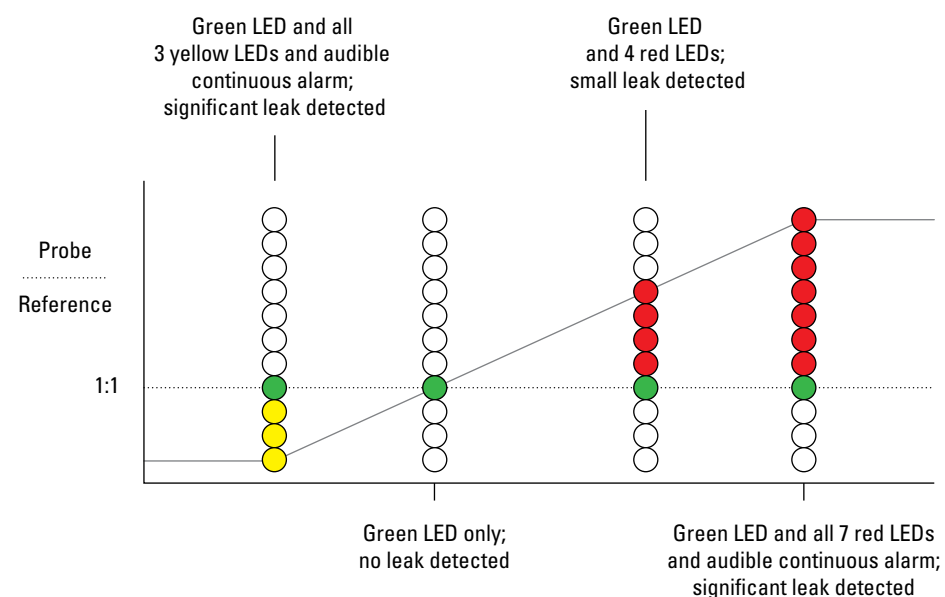
The Thermo Scientific™ GLD Pro™ Gas Leak Detector is specifically designed for use with gas chromatography instruments. Detection of leaks allows the user to reduce detector noise, provide a stable baseline, reduce carrier gas by minimizing waste, and maximize the lifetime of the analytical column by 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	10438494	1 Each
Small Probe Adaptor	10599165	1 Each
Soft-Sided Carry Case (Leak Detector not included)	10496844	1 Each



GFM Pro Electronic Flowmeter

Measure and monitor flow quickly and efficiently

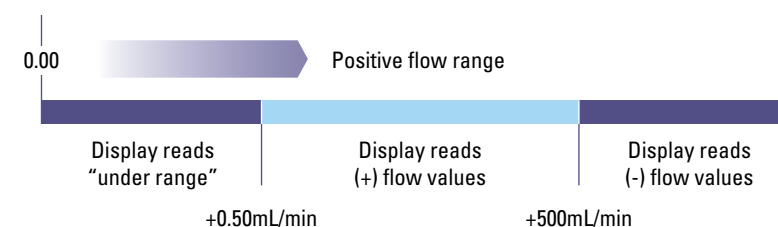
The Thermo Scientific™ GFM Pro™ Flowmeter is specifically designed for use with gas chromatography instruments. This versatile product is an electronic device capable of measuring volumetric flow for all types of gases. Real-time measurements can be made for various types of flow paths including continually 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	10744186	1 Each
Soft-Sided Carry Case (Flowmeter not included)	10496844	1 Each
GFM Pro Flowmeter Re-Calibration	15217518	1 Each



GC Columns

Technical Resources

visit 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

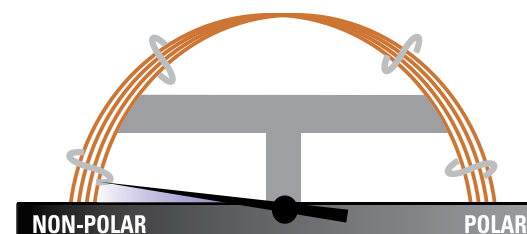
TraceGOLD GC columns offer you a leap forward in column performance delivering low bleed and superior inertness ideally suited to MS applications.

TG-1MS	5-037	TG-225MS	5-051
TG-5MS	5-038	TG-200MS	5-052
TG-5SiIMS	5-038	TG-WaxMS	5-053
TG-5MS AMINE	5-040	TG-WaxMS A	5-054
TG-5HT	5-041	TG-WaxMS B	5-055
TG-SQC	5-045	TG-POLAR	5-056
TG-35MS	5-043	TG-XLBMS	5-057
TG-35MS AMINE	5-044	TG-VRX	5-058
TG-1301MS	5-045	TG-VMS	5-059
TG-624	5-046	TG-OCP I / TG OCP II	5-060
TG-624SiIMS	5-047	TG-OPP I / TG-OPP II	5-061
TG-1701MS	5-048	TG-ALC Plus I / TG-ALC Plus II	5-062
TG-17MS	5-049	TG-Dioxin	5-063
TG-17SiIMS	5-050		

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	10436754	1 Each
0.20	12	0.33	15247488	1 Each
0.15	10	0.15	13458008	1 Each
	20	0.15	13468008	1 Each
	40	0.15	13448008	1 Each
0.18	20	0.18	15237488	1 Each
0.25	15	0.25	10744267	1 Each
		0.5	10137424	1 Each
	30	1.0	10046744	1 Each
		0.25	10554875	1 Each
		0.5	10270335	1 Each
		1.0	10407154	1 Each
	30 with 5m SafeGuard	0.25	11800463	1 Each
		0.25	10006654	1 Each
	60	0.5	10006324	1 Each
			10065784	1 Each
1.0		10096644	1 Each	
		10628535	1 Each	
30		0.25	10564875	1 Each
		0.5	10280335	1 Each
		1.0	10045784	1 Each
		3.0	15227488	1 Each
60		0.25	10127424	1 Each
		0.5	10016084	1 Each
	1.0	10477134	1 Each	
	1.5	10197464	1 Each	
0.53	15	1.0	10638535	1 Each
		1.5	10026084	1 Each
		0.5	10544875	1 Each
	30	1.0	10055784	1 Each
		1.5	10127714	1 Each
		1.0	11810463	1 Each

TraceGOLD TG-1MT Metal GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	11875702	1 Each
	30	0.25	11885702	1 Each
0.53	5	0.1	12612745	1 Each
		0.88	12602745	1 Each
	6	0.15	11835712	1 Each

Applications:

- Hydrocarbons
- Solvent impurities
- PCB congeners
- Aroclor mixes
- Simulated distillation
- Drugs of abuse
- Natural gas odorants
- Essential oils
- Pesticides

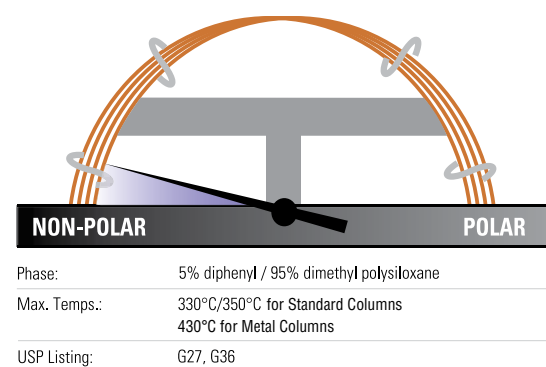
Similar to:

- 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



TraceGOLD TG-5MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	10723297	1 Each
0.15	10	0.15	13478008	1 Each
	20	0.15	13488008	1 Each
	40	0.15	13408018	1 Each
0.18	20	0.18	11531174	1 Each
	20 with 5m SafeGuard	0.18	11890453	1 Each
0.25	10	0.25	12576299	1 Each
		15	0.25	10649105
	15 with 5m SafeGuard	1.0	10467134	1 Each
		0.25	11850453	1 Each
		0.25	10584685	1 Each
	30	0.5	10408874	1 Each
		1.0	10650056	1 Each
		0.1	11840453	1 Each
		0.25	11860453	1 Each
	60	0.25	10659295	1 Each
0.5		10230005	1 Each	
1.0		10576185	1 Each	
1.0		10584105	1 Each	
0.32	15	1.0	10584105	1 Each
		0.25	10086644	1 Each
	30	0.5	10137904	1 Each
		1.0	10681206	1 Each
		0.25	11870453	1 Each
	30 with 5m SafeGuard	0.25	10289754	1 Each
		0.5	10056034	1 Each
		1.0	10586185	1 Each
		0.25	10137334	1 Each
		0.5	10096314	1 Each
0.53	15	1.0	10594105	1 Each
		1.5	10753117	1 Each
		0.25	10416954	1 Each
		0.5	10457914	1 Each
	30	1.0	10744257	1 Each
		1.5	10371025	1 Each
		0.25	12586299	1 Each
		5.0	12586299	1 Each

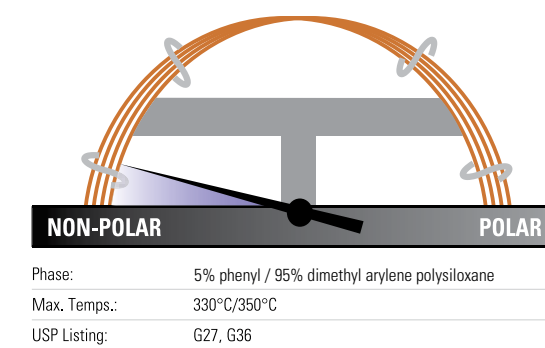
TraceGOLD TG-5MT Metal GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.1	11840473	1 Each
		0.25	11850473	1 Each
	30	0.25	11860473	1 Each
	60	0.25	11880473	1 Each

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	26096-2750	1 Each
	20	0.15	13418018	1 Each
	40	0.15	13428018	1 Each
0.18	20	0.18	13178295	1 Each
	0.25	15	0.25	10311595
0.25	15 with 10m SafeGuard	0.5	10586375	1 Each
		0.25	11890443	1 Each
	30	0.25	10177894	1 Each
		0.5	10239184	1 Each
	30 with 5m SafeGuard	1.0	10447914	1 Each
		0.25	11810453	1 Each
	30 with 10m SafeGuard	0.5	11820453	1 Each
		0.25	11800453	1 Each
	60	0.25	10526005	1 Each
		1.0	10167664	1 Each
0.32	15	0.25	10794637	1 Each
		0.25	10457524	1 Each
	30	0.5	10698905	1 Each
0.53	30	1.0	10046034	1 Each
		1.5	10702347	1 Each

Applications:

- GC-MS applications using ion-trap systems
- Polycyclic aromatics
- Hydrocarbons including chlorinated hydrocarbons
- Phthalates
- Phenols
- Amines
- Organophosphate

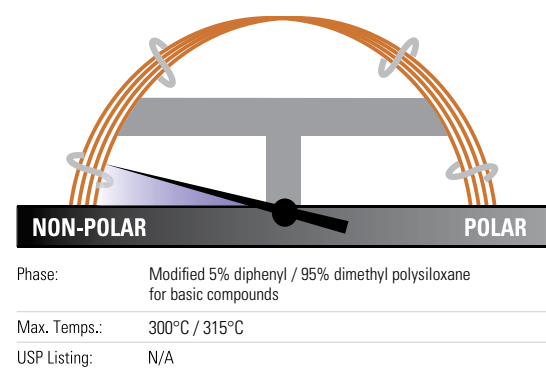
Similar to:

- 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



TraceGOLD TG-5MS AMINE GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	10690626	1 Each
		1.0	10311025	1 Each
	30	0.25	10157604	1 Each
		0.5	10555995	1 Each
0.32	30	1.0	10035834	1 Each
		1.0	10713107	1 Each
		1.0	11806224	1 Each
0.53	15	1.0	11806224	1 Each
	30	1.0	11836224	1 Each
		3.0	13496846	1 Each

Applications:

- Amines and other basic compounds, including alkylamines, diamines, triamines, ethanolamines
- Nitrogen-containing heterocyclics

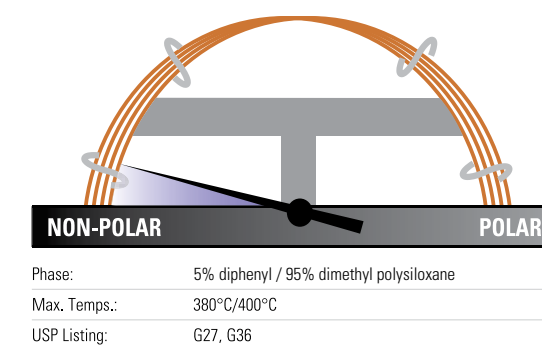
Similar to:

- Rtx-5 Amine

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	10137714	1 Each
		0.25	13466846	1 Each
	30	0.1	10200345	1 Each
		0.25	10240195	1 Each
0.32	15	0.1	10669105	1 Each
		0.1	10545065	1 Each
	30	0.25	10670636	1 Each
		0.15	13476846	1 Each
0.53	10	0.15	13476846	1 Each
	30	0.15	10230195	1 Each

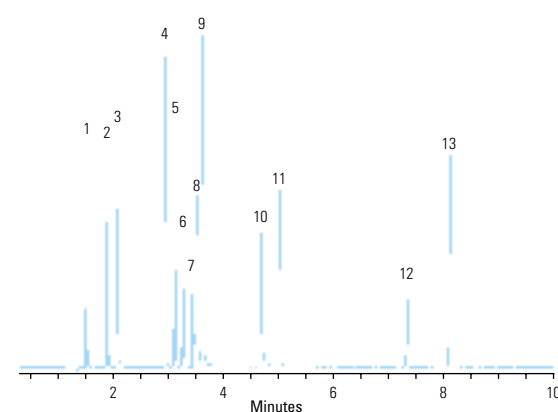
Applications:

- Phenols
- Residual solvents
- Solvents
- Semivolatiles
- Pesticides
- PCBs
- Solvent impurities

Similar to:

- Rxi-5HT
- BP-5HT
- VF-5HT
- ZB-5HT

Amines and phenols



TG-5MS Amine 30m x 0.32mm x 1.0µm

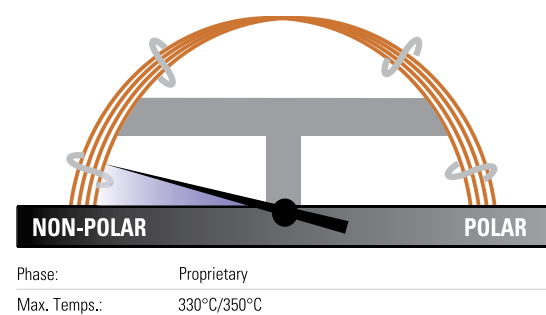
Temperature: 120°C to 220°C at 10°C/minute
 Detector Type: FID
 Carrier Gas: Hydrogen
 Flow Rate: 40cm/min
 Injection Volume: 1.0µL
 Injection Mode: Split 25:1, 300°C

- | | |
|-----------------------|---------------------------|
| 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-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	10127904	1 Each
	30	0.25	10157664	1 Each

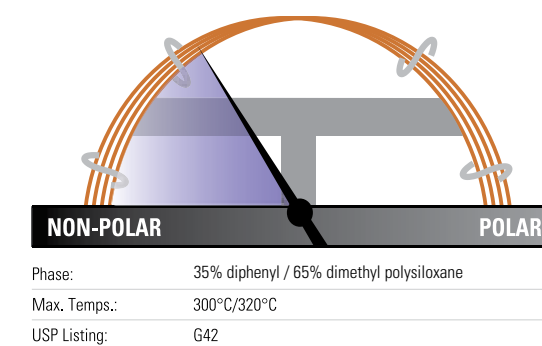
Applications:

- 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	10505635	1 Each
		0.25	10016174	1 Each
		0.5	10371115	1 Each
0.32	15	0.25	10534115	1 Each
		0.5	10639295	1 Each
		0.25	10167704	1 Each
	30	0.5	10279754	1 Each
		0.5	10545815	1 Each
		1.0	10219804	1 Each
0.53	15	1.5	10791957	1 Each
		0.5	10781957	1 Each
		1.0	10713297	1 Each
	30	1.5	10534875	1 Each

Applications:

- Organochlorine pesticides and herbicides
- Pharmaceuticals
- PCB congeners
- Aroclor mixes
- Sterols
- Rosin acids
- Phthalate esters

Similar to:

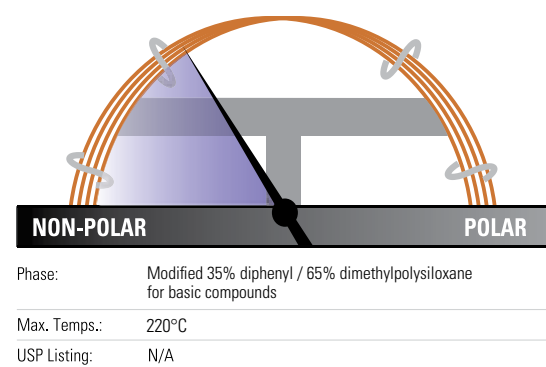
- Rtx-35
- BP-35
- HP-35
- SPB-35
- SPB-608



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	10585035	1 Each
		0.5	10659085	1 Each
		1.0	10427134	1 Each
0.32	15	1.0	10035874	1 Each
		1.0	10177504	1 Each
		1.5	10005824	1 Each
0.53	15	1.0	10341245	1 Each
		1.0	10229844	1 Each
		3.0	10249364	1 Each

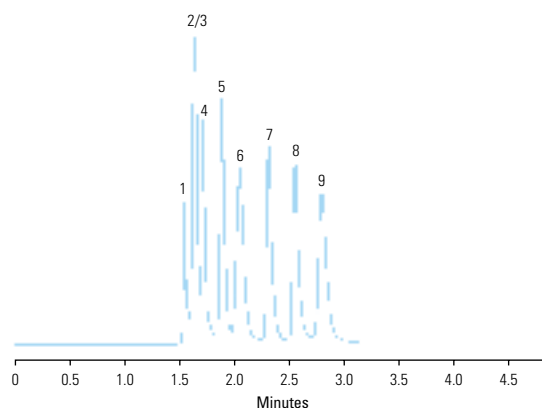
Applications:

- 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

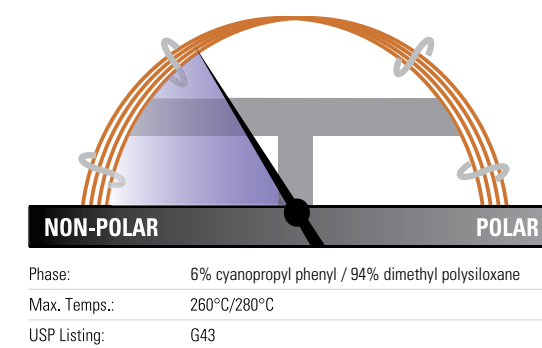
Temperature: 35°C (5 minute hold) Isothermal
 Detector Type: FID
 Carrier Gas: He
 Flow Rate: 35cm/sec
 Injection Volume: 1.0µL
 Injection Mode: Split (10:1), 250°C

- | | |
|-------------------|--------------------|
| 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	10514465	1 Each		
		0.5	10167894	1 Each		
		30	0.25	10259834	1 Each	
			0.5	10341305	1 Each	
			1.0	10321315	1 Each	
			0.25	10712917	1 Each	
	60	1.0	10127334	1 Each		
		0.32	15	0.25	10187544	1 Each
				0.25	10025834	1 Each
				0.5	10076074	1 Each
			60	1.0	10381355	1 Each
				1.5	10487134	1 Each
1.8	10229134			1 Each		
0.53	30	0.5	10792147	1 Each		
		1.0	10230295	1 Each		
		1.8	10784637	1 Each		
		60	0.25	10219134	1 Each	
			1.0	10117334	1 Each	
			1.5	10487324	1 Each	
	3.0		10406954	1 Each		
	0.53		30	0.25	10774637	1 Each
				0.5	10391015	1 Each
		3.0		10565815	1 Each	

Applications:

- Alcohols
- Volatile organics
- Oxygenates
- Residual solvents

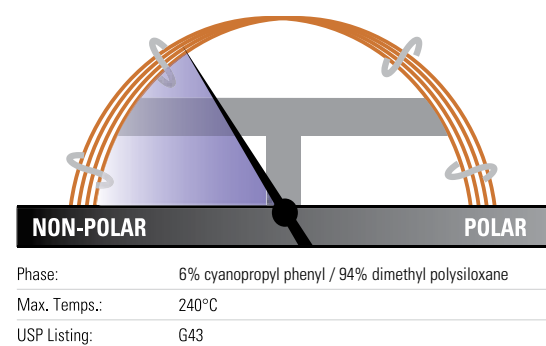
Similar to:

- 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	10280385	1 Each
	40	1.0	10763307	1 Each
0.25	30	1.4	10066984	1 Each
	60	1.4	10566575	1 Each
0.32	30	1.8	10669875	1 Each
	60	1.8	10240055	1 Each
0.53	30	3.0	10197844	1 Each
	60	3.0	10753307	1 Each
	75	3.0	10535255	1 Each
	105	3.0	10016074	1 Each

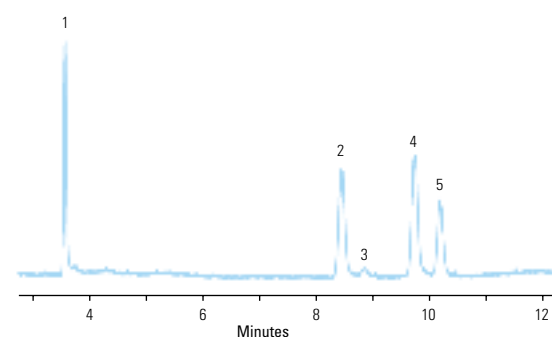
Applications:

- 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

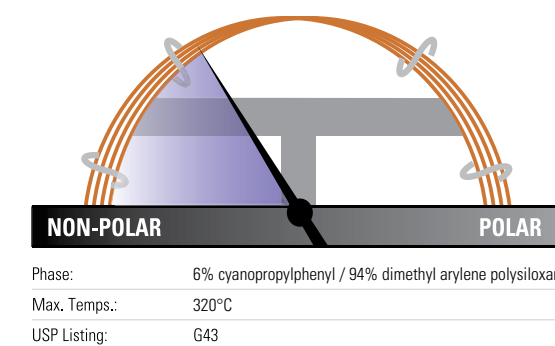
Residual solvents class 1



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	15244523	1 Each
	30	1.4	15254523	1 Each
0.25	60	1.4	15234523	1 Each
	30	1.8	15224523	1 Each
0.32	60	1.8	15284523	1 Each
	30	3.0	15264523	1 Each
0.53	60	3.0	15274523	1 Each
	75	3.0	15294523	1 Each
	105	3.0	15204533	1 Each

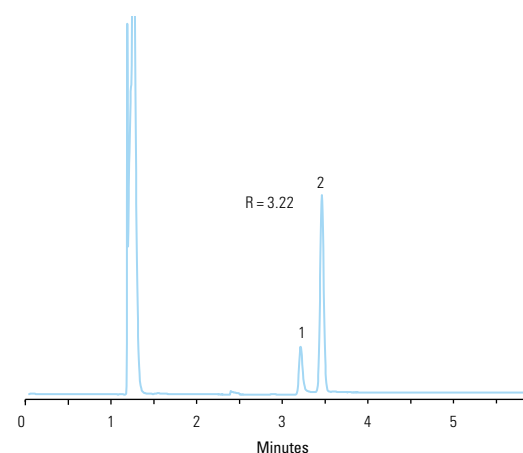
Applications:

- Residual Solvents
- Volatile Organic Compounds
- Alcohols
- Oxygenates

Similar to:

- DB-624 Ultra Inert
- VF-624ms
- CP-Select 624 CB
- ZB-624

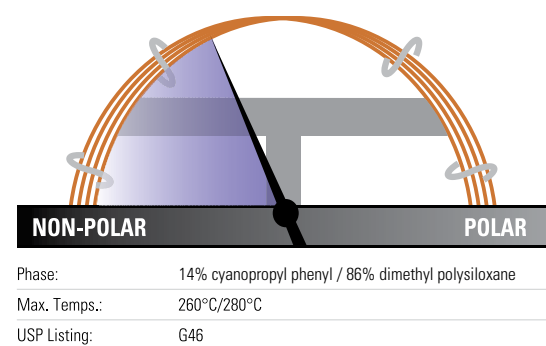
Acetonitrile and Dichloromethane



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	10628725	1 Each
0.25	15	0.25	10158084	1 Each
		0.25	10187844	1 Each
		0.5	10249614	1 Each
		1.0	10732927	1 Each
		1.0	10076214	1 Each
0.32	15	0.25	10331015	1 Each
		0.25	10066214	1 Each
		0.5	10565435	1 Each
0.53	15	1.0	10640836	1 Each
		0.25	10381205	1 Each
		1.0	10752727	1 Each
		0.25	10341015	1 Each
0.25	30	0.25	10566185	1 Each
		0.5	10678525	1 Each
		1.0	10649295	1 Each
		1.0	10310835	1 Each
		3.0	10310835	1 Each

Applications:

- Alcohols
- Pesticides
- Oxygenates
- PCB congeners
- Aroclor mixes

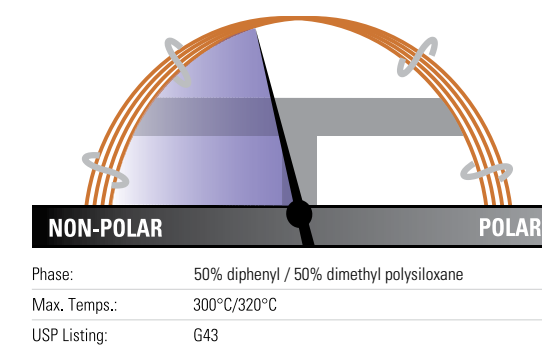
Similar to:

- 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	10648915	1 Each
0.25	15	0.25	10311315	1 Each
		0.25	10497904	1 Each
		0.5	10650256	1 Each
		1.0	10703107	1 Each
		1.0	12967131	1 Each
0.32	15	0.25	10487904	1 Each
		0.25	10723877	1 Each
		0.5	10764837	1 Each
0.53	30	1.0	10703297	1 Each
		0.25	10219714	1 Each
		0.5	10300835	1 Each
		1.0	10127704	1 Each
		1.5	10177614	1 Each

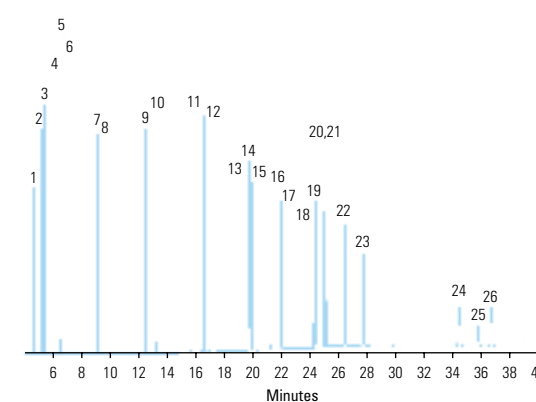
Applications:

- 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

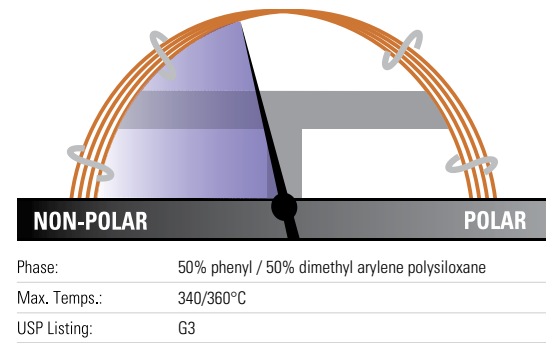
Detector Type: MS
Carrier Gas: He
Flow Rate: 1.2mL/min
Injection Volume: 1.0µL
Injection Mode: Splitless, 300°C

- | | |
|--------------------------|------------------------------|
| 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	13498018	1 Each
	20	0.15	13408028	1 Each
0.18	20	0.18	15214533	1 Each
		0.36	15234533	1 Each
0.25	15	0.25	15224533	1 Each
	30	0.25	15287478	1 Each
0.32	15	0.25	15244533	1 Each
	30	0.25	15264533	1 Each

Applications:

- PAHs
- Pesticides and herbicides
- Phthalate esters
- Triglycerides

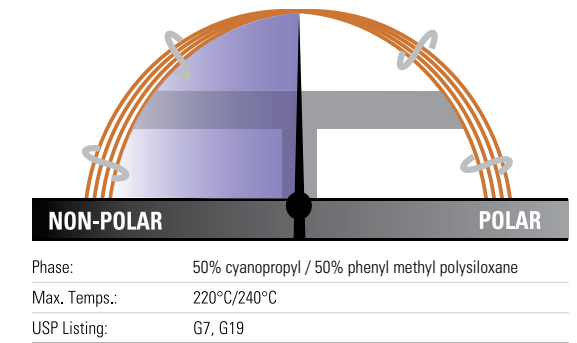
Similar to:

- 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	10575435	1 Each
	30	0.25	10704837	1 Each
	60	0.25	10350825	1 Each
0.32	30	0.25	10209614	1 Each
		0.5	10108094	1 Each

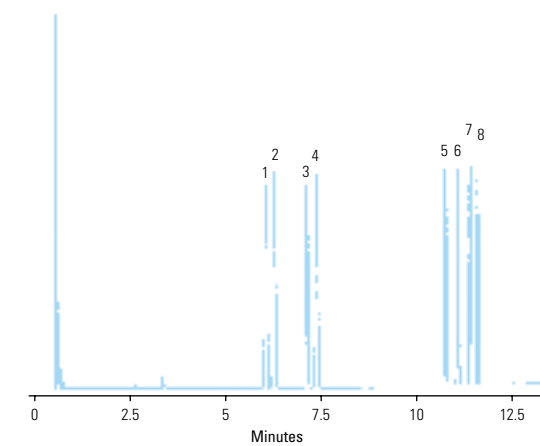
Applications:

- 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

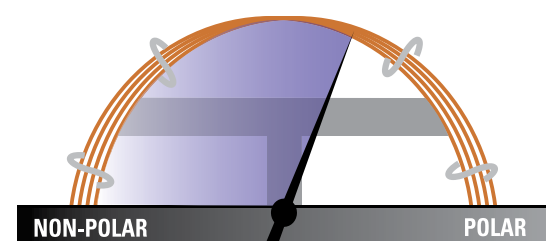
- | | |
|---------------|---------------|
| 1. rhamnitol | 5. mannitol |
| 2. fucitol | 6. galactitol |
| 3. ribitol | 7. glucitol |
| 4. arabinitol | 8. inositol |



TraceGOLD TG-200MS GC Columns

Exceptionally inert mid-polarity columns with selectivity and elution order optimized for difficult separations

- Polar phase, trifluoropropyl methylpolysiloxane 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



Phase:	Trifluoropropylmethyl Polysiloxane
Max. Temps.:	320°C/340°C
USP Listing:	G6

TraceGOLD TG-200MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.15	10	0.15	13478018	1 Each
	20	0.15	13488018	1 Each
0.25	30	0.25	10734647	1 Each
		0.5	10628525	1 Each
		1.0	10016604	1 Each
0.32	30	0.25	10524875	1 Each
		0.5	10504115	1 Each
		1.0	10743117	1 Each

Applications:

- Solvents
- Fluorocarbons
- Alcohols and ketones
- Silanes
- Glycols

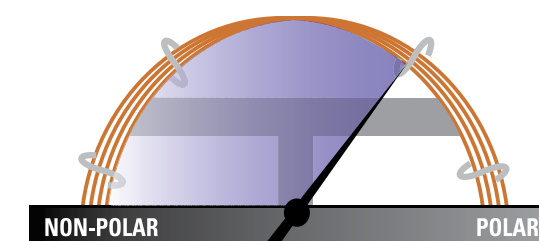
Similar to:

- 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



Phase:	Polyethylene Glycol (PEG)
Max. Temps.:	240/260°C
USP Listing:	G14, G15, G20, G39

TraceGOLD TG-WaxMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.0	10	0.1	10734267	1 Each
0.15	10	0.15	13448018	1 Each
	20	0.15	13438018	1 Each
	40	0.15	13458018	1 Each
0.18	20	0.18	13468018	1 Each
0.25	15	0.25	10419444	1 Each
	30	0.25	10477714	1 Each
	30 with 5m SafeGuard	0.5	10670446	1 Each
		0.25	11870443	1 Each
	60	0.25	10381065	1 Each
	60	0.5	10147944	1 Each
0.32	15	0.25	10137944	1 Each
		0.5	10157804	1 Each
		1.0	10535065	1 Each
	30	0.25	10209234	1 Each
		0.5	10744647	1 Each
		1.0	10187994	1 Each
	30m with 5m SafeGuard	0.25	11880443	1 Each
		0.25	10025794	1 Each
		0.5	10219614	1 Each
	60	1.0	10210055	1 Each
		0.5	10167804	1 Each
		1.0	10380875	1 Each
0.53	15	0.25	10219234	1 Each
		0.5	10055594	1 Each
		1.0	10280285	1 Each
	30	1.5	10321355	1 Each
		0.25	10722537	1 Each
		0.5	10229614	1 Each
	60	1.0	10468104	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

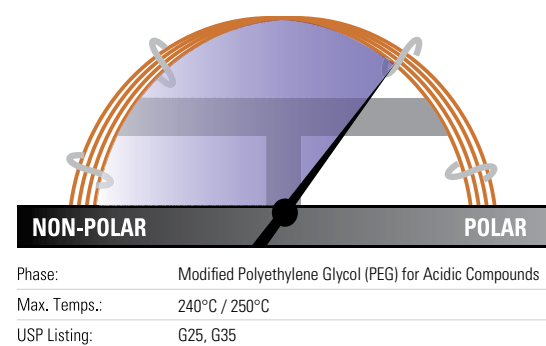
TraceGOLD TG-WaxMT Metal GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	11850463	1 Each
		0.5	11890463	1 Each
		0.25	11870463	1 Each
0.53	30	0.25	11860463	1 Each
		0.5	11800473	1 Each
		1.0	11820473	1 Each
		1.5	11830473	1 Each

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	10086254	1 Each
	30	0.25	10754057	1 Each
		0.5	10487314	1 Each
		0.25	10535615	1 Each
0.32	15	0.25	10594475	1 Each
		0.5	10468464	1 Each
	30	0.25	10229274	1 Each
		0.5	10781937	1 Each
1.0		10220245	1 Each	
0.53	60	0.25	10239274	1 Each
		0.5	10628515	1 Each
		0.5	10596755	1 Each
	15	1.0	10640256	1 Each
		0.25	10147604	1 Each
		0.5	10791937	1 Each
30	0.5	10417724	1 Each	

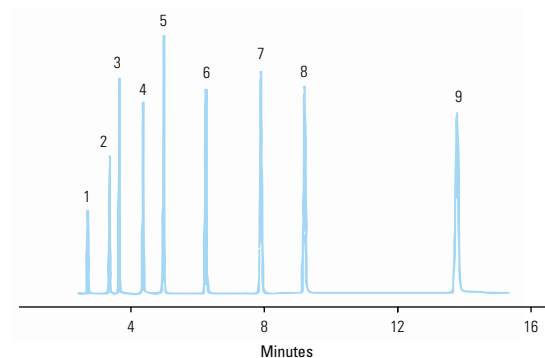
Applications:

- 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

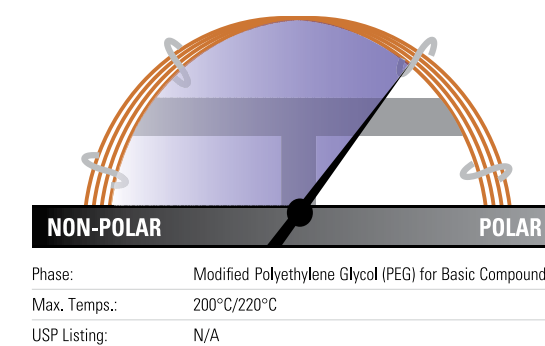
Temperature: 145°C Isothermal
 Detector Type: FID
 Carrier Gas: Hydrogen
 Flow Rate: 40cm/sec
 Injection Volume: 1.0µL
 Injection Mode: Split (50:1), 250°C

- | | |
|--------------------|--------------------|
| 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	10469634	1 Each
		0.5	10361335	1 Each
0.32	30	0.25	10782147	1 Each
		0.5	10299304	1 Each
	60	1.0	10137374	1 Each
		1.0	10361115	1 Each
0.53	30	0.5	10774437	1 Each
		1.0	10095834	1 Each

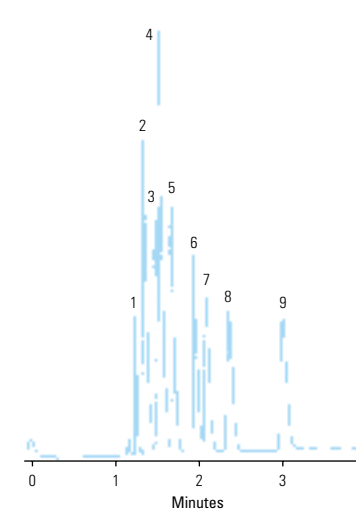
Applications:

- 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

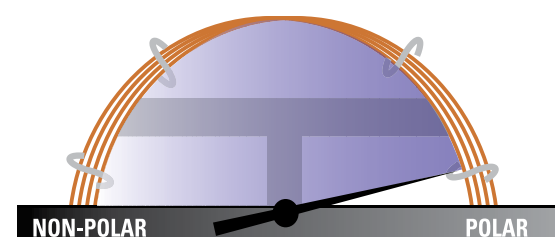
Temperature: 45°C Isothermal
 Detector Type: FID
 Carrier Gas: Hydrogen
 Flow Rate: 40cm/sec
 Injection Volume: 1µL
 Injection Mode: Direct Injection, 250°C

- | | |
|-------------------|--------------------|
| 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



Phase:	90% biscyanopropyl / 10% cyanopropyl phenyl polysiloxane
Max. Temps.:	260°C/275°C
USP Listing:	G8, G48

TraceGOLD TG-POLAR GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.1	10210245	1 Each
		0.2	10341265	1 Each
	60	0.1	10488484	1 Each
		0.2	10167614	1 Each
0.32	30	0.1	10596375	1 Each
		0.2	10467714	1 Each
	60	0.2	10301315	1 Each
		0.2	10723687	1 Each
0.53	30	0.1	10157854	1 Each
		0.2	10600066	1 Each
		0.1	10107574	1 Each
	60	0.1	10107574	1 Each
		0.2	10516195	1 Each
		0.2	10516195	1 Each

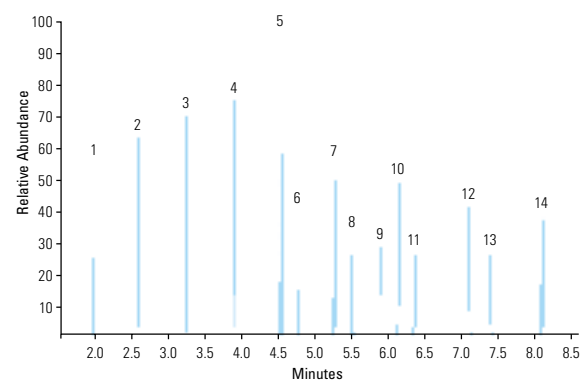
Applications:

- 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)

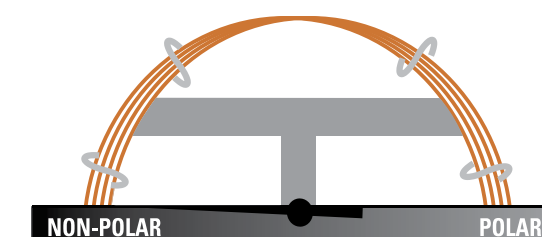
Detector Type: MS
Carrier Gas: He
Flow Rate: 1.2mL/min
Injection Volume: 0.1µL
Injection Mode: Split (100:1), 250°C

- | | |
|------------------------|-------------------------------|
| 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



Phase:	Proprietary
Max. Temps.:	340°C/360°C
USP Listing:	N/A

TraceGOLD TG-XLBMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	0.18	11511154	1 Each
0.25	15	0.1	11541134	1 Each
		0.25	11571134	1 Each
	30	0.1	11551134	1 Each
		0.25	11591134	1 Each
	60	0.5	11531144	1 Each
		0.25	11511144	1 Each
0.32	30	0.1	11561134	1 Each
		0.25	11501144	1 Each
	60	0.5	11541144	1 Each
		1.0	11581144	1 Each

Applications

- Pesticides
- PCB congeners
- PAHs
- Aroclor mixes

Similar to:

- Rxi-XLB
- DB-XLB
- VF-Xms

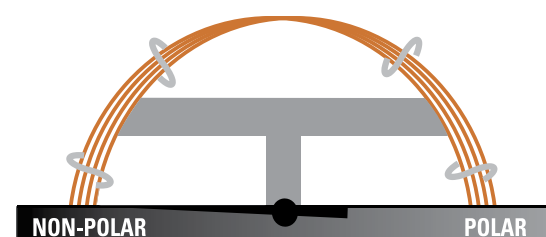
Semi-Volatile Drinking Water Application Kit

Description	Cat. No.	Quantity
Semi-Volatile Drinking Water Application Kit	13446966	1 Each
Containing the following:		
TraceGOLD TG-XLBMS GC Column 30m x 0.25mm x 0.25µm	11591134	1 Each
BTO Septa 17mm Diameter	10641324	50 Pack
S/SL Injector – Split/Splitless Liner, 5mm ID x 8mm OD x 105mm Length	10455173	5 Pack
S/SL Injector – Silver Seals	11524030	10 Pack
S/SL Injector – Graphite Liner Seals	10561115	10 Pack
S/SL Injector – Graphite Ferrules for 0.25mm ID Column	10756144	10 Pack
MS Interface – Graphite/Vespel Ferrules for 0.25mm ID Column	10466744	10 Pack
2mL Screw Top Vials, Amber Glass	13496806	100 Pack
Blue Caps With PTFE/Red Rubber Seals	13436946	100 Pack
5µL Fixed Needle Syringe, 50mm Length, 26 Gauge, Cone Needle	10512265	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



Phase:	Proprietary
Max. Temps.:	260°C
USP Listing:	N/A

TraceGOLD TG-VRX GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	1.0	11591164	1 Each
	40	1.0	11501174	1 Each
0.25	30	1.4	11511164	1 Each
	60	1.4	11521164	1 Each
0.32	30	1.8	11531164	1 Each
	60	1.8	11541164	1 Each

Applications:

- Volatile organic pollutants
- US EPA Method 8021 compounds

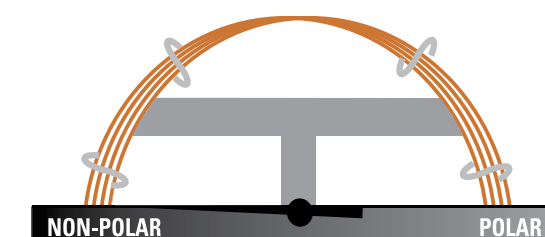
Similar to:

- 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



Phase:	Proprietary
Max. Temps.:	260°C
USP Listing:	N/A

TraceGOLD TG-VMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	1.0	11591154	1 Each
	40	1.0	11501164	1 Each
0.25	30	1.4	11521154	1 Each
	60	1.4	11531154	1 Each
0.32	30	1.8	11541154	1 Each
	60	1.8	11551154	1 Each

Applications:

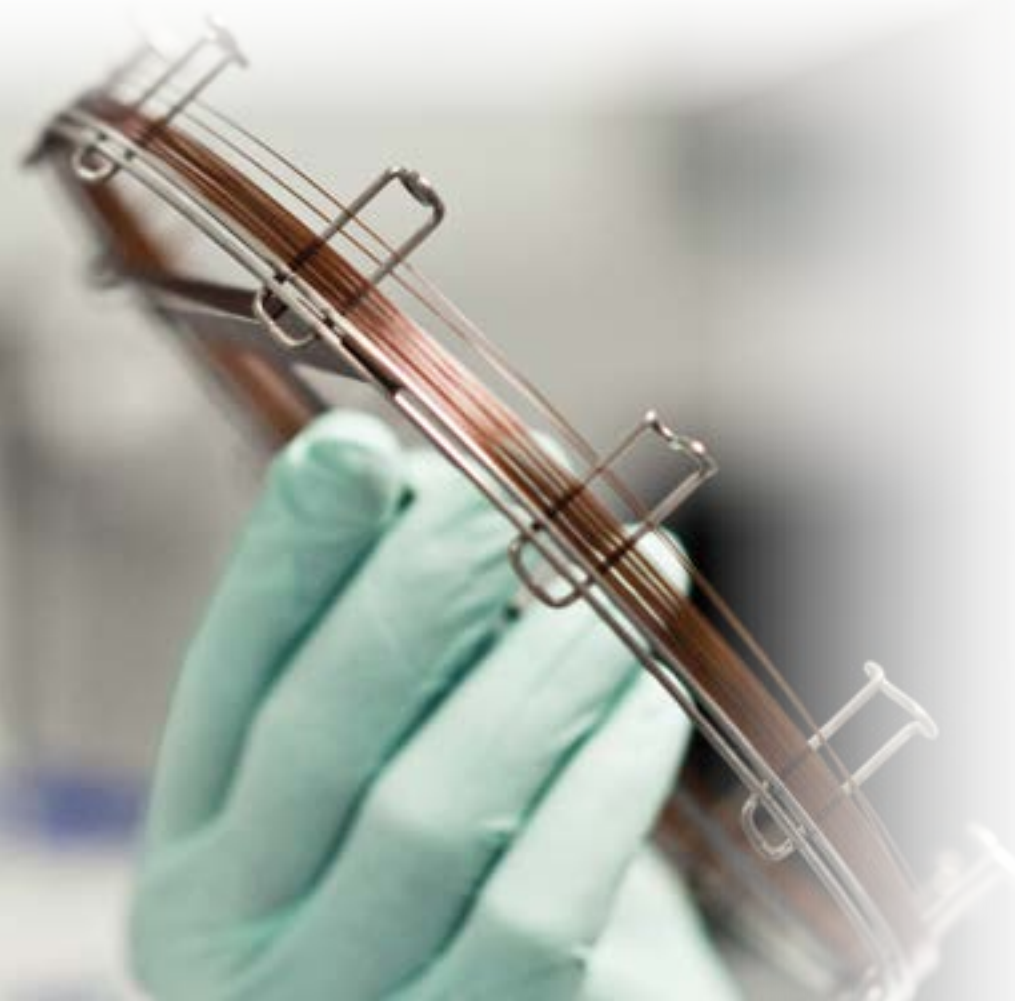
- Volatile organic pollutants
- US EPA Method 8260B compounds

Similar to:

- Rtx-VMS

Volatile Organic Compound (VOC) Application Kit

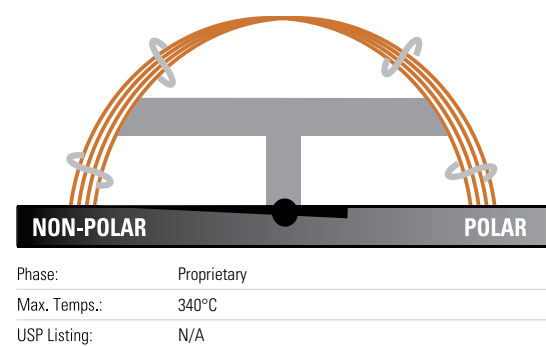
Description	Cat. No.	Quantity
Volatile Organic Compound (VOC) Application Kit	13416816	1 Each
Containing the following:		
TraceGOLD TG-VMS GC Column 20m x 0.18mm x 1.00µm	11591154	1 Each
S/SL Injector – BTO Septa 9mm Diameter	10384563	50 Pack
S/SL Injector – Silver Seals	11524030	10 Pack
S/SL Injector – Graphite Liner Seals	10561115	10 Pack
S/SL Injector – Graphite Ferrules for 0.25mm ID Column	10756144	10 Pack
MS Interface – Graphite/Vespel Ferrules for 0.25mm ID Column	10466744	10 Pack
2mL Screw Top Vials, Amber Glass	13496806	100 Pack
Blue Caps with PTFE/Red Rubber Seals	13436946	100 Pack
40mL VOA Sample Vials with Caps and Seals	11548480	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	11521124	1 Each
0.25	15	0.25	11531124	1 Each
	30	0.25	11541124	1 Each
	60	0.25	11561124	1 Each
0.53	30	0.32	11511134	1 Each
		0.5	11591124	1 Each

TraceGOLD TG-OCP II GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	11501114	1 Each
	20	0.1	11531114	1 Each
0.18	10	0.14	11561114	1 Each
	20	0.14	11551114	1 Each
0.25	15	0.2	11591114	1 Each
	30	0.2	11581114	1 Each
	60	0.2	11571114	1 Each
0.32	15	0.25	11511114	1 Each
		0.25	11521114	1 Each
		0.5	11541114	1 Each
0.53	15	0.42	11511124	1 Each
	30	0.42	11501124	1 Each

Applications:

- Organochlorine pesticides
- Herbicides

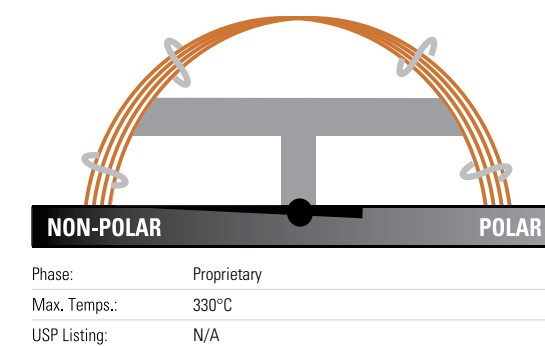
Similar to:

- Rtx-CLPesticides/
Rtx-CLPesticides2

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	11571104	1 Each
0.32	30	0.5	11591104	1 Each
0.53	30	0.83	11561104	1 Each

TraceGOLD TG-OPP II GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	11531104	1 Each
0.32	30	0.32	11551104	1 Each
0.53	30	0.5	26075-2250	1 Each

Applications:

- Organophosphorus pesticides

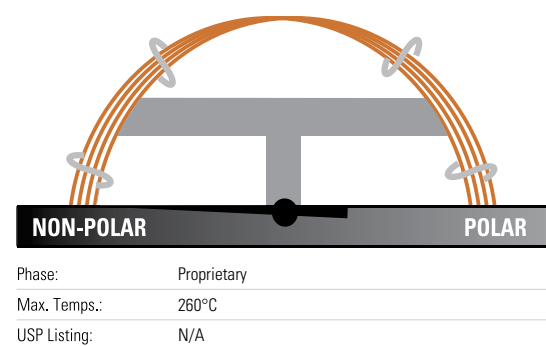
Similar to:

- 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	15274533	1 Each
0.53	30	3.0	15284533	1 Each

TraceGOLD TG-ALC Plus II GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	30	0.5	15294533	1 Each
0.53	30	1.0	15234543	1 Each

Applications:

- Blood alcohol analysis
- Abused inhalent anesthetics
- γ -hydroxybutyrate (GHB)
- γ -butyrolactone (GBL)
- Glycols
- Common industrial solvents

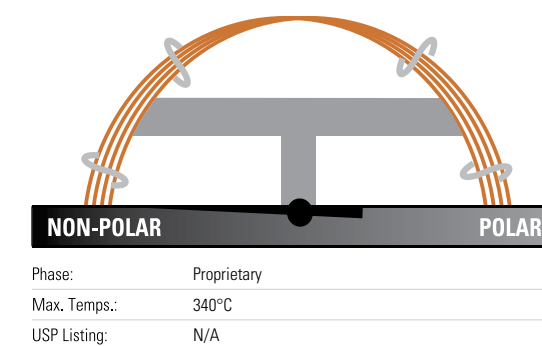
Similar to:

- 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	15277478	1 Each
0.25	60	0.25	15267478	1 Each

Applications:

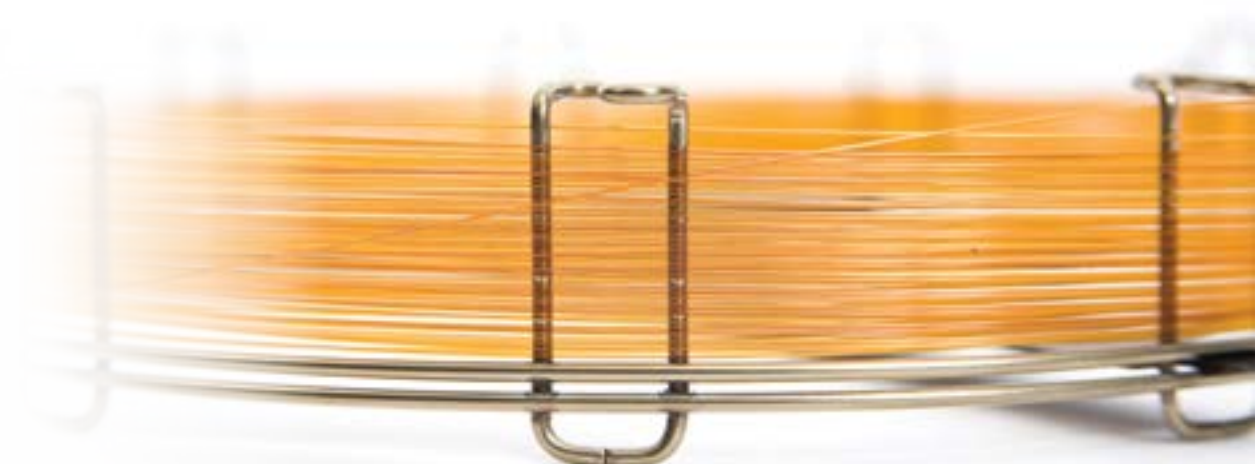
- Dioxins
- Furans

Similar to:

- Rtx-Dioxin2
- DB-Dioxin

Persistent Organic Pollutants (POPs) Confirmation Kit

Description	Cat. No.	Quantity
Persistent Organic Pollutants (POPs) Confirmation Kit	15207528	1 Each
Containing the following:		
TraceGOLD TG-Dioxin GC Column 60m x 0.25mm x 0.25µm	15267478	1 Each
S/SL Injector – BTO Septa 11mm diameter	12683166	50 Pack
S/SL Injector – Split Straight Liner 4 x 6.3 x 78.5mm, Quartz Wool	10415923	5 Pack
S/SL Injector – Splitless Liner with Single Taper 4 x 6.3 x 78.5mm, Quartz Wool	10100993	5 Pack
Gold Inlet Base Seals, Single Column Installation	10281665	10 Pack
Graphite Liner Sealing Rings	10467894	10 Pack
Graphite Ferrules for 0.1-0.32mm Column	10756334	10 Pack
Graphite/Vespel Ferrules for 0.1-0.25mm Column	10120513	10 Pack
1.1mL Screw Top Tapered Vial, Clear Gold Grade Glass	11503680	500 Pack
8mm Screw Caps with Pre-Fitted Silicone/PTFE Septa	11583710	500 Pack
10µL Fixed Needle Syringe for TriPlus RSH, 57mm Length, 26s Gauge	13414826	1 Each

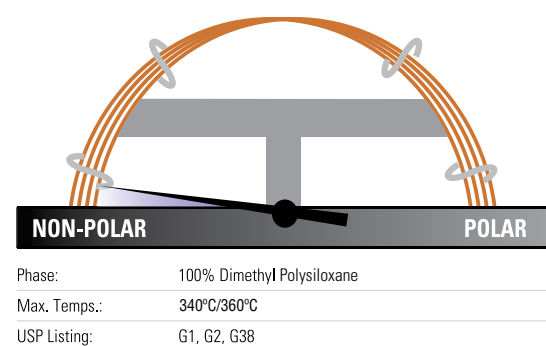


TRACE GC Columns

TRACE TR-1 GC Columns

Designed for method development

- Non-polar phase, 100% dimethyl polysiloxane
- High operating temperature



TRACE TR-1 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	10475533	1 Each
	30	0.1	10429154	1 Each
		0.25	10475723	1 Each
0.32	60	0.25	10219264	1 Each
	15	0.25	10068942	1 Each
	30	0.25	10600174	1 Each

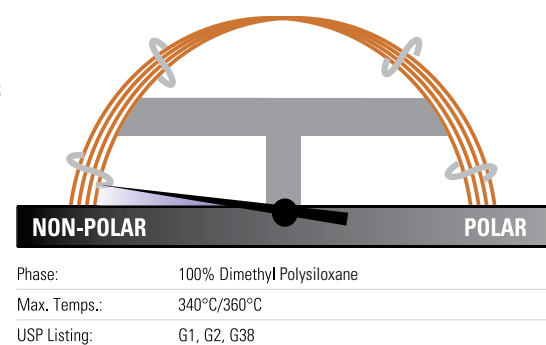
Applications:

- 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



TRACE TR-1MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.1	10392595	1 Each
		0.25	10681524	1 Each
		0.25	10455363	1 Each
0.32	30	0.25	10394663	1 Each
	60	0.25	10551505	1 Each
		1.0	10342785	1 Each

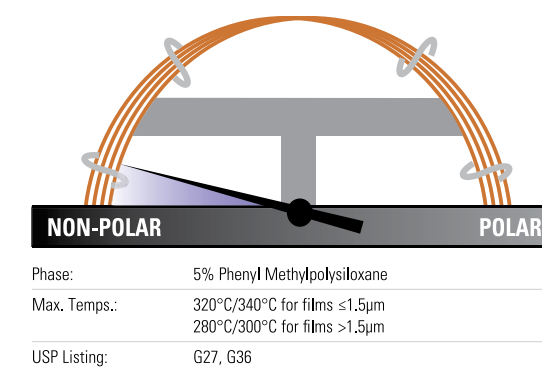
Applications:

- 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	10374603	1 Each
	30	0.25	10243263	1 Each
		0.5	10293593	1 Each
0.32	60	0.25	10384173	1 Each
	7	0.25	10219844	1 Each
	15	0.25	10079372	1 Each
0.53	30	0.25	10253263	1 Each
		0.5	10735983	1 Each
		1.0	10096004	1 Each
	60	0.25	10424963	1 Each
	100	0.5	10262005	1 Each
		0.5	10532465	1 Each
0.53	30	1.0	10089182	1 Each
		1.5	10585415	1 Each
		5.0	10223423	1 Each

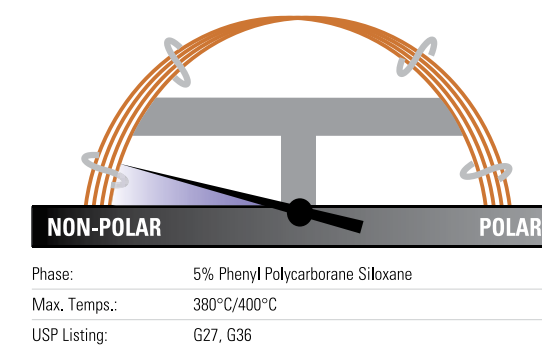
Applications:

- 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 polycarborene 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	10557455	1 Each
	30	0.1	10534685	1 Each
		0.25	10504105	1 Each
0.32	12	0.1	10168084	1 Each

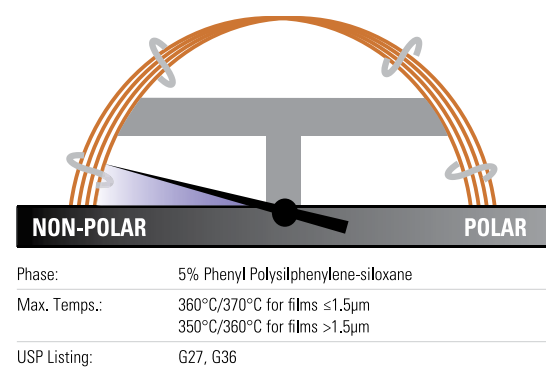
Applications:

- 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



TRACE TR-5MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	10239694	1 Each
0.15	25	0.25	10628895	1 Each
0.18	20	0.18	10638895	1 Each
0.25	15	0.1	10331265	1 Each
		0.25	10434403	1 Each
		0.1	10197564	1 Each
		0.25	10533795	1 Each
		0.25	11547771	1 Each
		0.5	10089422	1 Each
		1.0	10495533	1 Each
0.25	60	0.25	10029382	1 Each
		1.0	10753867	1 Each
0.32	15	1.0	10038952	1 Each
		0.25	10592065	1 Each
		0.5	10650174	1 Each
0.32	30	1.0	10593025	1 Each
		0.5	10380975	1 Each
		1.0	10659475	1 Each
0.53	30	1.5	10722927	1 Each
		3.0	10177934	1 Each

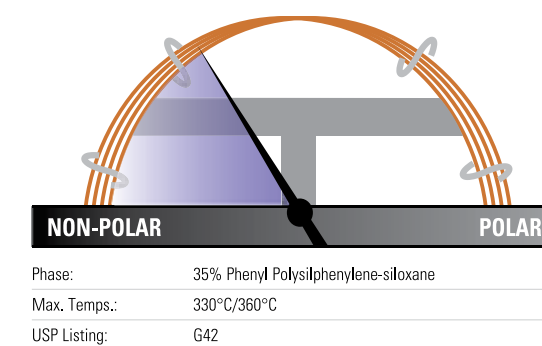
Applications:

- 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	10486493	1 Each
	30	0.25	10060013	1 Each
	60	0.25	10065634	1 Each
0.32	30	0.25	10070013	1 Each
0.53	15	1.0	10448274	1 Each
	30	1.0	10639085	1 Each

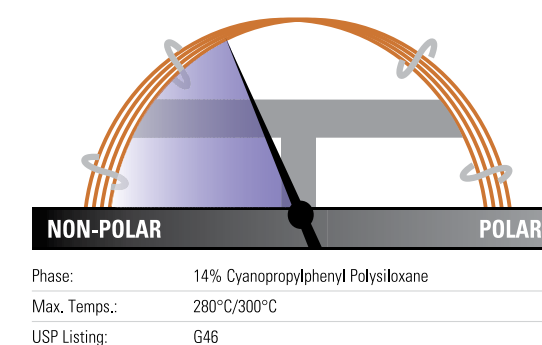
Applications:

- 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	10039732	1 Each
	60	0.25	10640236	1 Each
0.32	15	0.25	10630236	1 Each
		0.25	10344963	1 Each
	60	1.0	10209554	1 Each
		0.25	11507771	1 Each
0.53	30	1.0	10467124	1 Each

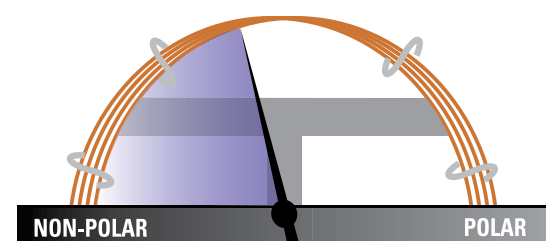
Applications:

- 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



Phase:	50% Phenyl Polysilphenylene-siloxane
Max. Temps.:	360°C/370°C
USP Listing:	G3

TRACE TR-50MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	10576565	1 Each
	30	0.15	10611206	1 Each
		0.25	10618895	1 Each
0.32	30	0.25	10055724	1 Each

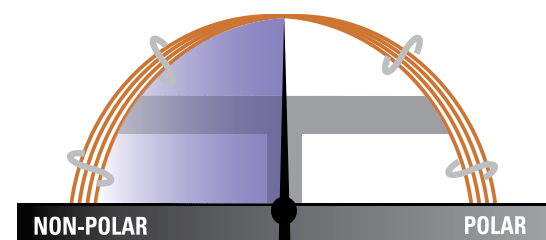
Applications:

- 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



Phase:	50% Cyanopropylphenyl Polysiloxane
Max. Temps.:	230°C / 250°C
USP Listing:	G7

TRACE TR-225 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	10370835	1 Each
	60	0.25	10210155	1 Each
0.32	25	0.25	10600266	1 Each

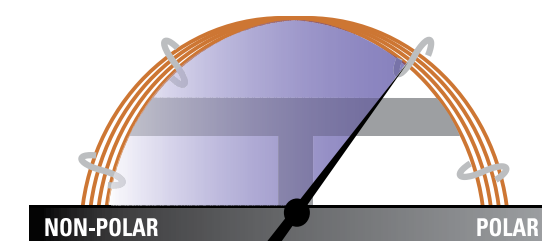
Applications:

- 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



Phase:	Polyethylene Glycol (PEG)
Max. Temps.:	260°C/280°C for films <1.0µm 240°C/260°C for 1.0µm films
USP Listing:	G16, G20

TRACE TR-Wax GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	10170643	1 Each
		0.5	10120983	1 Each
		1.0	10512075	1 Each
0.32	60	0.25	10315253	1 Each
		0.25	10059142	1 Each
		0.25	10642094	1 Each
	60	0.5	10333993	1 Each
		1.0	10130983	1 Each
		0.25	10469234	1 Each
0.53	15	1.0	10147834	1 Each
		1.0	10458464	1 Each
	30	0.5	10545475	1 Each
		1.0	10796324	1 Each
60	1.0	10712517	1 Each	

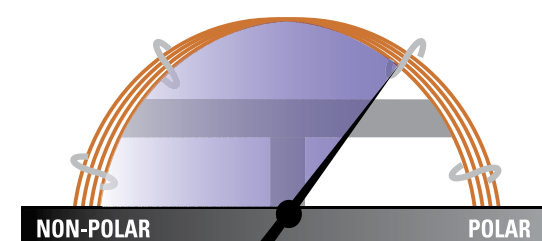
Applications:

- 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



Phase:	Polyethylene Glycol (PEG)
Max. Temps.:	260°C/280°C
USP Listing:	G16

TRACE TR-WaxMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	10503035	1 Each
		0.5	10651196	1 Each
		1.0	10314523	1 Each
0.32	60	0.25	10455353	1 Each
		0.25	10089682	1 Each
		0.5	10394323	1 Each
60	0.25	10513815	1 Each	

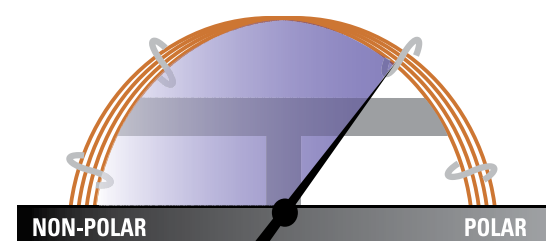
Applications:

- 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



Phase:	TPA Modified Polyethylene Glycol (PEG)
Max. Temps.:	240°C/250°C
USP Listing:	G25, G35

TRACE TR-FFAP GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	10704637	1 Each
	30	0.25	10086744	1 Each
	60	0.25	10259864	1 Each
0.32	30	0.25	10784077	1 Each
	50	0.5	10714827	1 Each
0.53	15	0.5	10704827	1 Each
	30	0.5	10447514	1 Each
		1.0	10189414	1 Each

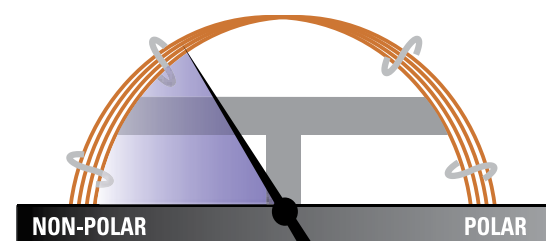
Applications:

- 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



Phase:	6% Cyanopropylphenyl Polysiloxane
Max. Temps.:	280°C/300°C
USP Listing:	G43

TRACE TR-V1 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	1.0	10355203	1 Each
0.25	30	1.4	10030213	1 Each
	60	1.4	10158074	1 Each
0.32	30	1.8	10090253	1 Each
	60	1.8	10219824	1 Each
0.53	30	3.0	10111383	1 Each

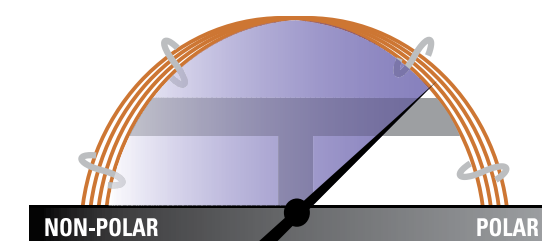
Applications:

- 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



Phase:	70% Cyanopropyl Polysilphenylene-siloxane
Max. Temps.:	250°C/260°C
USP Listing:	N/A

TRACE TR-FAME GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.2	10390975	1 Each
0.22	25	0.25	10325203	1 Each
	30	0.25	10497524	1 Each
	50	0.25	10407534	1 Each
0.25	60	0.25	10594495	1 Each
	30	0.25	10542465	1 Each
	60	0.25	10324773	1 Each
0.32	120	0.25	10543425	1 Each
	25	0.25	10085934	1 Each
	30	0.25	10299904	1 Each
	60	0.25	10310935	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	10187614	1 Each
TR-525	0.25	30	0.25	10407344	1 Each
TR-527	0.25	30	0.25	10239664	1 Each
TR-8095	0.32	12	0.25	10564685	1 Each
TR-8270	0.25	30	0.5	10107864	1 Each
TR-8270	0.25	30	1.0	10209744	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

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	10211635	1 Each
TR-Pesticide II	0.25	30	0.25	5m guard column attached	10773586	1 Each
TR-Pesticide III	0.25	30	0.25	5m guard column attached	10713236	1 Each
TR-Pesticide IV	0.25	30	0.25	—	10210705	1 Each

Applications:

- Organophosphate pesticides
- Organochlorine pesticides
- Pyrethroid pesticides
- Herbicides

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	10085834	1 Each
TR-Dioxin 5MS	0.25	60	0.25	10351335	1 Each
TR-Dioxin 5MS	0.25	30	0.1	10299314	1 Each
TR-Dioxin 5MS	0.25	60	0.1	10478464	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	10229664	1 Each
TR-BioDiesel (G)	EN 14105	0.32	10	0.1	10301255	1 Each
TR-BioDiesel (F)	EN 14103	0.25	30	0.25	10526955	1 Each
TR-BioDiesel (G) ASTM	ASTM D-6584	0.32	10	0.1	10383605	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	10381015	1 Each
TR-DoA5	0.25	15	0.25	10477514	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

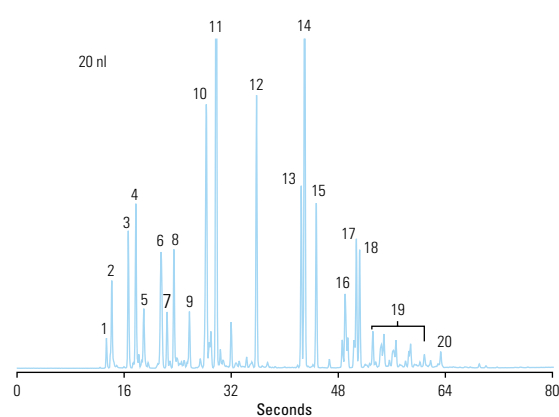
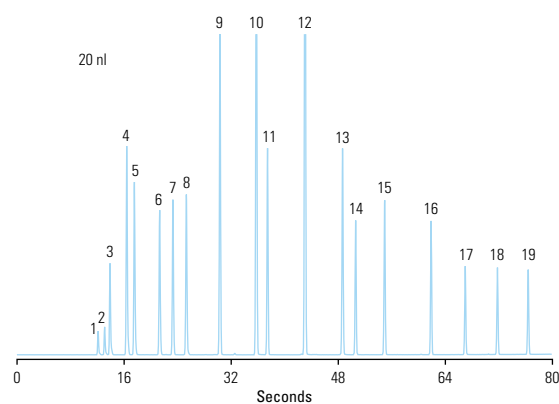
The analyses were performed in the UltraFast GC mode using a TRACE GC Ultra System equipped with a Split/Splitless injector (SSL) and a Digital Pressure and Flow Controller, as well as a FAST FID detector. The GC System was also equipped with an UltraFast Module (UFM).

Split injections were performed with a AS3000 Autosampler using a 0.5µL plunger-in-needle syringe p/n 10361505. 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



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	10269174	1 Each
		5	0.1	ASTM D-2887	10197974	1 Each
		5	0.25	ISO 9377-2	10086104	1 Each
		10	3.0	ASTM D-3710	10630056	1 Each
UFC-5	0.10	2.5	0.4	General	10497884	1 Each
		5	0.4	General	10311195	1 Each
		5	0.1	General	10321195	1 Each
		10	0.1	General	12947121	1 Each
		10	0.4	General	11531004	1 Each
UFC-1701	0.10	5	0.1	General	10178044	1 Each
UFC-WAX	0.10	5	0.1	FAMES, Essential Oils	10594265	1 Each
		5	0.2	General	10137934	1 Each
UFC-264	0.10	10	0.5	Volatiles	10197684	1 Each
UFC-BioDiesel	0.32	5	0.5	Biodiesel	10610646	1 Each
UFC-M1	0.32	5	0.25	General	10724657	1 Each
UFC-POR Q					11501004	1 Each



TracePLOT GC Columns

TracePLOT TG-BOND Alumina GC Columns: Na₂SO₄ 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
Na₂SO₄ Deactivation				
0.32	30	5	10107644	1 Each
	50	5	10035724	1 Each
0.53	30	10	10026554	1 Each
	50	10	10584305	1 Each
KCl Deactivation				
0.32	30	5	10554135	1 Each
	50	5	10704627	1 Each
0.53	30	10	10016124	1 Each
	50	10	10630636	1 Each

Applications:

- C1-C5 hydrocarbons
- Unsaturated hydrocarbon isomers

TracePLOT TG-BOND Msieve 5A GC Columns

Designed for separation of Ar/O₂ 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	10671386	1 Each
	30	30	10681386	1 Each
0.53	15	50	10198024	1 Each
	30	50	10371385	1 Each
	50	50	13426796	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	10429634	1 Each
	30	10	10439634	1 Each
0.53	15	20	10299654	1 Each
	30	20	26004-6090	1 Each

Applications:

- C1 to C3 isomers and alkanes up to C12
- Separation of CO₂, methane and O₂/N₂/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	10340825	1 Each
	30	10	10249564	1 Each
0.53	15	20	10679865	1 Each
	30	20	10299224	1 Each

Applications:

- Separation of ethane, ethylene and acetylene to baseline

GC Reagents

Making the undetectable, detectable

Improve separation and detection for GC and GC-MS applications with our selection of derivatization reagents.

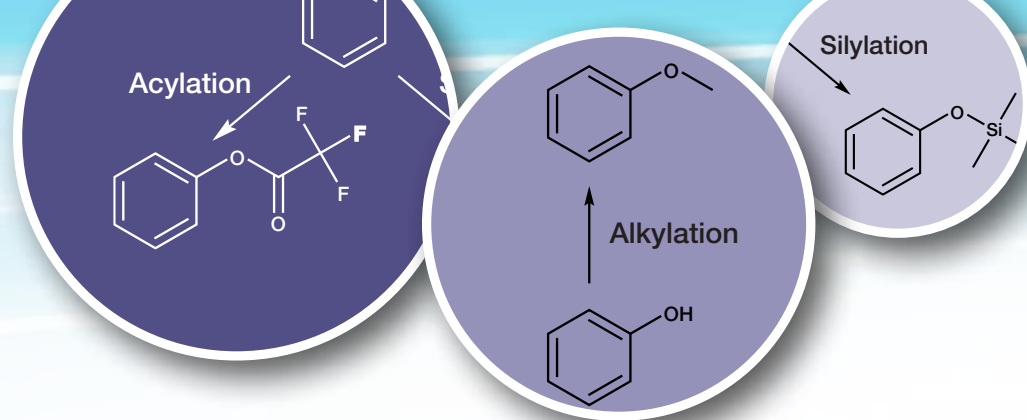
The Ideal Derivatization Procedure Will:

- 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



GC Reagents Technical Resources



visit 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

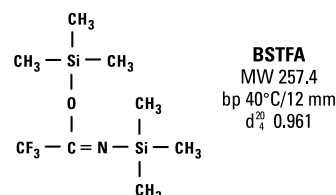


Silylation Reagents

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

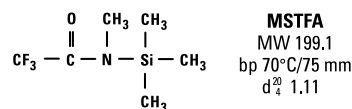
Description	Quantity	Cat. No.	Quantity
BSTFA	10 × 1mL ampules	11776957	1 Pack
	25g	11557570	1 Each
	100g	X 11567570	1 Each
BSTFA + 1% TMCS	10 × 1mL ampules	11557851	1 Pack
	10g	11597570	1 Each
	25g	11527851	1 Each
	100g	X 11517871	1 Each
BSTFA + 10% TMCS	10 × 1mL ampules	11577841	1 Pack

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(CH₃)₃ 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

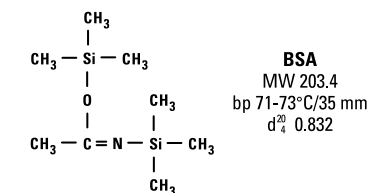
Description	Quantity	Cat. No.	Quantity
MSTFA	10 × 1mL ampules	11786957	1 Pack
	10g	11587670	1 Each
	25mL	11597670	1 Each
	100mL	X 11507680	1 Each
MSTFA + 1% TMCS	10 × 1mL ampules	11567851	1 Pack

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



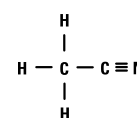
BSA

Description	Quantity	Cat. No.	Quantity
BSA	10 x 1mL	11726997	1 Pack

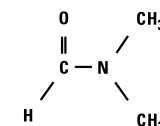
Silylation Grade Solvents

Manufactured to meet your exacting silylation needs

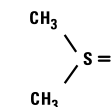
- Purified, dried and packaged under nitrogen in convenient 50mL Hypo-Vial Sample Storage Vials
- Supplied with elastomer septa, allowing immediate access to the sample without exposure to moisture and oxygen
- Use polar solvents (acetonitrile, dimethylformamide, dimethylsulfoxide, pyridine, tetrahydrofuran) to facilitate reactions; nonpolar organic solvents may be used, but they will not accelerate the rate of reaction



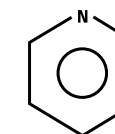
Acetonitrile
MW 41.05
bp 81.6°C



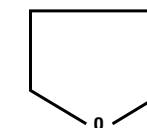
Dimethylformamide
MW 73.09
bp 153°C



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

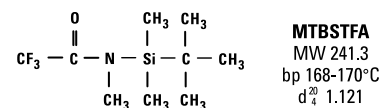
Description	Quantity	Cat. No.	Quantity
Acetonitrile	50mL	X 11577821	1 Each
Dimethylformamide (DMF)	50mL	X 11561941	1 Each
Dimethylsulfoxide (DMSO)	50mL	X 11581941	1 Each
Pyridine	50mL	X 11536661	1 Each
Tetrahydrofuran (THF)	50mL	X 11556661	1 Each

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



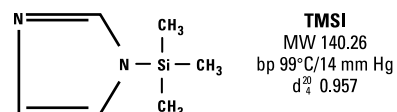
MTBSTFA and MTBSTFA + 1% TBDMCS

Description	Quantity	Cat. No.	Quantity
MTBSTFA	5mL ampules	11527680	1 Each
MTBSTFA + 1% TBDMCS	10 × 1mL	11597861	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



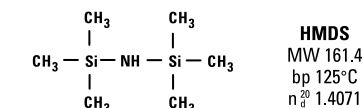
TMSI

Description	Quantity	Cat. No.	Quantity
TMSI (<i>N</i> -Trimethylsilylimidazole)	10 × 1mL ampules	11737027	1 Pack
	25g	11537841	1 Each
	100g	11587861	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



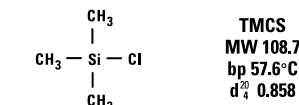
HMDS

Description	Quantity	Cat. No.	Quantity
HMDS (Hexamethyldisilazane)	25g	11552371	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	11562391	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	11567630	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	11547841	1 Pack
Tri-Sil HTP Reagent HMDS:TMCS:Pyridine (2:1:10)	50mL	X 11587841	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	11567680	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	11537851	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

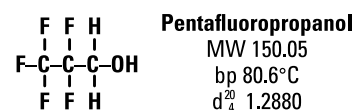
Description	Quantity	Cat. No.	Quantity
Tri-Sil TP Reagent TMSI: Pyridine (1:4)	10 × 1mL ampules	11597831	1 Pack
Tri-Sil TP Reagent TMSI: Pyridine (1:4)	25mL	11597680	1 Each

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



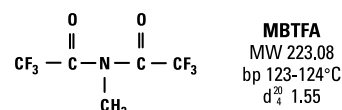
Pentafluoropropanol

Description	Quantity	Cat. No.	Quantity
Pentafluoropropanol	10 x 1mL ampules	11567841	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

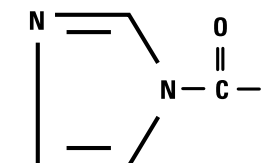
Description	Quantity	Cat. No.	Quantity
MBTFA [N-Methyl-bis(trifluoroacetamide)]	10 x 1mL ampules	11547690	1 Pack
	25mL	11577861	1 Each
	100mL	X 11577690	1 Each
	5g	11557690	1 Each

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 ₃ F ₇	HFBI	264.10	57 to 58°C/10mm
CF ₃	TFAI	164.08	38 to 40°C/14mm

Perfluoroacylimidazoles (HFBI and TFAI)

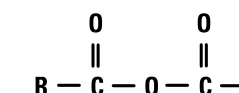
Description	Quantity	Cat. No.	Quantity
HFBI	5g	* 11587590	1 Each
TFAI	10 x 1mL ampules	11747067	1 Pack

* 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 11517800	1 Each
PFAA (Pentafluoropropionic Acid Anhydride)	10 x 1mL ampules	11507750	1 Pack
PFAA	25g	X 11597740	1 Each
PFAA	100g	X 11587740	1 Each
HFAA (Heptafluorobutyric Acid Anhydride)	10 x 1mL ampules	11577740	1 Pack
HFAA	25g	X 11567740	1 Each
HFAA	100g	X 11557740	1 Each

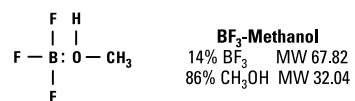
X in the ordering table indicates that hazardous shipping charges apply.

Alkylation Reagents

BF₃-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% BF₃, MW 67.82, and 86% CH₃OH, MW 32.04



BF₃-Methanol

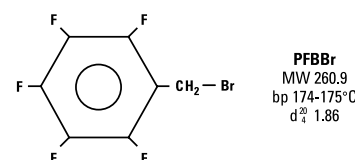
Description	Quantity	Cat. No.	Quantity
BF ₃ -Methanol	100mL	X 11537690	1 Each

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



Pentafluorobenzyl Bromide

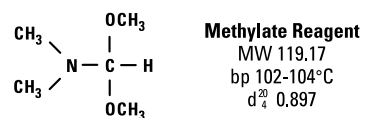
Description	Quantity	Cat. No.	Quantity
PFBBr (Pentafluorobenzyl Bromide)	5g	11547740	1 Each

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

Description	Quantity	Cat. No.	Quantity
Methylate Reagent (N, N-Dimethylformamide dimethyl acetal)	25mL	11527690	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	11507690	1 Each
MethElute Reagent (TMPAH)	12 × 1mL ampules	11597851	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 11597580	1 Each

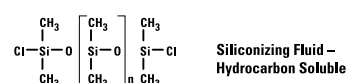
X in the ordering table indicates that hazardous shipping charges apply.

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 11507590	1 Each
Siliconizing Fluid-Hydrocarbon Soluble	480mL	X 11531094	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

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	11511064	1 Each
	Triple-block	11531064	1 Each
Remote Temperature Probe		11567500	1 Each

Reacti-Therm Heating and Stirring Modules

Type	Size of Unit	Cat. No.	Quantity
Heating and Stirring Function	Single block	11577500	1 Each
	Triple-block	11521064	1 Each
Magnetic Stirrers for 3.0, 5.0 & 10.0mL Reacti-Vials		11587450	6 Pack
Magnetic Stirrers for 0.3 and 1mL Small Reaction Vials		11597450	6 Pack

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	11541064	1 Each
27	Triple-block Reacti-Therm Module	11551064	1 Each

Gas Regulators

Description	Cat. No.	Quantity
1/8" tube fitting	15224613	1 Each
1/4" tube fitting	15234613	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
- Protein hydrolysis and vacuum hydrolysis reactions for amino acid analysis by HPLC



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
Reacti-Block A-1 Holds 13 x 0.3mL or 1mL Reacti-Vials; 13 holes/14mm dia. x 23mm deep		TS-18801
Reacti-Block B-1 Holds 9 x 3mL or 5mL Reacti-Vials; 9 holes/21mm dia. x 32mm deep		11537490
Reacti-Block C-1 Holds 13 x 3.5mL Screw Cap Septum Vials; 13 holes/15mm dia. x 34mm deep		11547490
Reacti-Block Z-1 Holds 9 x 0.1mL Reacti-Vials; 9 holes/12mm dia. x 21mm deep		15237518
Reacti-Block M-1 Holds 6 x 27.5mL Reacti-Vials; 6 holes/28.5mm dia. x 70mm deep		11597490
Reacti-Block S-1 Holds 13 x 13mm dia. Test Tubes; 13 holes/14mm dia. x 45mm deep		11527500
Reacti-Block T-1 Holds 9 x 16mm dia. Test Tubes; 9 holes/17mm dia. x 45mm deep		11537500
Reacti-Block U-1 Holds 8 x 20mm dia. Test Tubes; 8 holes/21mm dia. x 45mm deep		TS-18818
Reacti-Block V-1 Holds 17 Microcentrifuge Test Tubes; 17 holes/11mm dia. x 45mm deep		11557500

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
Reacti-Block F Holds 8 x 6mL Vacuum Hydrolysis Tubes; 8 holes/10mm dia. x 64mm deep		11557490
Reacti-Block G Holds 4 x 18mL Vacuum Hydrolysis Tubes; 4 holes/19mm dia. x 64mm deep		11567490
Reacti-Block J Blank/no holes (for custom drilling) 7.6cm tall		11577490
Reacti-Block K Blank/no holes (for custom drilling) 5.1cm tall		TS-18810
Reacti-Block L 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	11537510	1 Each
0	200	TS-18915	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)	11597480	9 Pack
Reacti-Vap PTFE-Coated Needles 102mm (4in) Length	11507490	9 Pack
Reacti-Vap PTFE-Coated Needles 152mm (6in) Length	11517490	9 Pack
Replacement Luer-Lok Fitting	11561064	1 Each
Replacement Screws for Mounting Bracket	15247518	4 Pack
Replacement Height Adjustment Knob	15257518	1 Each
Replacement Mounting Bracket	15267518	1 Each
Replacement Metal Rod	15277518	1 Each
Replacement Dial for Flow Control	15287518	1 Each
Replacement Long Screws for Mounting Bracket	15297518	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	13150093	1 Each
6	10	150	13160093	1 Each
18	19	100	13170093	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
Amber		
1mL	11507350	12 Pack
5mL	11517350	12 Pack
Clear		
100µL	11732257	12 Pack
300µL	11742257	12 Pack
1mL	11517360	12 Pack
3mL	11527360	12 Pack
5mL	11752257	12 Pack
10mL	11547360	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	11591004	72 Pack
12	0.3 and 1mL Reacti-Vial Small Reaction Vials, 3.5mL Screw Cap Septum Vials	11501014	72 Pack
13	7mL Screw Cap Septum Vials	11587330	72 Pack
16	14mL Screw Cap Septum Vials; 15mL (0.5 oz.) Screw Cap Bottles	11597330	72 Pack
18	3 and 5mL Reacti-Vial Small Reaction Vials	11531014	72 Pack
22	25 and 40mL Screw Cap Septum Vials, 240mL (8 oz.) Screw Cap Bottles, 10mL Reacti-Vial	11527340	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	11537330	72 Pack
18	3 and 5mL Reacti-Vial Small Reaction Vials; 10 and 25mL Reacti-Flask	11547330	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	11501034	72 Pack
0.3 and 1.0mL Reacti-Vials, 3.5mL Screw Cap Septum Vial	11571024	72 Pack
10mL Reacti-Vials, 40mL Screw Cap Septum Vials	11597350	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
Clear		
3.5	11547340	72 Pack
7	11557340	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	11527330	12 Pack
27	Fits 40mL Screw Cap Septum Vials	11517330	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

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 μ 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.

Visit www.thermoscientific.com/triplusrsh



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.

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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.

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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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11568240	2-025	12453608	2-033	12812344	2-025	12493708	2-036	11971523	2-037	12433778	2-059	10332825	2-035	10538215	2-058	C4013-54Y	2-023	10476854	2-047
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13426816	4-104	11591094	4-106	10488294	4-085	U-321x	4-087	10630056	5-075
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11786957	5-082	11547740	5-090	10446754	4-085	U-400x	4-087	10311195	5-075
11587670	5-082	11557740	5-089	10764994	4-085	U-401x	4-087	10321195	5-075
11597670	5-082	11567740	5-089	10582265	4-085	10669365	4-088	10178044	5-075
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11577861	5-088	13206429	2-069	10784604	4-085	10197684	5-075		
11577690	5-088	11598180	2-071	10712424	4-085	12947121	5-075		

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1,1-Dichloroethane	5-046	3,5-Xylenol	4-060	Anthracene	5-049	Chloride	4-053
1,2,4-trimethyl-benzene	5-074	3-Hydroxy carbofuran	4-057	Arabinitol	5-051	Chlorotoluron	4-006
1,2-Dichloroethane	5-046	3-methylcholanthrene	5-049	Arabinose	4-077	Chlorotoluron	4-064
1,3,5-TNB	4-055	3-methyl-pentane	5-074	Arach	4-038	Choline	4-050
11-a-Hydroxyprogesterone	4-032	3-NT	4-055	Aspirin	4-018	Chrysene	5-049
17-a-Hydroxyprogesterone	4-032	4,6-Dinitro-2-methylphenol	4-039	Atenolol	4-021	Chymotrypsinogen	3-031
1-Methyl-2-Pyrrolidone	5-040	4. Conalbumin 66	3-022	Atrazine	4-006	cis-Aconitic acid	4-052
1-Methylnaphthalene	5-049	4-Am-2,6-DNT	4-055	Atrazine	4-009	Citrate	4-051
1-Naphthol	4-057	4-Chloro-2-Methylphenol	4-015	Atrazine	4-019	Citric acid	4-052
2,2'-Bipyridine	4-045	4-Chloro-2-nitroaniline	4-045	Benzaldehyde DNPH	4-058	Corticosterone	4-032
2,3-Difluorophenol	4-015	4-Chloro-3-Methylphenol	4-015	Benzene	5-046	Cortisone	4-032
2,4,6-TNT	4-055	4-Chloro-3-methylphenol	4-039	Benzo(a)anthracene	5-049	Crotonaldehyde DNPH	4-058
2,4,6-Trichlorophenol	4-039	4-Fluorobenzoic	4-028	Benzo(a)pyrene	5-049	Curcumin	4-012
2,4,6-Trimethylbenzoic Acid	4-028	4-Hydroxybenzamide	4-045	Benzo(b)fluoranthene	5-049	Curcumin	4-040
2,4-Dichlorophenol	4-039	4-Nitrophenol	4-039	Benzo(g,h,i)perylene	5-049	Cyanazine	4-006
2,4-Difluorophenol	4-015	4-NT	4-055	Benzo(j)fluoranthene	5-049	Cyclohexane	5-074
2,4-Dimethylphenol	4-039	5-HIAA	4-017	Benzo(k)fluoranthene	5-049	Cyclohexanone DNPH	4-058
2,4-Dinitroaniline	4-045	5-HIAA	4-069	Beta-agonists	4-013	Cys-conjugated ADC mimic	3-013
2,4-Dinitrophenol	4-039	7H-dibenzo(c,g)carbazole	5-049	Bis-demethoxycurcumin	4-040	Cytidine-5'-diphosphate	4-065
2,4-DNT	4-055	Acenaphthene	4-008	Bis-desmethoxycurcumin	4-012	Cytochrome C	3-024
2,5-Dimethylbenzoic Acid	4-028	Acenaphthene	5-049	Bisphenol A	4-019	Cytochrome C	3-029
2,6-Dichloro-4-nitroaniline	4-045	Acenaphthylene	5-049	Bornide	4-050	Cytochrome C	3-030
2,6-Dichlorophenol	4-015	Acetaldehyde DNPH	4-058	Bromide	4-051	Cytochrome C	3-031
2,6-Difluorophenol	4-015	Acetaminophen	4-018	Bromide	4-053	Cytosine	4-042
2,6-Dimethoxyphenol	4-015	Acetaminophen	4-027	BSA	3-030	Cytosine	4-060
2,6-Dimethoxyphenol	4-015	Acetaminophen	4-043	Budesonide epimers	3-027	Decanal DNPH	4-058
2,6-Dimethylaniline	5-040	Acetic acid	4-052	Butane	5-074	Decyl sulfate	4-053
2,6-DNT	4-055	Acetic acid	5-054	Butane	5-074	Decyl-trimethylammonium	4-054
21-Hydroxyprogesterone-		Acetone	4-060	Butanone DNPH	4-058	delta-Tocopherol	4-037
21-acetate	4-032	Acetone DNPH	4-058	Butyl-benzene	5-074	Demethoxycurcumin	4-040
2-AB labelled glycans	3-015	Acetonitrile	5-047	Butylparaben	4-008	Desethyl Atrazine	4-019
2-AB labelled glycans	3-016	Acetyl salicylic acid (Aspirin)	4-043	Butyraldehyde DNPH	4-058	Desethylatrazine	4-006
2-AB labelled glycans	3-017	Acrolein DNPH	4-058	C10-LAS	4-053	Desmethoxycurcumin	4-012
2-Am-4,6-DNT	4-055	Adenine	4-060	C11-LAS	4-053	Dexamethasone	4-044
2-Chlorophenol	4-039	Adenosine-5'-diphosphate	4-065	C12-LAS	4-053	DHA	4-038
2-Chlorophenol	5-040	Adenosine-5'-monophosphate	4-065	C13-LAS	4-053	diazepam	4-027
2-methyl-butane	5-074	Adenosine-5'-triphosphate	4-065	Caffeine	4-043	Dibenzo(a,e)pyrene	5-049
2-Methylnaphthalene	5-049	Adonitol	4-077	Calcium	4-051	dibenzo(a,h)acridine	5-049
2-Nitroaniline	5-040	ALA	4-038	Caproic acid	5-054	Dibenzo(a,h)anthracene	5-049
2-Nitrophenol	4-039	Aldicarb	4-057	Carbaryl	4-057	Dibenzo(a,h)pyrene	5-049
2-Nitrophenol	5-040	Aldicarb sulfone	4-057	Carbofuran	4-057	Dibenzo(a,i)pyrene	5-049
2-NT	4-055	Aldicarb sulfoxide	4-057	Carbon tetrachloride	5-046	dibenzo(a,j)acridine	5-049
3,4-Dichlorophenol	4-015	alpha-tocopherol (vitamin E)	4-037	Carbonic anhydrase	3-029	Dibenzylamine	4-045
3,4-Difluorophenol	4-015	Ametryn	4-009	Carbonic anhydrase	3-030	Dichloromethane	5-047
3,4-Dimethoxyphenol	4-015	Amitriptyline	4-008	Catachol	4-069	Diethylamine	5-040
3,5-Dichlorophenol	4-015	Angiotensin II	3-032	Catechol	4-017	Diethylamine	5-044
3,5-Dimethoxyphenol	4-015	Angiotensin III	3-028	Cetyl betaine	4-053	Diethylamine	5-055
3,5-Dimethoxyphenol	4-015	Aniline	5-040	Chloride	4-050	Diethylenetriamine	5-040

Di-isopropyl phthalate	4-027	Glucitol	5-051	Leu-Enkephalin	3-028	Methyl-pentane	5-074	Oligonucleotides	3-033	Propane	5-074	Simetryn	4-009	Tristearin	4-041
Dilaurin isomer 1	4-041	Glucose	4-029	Linoleic acid	4-024	Methyl-pentane	5-074	Oligonucleotides	3-034	Propanolol	4-021	Simizine	4-009	Tri-tetramethyl-benzene isomers	5-074
Dilaurin isomer 2	4-041	Glucose	4-077	Linolenic acid	4-024	Methyl-propane	5-074	Oligonucleotides	3-035	Propazine	4-006	Sodium	4-050	Triton X-100	4-053
Dimethylamine	5-044	Glycerol	4-077	Linuron	4-006	Metobromuron	4-006	Orotic acid	4-045	Propazine	4-009	Sodium	4-051	Tromethamine	4-050
Dimethylamine	5-055	Glycine-Tyrosine	3-028	Linuron	4-064	Metolachlor	4-006	o-Toluic Acid	4-028	Propionaldehyde DNPH	4-058	Sorbitol	4-077	Tyrosine	4-069
Dimethyl-hexane	5-074	Guanine	4-060	LLA	4-021	Metoprolol	4-021	Ovalbumin	3-029	Propionic acid	5-054	Soybean Trysin Inhibitor 66	3-022	Uracil	4-008
Dimethyl-pentane	5-074	Hemoglobin	3-018	L-tyrosine	4-017	Metoxuron	4-006	Ovalbumin	3-030	Propoxur	4-057	Succinic acid	4-052	Uracil	4-027
Dimethyl-pentane	5-074	Hemoglobin C	3-018	Luminol	4-045	Metoxuron	4-064	Ovalbumin	3-032	Propranolol	4-008	Sucrose	4-029	Uracil	4-060
Di-n-propyl phthalate	4-027	Heptanal DNPH	4-058	Lutein	4-023	Monoclonal antibody	3-013	Ovalbumin 66	3-022	Propyl-benzene	5-074	Sucrose	4-077	Urea	4-033
Diquat	4-056	Heptane	5-074	Lycopene	4-023	Monolaurin	4-041	Oxacillin sodium	4-066	Propyl-benzene	5-074	Sulfate	4-051	Valeraldehyde DNPH	4-058
Distearin isomer 1	4-041	Heptanoic acid	5-054	Lysozyme	3-024	Monolinuron	4-006	Oxalic acid	4-052	p-Toluic Acid	4-028	Tartaric acid	4-052	Valerophenone	4-019
Distearin isomer 2	4-041	Hexadecyl-trimethylammonium	4-054	Lysozyme	3-031	Monophosphates	4-031	Oxamyl	4-057	p-xylene	5-074	Tebuthiuron	4-064	Valine-Tyrosine-Valine	3-028
Diuron	4-006	Hexanal DNPH	4-058	Lysozyme	3-029	Monostearin	4-041	Oxazepam	4-027	p-xylene	5-074	Terbutylazine	4-006	Vanillic acid	4-035
Diuron	4-019	Hexane	5-074	Mab	3-007	Monuron	4-064	Oxprenolol	4-021	Pyrene	5-049	ter-butyl alcohol	5-074	Vanillin	4-035
Diuron	4-064	Hexane	5-074	Mab B	3-006	Morpholine	5-040	Oxprenolol	4-044	Pyridine	5-045	Tert-butylamine	5-044	Vitamin B1 (thiamine)	4-025
DNA	3-037	Hexazinone	4-006	Magnesium	4-051	m-xylene	5-074	PABA	4-045	Pyridine	5-040	tert-butylamine	5-055	Vitamin B12 (cyanocobalamin)	4-025
Dodecyl sulfate	4-053	HMX	4-055	Malate	4-051	Myoglobin	3-029	PABA	3-032	Pyrogallol	4-026	Testosterone	4-010	Vitamin B2 (riboflavin)	4-025
Dodecyl-trimethylammonium	4-054	Horseheart myoglobin	3-022	Maleate	4-044	Myoglobin	3-031	Papain digest	3-013	Raffinose	4-077	Tetrabutylammonium	4-054	Vitamin B2 (riboflavin)	4-025
DOPAC	4-017	Hydrocortisone	4-032	Malic acid	4-052	Nadolol	4-021	Paraquat	4-056	RDX	4-055	Tetradecyl-trimethylammonium	4-054	Vitamin B3 (nicotinamide)	4-025
DOPAC	4-069	Hydrocortisone	4-044	Maltose	4-029	Naphthalene	4-008	p-Cresol	4-060	Resorcinol	4-026	Tetraethylammonium	4-054	Vitamin B5 (pantothenic acid)	4-025
Dopamine	4-017	Hydroquinone	4-026	Maltose	4-077	Naphthalene	4-042	Pentachlorophenol	4-039	Retinol acetate		Tetraheptylammonium	4-054	Vitamin B6 (pyridoxine)	4-025
Dopamine	4-069	Ibuprofen	4-007	Maltotriose	4-077	Naphthalene	5-049	Pentane	5-074	(vitamin A acetate)	4-037	Tetrahexylammonium	4-054	Vitamin C	4-030
EPA	4-038	Ibuprofen	4-019	Mannitol	4-077	Naphthalene	5-074	Pentane	5-074	Rhamnitol	5-051	Tetramethyl-octane	5-074	Vitamin D2	4-037
Erythritol	4-077	Ibuprofen	1-010	Mannitol	5-051	Naphthalene	4-007	Phenanthrene	5-049	Ribitol	5-051	Tetrapentylammonium	4-054	Vitamin D3	4-037
Estradiol (E2)	4-014	indeno(1,2,3-cd)pyrene	5-049	Meglumine	4-050	Naproxen	4-044	Phenetole	4-060	Ribonuclease A	3-024	Tetryl	4-055	Vitamin E acetate	4-037
Estriol (E3)	4-014	Inositol	5-051	Mesylate	4-050	Naproxen	4-044	Phenol	4-026	Ribonuclease A	3-028	Thymine	4-060	Vitamin H (biotin)	4-025
Estrone (E1)	4-014	Insulin	3-028	Metazchlor	4-006	NB	4-055	Phenol	4-039	Ribonuclease A	3-030	Thyroglobulin	3-032	Vitamin K1	4-037
Ethylamine	5-044	Insulin	3-029	Met-Enkephalin	3-028	n-butyric acid	5-054	Phenol	4-060	Ribonuclease A	3-031	Timolol	4-021	Vitamin K1 (cis isomer)	4-016
Ethylamine	5-055	Intact Mab	3-013	Methabenzthiazuron	4-006	n-decane	5-074	Phenol	5-040	Ribonuclease A	4-036	Timolol	4-044	Vitamin K1 (trans isomer)	4-016
Ethyl-benzene	5-074	Iodide	4-050	Methacrolein DNPH	4-058	n-dodecane	5-074	Phosphate	4-051	Saccharin	4-036	Tolualdehyde DNPH	4-058	Vitamin K2	4-016
Ethynylestradiol	4-014	Isobutyric acid	5-054	Methiocarb	4-057	Nicotine	5-040	p-Hydroxybenzaldehyde	4-035	Salicylic Acid	4-018	Toluene	5-074	Vitamin K2	4-037
Fenoprofen	4-007	Isocaproic acid	5-054	Methiomyl	4-057	Niflumic acid	1-009	p-Hydroxybenzoic acid	4-027	Salicylamide	4-043	Toluene	5-074	Xanthine	4-060
Fetal hemoglobin	3-018	iso-Citric acid	4-052	Methyl arachidate	5-056	Niflumic acid	1-009	p-Hydroxybenzoic acid	4-035	Salicylic acid	4-043	trans-Aconitic acid	4-052	Xylene sulfonate	4-053
Fluoranthene	5-049	Isopropylamine	5-044	Methyl behenate	5-056	Nitrate	4-050	Pindolol	4-021	SDA	4-038	Trastuzumab	3-014	Xylose	4-077
Fluorene	5-049	Isopropylamine	5-055	Methyl cis-13-docosenoate	5-056	Nitrate	4-051	P-Nitroaniline	4-045	Sebuthylazin	4-006	Trastuzumab + DTT	3-014	Xylyaldehyde DNPH	4-058
Folic Acid	4-025	Isoproturon	4-006	Methyl decanoate	5-056	Nitrate	4-053	Polyacrylic acid	4-046	sec-Butylamine	5-044	Trastuzumab + IdeS	3-014	Zidovudine	4-063
Formaldehyde DNPH	4-058	Isovaleraldehyde DNPH	4-058	Methyl linoleate	5-056	Nitrobenzoic acid	4-045	Potassium	4-050	sec-butylamine	5-055	Trastuzumab + Papain	3-014	α -tocopherol	4-068
formic acid	4-052	Isovaleric acid	5-054	Methyl linolenate	5-056	N-Methyl-N-nitrosaniline	4-045	Potassium	4-051	Serotonin	4-017	Tribenzylamine	4-045	β -Carotene	4-023
Fructose	4-029	Ketoprofen	4-044	Methyl myristate	5-056	Nonanal DNPH	4-058	Potassium	4-051	Serotonin	4-069	Triclosan	4-036	β -tocopherol	4-068
Fructose	4-077	Lactic acid	4-052	Methyl octanoate	5-056	n-pentadecane	5-074	p-Phenylenediamine	4-045	Sickle cell hemoglobin	3-018	Trilaurin	4-041	γ -tocopherol	4-068
Fucitol	5-051	Lactose	4-029	Methyl oleate	5-056	n-propylamine	5-044	Progesterone	4-032	Simazine	4-006	Trimethylamine	5-044	δ -tocopherol	4-068
Fucose	4-077	Lactose	4-077	Methyl palmitate	5-056	n-tetradecane	5-074	Prometryn	4-009	Simazine	4-019	Trimethylamine	5-055		
Fumarate	4-051	Lactulose	4-067	Methyl palmitoleate	5-056	n-tridecane	5-074								
Fumaric acid 7	4-052	Lamivudine	4-011	Methyl propane	5-074	n-valeric acid	5-054								
Galactitol	5-051	Lauryldimethylbenzyl-ammonium chloride	4-053	Methyl stearate	5-056	Octanal DNPH	4-058								
Galactose	4-077	Laurylpyridinium chloride	4-053	Methyl tatracosanoate	5-056	Octane	5-074								
gamma-Tocopherol	4-037	L-DOPA	4-017	Methylamine	5-044	Octylamine	5-040								
Gentamicin	4-049	L-DOPA	4-069	Methylamine	5-055	o-Hydroxybenzoic acid	4-027								
GLA	4-038			Methyl-butane	5-074										

Terms and Conditions of Sale

UNLESS OTHERWISE EXPRESSLY AGREED IN WRITING, ALL SALES ARE SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS:

1. **GENERAL.** Thermo Fisher Scientific ("Seller") hereby offers for sale to the buyer named on the face hereof ("Buyer") the products listed on the face hereof (the "Products") on the express condition that Buyer agrees to accept and be bound by the terms and conditions set forth herein. Any provisions contained in any document issued by Buyer are expressly rejected and if the terms and conditions in this Agreement differ from the terms of Buyer's offer, this document shall be construed as a counter offer and shall not be effective as an acceptance of Buyer's document. Buyer's receipt of Products or Seller's commencement of the services provided hereunder will constitute Buyer's acceptance of this Agreement. This is the complete and exclusive statement of the contract between Seller and Buyer with respect to Buyer's purchase of the Products. No waiver, consent, modification, amendment or change of the terms contained herein shall be binding unless in writing and signed by Seller and Buyer. Seller's failure to object to terms contained in any subsequent communication from Buyer will not be a waiver or modification of the terms set forth herein. All orders are subject to acceptance in writing by an authorized representative of Seller.

2. **PRICE.** All prices published by Seller or quoted by Seller's representatives may be changed at any time without notice. All prices quoted by Seller or Seller's representatives are valid for thirty (30) days, unless otherwise stated in writing. All prices for the Products will be as specified by Seller or, if no price has been specified or quoted, will be Seller's price in effect at the time of shipment. All prices are subject to adjustment on account of specifications, quantities, raw materials, cost of production, shipment arrangements or other terms or conditions which are not part of Seller's original price quotation.

3. **TAXES AND OTHER CHARGES.** Prices for the Products exclude all sales, value added and other taxes and duties imposed with respect to the sale, delivery, or use of any Products covered hereby, all of which taxes and duties must be paid by Buyer. If Buyer claims any exemption, Buyer must provide a valid, signed certificate or letter of exemption for each respective jurisdiction.

4. **TERMS OF PAYMENT.** Seller may invoice Buyer upon shipment for the price and all other charges payable by Buyer in accordance with the terms on the face hereof. If no payment terms are stated on the face hereof, payment shall be net thirty (30) days from the date of invoice. If Buyer fails to pay any amounts when due, Buyer shall pay Seller interest thereon at a periodic rate of one and one-half percent (1.5%) per month (or, if lower, the highest rate permitted by law), together with all costs and expenses (including without limitation reasonable attorneys' fees and disbursements and court costs) incurred by Seller in collecting such overdue amounts or otherwise enforcing Seller's rights hereunder. Seller reserves the right to require from Buyer full or partial payment in advance, or other security that is satisfactory to Seller, at any time that Seller believes in good faith that Buyer's financial condition does not justify the terms of payment specified. All payments shall be made in U.S. Dollars.

5. **DELIVERY; CANCELLATION OR CHANGES BY BUYER.** The Products will be shipped to the destination specified by Buyer, F.O.B. Seller's shipping point. Seller will have the right, at its election, to make partial shipments of the Products and to invoice each shipment separately. Seller reserves the right to stop delivery of Products in transit and to withhold shipments in whole or in part if Buyer fails to make any payment to Seller when due or otherwise fails to perform its obligations hereunder. All shipping dates are approximate only, and Seller will not be liable for any loss or damage resulting from any delay in delivery or failure to deliver which is due to any cause beyond Seller's reasonable control. In the event of a delay due to any cause beyond Seller's reasonable control, Seller reserves the right to terminate the order or to reschedule the shipment within a reasonable period of time, and Buyer will not be entitled to refuse delivery or otherwise be relieved of any obligations as the result of such delay. Products as to which delivery is delayed due to any cause within Buyer's control may be placed in storage by Seller at Buyer's risk and expense and for Buyer's account. Orders in process may be canceled only with Seller's written consent and upon payment of Seller's cancellation charges. Orders in process may not be changed except with Seller's written consent and upon agreement by the parties as to an appropriate adjustment in the purchase price therefor. Credit will not be allowed for Products returned without the prior written consent of Seller.

6. **TITLE AND RISK OF LOSS.** Notwithstanding the trade terms indicated above and subject to Seller's right to stop delivery of Products in transit, title to and risk of loss of the Products will pass to Buyer upon delivery of possession of the Products by Seller to the carrier; provided, however, that title to any software incorporated within or forming a part of the Products shall at all times remain with Seller or the licensor(s) thereof, as the case may be.

7. **WARRANTY.** Seller warrants that the Products will operate or perform substantially in conformance with Seller's published specifications and be free from defects in material and workmanship, when subjected to normal, proper and intended usage by properly trained personnel, for the period of time set forth in the product documentation, published specifications or package inserts. If a period of time is not specified in Seller's product documentation, published specifications or package inserts, the warranty period shall be one (1) year from the date of shipment to Buyer for equipment and ninety (90) days for all other products (the "Warranty Period"). Seller agrees during the Warranty Period, to repair or replace, at Seller's option, defective Products so as to cause the same to operate in substantial conformance with said published specifications; provided that Buyer shall (a) promptly notify Seller in writing upon the discovery of any defect, which notice shall include the product model and serial number (if applicable) and details of the warranty claim; and (b) after Seller's review, Seller will provide Buyer with service data and/or a Return Material Authorization ("RMA"), which may include biohazard decontamination procedures and other product-specific handling instructions, then, if applicable, Buyer may return the defective Products to Seller with all costs prepaid by Buyer. Replacement parts may be new or refurbished, at the election of Seller. All replaced parts shall become the property of Seller. Shipment to Buyer of repaired or replacement Products shall be made in accordance with the Delivery provisions of the Seller's Terms and Conditions of Sale. Consumables are expressly excluded from this warranty.

Notwithstanding the foregoing, Products supplied by Seller that are obtained by Seller from an original manufacturer or third party supplier are not warranted by Seller, but Seller agrees to assign to Buyer any warranty rights in such Product that Seller may have from the original manufacturer or third party supplier, to the extent such assignment is allowed by such original manufacturer or third party supplier.

In no event shall Seller have any obligation to make repairs, replacements or corrections required, in whole or in part, as the result of (i) normal wear and tear, (ii) accident, disaster or event of force majeure, (iii) misuse, fault or negligence of or by Buyer, (iv) use of the Products in a manner for which they were not designed, (v) causes external to the Products such as, but not limited to, power failure or electrical power surges, (vi) improper storage and handling of the Products or (vii) use of the Products in combination with equipment or software not supplied by Seller. If Seller determines that Products for which Buyer has requested warranty services are not covered by the warranty hereunder, Buyer shall pay or reimburse Seller for all costs of investigating and responding to such request at Seller's then prevailing time and materials rates. If Seller provides repair services or replacement parts that are not covered by this warranty, Buyer shall pay Seller therefor at Seller's then prevailing time and materials rates. ANY INSTALLATION, MAINTENANCE, REPAIR, SERVICE, RELOCATION OR ALTERATION TO OR OF, OR OTHER TAMPERING WITH, THE PRODUCTS PERFORMED BY ANY PERSON OR ENTITY OTHER THAN SELLER WITHOUT SELLER'S PRIOR WRITTEN APPROVAL, OR ANY USE OF REPLACEMENT PARTS NOT SUPPLIED BY SELLER, SHALL IMMEDIATELY VOID AND CANCEL ALL WARRANTIES WITH RESPECT TO THE AFFECTED PRODUCTS.

THE OBLIGATIONS CREATED BY THIS WARRANTY STATEMENT TO REPAIR OR REPLACE A DEFECTIVE PRODUCT SHALL BE THE SOLE REMEDY OF BUYER IN THE EVENT OF A DEFECTIVE PRODUCT. EXCEPT AS EXPRESSLY PROVIDED IN THIS WARRANTY STATEMENT, SELLER DISCLAIMS ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, ORAL OR WRITTEN, WITH RESPECT TO THE PRODUCTS, INCLUDING WITHOUT LIMITATION ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. SELLER DOES NOT WARRANT THAT THE PRODUCTS ARE ERROR-FREE OR WILL ACCOMPLISH ANY PARTICULAR RESULT.

8. **INDEMNIFICATION.**

8.1 By Seller. Seller agrees to indemnify, defend and save Buyer, its officer, directors, and employees from and against any and all damages, liabilities, actions, causes of action, suits, claims, demands, losses, costs and expenses (including without limitation reasonable attorney's fees) ("Indemnified Items") for (i) injury to or death of persons or damage to property to the extent caused by the negligence or willful misconduct of Seller, its employees, agents or representatives or contractors in connection with the performance of services at Buyer's

premises under this Agreement and (ii) claims that a Product infringes any valid United States patent, copyright or trade secret; provided, however, Seller shall have no liability under this Section to the extent any such Indemnified Items are caused by either (i) the negligence or willful misconduct of Buyer, its employees, agents or representatives or contractors, (ii) by any third party, (iii) use of a Product in combination with equipment or software not supplied by Seller where the Product would not itself be infringing, (iv) compliance with Buyer's designs, specifications or instructions, (v) use of the Product in an application or environment for which it was not designed or (vi) modifications of the Product by anyone other than Seller without Seller's prior written approval. Buyer shall provide Seller prompt written notice of any third party claim covered by Seller's indemnification obligations hereunder. Seller shall have the right to assume exclusive control of the defense of such claim or, at the option of the Seller, to settle the same. Buyer agrees to cooperate reasonably with Seller in connection with the performance by Seller of its obligations in this Section.

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