

trust



Sample Preparation Products

Our comprehensive range of sample preparation products have been developed for rapid, effective and economical sample preparation. Thermo Scientific HyperSep SPE products are available in a range of formats including columns, multi-well plates and pipette tips. We also offer the complete line of Thermo Scientific syringe filters and the innovative WebSeal™ system.

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Featured Products

SOLA

First in class SPE performance, maximize reproducibility and extract cleanliness

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HyperSep Retain

Reproducible and clean sample extraction

» **PAGE 1-012**



QuEChERS – Dispersive SPE

Efficient pesticide sample preparation from food matrices

» **PAGE 1-057**



HyperSep SLE and Protein Precipitation

Fast, efficient methods for sample extraction from complex biological matrices

» **PAGE 1-043**



Filtration

Simplified sample clean up

» **PAGE 1-064**



WebSeal

Sample storage solutions, preventing cross contamination and sample loss

» **PAGE 1-074**



Thermo Scientific SPE Products

SPE Column Selection

Thermo Scientific HyperSep SPE products have been developed to meet the requirements of today's sample preparation challenges. HyperSep SPE columns and multi-well plates are offered in a range of phases, ideal for use in application areas such as: Pharmaceutical, Biochemical, Environmental, and Food and Beverage.

The following flow chart is designed to help in selecting the correct phase for the compound of interest.

SPE Phase Selection

Sample Matrix	Solubility of Sample	Polarity of Sample	Separation Mode	Recommended HyperSep Sorbent(s)
Aqueous	Water Soluble	Non-Polar	Reversed Phase	SOLA, C18, C8, Phenyl Retain PEP
		Moderately Polar	Reversed Phase	SOLA, C18, C8, Retain PEP
		Polar	Reversed Phase	SOLA, Hypercarb Retain PEP
		Cationic	Ion Exchange	SCX
		Anionic	Ion Exchange	SAX Aminopropyl
		Non-Polar & Cationic	Reversed Phase and Ion Exchange	SOLA CX, Verify CX Retain CX
		Non-Polar & Anionic	Reversed Phase and Ion Exchange	SOLA AX, Verify AX Retain AX
Aqueous	Organic Soluble	Non-Polar	Reversed Phase	SOLA, C18, C8, Phenyl Retain PEP
Organic	Organic Soluble	Polar	Normal Phase	Silica, Aminopropyl Cyano, Diol
		Moderately Polar	Normal Phase	Silica, Florisil, Aminopropyl Cyano, Diol
		Cationic	Ion Exchange	SCX
		Anionic	Ion Exchange	SAX Aminopropyl
		Non-Polar & Cationic	Reversed Phase and Ion Exchange	Verify CX
		Non-Polar & Anionic	Reversed Phase and Ion Exchange	Verify AX

SPE Phase Selection by Manufacturer

Thermo Scientific HyperSep Product	Alternative To
HyperSep C18 Page 1-025	CLEAN-UP™ C18-U Supelclean™ ENVI-18 / LC-18 SampliQ C18 BAKERBOND spe™ Polar Plus™ Isolute™ C18 CHROMABOND™ C18 Bond Elut™ C18 strata™ C18-U Sep-Pak™ C18
HyperSep C8 Page 1-026	CLEAN-UP C8 Supelclean ENVI-8 / LC-8 SampliQ C8 BAKERBOND spe Octyl C8 Isolute C8 CHROMABOND C8 Bond Elut C8 strata C8 Sep Pak C8
HyperSep Phenyl Page 1-027	CLEAN-UP Phenyl Supelclean LC-Ph SampliQ Phenyl BAKERBOND spe Phenyl Isolute Ph Bond Elut Ph strata Phenyl (PH)
HyperSep Silica Page 1-028	CLEAN-UP Silica Supelclean LC-Si SampliQ Silica BAKERBOND spe Silica Gel Isolute Silica CHROMABOND SiOH Bond Elut Si strata Si-1 Sep Pak Si
HyperSep Aminopropyl Page 1-034	CLEAN-UP Aminopropyl Supelclean LC-NH ₂ SampliQ Amino BAKERBOND spe Amino Isolute NH ₂ CHROMABOND NH ₂ Bond Elut NH ₂ strata NH ₂ Sep-Pak NH ₂
HyperSep Florisil Page 1-033	CLEAN-UP Florisil Supelclean ENVI-Florisil / LC-Florisil SampliQ Florisil BAKERBOND spe Florisil Isolute Florisil CHROMABOND Florisil Bond Elut Florisil strata FL-PR Sep Pak Florisil

Thermo Scientific HyperSep Product	Alternative To
HyperSep SAX Page 1-029	CLEAN-UP QAX Supelclean LC-SAX SampliQ Si-SAX BAKERBOND spe Quaternary amine Isolute SAX CHROMABOND SB Bond Elut SAX strata SAX
HyperSep SCX Page 1-030	CLEAN-UP BCX Supelclean LC-SCX SampliQ Si-SCX BAKERBOND spe Aromatic Sulfonic Acid Isolute SCX CHROMABOND SA Bond Elut SCX strata SCX
HyperSep Verify AX Page 1-032	CLEAN-UP THC Isolute HAX Bond Elut Certify II strata Screen-A
HyperSep Verify CX Page 1-031	CLEAN-UP DAU Discovery DSC-MCAX SampliQ C8/SCX Isolute HCX CHROMABOND Drug Bond Elut Certify I strata Screen-C
HyperSep Retain PEP Page 1-012	Oasis HLB (Waters) Strata-X (Phenomenex) FOCUS™ (Varian) Easy (Macherey Nagel) Isolute ENV+ (Biotage) SampliQ OPT StyreScreen DVB (UCT) H ₂ O-philic DVB (JT Baker)
HyperSep Retain CX Page 1-013	Oasis MCX (Waters) SampliQ SCX Strata-X-C (Phenomenex) StyreScreen DBX (UCT)
HyperSep Retain AX Page 1-014	Oasis MAX (Waters) SampliQ SAX StyreScreen QAX (UCT)



Removing Uncertainty by Applying the Science to SPE

Our comprehensive range of SPE solutions offer un-paralleled performance in purity of extract and reproducibility. Having a fundamental effect on the quality, time and analysis cost, SPE is a critical step during the sample analysis procedure.

We are dedicated to supplying the highest quality SPE solutions, in combination with providing our customers with the support and resources to optimize their SPE solutions and maximize their analysis.

The Importance of SPE

Reducing the effects of the matrix on the separation (GC/LC) and detection (UV, MS etc.) is beneficial. The use of SPE as a sample preparation technique can significantly improve analysis aiding robustness and generating reproducibly accurate, precise and sensitive analytical methods. This relies on the ability of SPE to reproducibly:

Maximize detection selectivity

- Reduce ion suppression
- Reduce protein binding
- Reduce matrix interferences by elimination of matrix and particulates
- Compatibility of solvent with analytical technique

Improve analytical system performance

- Longer column lifetimes
- Less detector maintenance
- Syringes less likely to block
- Less contamination

Improve sensitivity by concentration of the analytes

- Lower limits of detection
- More accurate quantitation
- Improved data processing

Matrix effects are an issue in many areas of analytical chemistry, however, modification of ionisation (ion suppression/enhancement) can be a major problem in atmospheric pressure ionisation (API) mass spectrometry and, in particular, electrospray based ion sources.



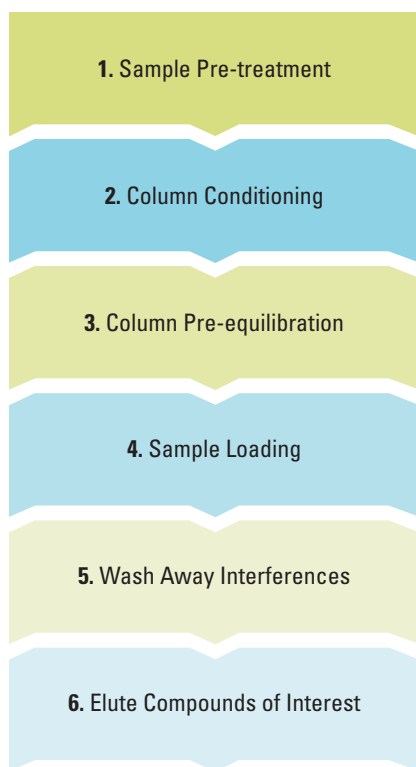
View our video on SPE

www.thermoscientific.com/chromatographyvideos

What are these codes? Visit www.thermoscientific.com/codes



SPE Procedure – Six Steps for Clean Extract



1. Sample Pre-treatment

It is important to optimize the sample for effective analyte retention. The following should be considered:

- Sample volume/analyte concentration/matrix complexity
- Adjust sample/matrix composition for proper dilution/ionic strength
- Sample pH for optimum retention
- Confirm that analytes are free in solution
- Remove any unwanted particulates via filtration or centrifugation

2. Column Conditioning

Prepare the sorbent for effective interaction(s) with the compounds of interest.

- Use appropriate solvent for column condition/activation
- Prevent sorbent drying during conditioning

3. Column Pre-equilibration

Equilibrate with weakly eluting solvent to prepare the phase for sample addition.

- Use the same solvent as for sample pre-treatment
- Prevent sorbent drying during column equilibration

4. Sample Loading

Analytes are retained on the sorbent.

- Apply samples at appropriate flow rate (1mL/minute typical)

For Reversed-Phase Interactions

- Neutral compounds are not affected by pH
- For charged compounds, a pH at which the compound is not charged is used. Neutralize the molecule according to the following:
 - For basic compounds, the neutral molecule exists at least 2pH units below the pK_a of the compound
 - For acidic compounds, the neutral molecule exists at least 2pH units above the pK_a of the compound

For Normal-Phase Interactions

- pH is not normally an issue in normal phase interactions, as the solvents used are typically non-polar organic solvents, rather than water
- There is no need to verify the sample application pH

For Ion-Exchange Interactions

- pH and pK_a are important considerations
- Acidic compounds are extracted from a sample solution at least 2pH units above the pK_a of the analyte
- Basic compounds are extracted from a sample solution 2 or more pH units below the pK_a of the analyte
- For second (organic) wash, choose the strongest solution where no compound breakthrough occurs
- For elution step, use a solution stronger than where all the compound of interest is eluted
- NB: when choosing these solutions allow some margin for error

5. Wash Away Interferences

Remove impurities bound less strongly than the compounds of interest.

- Select a strong enough wash solvent to remove interferences but weak enough to leave compounds of interest bound
- Selectively rinse away the less strongly bonded interferences
- Wash solvent selected according to phase mechanism/analyte properties

6. Elute Compounds of Interest

Selectively recover the analyte(s) by disrupting the analyte-sorbent interaction.

- Selectively elute analytes of interest using different solvents
- Smaller elution volume produces a more concentrated extract
- Select elution solvent that does not elute strongly retained impurities
- Select elution solvent according to phase mechanism/analyte properties

It is important to optimize the Wash and Elution steps in order to obtain maximum levels of recovery.

Get your copy of our application notebook, featuring over 150 SPE applications
www.thermoscientific.com/spe



Method Development Optimization in SPE

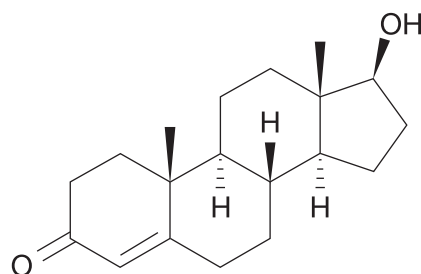
For cleaner extracts, optimization of the SPE process can be important. By optimizing the load, wash, and elution steps of the SPE process, a cleaner sample extract can be obtained.

An example of this is in the development of an SPE method for testosterone.

HyperSep Retain PEP

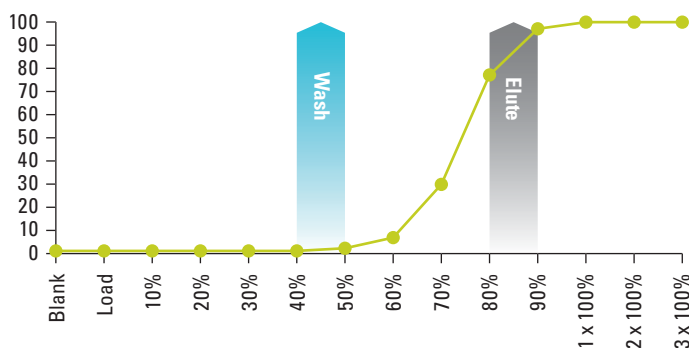
Using a 30mg 1mL SPE Cartridge
(Part Number **60107-201**)

1. Condition with 1mL methanol followed by 1mL water
2. Load 1mL of 500ng/mL sample in water
3. Sequentially wash with increasing strengths of methanol in water, collecting the eluent 0% methanol/100% water to 90% methanol/10% water, increasing methanol content by 10% each time
4. Elution with multiple volumes of methanol



$$\text{LogP} = 3.6 \quad \text{P}K_a = 2.99$$

Elution Profile of Testosterone



An alternative would be to use HyperSep Retain AX with the added benefit of Phospholipid removal.



For more information on how to optimize your SPE methodology and specific applications visit www.thermoscientific.com/spe and request your free copy of the Thermo Scientific HyperSep Columns Application Notebook.

Thermo Scientific SOLA SPE Columns and Plates

Join the revolution

Thermo Scientific SOLA products revolutionize Solid Phase Extraction (SPE). This first fritless SPE product range provides greater reproducibility with cleaner, more consistent extracts.

SOLA products provide unparalleled performance characteristics compared to conventional SPE, phospholipid removal and protein precipitation products. This includes:

- Higher levels of reproducibility
- Higher levels of extract cleanliness
- Reduced solvent requirements
- Increased sensitivity

This increased performance gives higher confidence in analytical results and lowers cost without compromising ease of use or requiring complex method development.

SOLA products provide reduced failure rates, higher analysis speeds and lower solvent requirements which are critical in today's high throughput laboratory environment.

Technical Information

The following information highlights the advantages associated with SOLA products over conventional loose packed SPE products.

Improved Reproducibility and Recovery

The data in Figure 1 and Table 1 shows that SOLA products out perform conventional loose packed competitor SPE products even when utilizing the competitor recommended generic methodology.

The error bars illustrate significantly lower variability sample to sample for SOLA products compared to conventional loose packed competitor SPE products, ensuring you achieve the correct result time after time.

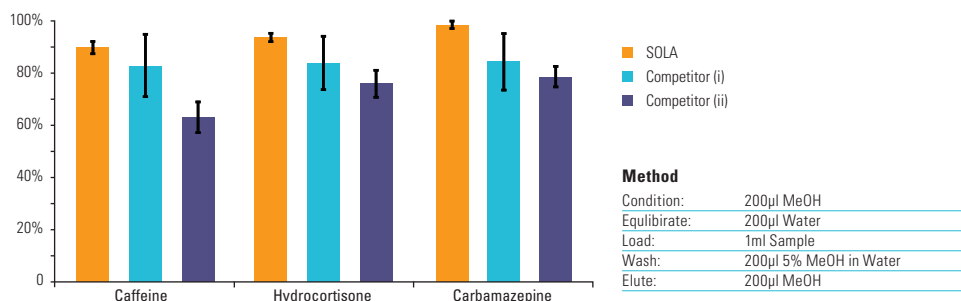


Figure 1: SOLA shows significantly higher reproducibility and recovery levels

	SOLA		Competitor (i)		Competitor (ii)	
	Recovery	Precision (%RSD n=30)	Recovery	Precision (%RSD n=30)	Recovery	Precision (%RSD n=30)
Caffeine	89.88%	4.37%	63.10%	23.89%	82.88%	12.11%
Hydrocortisone	93.76%	3.32%	76.05%	20.49%	83.95%	10.41%
Carbamazepine	98.72%	2.71%	78.64%	21.83%	84.47%	7.79%

Table 1: SOLA provides higher reproducibility and recovery levels

Improved reproducibility

Figure 2 shows that SOLA products have consistent recoveries (across all 30 test samples). The conventional loose packed SPE product from competitor (i) shows that on average one in every four samples gives a significantly lower recovery. This results in inconsistencies in results. In comparison SOLA products provide significantly higher levels of reproducibility which is vitally important for high throughput studies.

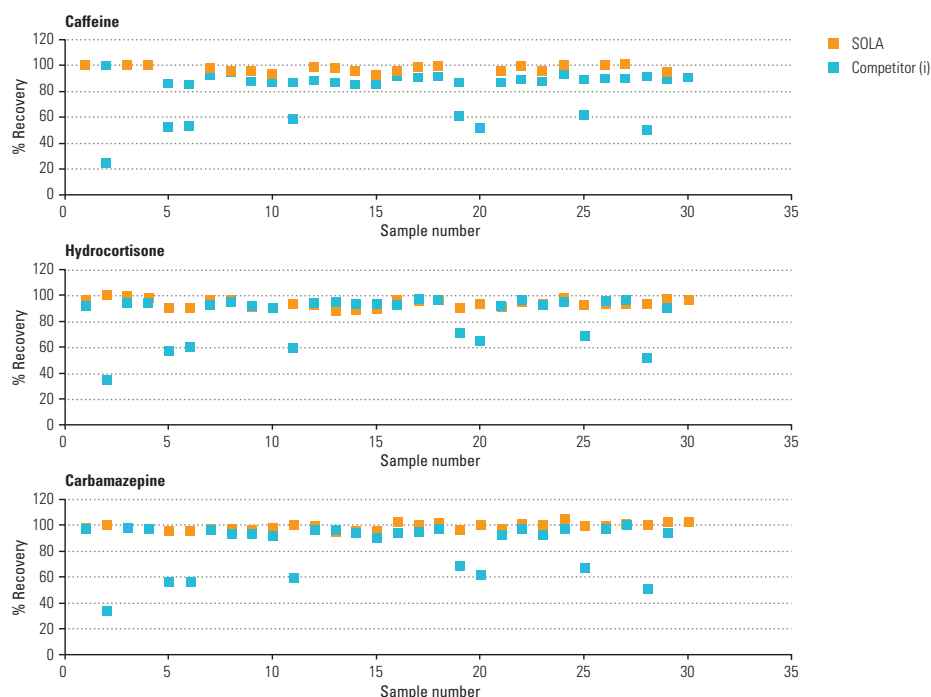


Figure 2: Shows inconsistency of loose packed products compared to SOLA.

Higher sensitivity and lower solvent consumption

Figure 3 shows that SOLA products achieve excellent recovery levels even with low volumes of extract solvents, resulting in a more concentrated analyte and increased sensitivity. Additional cost and time saving benefits can be achieved from reduced sample dry down time and solvent usage. These low volume extractions would be significantly compromised when using a conventional loose packed, low bed weight, SPE product as seen in Figure 4.

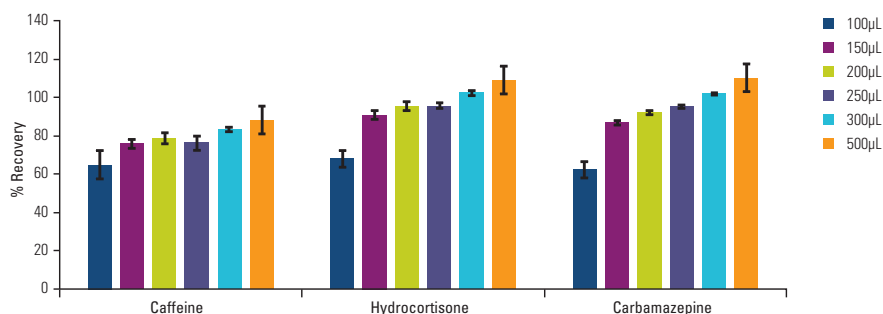


Figure 3: Shows high recovery levels are achieved with SOLA products at low elution volumes, resulting in increased sample concentrations and sensitivity

The data in Figure 4 shows significantly higher recovery levels and lower variability sample to sample with SOLA products at low elution volumes compared to conventional loose packed SPE products. This ensures correct results time after time.

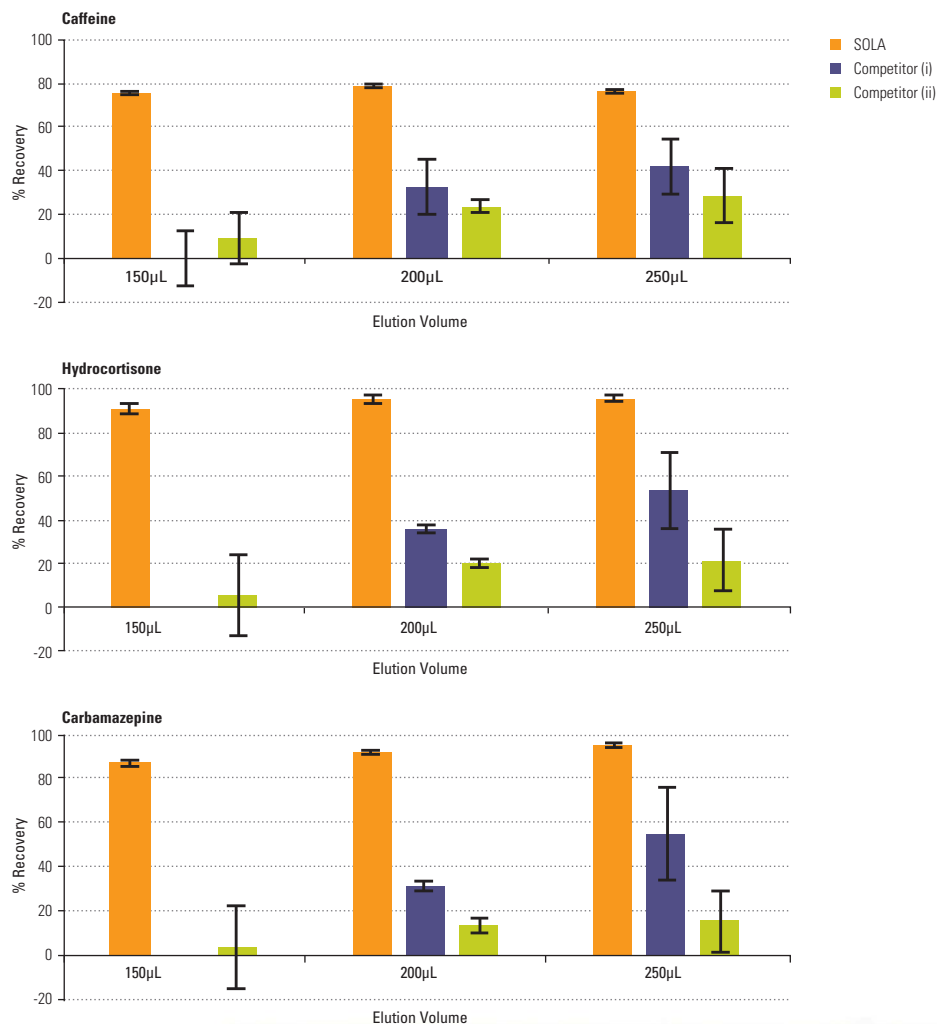
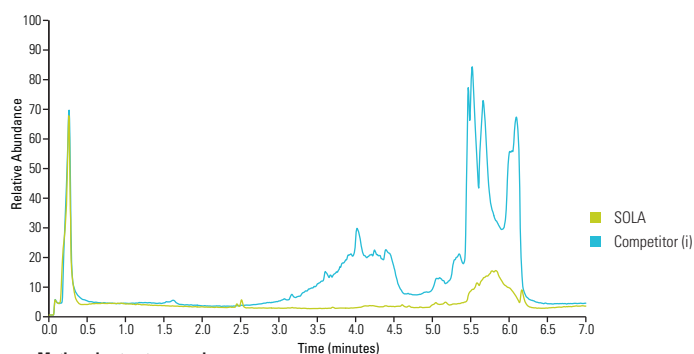


Figure 4: SOLA products recovery and reproducibility at low extraction volumes

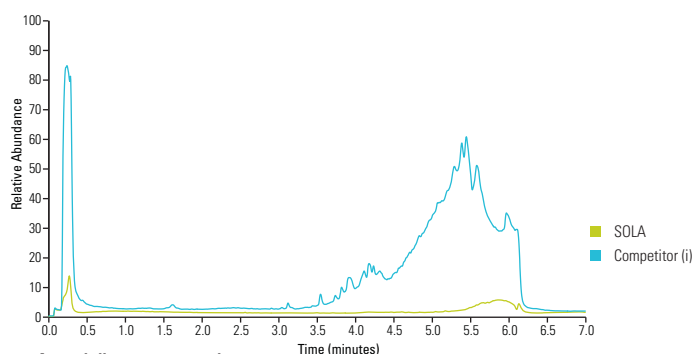


Cleanliness of Extract

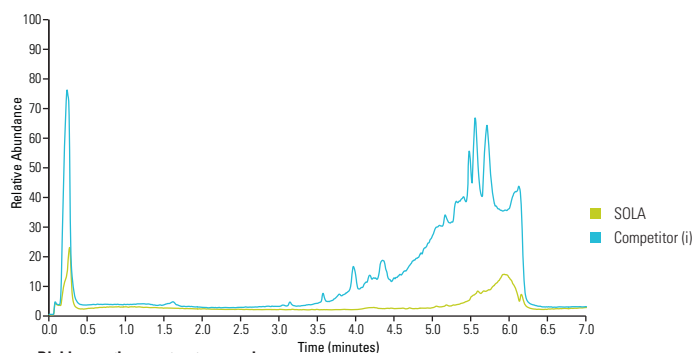
SOLA products proprietary manufacturing process provides a cleaner product and as a result a cleaner sample extract. This is shown in Figure 5 where SOLA products are compared against competitor (i) conventional loose packed SPE product, which have both been extracted with acetonitrile, dichloromethane and methanol, respectively.



Methanol extract comparison:
SOLA products versus competitor (i)



Acetonitrile extract comparison:
SOLA products versus competitor (i)



Dichloromethane extract comparison:
SOLA products versus competitor (i)

Figure 5: Shows SOLA products are significantly cleaner than the equivalent loose packed SPE product from competitor (i)

In today's demanding laboratory environment where reproducibility, certainty of results and cost saving is a fundamental requirement, SOLA products are an indispensable tool to provide confidence and first time/ every time success in the analytical process.



Product information

SOLA SPE columns and plates are available in 10mg/1ml cartridge and 10mg/2mL 96 well plate formats.

SOLA SPE Cartridges

Description	Bed weight	Column volume (mL)	Cat No.	Quantity
SOLA	10mg	1mL	60109-001	100
SOLA CX	10mg	1mL	60109-002	100
SOLA AX	10mg	1mL	60109-003	100

SOLA 96 Well Plates

Description	Bed weight	Column volume (mL)	Cat No.	Quantity
SOLA	10mg	2mL	60309-001	1
SOLA CX	10mg	2mL	60309-002	1
SOLA AX	10mg	2mL	60309-003	1

To Learn more about SOLA visit

www.thermoscientific.com/chromatography



Thermo Scientific HyperSep SPE Columns and Plates

HyperSep Retain PEP SPE Columns and Plates

Versatile polymeric material for retention of polar and non-polar analytes

- Exceptional recoveries for polar and non-polar analytes
- High and consistent recoveries
- High capacity material is a high purity, highly porous polystyrene DVB material modified with urea functional groups to give balanced retention of polar and non-polar analytes
- Fast and easy sample preparation and method development
- pH stable 0 to 14



HyperSep Retain PEP SPE Columns

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
10mg	1	60107-222	100 Pack
30mg	1	60107-201	100 Pack
30mg	3	60107-202	50 Pack
60mg	3	60107-203	50 Pack
60mg	6	60107-208	30 Pack
100mg	3	60107-217	50 Pack
100mg	6	60107-207	30 Pack
150mg	6	60107-211	30 Pack
200mg	3	60107-204	50 Pack
200mg	6	60107-212	30 Pack
500mg	3	60107-205	50 Pack
500mg	6	60107-206	30 Pack
1g	25	60107-215	20 Pack
1g	6	60107-218	30 Pack
2g	25	60107-214	20 Pack

Applications:

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

HyperSep Retain PEP 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
5	1	60303-201	100 Pack
10	1	60303-202	100 Pack
30	1	60303-203	100 Pack
Well Plates – Removable Wells			
5	1	60303-205	1 Each
10	1	60303-206	1 Each
30	1	60303-207	1 Each

HyperSep Retain PEP 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
5	1	60306-205	1 Each
10	1	60306-206	1 Each
30	1	60306-207	1 Each
60	1	60306-208	1 Each

HyperSep Retain CX SPE Columns and Plates

Versatile polymeric material for retention of basic compounds

- Exceptional recoveries for basic analytes
- High and consistent recoveries
- High capacity material is a high purity, highly porous polystyrene DVB material partially modified with sulfonic acid functional groups
- Fast and easy sample preparation and method development
- pH stable 0 to 14

HyperSep Retain CX SPE Columns

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
30mg	1	60107-301	100 Pack
30mg	3	60107-302	50 Pack
60mg	3	60107-303	50 Pack
60mg	6	60107-308	30 Pack
100mg	6	60107-307	30 Pack
150mg	6	60107-311	30 Pack
200mg	3	60107-304	50 Pack
200mg	6	60107-314	30 Pack
500mg	3	60107-305	50 Pack
500mg	6	60107-306	30 Pack
1g	25	60107-315	20 Pack
2g	25	60107-312	20 Pack

Applications:

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

HyperSep Retain CX 96 Well Plates and Individual Wells

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
Individual Wells			
5	1	60303-301	100 Pack
10	1	60303-302	100 Pack
30	1	60303-303	100 Pack
Well Plates – Removable Wells			
5	1	60303-305	1 Each
10	1	60303-306	1 Each
30	1	60303-307	1 Each

HyperSep Retain CX 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
5	1	60306-301	1 Each
10	1	60306-302	1 Each
30	1	60306-303	1 Each
60	1	60306-304	1 Each

HyperSep Retain AX SPE Columns and Plates

Versatile polymeric material for retention of acidic compounds

- Exceptional recoveries for acidic analytes
- High and consistent recoveries
- High capacity material is a high purity, highly porous polystyrene DVB material partially modified with quaternary amine functional groups
- Fast and easy sample preparation and method development
- pH stable 0 to 14



HyperSep Retain AX SPE Columns

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
30mg	1	60107-401	100 Pack
30mg	3	60107-402	50 Pack
60mg	3	60107-403	50 Pack
60mg	6	60107-408	30 Pack
100mg	3	60107-417	50 Pack
100mg	6	60107-407	30 Pack
150mg	6	60107-411	30 Pack
200mg	3	60107-404	50 Pack
200mg	6	60107-412	30 Pack
500mg	3	60107-405	50 Pack
500mg	6	60107-406	30 Pack
500mg	15	60107-419	20 Pack
1g	25	60107-415	20 Pack
2g	25	60107-414	20 Pack

Applications:

- Analysis of THC and its metabolites

HyperSep Retain AX 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
5	1	60303-401	100 Pack
10	1	60303-402	100 Pack
30	1	60303-403	100 Pack
Well Plates – Removable Wells			
5	1	60303-405	1 Each
10	1	60303-406	1 Each
30	1	60303-407	1 Each

HyperSep Retain AX 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
5mg	1	60306-401	1 Each
10mg	1	60306-402	1 Each
30mg	1	60306-403	1 Each
60mg	1	60306-404	1 Each

HyperSep Hypercarb SPE Columns and Plates

Unique material for retention of highly polar compounds

- 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 Columns

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

HyperSep Hypercarb 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
10	1	60302-601	100 Pack
25	1	60302-602	100 Pack
50	1	60302-603	100 Pack
Well Plates – Removable Wells			
10	1	60302-606	1 Each
25	1	60302-607	1 Each
50	1	60302-608	1 Each

HyperSep Hypercarb 96 Fixed Well Plates

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

HyperSep Servo+ and HyperSep Servo Columns and Plates

Thermo Scientific HyperSep Servo+ and HyperSep Servo provide optimized SPE solutions for analysis of drugs of abuse. Both product ranges have been specifically designed to provide an out-of-the-box solution for sample preparation for drugs of abuse.

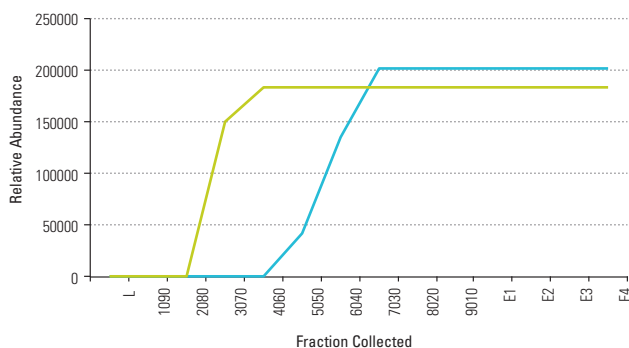
Both product ranges offer high levels of reproducibility and cleanliness of extract for dealing with difficult to analyze biological sample matrices where absolute confidence in your results is required. HyperSep Servo+ provides the additional benefit of greater selectivity, higher loading capacities and improved robustness. Both HyperSep Servo+ and HyperSep Servo ranges offer optimized solutions for different compound classes.

Optimized extraction procedures have been developed to allow ready-to-use solutions where there are no requirements for method development and allow confidence that the sample extraction technique will provide the cleanest extract possible.

The following information highlights the elution profiles generated to provide optimized methods for the different drug classes for Servo+.

HyperSep Servo+ Opiates

Elution Profile

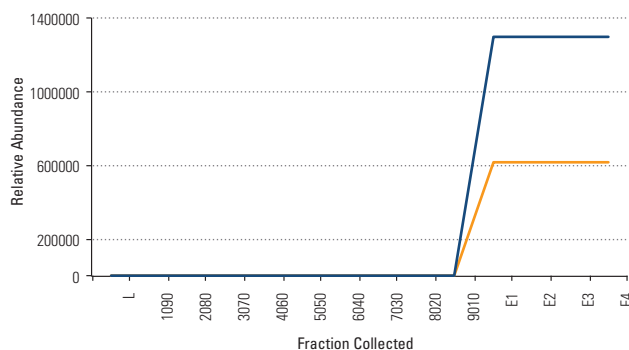


Optimized Method:

Washing the Servo+ Opiates Cartridge or plate with 2% Formic Acid in Methanol, followed by 10:90 Methanol:Water/NH₄OH (95:5) provides an extract with minimal interferences.

HyperSep Servo+ AMP

Elution Profile

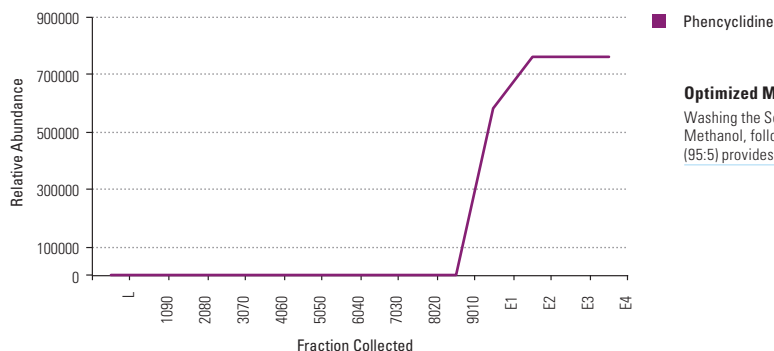


Optimized Method:

Washing the Servo+ AMP cartridge with 2% Formic Acid in Methanol, followed by 80:20 Methanol:Water/NH₄OH (95:5) provides an extract with minimal interferences.

HyperSep Servo+ PCP

Elution Profile

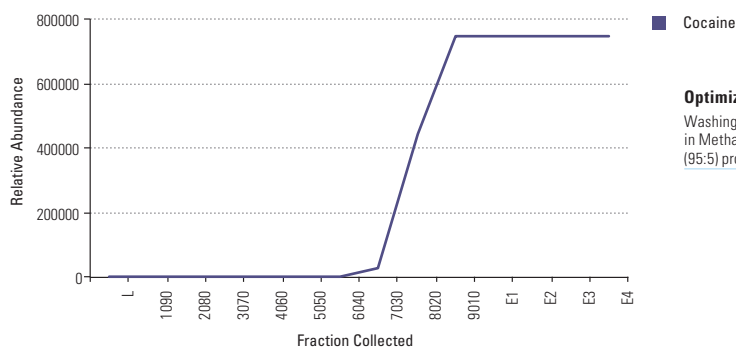


Optimized Method:

Washing the Servo+ PCP tube with 2% Formic Acid in Methanol, followed by 80:20 Methanol:Water/ NH_4OH (95:5) provides an extract with minimal interferences.

HyperSep Servo+ Cocaine

Elution Profile

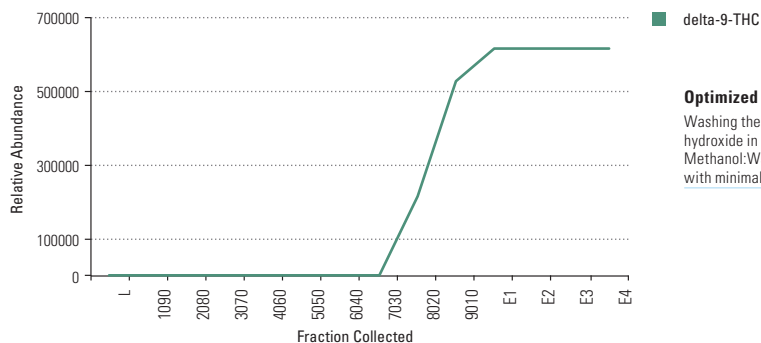


Optimized Method:

Washing the Servo+ Cocaine tube with 2% Formic Acid in Methanol, followed by 50:50 Methanol:Water/ NH_4OH (95:5) provides an extract with minimal interferences.

HyperSep Servo+ THC

Elution Profile



Optimized Method:

Washing the Servo+ THC tube with 2% Ammonia hydroxide in Methanol, followed by 70:30 Methanol:Water/Formic Acid (95:5) provides an extract with minimal interferences.

HyperSep Servo+ Total SPE Columns

Servo+ Total – for screening of a wide range of unknown components

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
30mg	1	60110-101C	100 Pack
30mg	3	60110-102C	50 Pack
60mg	3	60110-103C	50 Pack
200mg	3	60110-104C	50 Pack
500mg	3	60110-105C	50 Pack
500mg	6	60110-106C	30 Pack
100mg	6	60110-107C	30 Pack
60mg	6	60110-108C	30 Pack
150mg	6	60110-109C	30 Pack
200mg	6	60110-110C	30 Pack
1g	25	60110-111C	20 Pack

HyperSep Servo+ Total 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60110-101P	1 Each
10	1	60110-102P	1 Each
30	1	60110-103P	1 Each

HyperSep Servo+ Total-A SPE Columns

Servo+ Total A – for screening of a wide range of unknown acidic compounds

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
30mg	1	60110-201C	100 Pack
30mg	3	60110-202C	50 Pack
60mg	3	60110-203C	50 Pack
200mg	3	60110-204C	50 Pack
500mg	3	60110-205C	50 Pack
500mg	6	60110-206C	30 Pack
100mg	6	60110-207C	30 Pack
60mg	6	60110-208C	30 Pack
150mg	6	60110-209C	30 Pack
200mg	6	60110-210C	30 Pack
1g	25	60110-211C	20 Pack

HyperSep Servo+ Total-A 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60110-201P	1 Each
10	1	60110-202P	1 Each
30	1	60110-203P	1 Each

HyperSep Servo+ Total-B SPE Columns

Servo+ Total B – for screening of a wide range of unknown basic compounds

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
30mg	1	60110-301C	100 Pack
30mg	3	60110-302C	50 Pack
60mg	3	60110-303C	50 Pack
200mg	3	60110-304C	50 Pack
500mg	3	60110-305C	50 Pack
500mg	6	60110-306C	30 Pack
100mg	6	60110-307C	30 Pack
60mg	6	60110-308C	30 Pack
150mg	6	60110-309C	30 Pack
200mg	6	60110-310C	30 Pack
1g	25	60110-311C	20 Pack

HyperSep Servo+ Total-B 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60110-301P	1 Each
10	1	60110-302P	1 Each
30	1	60110-303P	1 Each

HyperSep Servo+ THC SPE Columns

Servo+ THC – for dedicated extraction of THC and associated metabolites

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
30mg	1	60110-401C	100 Pack
30mg	3	60110-402C	50 Pack
60mg	3	60110-403C	50 Pack
200mg	3	60110-404C	50 Pack
500mg	3	60110-405C	50 Pack
500mg	6	60110-406C	30 Pack
100mg	6	60110-407C	30 Pack
60mg	6	60110-408C	30 Pack
150mg	6	60110-409C	30 Pack
200mg	6	60110-410C	30 Pack
1g	25	60110-411C	20 Pack

HyperSep Servo+ THC 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60110-401P	1 Each
10	1	60110-402P	1 Each
30	1	60110-403P	1 Each

HyperSep Servo+ OPIATE SPE Columns

Servo+ Opiates – for dedicated extraction of Opiate class compounds

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
30mg	1	60110-501C	100 Pack
30mg	3	60110-502C	50 Pack
60mg	3	60110-503C	50 Pack
200mg	3	60110-504C	50 Pack
500mg	3	60110-505C	50 Pack
500mg	6	60110-506C	30 Pack
100mg	6	60110-507C	30 Pack
60mg	6	60110-508C	30 Pack
150mg	6	60110-509C	30 Pack
200mg	6	60110-510C	30 Pack
1g	25	60110-511C	20 Pack

HyperSep Servo+ OPIATE 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60110-501P	1 Each
10	1	60110-502P	1 Each
30	1	60110-503P	1 Each

HyperSep Servo+ PCP SPE Columns

Servo+ PCP – for dedicated extraction of PCP class compounds

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
30mg	1	60110-601C	100 Pack
30mg	3	60110-602C	50 Pack
60mg	3	60110-603C	50 Pack
200mg	3	60110-604C	50 Pack
500mg	3	60110-605C	50 Pack
500mg	6	60110-606C	30 Pack
100mg	6	60110-607C	30 Pack
60mg	6	60110-608C	30 Pack
150mg	6	60110-609C	30 Pack
200mg	6	60110-610C	30 Pack
1g	25	60110-611C	20 Pack

HyperSep Servo+ PCP 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60110-601P	1 Each
10	1	60110-602P	1 Each
30	1	60110-603P	1 Each

HyperSep Servo+ AMP SPE Columns

Servo+ AMP – for dedicated extraction of Amphetamine class compounds

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
30mg	1	60110-701C	100 Pack
30mg	3	60110-702C	50 Pack
60mg	3	60110-703C	50 Pack
200mg	3	60110-704C	50 Pack
500mg	3	60110-705C	50 Pack
500mg	6	60110-706C	30 Pack
100mg	6	60110-707C	30 Pack
60mg	6	60110-708C	30 Pack
150mg	6	60110-709C	30 Pack
200mg	6	60110-710C	30 Pack
1g	25	60110-711C	20 Pack

HyperSep Servo+ AMP 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60110-701P	1 Each
10	1	60110-702P	1 Each
30	1	60110-703P	1 Each

HyperSep Servo+ Cocaine SPE Columns

Servo+ Cocaine – for dedicated extraction of Cocaine class compounds

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
30mg	1	60110-801C	100 Pack
30mg	3	60110-802C	50 Pack
60mg	3	60110-803C	50 Pack
200mg	3	60110-804C	50 Pack
500mg	3	60110-805C	50 Pack
500mg	6	60110-806C	30 Pack
100mg	6	60110-807C	30 Pack
60mg	6	60110-808C	30 Pack
150mg	6	60110-809C	30 Pack
200mg	6	60110-810C	30 Pack
1g	25	60110-811C	20 Pack

HyperSep Servo+ Cocaine 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60110-801P	1 Each
10	1	60110-802P	1 Each
30	1	60110-803P	1 Each

HyperSep Servo Total SPE Columns

Servo Total – for screening of a wide range of unknown components

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
50mg	1	60110-901C	100 Pack
100mg	1	60110-902C	100 Pack
200mg	3	60110-903C	50 Pack
500mg	3	60110-904C	50 Pack
500mg	6	60110-905C	30 Pack
1g	6	60110-906C	30 Pack
2g	15	60110-907C	20 Pack

HyperSep Servo Total 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
10	1	60110-901P	1 Each
25	1	60110-902P	1 Each
50	1	60110-903P	1 Each
100	1	60110-904P	2 Each

HyperSep Servo Total-A SPE Columns

Servo Total A – for screening of a wide range of unknown acidic compounds

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
130mg	1	60111-101C	100 Pack
300mg	3	60111-102C	50 Pack
500mg	3	60111-103C	50 Pack
200mg	6	60111-104C	50 Pack
500mg	6	60111-105C	30 Pack
1g	6	60111-106C	30 Pack

HyperSep Servo Total-A 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60111-101P	1 Each
10	1	60111-102P	1 Each
30	1	60111-103P	1 Each
100	1	60111-104P	2 Each

HyperSep Servo Total-B SPE Columns

Servo Total B – for screening of a wide range of unknown basic compounds

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
130mg	1	60111-201C	100 Pack
300mg	3	60111-202C	50 Pack
500mg	3	60111-203C	50 Pack
200mg	6	60111-204C	50 Pack
500mg	6	60111-205C	30 Pack
1g	6	60111-206C	30 Pack

HyperSep Servo Total-B 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60111-201P	1 Each
10	1	60111-202P	1 Each
30	1	60111-203P	1 Each
100	1	60111-204P	2 Each

HyperSep Servo THC SPE Columns

Servo THC – for dedicated extraction of THC and associated metabolites

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
130mg	1	60111-301C	100 Pack
300mg	3	60111-302C	50 Pack
500mg	3	60111-303C	50 Pack
200mg	6	60111-304C	50 Pack
500mg	6	60111-305C	30 Pack
1g	6	60111-306C	30 Pack

HyperSep Servo THC 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60111-301P	1 Each
10	1	60111-302P	1 Each
30	1	60111-303P	1 Each
100	1	60111-304P	2 Each

HyperSep Servo OPIATE SPE Columns

Servo Opiates – for dedicated extraction of Opiate class compounds

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
130mg	1	60111-401C	100 Pack
300mg	3	60111-402C	50 Pack
500mg	3	60111-403C	50 Pack
200mg	6	60111-404C	50 Pack
500mg	6	60111-405C	30 Pack
1g	6	60111-406C	30 Pack

HyperSep Servo OPIATE 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60111-401P	1 Each
10	1	60111-402P	1 Each
30	1	60111-403P	1 Each
100	1	60111-404P	2 Each

HyperSep Servo PCP SPE Columns

Servo PCP – for dedicated extraction of PCP class compounds

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
130mg	1	60111-501C	100 Pack
300mg	3	60111-502C	50 Pack
500mg	3	60111-503C	50 Pack
200mg	6	60111-504C	50 Pack
500mg	6	60111-505C	30 Pack
1g	6	60111-506C	30 Pack

HyperSep Servo PCP 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60111-501P	1 Each
10	1	60111-502P	1 Each
30	1	60111-503P	1 Each
100	1	60111-504P	2 Each

HyperSep Servo AMP SPE Columns

Servo AMP – for dedicated extraction of Amphetamine class compounds

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
130mg	1	60111-601C	100 Pack
300mg	3	60111-602C	50 Pack
500mg	3	60111-603C	50 Pack
200mg	6	60111-604C	50 Pack
500mg	6	60111-605C	30 Pack
1g	6	60111-606C	30 Pack

HyperSep Servo AMP 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60111-601P	1 Each
10	1	60111-602P	1 Each
30	1	60111-603P	1 Each
100	1	60111-604P	2 Each

HyperSep Servo Cocaine SPE Columns

Servo Cocaine – for dedicated extraction of Cocaine class compounds

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
130mg	1	60111-701C	100 Pack
300mg	3	60111-702C	50 Pack
500mg	3	60111-703C	50 Pack
200mg	6	60111-704C	50 Pack
500mg	6	60111-705C	30 Pack
1g	6	60111-706C	30 Pack

HyperSep Servo Cocaine 96 Well Plates

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
5	1	60111-701P	1 Each
10	1	60111-702P	1 Each
30	1	60111-703P	1 Each
100	1	60111-704P	2 Each

To learn more about
HyperSep Servo+ and Servo visit
www.thermoscientific.com/servo

HyperSep C18 SPE Columns and Plates

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

- Retentive for most non-polar compounds
- Retains most organic analytes from aqueous matrices
- Hydrophobic reversed phase
- For non-polar to moderately polar compounds

HyperSep C18 SPE Columns

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

Applications:

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

HyperSep C18 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
10	1	60300-421	100 Pack
25	1	60300-422	100 Pack
50	1	60300-423	100 Pack
100	1	60300-524	100 Pack
Well Plates – Removable Wells			
10	1	60300-425	1 Each
25	1	60300-426	1 Each
50	1	60300-427	1 Each
100	1	60300-428	1 Each

HyperSep C18 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
10	1	60307-201	1 Each
25	1	60307-202	1 Each
50	1	60307-203	1 Each
100	1	60307-204	1 Each

HyperSep C8 SPE Columns and Plates

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

- Well-suited for methods requiring less retention than C18
- Excellent for moderately polar analytes
- Potential for polar interactions greater than with C18



HyperSep C8 SPE Columns

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

Applications:

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

HyperSep C8 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
10	1	60300-441	100 Pack
25	1	60300-442	100 Pack
50	1	60300-443	100 Pack
100	1	60300-444	100 Pack
Well Plates – Removable Wells			
10	1	60300-445	1 Each
25	1	60300-446	1 Each
50	1	60300-447	1 Each
100	1	60300-448	1 Each

HyperSep C8 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
10	1	60307-211	1 Each
25	1	60307-212	1 Each
50	1	60307-213	1 Each
100	1	60307-214	1 Each

HyperSep Phenyl SPE Columns and Plates

Offer alternative selectivity for retention of basic compounds

- Commonly employed for non-polar interactions
- The electron density of the aromatic ring provides different selectivity than other non-polar sorbents

HyperSep Phenyl SPE Columns

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

Applications:

- Extraction of aromatic compounds
- Extraction of basic analytes

HyperSep Phenyl 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
10	1	60300-681	100 Pack
25	1	60300-682	100 Pack
50	1	60300-683	100 Pack
100	1	60300-684	100 Pack
Well Plates – Removable Wells			
10	1	60300-685	1 Each
25	1	60300-686	1 Each
50	1	60300-687	1 Each
100	1	60300-688	1 Each

HyperSep Phenyl 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
10	1	60307-221	1 Each
25	1	60307-222	1 Each
50	1	60307-223	1 Each
100	1	60307-224	1 Each

HyperSep Silica SPE Columns and Plates

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

- Effectively separates compounds of very similar structure
- Adsorbs analytes from non-polar solvents like hydrocarbons, less polar esters and ethers
- Suitable for use as an intermediate strength cation exchanger in aqueous medium

HyperSep Silica SPE Columns

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

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 Silica 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
10	1	60300-481	100 Pack
25	1	60300-482	100 Pack
50	1	60300-483	100 Pack
100	1	60300-484	100 Pack
Well Plates – Removable Wells			
10	1	60300-485	1 Each
25	1	60300-486	1 Each
50	1	60300-487	1 Each
100	1	60300-488	1 Each

HyperSep Silica 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
10	1	60307-231	1 Each
25	1	60307-232	1 Each
50	1	60307-233	1 Each
100	1	60307-234	1 Each

HyperSep SAX Strong Anion Exchanger SPE Columns and Plates

Strong anion exchange sorbent for extraction of weak acids

- Extracts negatively charged compounds from both aqueous and non-aqueous solutions
- Ideally suited for the extraction of weak acids, e.g. carboxylic acids
- Amine group masks the effect of the carbon chain of the functional group
- Selectivity can be tuned by selection of buffer

HyperSep SAX SPE Columns

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

Applications:

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

HyperSep SAX 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
10	1	60300-561	100 Pack
25	1	60300-562	100 Pack
50	1	60300-563	100 Pack
100	1	60300-564	100 Pack
Well Plates – Removable Wells			
10	1	60300-565	1 Each
25	1	60300-566	1 Each
50	1	60300-567	1 Each
100	1	60300-568	1 Each

HyperSep SAX 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
10	1	60307-241	1 Each
25	1	60307-242	1 Each
50	1	60307-243	1 Each
100	1	60307-244	1 Each

HyperSep SCX Strong Cation Exchanger SPE Columns and Plates

A strong cation exchange sorbent for extraction of charged basic compounds

- Modified benzene ring provides potential for non-polar interactions
- Low pK_a value sorbent

HyperSep SCX SPE Columns

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

Applications:

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

HyperSep SCX 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
10	1	60300-581	100 Pack
25	1	60300-582	100 Pack
50	1	60300-583	100 Pack
100	1	60300-584	100 Pack
Well Plates – Removable Wells			
10	1	60300-585	1 Each
25	1	60300-586	1 Each
50	1	60300-587	1 Each
100	1	60300-588	1 Each

Hyper Sep SCX 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
10	1	60307-251	1 Each
25	1	60307-252	1 Each
50	1	60307-253	1 Each
100	1	60307-254	1 Each

HyperSep Verify CX SPE Columns and Plates

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

- Mixed mode sorbent for extraction of basic drugs
- Separation based on two functional groups: reversed phase C8 and an ion exchanger, benzene sulfonic acid
- Co-polymerized on a rigid, purified silica gel support

HyperSep Verify CX SPE Columns

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

Applications:

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

HyperSep Verify CX 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
10	1	60300-801	100 Pack
25	1	60300-802	100 Pack
50	1	60300-803	100 Pack
100	1	60300-804	100 Pack
Well Plates – Removable Wells			
10	1	60300-805	1 Each
25	1	60300-806	1 Each
50	1	60300-807	1 Each
100	1	60300-808	1 Each

Hyper Sep Verify CX 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
10	1	60307-261	1 Each
25	1	60307-262	1 Each
50	1	60307-263	1 Each
100	1	60307-264	1 Each

HyperSep Verify AX SPE Columns and Plates

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

- Mixed mode sorbent suited for the extraction of acidic drugs and metabolites from biological matrices
- Separation based on two functional groups: reversed phase C8 and an ion exchanger, quaternary amine
- Rigid, purified silica gel support to which the two functionalities are co-polymerized



HyperSep Verify AX SPE Columns

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

Applications:

- Analysis of THC and its metabolites

HyperSep Verify AX 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
10	1	60300-809	100 Pack
25	1	60300-810	100 Pack
50	1	60300-811	100 Pack
100	1	60300-812	100 Pack
Well Plates – Removable Wells			
10	1	60300-813	1 Each
25	1	60300-814	1 Each
50	1	60300-815	1 Each
100	1	60300-816	1 Each

Hyper Sep Verify AX 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
10	1	60307-271	1 Each
25	1	60307-272	1 Each
50	1	60307-273	1 Each
100	1	60307-274	1 Each

HyperSep Florisil SPE Columns and Plates

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

- Magnesia-loaded silica gel offers rapid flowrates for large sample volumes
- Extremely polar in nature, especially well-suited for extraction of chlorinated pesticides



HyperSep Florisil SPE Columns

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

Applications:

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

HyperSep Florisil 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
10	1	60300-721	100 Pack
25	1	60300-722	100 Pack
50	1	60300-723	100 Pack
100	1	60300-724	100 Pack
Well Plates – Removable Wells			
10	1	60300-725	1 Each
25	1	60300-726	1 Each
50	1	60300-727	1 Each
100	1	60300-728	1 Each

Hyper Sep Florisil 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
10	1	60307-281	1 Each
25	1	60307-282	1 Each
50	1	60307-283	1 Each
100	1	60307-284	1 Each

HyperSep Aminopropyl SPE Columns and Plates

A polar sorbent for both polar and anion exchange interactions

- Weak anion exchanger
- Enhanced retention of strong anions like sulfonic acids
- Excellent retention of drugs, metabolites and structural isomer

HyperSep Aminopropyl SPE Columns

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

Applications:

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

HyperSep Aminopropyl 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
10	1	60300-501	100 Pack
25	1	60300-502	100 Pack
50	1	60300-503	100 Pack
100	1	60300-504	100 Pack
Well Plates – Removable Wells			
10	1	60300-505	1 Each
25	1	60300-506	1 Each
50	1	60300-507	1 Each
100	1	60300-508	1 Each

Hyper Sep Aminopropyl 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
10	1	60307-291	1 Each
25	1	60307-292	1 Each
50	1	60307-293	1 Each
100	1	60307-294	1 Each

HyperSep Cyano SPE Columns and Plates

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

- Medium polarity sorbent, less retentive than silica or diol
- Suitable for reverse phase extractions of moderately polar compounds

HyperSep Cyano SPE Columns

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

Applications:

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

HyperSep Cyano 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
10	1	60300-817	100 Pack
25	1	60300-818	100 Pack
50	1	60300-819	100 Pack
100	1	60300-820	100 Pack
Well Plates – Removable Wells			
10	1	60300-821	1 Each
25	1	60300-822	1 Each
50	1	60300-823	1 Each
100	1	60300-824	1 Each

Hyper Sep Cyano 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
10	1	60307-301	1 Each
25	1	60307-302	1 Each
50	1	60307-303	1 Each
100	1	60307-304	1 Each

HyperSep Diol SPE Columns and Plates

Ideal for the extraction of polar compounds

- Short alkyl chains with polar functional groups

HyperSep Diol SPE Columns

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

Applications:

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

HyperSep Diol 96 Well Plates and Individual Wells

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
Individual Wells			
10	1	60300-635	100 Pack
25	1	60300-636	100 Pack
50	1	60300-637	100 Pack
100	1	60300-638	100 Pack
Well Plates – Removable Wells			
10	1	60300-630	1 Each
25	1	60300-631	1 Each
50	1	60300-632	1 Each
100	1	60300-633	1 Each

Hyper Sep Diol 96 Fixed Well Plates

Bed Weight (mg)	Volume (mL)	Cat. No.	Quantity
10	1	60307-311	1 Each
25	1	60307-312	1 Each
50	1	60307-313	1 Each

Thermo Scientific SPE Accessories

A comprehensive range of accessories to improve your sample preparation workflow

HyperSep Universal Vacuum Manifold

- Accommodates both SPE columns 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	60104-230	1 Each
Vacuum Pump, European Version	60104-241	1 Each
Vacuum Pump, North American Version	60104-243	1 Each
24 Well Extraction Plate	60104-284	1 Each
48 Well Extraction Plate	60104-289	1 Each
Plugs for 24-position Extraction Plate	60104-234	24 Pack
Plugs for 48-position Extraction Plate	60104-235	48 Pack
Plugs for UVM 24 Port Plate	60104-234	24 Pack
Plugs for UVM 48 Port Plate	60104-235	48 Pack

HyperSep Positive Pressure Manifold

HyperSep Positive Pressure Manifold

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



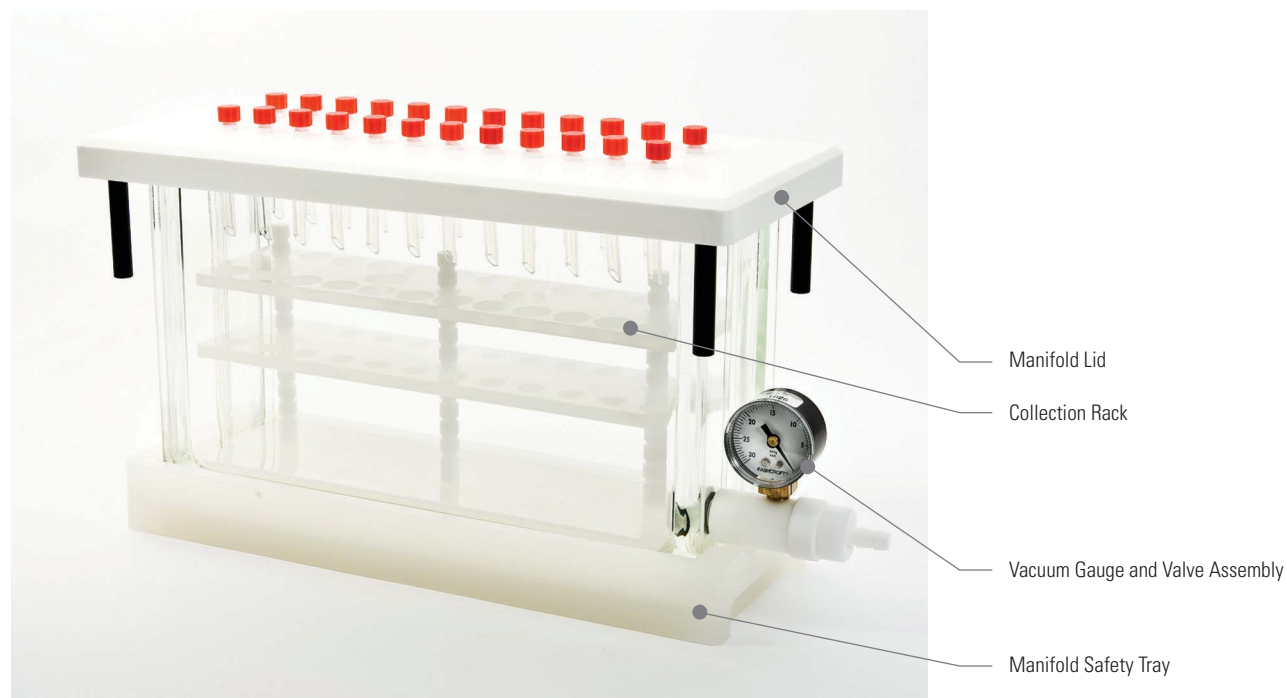
HyperSep Glass Block Manifolds

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 Luer Lock



Retaining Clips for
Collection Rack



Bulkhead Luer Fittings



Collection Rack



Vacuum Gauge



Valve Assembly



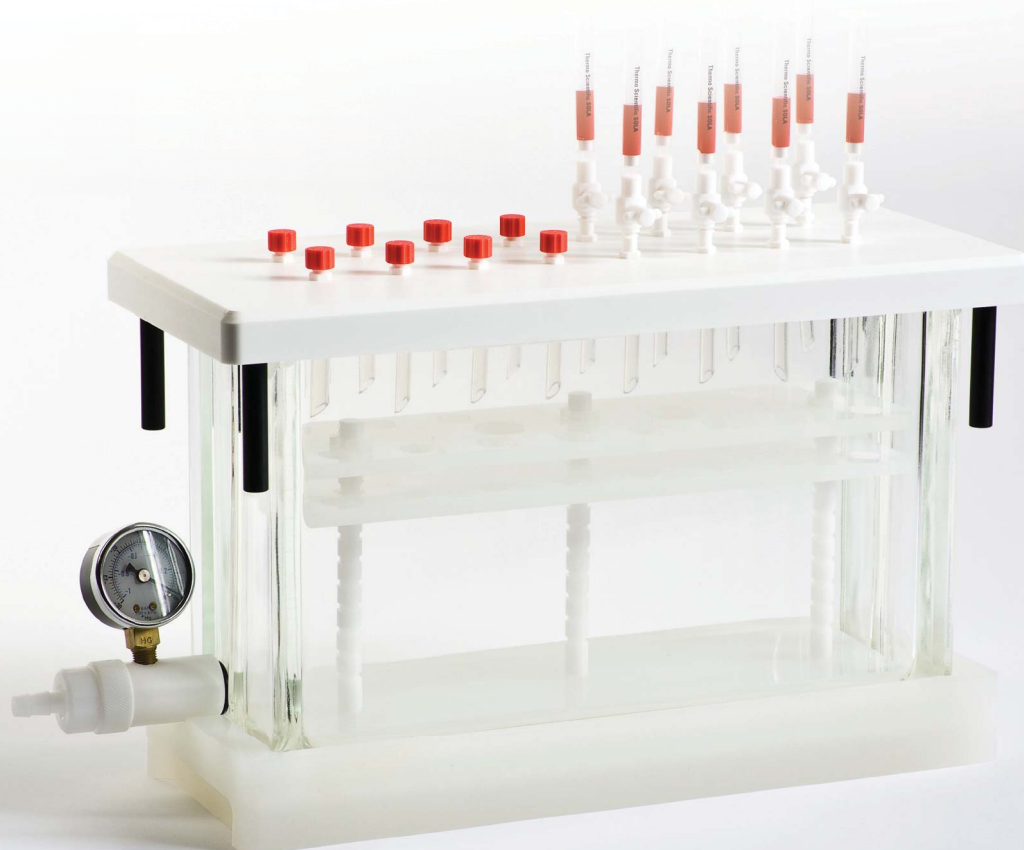
Tips



Manifold Lid Legs

HyperSep Glass Block Manifolds

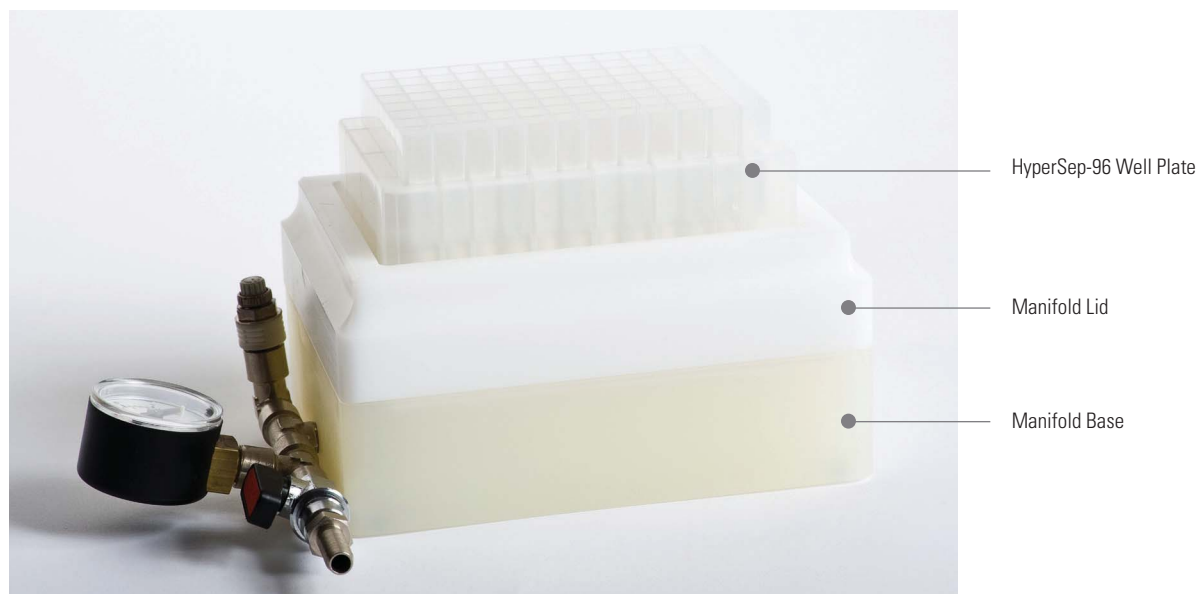
Description	Cat. No.	Quantity
16-port Vacuum Manifold	60104-232	1 Each
24-port Vacuum Manifold	60104-233	1 Each
Vacuum Pump, European Version	60104-241	1 Each
Vacuum Pump, North American Version	60104-243	1 Each
Replacement Parts		
Vacuum Gauge	60104-240	1 Each
Stopcocks for 16-port Vacuum Manifold	60104-242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



HyperSep-96 Well Plate 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	60103-351	1 Each
Vacuum Pump, European Version	60104-241	1 Each
Vacuum Pump, North American Version	60104-243	1 Each

HyperSep SPE Accessories

A range of accessories to complement the HyperSep SPE Manifolds

HyperSep SPE Accessories

Description	Cat. No.	Quantity
Base Plate for HyperSep-96 Well Plate	60300-301	1 Each
Base Plate for HyperSep-96 Well Plate	60300-303	5 Pack
Sample Collection Plate, 1mL	60300-402	50 Pack
Sample Collection Plate, 2mL	60300-403	50 Pack
Adaptors for 1mL, 3mL and 6mL SPE Columns	60104-259	15 Pack
Empty 1mL Wells	60300-318	100 Pack
Empty 1mL Wells, Fritted	60300-311	100 Pack



HyperSep Protein Precipitation Plate

Provides a quick 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 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

Protein Precipitation Products

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

HyperSep SLE Columns and Plates

Solid supported liquid/liquid extraction (SLE) is a fast 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 as the sample and water immiscible solvents are not in direct contact
- 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

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



HyperSep SLE Columns

Special treated diatomite SLE (pH=7)

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
200mg	3	60109-200-3-7	50
500mg	3	60109-500-3-7	50
500mg	6	60109-500-6-7	30
1g	6	60109-1000-6-7	30
2g	12	60109-2000-12-7	20
4g	25	60109-4000-25-7	15
20g	60	60109-20000-60-7	10

HyperSep SLE Plates

Special treated diatomite SLE (pH=7)

Bed Weight (mg)	Column Volume (mL)	Cat. No.	Quantity
200	2	60109-200-2-7W	1 Each
300	2	60109-300-2-7W	1 Each
400	2	60109-400-2-7W	1 Each
500	2	60109-500-2-7W	1 Each

HyperSep SLE Columns

Special treated diatomite SLE (pH=9)

Bed Weight	Column Volume (mL)	Cat. No.	Quantity
200mg	3	60109-200-3-9	50
500mg	3	60109-500-3-9	50
500mg	6	60109-500-6-9	30
1g	6	60109-1000-6-9	30
2g	12	60109-2000-12-9	20
4g	25	60109-4000-25-9	15
20g	60	60109-20000-60-9	10

HyperSep SLE Plates

Special treated diatomite SLE (pH=9)

Bed Weight (mg)	Column Volume (mL)	Catalog No	Quantity
200	2	60109-200-2-9W	1 Each
300	2	60109-300-2-9W	1 Each
400	2	60109-400-2-9W	1 Each
500	2	60109-500-2-9W	1 Each

To learn more visit www.thermoscientific.com/sle

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 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.	Quantity
Polystyrene		
C18	60110-201	5 Pack
C8	60110-202	5 Pack
C4	60110-203	5 Pack
Hypercarb	60110-204	5 Pack
Hypercarb and C18 (Mixed Mode)	60110-205	5 Pack
Zirconium Dioxide	60110-206	5 Pack
Titanium Dioxide	60110-207	5 Pack
SCX	60110-208	5 Pack
SAX	60110-209	5 Pack
Polypropylene		
C18	60110-301	5 Pack
C8	60110-302	5 Pack
C4	60110-303	5 Pack
Hypercarb	60110-304	5 Pack
Hypercarb and C18 (Mixed Mode)	60110-305	5 Pack
Zirconium Dioxide	60110-306	5 Pack
Titanium Dioxide	60110-307	5 Pack
SCX	60110-308	5 Pack
SAX	60110-309	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
- Cleanup of microgram-level samples
- Can be used under vacuum
- Available in a range of chromatographic materials

HyperSep Filter Plates

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

TurboFlow Columns

- For use with Thermo Scientific Aria and Transcend systems only
- Unique, patented technology
- Automated online sample extraction
- Reduce costs and improve data results



TurboFlow™ columns are used exclusively with the Aria and Transcend TLX Systems. Their patented design allows for compounds of interest to be retained on the TurboFlow column while the complex matrices quickly and completely flow through to waste.

The retained compounds can then be eluted to another column for further separation or directly into a detector. Using TurboFlow technology, the Aria and Transcend TLX systems provide an alternative high throughput sample preparation technique to solid phase extraction (SPE), liquid-liquid extraction (LLE), and protein precipitation (PPT). TurboFlow technology minimizes ion suppression, resulting in clean sample extracts and more reproducible MS detection. This provides significant advantages compared to PPT and as an alternative to SPE, making it a powerful tool for analysis of biological fluids, food and other complex matrices.

TurboFlow columns are available in a variety of packing chemistries to enable extraction of many different compounds of interest. The most appropriate column can be selected by determining the overall polarity of the analyte, the mobile phase needed to solubilize it and the sample matrix from which it must be extracted.

TurboFlow XL columns have an improved silica packing material and TurboFlow Cyclone columns are polymer based. Both columns are robust and have long lasting performance. All columns are available in both 1.0 and 0.5mm ID.

Transcend™ and Aria™ System TurboFlow Columns

Product Description	1x50mm	.5x50mm
TurboFlow Cyclone Column	CH-952434	CH-953288
TurboFlow Cyclone-P Column	CH-952605	CH-953289
TurboFlow Cyclone MAX Column	CH-952979	CH-953286
TurboFlow Cyclone MCX Column	CH-952813	CH-953287
TurboFlow Cyclone MCX-2 Column	CH-953456	CH-953457
TurboFlow XL Column C18	CH-953244	CH-953280
TurboFlow XL Column C18-P	CH-953275	CH-953281
TurboFlow XL Column C2	CH-953279	CH-953285
TurboFlow XL Column C8	CH-953276	CH-953282
TurboFlow XL Column Fluoro	CH-953277	CH-953283
TurboFlow Column Phenyl*	CH-952178	CH-952820
TurboFlow Column PolarPlus™*	CH-952242	CH-952708

*Suggested operating pressure of 250 bar or below

For more information please visit www.thermoscientific.com/transcend

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 Retain PEP: for retention of polar and non-polar analytes
- HyperSep Retain CX: for retention of basic and non-polar analytes
- HyperSep Retain AX: for retention of acidic and non-polar analytes
- HyperSep Hypercarb: for retention of extremely polar analytes



HyperSep Javelin Direct-Connect Online SPE Columns

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

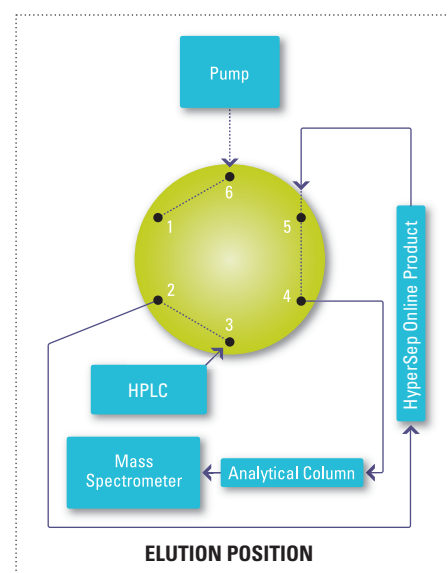
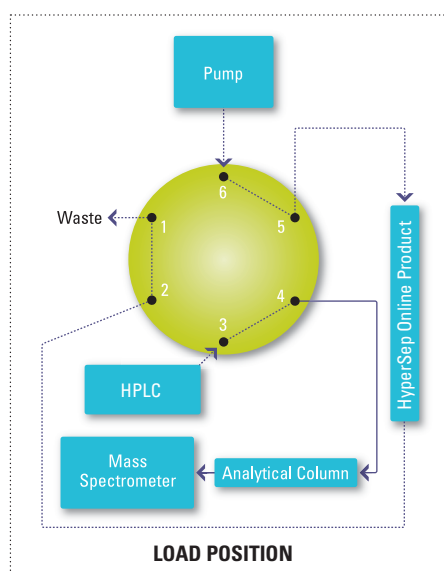
HyperSep UNIGUARD Direct-Connect Online SPE Cartridges

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

HyperSep HPLC Columns for Online SPE

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

This diagram shows the typical load and elution positions for the HyperSep Online SPE Setup



Dionex SolEx HRP Online Sample SPE Concentration Columns

Dionex SolEx™ Online Solid-phase extraction (SPE) columns are designed for fast, easy preconcentration of contaminants from water samples prior to HPLC analysis. The column is placed in the valve to automatically concentrate the analytes of interest. The online Dionex SolEx HRP columns are packed with a hydrophilic reversed-phase packing.

- Greater confidence in results due to less sample handling
- More reproducible results because of automated online use
- A wide range of compounds: from polar to hydrophobic analytes
- High capacity with good recoveries
- Wide pH compatibility (0-14)

Dionex SolEx HRP columns (2.1 × 20mm) are designed specifically for online HPLC use, and are packed with a divinylbenzene polymer with a hydrophilic bonded layer. This resin is used in the reversed-phase mode and demonstrates excellent retention properties on both polar and hydrophobic analytes. Even with 100% aqueous mobile phases, no de-wetting occurs. The Dionex SolEx HRP columns are available in both a cartridge format and an ultra high pressure compatible (UHPLC), rapid separation (RSLC) column format. The cartridge fits in a holder for easy cartridge exchange when necessary. The ultra high pressure, rapid separation column format can be used up to 800 bar.

Dionex SolEx Columns for Online HPLC Sample Preparation

Dionex SolEx Online Sample Preparation Columns	Cat No.
SolEx HRP cartridge (2.1 x 20mm), requires Holder V-3	074400
Cartridge Holder V-3	074403
SolEx RSLC HRP column (2.1 x 20mm)	075590



HyperSep MEPS Products

Online SPE for GC and LC sample preparation – extraction to injection in a single process

- Save hours in sample preparation
- Significantly reduce the time to prepare and inject samples from hours to minutes
- Eliminate all extra steps between sample preparation and sample injection (fully compatible with direct injection onto LC or GC)
- Reduce buffer and solvent volume from milliliters to microliters
- Reduce the sample volume needed to as little as 3.6µL
- Compatible with CTC and eVol platforms for automation

MEPS (Micro Extraction by Packed Sorbent) is the miniaturization of conventional SPE packed bed devices from milliliter bed volumes to microliter volumes and is available in a variety of phase chemistries. It offers advantages in rapid and effective SPE method development.



To learn more visit www.thermoscientific.com/chromatography and download the brochure.

Discover eVol – the world's first analytical syringe



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HyperSep MEPS Syringe Components

MEPS Syringes and Components

Description	Cat. No.	Quantity
Thermo Scientific, CTC analytics, HTA and Varian 8400 systems		
100µL removable needle MEPS syringe	60308-101	1 Each
Replacement plunger assembly for 100µL MEPS syringe	60308-102	1 Each
250µL removable needle MEPS Syringe	60308-103	1 Each
Replacement plunger assembly for 250µL MEPS syringe	60308-104	1 Each
CTC Analytics Only		
250µL removable needle MEPS syringe	60308-105	1 Each
Replacement plunger assembly for 250µL CTC-compatible syringe	60308-106	1 Each

HyperSep MEPS for GC Applications: Thermo Scientific, CTC Analytics, HTA and Varian 8400 Systems

- For use with 100 and 250µL MEPS syringes

MEPS For GC: Thermo Scientific, CTC Analytics, HTA and Varian 8400 Systems

Description	Cat. No.	Quantity
HyperSep Retain PEP MEPS	60308-201	5 Pack
HyperSep Retain CX MEPS	60308-202	5 Pack
HyperSep Retain-AX MEPS	60308-203	5 Pack
HyperSep Hypercarb MEPS	60308-204	5 Pack
HyperSep Verify CX MEPS	60308-205	5 Pack
HyperSep Verify AX MEPS	60308-206	5 Pack
HyperSep C18 MEPS	60308-207	5 Pack
HyperSep Silica MEPS	60308-208	5 Pack
MEPS Development Kit for GC Applications	60308-209	5 Pack

HyperSep MEPS Development Kit for GC applications contains 1 each of Retain PEP, Retain CX, Retain AX, Hypercarb and C18

HyperSep MEPS for GC Applications: CTC Analytics Using 250µL Syringes

MEPS For GC: CTC Analytics Using 250µL Syringes

Description	Cat. No.	Quantity
HyperSep Retain PEP MEPS	60308-301	5 Pack
HyperSep Retain CX MEPS	60308-302	5 Pack
HyperSep Retain AX MEPS	60308-303	5 Pack
HyperSep Hypercarb MEPS	60308-304	5 Pack
HyperSep Verify CX MEPS	60308-305	5 Pack
HyperSep Verify AX MEPS	60308-306	5 Pack
HyperSep C18 MEPS	60308-307	5 Pack
HyperSep Silica MEPS	60308-308	5 Pack
MEPS Development Kit for GC Applications	60308-309	5 Pack

HyperSep MEPS Development Kit for GC applications contains 1 each of Retain PEP, Retain CX, Retain AX, Hypercarb and C18

HyperSep MEPS For LC Applications: Thermo Scientific, CTC Analytics, HTA and Varian 8400 Systems

- For use with 100 and 250µL MEPS syringes

MEPS For LC: Thermo Scientific, CTC Analytics, HTA and Varian 8400 Systems

Description	Cat. No.	Quantity
HyperSep Retain PEP MEPS	60308-401	5 Pack
HyperSep Retain CX MEPS	60308-402	5 Pack
HyperSep Retain AX MEPS	60308-403	5 Pack
HyperSep Hypercarb MEPS	60308-404	5 Pack
HyperSep Verify CX MEPS	60308-405	5 Pack
HyperSep Verify AX MEPS	60308-406	5 Pack
HyperSep C18 MEPS	60308-407	5 Pack
HyperSep Silica MEPS	60308-408	5 Pack
MEPS Development Kit for LC applications	60308-409	5 Pack

HyperSep MEPS Development Kit for LC applications contains 1 each of Retain PEP, Retain CX, Retain AX, Hypercarb and C18.

HyperSep MEPS For LC Applications: CTC Analytics Using 250µL Syringes

- For use with 250µL MEPS syringes

MEPS For LC Applications: CTC Analytics Using 250µL Syringes

Description	Cat. No.	Quantity
HyperSep Retain PEP MEPS	60308-501	5 Pack
HyperSep Retain CX MEPS	60308-502	5 Pack
HyperSep Retain AX MEPS	60308-503	5 Pack
HyperSep Hypercarb MEPS	60308-504	5 Pack
HyperSep Verify CX MEPS	60308-505	5 Pack
HyperSep Verify AX MEPS	60308-506	5 Pack
HyperSep C18 MEPS	60308-507	5 Pack
HyperSep Silica MEPS	60308-508	5 Pack
HyperSep MEPS Development Kit for LC applications	60308-509	5 Pack

HyperSep MEPS Development Kit for LC applications contains 1 each of Retain PEP, Retain CX, Retain AX, Hypercarb and C18.

eVol 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
- Addition of MEPS to XCHANGE syringe offers automated sample preparation by SPE in a handheld system

eVol Dispensing System

Description	Cat. No.	Quantity
Sample Dispensing System	66002-020	1 Each
eVol™ XCHANGE syringe 5µL	66002-021	1 Each
eVol XCHANGE syringe 50µL	66002-022	1 Each
eVol XCHANGE syringe 500µL	66002-023	1 Each
Sample Dispensing System Kit	66002-024	1 Each
eVol Stand	66002-025	1 Each
Charger for eVol System	66002-026	1 Each
Charging Stand for eVol System	66002-027	1 Each
Replacement Battery for eVol System	66002-028	1 Each
Replacement Plunger for 5µL eVol Syringe	66002-029	1 Each
Replacement Plunger for 50µL eVol Syringe	66002-030	1 Each
Replacement Plunger for 500µL eVol Syringe	66002-031	1 Each
Charger for eVol System	66002-026	1 Each
Charging Stand for eVol System	66002-027	1 Each
Replacement Battery for eVol System	66002-028	1 Each
Replacement Plunger for 5µL eVol Syringe	66002-029	1 Each
Replacement Plunger for 50µL eVol Syringe	66002-030	1 Each
Replacement Plunger for 500µL eVol Syringe	66002-031	1 Each



Applications:

- Routine dispensing of volatile solvents, hazardous, corrosive or viscous chemicals



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



HyperSep Tip Microscale Solid Phase Extraction Tips

Material	Cat. No.	Quantity
1-10µL Capacity		
BioBasic C18	60109-201	96 Pack
BioBasic C8	60109-202	96 Pack
BioBasic C4	60109-203	96 Pack
Hypercarb	60109-204	96 Pack
Hypercarb and C18 (mix mode)	60109-205	96 Pack
HILIC	60109-206	96 Pack
Trypsin	60109-207	96 Pack
Titanium Dioxide	60109-208	96 Pack
Zirconium Dioxide	60109-217	96 Pack
10-200µL Capacity		
BioBasic C18	60109-209	96 Pack
BioBasic C8	60109-210	96 Pack
BioBasic C4	60109-211	96 Pack
Hypercarb	60109-212	96 Pack
Hypercarb and C18 (Mix Mode)	60109-213	96 Pack
HILIC	60109-214	96 Pack
Trypsin	60109-215	96 Pack
Titanium Dioxide	60109-216	96 Pack
Zirconium Dioxide	60109-218	96 Pack

Applications:

- Mass spectrometry
- Desalting
- Protein purification
- MALDI
- Electrophoresis
- HPCE
- HPLC
- CEC

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

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

Aspire Protein A and Protein G Tips

Purify antibodies in minutes

- Capture and purify a wide range of monoclonal and polyclonal IgG antibodies from serum, ascites and cell culture supernatants
- Embedded with high quality immobilized Thermo Scientific Protein A Plus and Protein G Plus Agarose with the capacity to purify (1mg of human IgG)
- Spin column capacity for a fraction of the cost
- Fast and easy protocol does not compromise purity and yield



Aspire Protein A and Protein G Tips

Description	Cat. No.	Quantity
Aspire Protein A Tips	990-03	96 Pack
Aspire Protein G Tips	990-02	96 Pack

Aspire IMAC

Quick and clean purification

- Designed in a pipette tip format to effectively purify up to 0.5mg of his-tagged from cell protein lysates
- Color-coded, multichannel Thermo Scientific Aspire protocol allows parallel sample processing in minutes without the need for centrifugation



Aspire IMAC Cobalt Tips

Description	Cat. No.	Quantity
Aspire IMAC Cobalt Tips	990-04	96 Pack
Aspire Nickel-NTA Tips	990-08	96 Pack
Aspire Glutathione Tips	990-07	96 Pack

Aspire RP30 Desalting Tips

Effectively remove ion-suppressing contaminants from digested complex protein mixtures for LC/MS analysis within 20 minutes

Proprietary reversed-phase resin allows superior peptide binding and recovery of digested complex protein mixtures compared to conventional C18 products.

- Removes salts, detergents and other ion-suppressing contaminants
- Reduced ion-suppression, increase signal-to-noise ratios and sequence coverage
- Effective sample clean-up prior to LC/MS and LC/MS/MS analysis
- 20-Minute purification protocol features color-coded parallel sample processing
- Bind up to 30µg of total peptide without the need for centrifugation



Aspire RP30 Desalting Tips

Description	Cat. No.	Quantity
Aspire RP30 Desalting Tips	990-01	96 Pack

HyperSep Dispersive SPE Products

QuEChERS Products

Convenient and effective approach for determining pesticide residues in fruit, vegetables and other foods

QuEChERS Dispersive SPE Product Selection

The QuEChERS (Quick, Easy, Cheap, Effective, Rugged and Safe) technique is increasingly becoming the technique of choice for extraction and clean-up of pesticide residues. It was developed by the USDA Eastern Regional Research Center. Please refer to the information below for selection of the most appropriate QuEChERS product for multi-residue pesticide analysis.

There are four variations of the QuEChERS method currently being used:

- The original QuEChERS method – this was introduced in 2003, using sodium chloride to enhance extraction
- Dispersive AOAC 2007.01 – this uses sodium acetate as a buffer, replacing sodium chloride
- The dual phase variation – this method introduces the use of PSA and GCB to remove high levels of chlorophyll and plant sterols in the final extract without the loss of planar pesticides (polar aromatics) using an acetone:toluene solvent mix (3:1)
- The European version is similar to the AOAC method, except the extraction uses sodium chloride, sodium citrate dihydrate and disodium citrate sesquihydrate instead of sodium acetate

Sorbents used in QuEChERS Methods

Material	Purpose	Typical Matrices
Magnesium Sulfate	Removal of excess water	Fruits, vegetables
PSA (Primary/Secondary Amine)	Removal of organic acids, fatty acids, sugars	Fruits
C18	Removal of lipids and sterols	Milk, meat, fish
GCB (Graphitized Carbon Black)	Removal of pigments and sterols	Wine, green vegetables, carrots

Product Selection

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 Products *continued*

Method	Description	Cat. No.	Quantity
Original	50mL tube with 4g magnesium sulfate, 1g sodium chloride	60105-211	250pk
AOAC 2007.1	50mL tube with 6g magnesium sulfate, 1.5g sodium acetate	60105-210	250pk
	2mL tube with 150mg magnesium sulfate, 50mg PSA	60105-203	100pk
	2mL tube with 150mg magnesium sulfate, 50mg PSA, 50mg C18	60105-204	100pk
	15mL tube with 900mg magnesium sulfate, 300mg PSA, 150mg GCB	60105-205	50pk
	15mL tube with 900mg magnesium sulfate, 300mg PSA, 150mg C18	60105-206	50pk
	2mL tube with 150mg magnesium sulfate, 50mg PSA, 50mg C18, 50mg GCB	60105-223	100pk
	15mL tube with 1200mg magnesium sulfate, 400mg PSA	60105-224	50pk
	15mL tube with 1200mg magnesium sulfate, 400mg PSA, 400mg C18	60105-225	50pk
	15mL tube with 1200mg magnesium sulfate, 400mg PSA, 400mg C18, 400mg GCB	60105-226	50pk
European EN15662	50mL tube with 6g magnesium sulfate, 1.5g sodium chloride, 1.5g sodium citrate tribasic dihydrate, 0.75g sodium citrate dibasic sesquihydrate	60105-212	250pk
	50mL tube with 4g magnesium sulfate, 1g sodium chloride, 1g sodium citrate tribasic dihydrate, 0.5g sodium citrate dibasic sesquihydrate	60105-216	250pk
	15mL tube with 900mg magnesium sulfate, 150mg PSA,	60105-215	50pk
	15mL tube with 900mg magnesium sulfate, 150mg PSA, 45mg GCB	60105-217	50pk
	15mL tube with 900mg magnesium sulfate, 150mg PSA, 15mg GCB	60105-218	50pk
	2mL tube with 150mg magnesium sulfate, 25mg PSA	60105-219	100pk
	2mL tube with 150mg magnesium sulfate, 25mg PSA, 2.5mg GCB	60105-221	100pk
	2mL tube with 150mg magnesium sulfate, 25mg PSA, 7.5mg GCB	60105-222	100pk
	15mL tube with 900mg magnesium sulfate, 150mg PSA, 150mg C18	60105-227	50pk
Dual Phase Method	6mL column with 200mg GCB on top, 400mg PSA on bottom, separated by a Frit	60105-207	30pk
	6mL column with 250mg GCB on top, 500mg PSA on bottom, separated by a Frit	60105-208	30pk
	6mL column with 500mg GCB on top, 500mg PSA on bottom, separated by a Frit	60105-209	30pk



The QuEChERS method is a two-step process: extraction followed by clean-up. The extraction step products use magnesium sulfate to aid extraction, along with either sodium chloride, sodium citrate, or anhydrous sodium acetate for “base-sensitive” compounds (e.g., folpet or captan). The extraction step products are supplied in a 50mL polypropylene centrifuge tube for convenient extractions. The clean-up step products contain PSA (primary/secondary amine) for the removal of organic acids and polar pigments among other compounds. Some products couple the PSA with endcapped C18 for the removal of most lipids and sterols, or graphitized carbon black for the removal of sterols and pigments such as chlorophyll. A variety of tube formats and bed weights are available to accommodate large and small sample sizes.

- Determine greater number of pesticides than with standard SPE
- Easy to use
- Available in a number of configurations

HyperSep Dispersive SPE Extraction Products

Description	Capacity (mL)	Cat. No.	Quantity
6g anhydrous magnesium sulfate, 1.5g anhydrous sodium acetate	50	60105-210	250 Pack
4g anhydrous magnesium sulfate, 1g anhydrous sodium chloride	50	60105-211	250 Pack
4g anhydrous magnesium sulfate, 1g sodium chloride, 1g sodium citrate dihydrate, 0.5g disodium citrate sesquihydrate	50	60105-216	250 Pack
6g anhydrous magnesium sulfate, 1.5g sodium chloride, 1.5g sodium citrate dihydrate, 0.75g disodium citrate sesquihydrate	50	60105-212	250 Pack
Centrifuge tube with 1500mg magnesium sulfate, 500mg C18	50	60105-234	250 Pack
Centrifuge tube with 4g anhydrous magnesium sulfate, 1g sodium chloride	50	60105-311	25 Pack
Centrifuge tube with 6g anhydrous magnesium sulfate, 1.5g sodium chloride, 1.5g Sodium citrate tribasic dihydrate, 750mg sodium citrate dibasic	50	60105-312	25 Pack
Centrifuge tube with 4g anhydrous magnesium sulfate, 1g sodium chloride, 1g Sodium citrate tribasic dihydrate, 500mg sodium citrate dibasic	50	60105-316	25 Pack



HyperSep Dispersive SPE Clean-Up Products

HyperSep Dispersive SPE Clean-Up Products

Description	Capacity (mL)	Cat. No.	Quantity
150mg anhydrous magnesium sulfate, 25mg PSA	2	60105-219	100 Pack
150mg anhydrous magnesium sulfate, 25mg PSA, 25mg C18	2	60105-220	100 Pack
150mg anhydrous magnesium sulfate, 25mg PSA, 2.5mg GCB	2	60105-221	100 Pack
150mg anhydrous magnesium sulfate, 25mg PSA, 7.5mg GCB	2	60105-222	100 Pack
150mg anhydrous magnesium sulfate, 50mg PSA, 50mg GCB	2	60105-202	100 Pack
150mg anhydrous magnesium sulfate, 50mg PSA	2	60105-203	100 Pack
150mg anhydrous magnesium sulfate, 50mg PSA, 50mg C18	2	60105-204	100 Pack
150mg anhydrous magnesium sulfate, 50mg PSA, 50mg C18, 50mg GCB	2	60105-223	100 Pack
900mg anhydrous magnesium sulfate, 300mg PSA, 150mg C18	15	60105-206	50 Pack
900mg anhydrous magnesium sulfate, 300mg PSA, 150mg GCB	15	60105-205	50 Pack
1200mg anhydrous magnesium sulfate, 400mg PSA	15	60105-224	50 Pack
1200mg anhydrous magnesium sulfate, 400mg PSA, 400mg C18	15	60105-225	50 Pack
1200mg anhydrous magnesium sulfate, 400mg PSA, 400mg C18, 400mg GCB	15	60105-226	50 Pack
900mg anhydrous magnesium sulfate, 150mg PSA, 150mg C18	15	60105-227	50 Pack
150mg anhydrous magnesium sulfate, 50mg PSA, 50mg GCB	15	60105-230	50 Pack
900mg anhydrous magnesium sulfate, 150mg PSA, 45mg GCB	15	60105-217	50 Pack
900mg anhydrous magnesium sulfate, 150mg PSA, 15mg GCB	15	60105-218	50 Pack
900mg anhydrous magnesium sulfate, 150mg PSA	15	60105-215	50 Pack
150mg anhydrous magnesium sulfate, 300mg PSA, 150mg chlorofiltr	15	60105-231	50 Pack
750mg anhydrous magnesium sulfate, 250mg PSA, 250mg C18, 250mg GCB	15	60105-213	50 Pack
900mg anhydrous magnesium sulfate, 300mg PSA	15	60105-214	50 Pack
400mg PSA on bottom, 200mg GCB on top, separated by a frit	6	60105-207	30 Pack
500mg PSA on bottom, 250mg GCB on top, separated by a frit	6	60105-208	30 Pack
500mg PSA on bottom, 500mg GCB on top, separated by a frit	6	60105-209	30 Pack

HyperSep Dispersive SPE Multipacks

QuEChERS reagents are provided in individual metalized pouches. Each pack of 50 pouches is supplied with 50 empty centrifuge tubes with plug seal caps.

HyperSep Dispersive SPE Multipacks

Description	Cat. No.	Quantity
4000mg magnesium sulfate, 1000mg sodium chloride	60105-332	50 Pack
4000mg magnesium sulfate, 1000mg sodium chloride, 500mg sodium citrate dibasic sesquihydrate, 1000mg sodium citrate tribasic	60105-333	50 Pack
4000mg magnesium sulfate, 1g sodium acetate	60105-334	50 Pack
6000mg magnesium sulfate, 1500mg sodium acetate	60105-335	50 Pack
6000mg magnesium sulfate, 1500mg sodium chloride	60105-336	50 Pack
6000mg magnesium sulfate, 1500mg magnesium sulfate, 1500mg sodium citrate dihydrate, 750mg disodium citrate sesquihydrate	60105-337	50 Pack
8000mg magnesium sulfate, 200mg of sodium chloride	60105-338	50 Pack
8000mg magnesium sulfate, 3500mg of sodium chloride	60105-339	50 Pack

HyperSep Dispersive SPE Mylar Packs

QuEChERS reagents are provided in individual pouches. Each pack contains 50 pouches (no centrifuge tubes are supplied).

HyperSep Dispersive SPE Mylar Packs

Description	Cat. No.	Quantity
Mylar pouch: 4000mg magnesium sulfate, 1000mg sodium chloride	60105-340	50Pk
Mylar pouch: 6000mg magnesium sulfate, 1500mg sodium acetate (anhydrous)	60105-341	50Pk
Mylar pouch: 6000mg magnesium sulfate, 1500mg sodium chloride – (no tubes)	60105-342	50Pk
Mylar pouch: 6000mg magnesium sulfate, 1500mg sodium chloride, 1500mg sodium citrate dihydrate, 750mg disodium citrate sesquihydrate	60105-343	50Pk
Mylar pouch: 4000mg magnesium sulfate, 1000mg sodium chloride, 500mg sodium citrate dibasic sesquihydrate, 1000mg sodium citrate tribasic	60105-344	50Pk
Mylar pouch: 1.2g sodium chloride	60105-345	50Pk
Mylar pouch: 4g sodium sulfate and 0.5g magnesium sulfate	60105-346	50Pk

QuEChERS Methods

For non-base sensitive compounds, such as bendiocarb and diuron using the original QuEChERS method

- Add 15mL of acetonitrile to QuEChERS centrifuge tube
- Shake to mix contents
- Add surrogate or internal standards if necessary
- Add 15g of homogenised hydrated sample and shake for 1 minute
- Centrifuge tube for 1 minute at 3700rcf
- Add an aliquot of the supernatant to the appropriate clean-up tube (and shake for 1 minute)
- Centrifuge for 1 minute at 3700rcf
- Analyze extract

For base sensitive compounds such as folpet and captan using the AOAC 2007.01 QuEChERS method

- Add 15mL of 1% acetic acid in acetonitrile to QuEChERS centrifuge tube
- Shake to mix contents
- Add surrogate or internal standards if necessary
- Add 15g of homogenised hydrated sample and shake for 1 minute
- Centrifuge tube for 1 minute at 3700rcf
- Add an aliquot of the supernatant to the appropriate clean-up tube and shake for 1 minute
- Centrifuge for 1 minute at 3700rcf
- Analyze extract

For non-base sensitive compounds using the European EN15662 method

- Weigh 15g of homogenized (hydrated at least 80%) sample in a 50mL centrifuge tube
- Add 15mL acetonitrile (or 1:1 acetone/hexane, ethyl acetate) and IS
- Shake briefly
- Add 6g anhydrous magnesium sulfate, 1.5g sodium chloride, 1.5g sodium citrate tribasic dehydrate, 0.75g sodium citrate dibasic
- Shake by hand for 1 minute
- Centrifuge at 5,000 rpm for 5 minutes
- Transfer a portion of supernatant to a QuEChERS clean up tube
- Shake for 30 seconds
- Centrifuge for 1 minute at 6,000 rpm

For polar aromatic (planar) compounds such as matrix plant pigments using the Schenck method

- Pre-rinse the cartridge with 5mL of toluene
- Add an aliquot of the supernatant to the cartridge
- Start collection
- Elute with 6-12mL of 3:1 acetone:toluene
- Concentrate for GC/MS analysis – or –
- Concentrate to dryness and reconstitute in mobile phase for LC analysis



QuEChERS Dispersive SPE Technical Information

Considerations in Method Development

1) Determine the properties of the pesticides of interest:

- Base sensitive
- pH dependent
- Non-base sensitive

Product Selection – Sample Extraction

- Base Sensitive Compounds
Use extraction product with sodium acetate
- 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 homogenisation 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

Thermo Scientific Syringes and Filters

Titan3 and Target2 Syringe Filters

Sample preparation with Titan3 and Target2 syringe filters help provide consistent and reliable experimental results. Both these products provide high quality filtration solutions for a range of samples and applications. The premium Titan3 range provides even higher levels of confidence due to the robust design characteristics (burst pressures of 120psi for the 30mm range) cleaner extracts due to the inclusion of a pre-filter (most 30mm products) and ease of membrane selection via the color coded ring.

Membrane Selection Guide

Choose a filter or membrane based on:

1. Chemical compatibility of the membrane and housing with your sample matrix
2. Size and amount of particulates in the sample
3. Potential interactions (binding) between the membrane and sample components
4. Special considerations such as requirement for pre-filter or inorganic ion certification

Housings

- Target2 and Titan3 filter housings are manufactured from solvent-resistant, low-extractable polypropylene resins specifically selected for wide compatibility with common HPLC sample matrices
- Solutions at temperatures up to 100°C can be filtered using Target2 and Titan3 syringe filters.
- Syringe filters can be sterilized by autoclave at 125°C for 15 minutes
- The inlet connection is an enhanced female Luer Lock™ fitting designed for extra security when attached to a Luer Lock syringe
- The outlet fitting is a standard size male Luer-slip fitting for ease of filtrate collection
- Target2 polypropylene syringe filter housings meet the requirements of 21 CFR 177.1520



This table offers general guidelines for membrane characteristics and compatible applications.

Membrane Type	Membrane Characteristics	Applications
Cellulose Acetate	Low protein binding, ideal for aqueous-based samples; high protein recovery from filtrate; lower protein binding compared to PVDF	Tissue culture media filtration, sensitive biological samples
Glass MicroFiber	Larger porosity; able to remove large particulates without clogging	Dissolution testing, general filtration
Nylon	Most frequently selected membrane; broad compatibility with aqueous and organic naturally hydrophilic membrane; extremely low in extractables; excellent flowrate with most sample matrices; not compatible with strong acids or bases	General laboratory filtration; filtration for most samples; HPLC samples NOTE: Nylon binds protein, do not use when high protein recovery is desired
Polyethersulfone	High flowrates with good throughput volume; low protein binding; compatible with high temperature liquids; mechanically strong membrane low in inorganic extractable ions	PES is certified for ion chromatography; tissue culture filtration; filtration of proteins and nucleic acids
Polypropylene	Hydrophobic membrane has wide chemical compatibility with organic solvents; low nonspecific protein binding	Filtration of biological samples; filtration of aggressive organic solutions
PTFE	Hydrophobic membrane is resistant to nearly all solvents, acids, and bases; membrane is mechanically strong and will withstand exposure to high temperature liquids; low in extractables; PTFE blocks water vapor; can be used to filter aqueous solutions after prewetting with an alcohol	Filtration of aggressive organic, highly basic or hot solutions, ideal for transducer protectors
PVDF	Hydrophilic membrane with good solvent resistance; low UV absorbing extractables and low nonspecific binding	General biological filtration; filtration of samples where high protein recovery is desired
Regenerated Cellulose	Hydrophilic membrane with good solvent resistance, extremely low nonspecific binding; compatible with nearly all common HPLC solvents; tolerates aqueous samples in pH range of 3 to 12	Membrane of choice for low nonspecific binding applications; Tissue Culture media filtration and general biological sample filtration

Syringe Filter Membrane Compatibility Chart

Use the information in this table to determine the ability of a specific syringe filter membrane to withstand exposure to a solvent. All concentrations are 100% unless noted.

Legend

C = Compatible

LC = Limited Compatibility (Membrane may swell and shrink)

IC = Incompatible (Not Recommended)

ND = No Compatibility Data Currently Available

PTFE = Polytetrafluoroethylene

PVDF = Polyvinylidene

PES = Polyethersulfone

CA = Cellulose Acetate

RC = Regenerated Cellulose

PP = Polypropylene

GMF = Glass MicroFiber

Chemical	Nylon	PTFE	PVDF	PES	CA	RC	PP	GMF
Acids								
Acetic, Glacial	LC	C	C	C	IC	C	C	C
Acetic, 25%	C	C	C	C	CA	C	C	C
Hydrochloric, Concentrated	IC	C	C	C	IC	IC	C	C
Hydrochloric, 25%	IC	C	C	C	IC	IC	C	C
Sulfuric, Concentrated	IC	C	IC	IC	IC	IC	C	C
Sulfuric, 25%	IC	C	C	C	IC	LC	C	C
Nitric, Concentrated	IC	C	C	IC	IC	IC	C	LC
Nitric, 25%	IC	C	C	C	IC	IC	C	LC
Phosphoric, 25%	IC	C	ND	ND	C	LC	C	ND
Formic, 25%	IC	C	ND	ND	LC	C	C	C
Trichloroacetic, 10%	IC	C	ND	ND	C	C	C	ND
Alcohols								
Methanol, 98%	C	C	C	C	C	C	C	C
Ethanol, 98%	C	C	C	C	C	C	C	C
Ethanol, 70%	LC	C	C	C	C	C	C	C
Isopropanol	C	C	C	C	C	C	C	C
n-Propanol	C	C	C	C	C	C	C	C
Amyl Alcohol (Butanol)	C	C	C	C	C	C	C	C
Benzyl Alcohol	C	C	C	ND	LC	C	C	IC
Ethylene Glycol	C	C	C	C	C	C	C	C
Propylene Glycol	C	C	C	C	LC	C	C	C
Glycerol	C	C	C	C	C	C	C	C
Alkalies								
Ammonium Hydroxide, 25%	C	C	LC	C	C	LC	C	C
Sodium Hydroxide, 3N	C	C	C	C	IC	LC	C	IC
Amines and Amides								
Dimethyl Formamide	LC	C	IC	IC	IC	LC	C	C
Diethylacetamide	C	C	ND	ND	IC	C	ND	C
Triethanolamine	C	C	ND	ND	C	C	ND	ND
Aniline	ND	C	ND	ND	IC	C	ND	ND
Pyridine	C	C	IC	IC	IC	C	IC	C
Acetonitrile	C	C	C	LC	IC	C	C	C

Chemical	Nylon	PTFE	PVDF	PES	CA	RC	PP	GMF
Esters								
Ethyl Acetate/Methyl Acetate	C	C	C	IC	IC	C	LC	C
Amyl Acetate/Butyl Acetate	C	C	IC	IC	LC	C	LC	C
Propyl Acetate	C	C	IC	IC	LC	C	LC	ND
Propylene Glycol Acetate	ND	C	ND	IC	IC	C	C	ND
2-Ethoxyethyl Acetate	ND	C	ND	IC	LC	C	ND	ND
Methyl Cellulosolve	ND	C	ND	IC	IC	C	C	C
Benzyl Benzoate	C	C	ND	IC	C	C	ND	ND
Isopropyl Myristate	C	C	ND	IC	C	C	ND	ND
Tricresyl Phosphate	ND	C	ND	IC	C	C	ND	ND
Halogenated Hydrocarbons								
Methylene Chloride	LC	C	C	IC	IC	C	LC	C
Chloroform	C	C	C	IC	IC	C	LC	C
Trichloroethylene	C	C	C	IC	C	C	C	C
Chlorobenzene	C	C	C	LC	C	C	C	C
Freon®	C	C	C	LC	C	C	C	C
Carbon Tetrachloride	C	C	C	IC	LC	C	LC	C
Hydrocarbons								
Hexane/Xylene	C	C	C	IC	C	C	IC	C
Toluene/Benzene	C	C	C	IC	C	C	IC	C
Kerosene/Gasoline	C	C	C	LC	C	C	LC	ND
Tetralin/Decalin	ND	C	C	ND	C	C	ND	ND
Ketones								
Acetone	C	C	IC	IC	IC	C	C	C
Cyclohexanone	C	C	IC	IC	IC	C	C	C
Methyl Ethyl Ketone	C	C	LC	IC	LC	C	LC	C
Isopropylacetone	C	C	IC	IC	C	C	ND	C
Methyl Isobutyl Ketone	ND	C	LC	IC	ND	C	LC	C
Organic Oxides								
Ethyl Ether	C	C	C	C	C	C	LC	ND
Dioxane	C	C	LC	IC	LC	C	C	C
Tetrahydrofuran	C	C	LC	IC	LC	C	C	C
Triethanolamine	C	C	ND	ND	C	C	ND	ND
Dimethylsulfoxide (DMSO)	C	C	IC	IC	LC	C	C	C
Isopropyl Ether	ND	C	C	C	C	C	C	ND
Miscellaneous								
Phenol, Aqueous Solution, 10%	ND	C	LC	IC	IC	IC	C	C
Formaldehyde Aqueous Solution, 30%	C	C	C	C	C	LC	C	C
Hydrogen Peroxide, 30%	C	C	ND	ND	C	C	ND	ND
Silicone Oil/Mineral Oil	ND	C	C	C	C	C	C	C



Titan3 Syringe Filters

Titan3 Syringe Filters provide:

- 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

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

Applications:

- General laboratory filtration
- Filtration for most HPLC samples

Titan3 PTFE

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	42204-NPE	100 Pack
	0.45	No	44504-NPE	100 Pack
17	0.2	No	RM42213-NPE	100 Pack
	0.45	No	RM44513-NPE	100 Pack
30	0.2	Yes	RM42225-NPE	100 Pack
	0.45	Yes	RM44525-NPE	100 Pack
	1.0	No	RM41025-NPE	100 Pack

Applications:

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

Titan3 PVDF Syringe filters

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	42204-PV	100 Pack
	0.45	No	44504-PV	100 Pack
17	0.2	Yes	42213-PV	100 Pack
	0.45	No	44513-PV	100 Pack
30	0.2	Yes	42225-PV	100 Pack
	0.45	No	44525-PV	100 Pack

Applications:

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

Titan3 Cellulose Acetate Syringe Filters

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	52204-RCE	100 Pack
	0.45	No	54504-RCE	100 Pack
17	0.2	Yes	RM52213-RCE	100 Pack
	0.45	No	RM54513-RCE	100 Pack
30	0.2	Yes	RM52225-RCE	100 Pack
	0.45	No	RM54525-RCE	100 Pack

Applications:

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

Titan3 PES (Polyethersulfone) Syringe Filters

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
17	0.2	No	42213-PS	100 Pack
	0.45	No	44513-PS	100 Pack
30	0.2	Yes	42225-PS	100 Pack
	0.45	No	44525-PS	100 Pack

Applications:

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

Titan3 GMF (Glass MicroFiber) Syringe Filters

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
30	0.7	No	40725-GM	100 Pack
	1.2	No	41225-GM	100 Pack
	3.1	No	42725-GM	100 Pack

Applications:

- Dissolution testing
- General filtration

Titan3 Polypropylene Syringe Filters

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
17	0.2	No	42213-PP	100 Pack
	0.45	No	44513-PP	100 Pack
30	0.2	No	42225-PP	100 Pack
	0.45	No	44525-PP	100 Pack

Applications:

- Filtration of biological samples
- Filtration of aggressive organic solutions

Titan3 Cellulose Acetate Syringe Filters

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.2	No	42204-CA	100 Pack
	0.45	No	44502-CA	100 Pack
17	0.2	No	42213-CA	100 Pack
	0.45	No	44513-CA	100 Pack
30	0.2	No	42225-CA	100 Pack
	0.45	No	44525-CA	100 Pack

Applications:

- Tissue culture media filtration, sensitive biological samples

Target2 Syringe Filters

Target2 Syringe Filters provide:

- 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

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

Applications:

- General laboratory filtration
- Filtration for most HPLC samples

Target2 PTFE Syringe Filters

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.45	No	F2504-3	100 Pack
	0.2	No	F2504-4	100 Pack
17	0.45	No	F2513-3	100 Pack
	0.2	No	F2513-4	100 Pack
30	0.45	No	F2500-3	100 Pack
	0.2	No	F2500-4	100 Pack
	1.0	No	F2500-13	100 Pack
	0.45	Yes	F2502-3	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

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.45	No	F2504-5	100 Pack
	0.2	No	F2504-6	100 Pack
17	0.45	No	F2513-5	100 Pack
	0.2	No	F2513-6	100 Pack
30	0.45	No	F2500-5	100 Pack
	0.2	No	F2500-6	100 Pack

Applications:

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

Target2 Regenerated Cellulose Syringe Filters

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.45	No	F2504-7	100 Pack
	0.2	No	F2504-8	100 Pack
17	0.45	No	F2513-7	100 Pack
	0.2	No	F2513-8	100 Pack
30	0.45	No	F2500-7	100 Pack
	0.2	Yes	F2500-8	100 Pack

Applications:

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

Target2 PES (Polyethersulfone) Syringe Filters

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
17	0.45	No	F2513-14	100 Pack
	0.2	No	F2513-17	100 Pack
30	0.45	No	F2500-14	100 Pack
	0.2	No	F2500-17	100 Pack

Applications:

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

Target2 GMF (Glass MicroFiber) Syringe Filters

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
30	0.7	No	F2500-18	100 Pack
	1.2	No	F2500-19	100 Pack
	3.1	No	F2500-20	100 Pack

Applications:

- Dissolution testing
- General filtration

Target2 Polypropylene Syringe Filters

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.45	No	F2504-9	100 Pack
	0.2	No	F2504-10	100 Pack
17	0.45	No	F2513-9	100 Pack
	0.2	No	F2513-10	100 Pack
30	0.45	No	F2500-9	100 Pack
	0.2	No	F2500-10	100 Pack
	0.45	Yes	F2502-9	100 Pack

Applications:

- Filtration of biological samples
- Filtration of aggressive organic solutions

Target2 Cellulose Acetate Syringe Filters

Outside Dia (mm)	Pore Size (µm)	PreFilter	Cat. No.	Quantity
4	0.45	No	F2504-15	100 Pack
	0.2	No	F2504-16	100 Pack
17	0.45	No	F2513-15	100 Pack
	0.2	No	F2513-16	100 Pack
30	0.45	No	F2500-15	100 Pack
	0.2	No	F2500-16	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



National Target All-Plastic Disposable Syringes

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

Nonsterile; packed in bulk.

National 750µL Micro-Centrifugal Filters, Nonsterile

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



National 750µL Micro-Centrifugal Filters, Nonsterile

Material [Membrane]	Pore Size (µm)	Cat. No.	Quantity
Cellulose Acetate	0.22	F2517-1	100 Pack
Cellulose Acetate	0.45	F2517-2	100 Pack
Nylon	0.2	F2517-3	100 Pack
Nylon	0.45	F2517-4	100 Pack
PVDF	0.2	F2517-5	100 Pack
PVDF	0.45	F2517-6	100 Pack
Regenerated Cellulose	0.2	F2517-7	100 Pack
Regenerated Cellulose	0.45	F2517-8	100 Pack
PTFE	0.2	F2517-9	100 Pack
PTFE	0.45	F2517-10	100 Pack

National 2mL Centrifugal Filters, Nonsterile

- 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

National 2mL Centrifugal Filters, Nonsterile

Material	Pore Size (µm)	Cat. No.	Quantity
Cellulose Acetate	0.22	F2520-1	25 Pack
Cellulose Acetate	0.45	F2520-2	25 Pack
Nylon	0.2	F2520-3	25 Pack
Nylon	0.45	F2520-4	25 Pack
PVDF	0.2	F2520-5	25 Pack
PVDF	0.45	F2520-6	25 Pack
PTFE	0.2	F2520-7	25 Pack
PTFE	0.45	F2520-8	25 Pack



National 25mL Centrifugal Filters, Nonsterile

- 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

National 25mL Centrifugal Filters, Nonsterile

Material	Pore Size (µm)	Cat. No.	Quantity
Cellulose Acetate	0.22	F2519-1	50 Pack
Cellulose Acetate	0.45	F2519-2	50 Pack
Nylon	0.22	F2519-3	50 Pack
Nylon	0.45	F2519-4	50 Pack
PVDF	0.22	F2519-5	50 Pack
PVDF	0.45	F2519-6	50 Pack



Notes

This image shows a full page of blank, lined paper. It features approximately 28 horizontal grey lines spaced evenly apart, typical of notebook paper. The lines extend across the entire width of the page, leaving small margins at the top and bottom. There are no vertical lines, text, or other markings present.

Thermo Scientific WebSeal

The WebSeal system is a comprehensive range of 96 well titer plates with glass inserts and a silicone/PTFE coated sealing mat. This system provides the analyst with 96 completely inert chambers and reduces the risk of cross-contamination from well to well when removing the cover. The products are ideal for High Throughput Screening, Combinatorial Chemistry, Life Science applications and HPLC.

WebSeal Product Selection

- WebSeal mats are typically blue or clear silicone rubber in nature. The clear mats have no PTFE coating, making them ideal for use with aqueous mobile phases
- Blue mats have a thin protective film of sprayed PTFE, making them ideal for use with organic solvents
- Mats are available in standard and pre-cut versions for delicate autosampler needles
- The addition of vials to the 96 well plates allows the use of aggressive solvents in the WebSeal system
- Products are available in volumes from 500µL to 1.5mL

Product Selection According to Manufacturer Type

Manufacturer	96 Round Silicone	96 Round Silicone/PTFE	96 Square Silicone	96 Square Silicone/PTFE	384 Square	384 Square Silicone/PTFE
Abgene	WSM-2E	WSM-2				
CoStar	WSM-2FBE	WSM-2FB WSM-2			WSM-5E	WSM-5
Greiner	WSM-2FBE WSM-2E	WSM-2FB WSM-2	WSM-3SXE	WSM-3S	WSM-5E	WSM-5
Matrix	WSM-2FBE WSM-2E	WSM-2FB WSM-2	WSM-3SXE	WSM-3S		
NUNC	WSM-7E		WSM-3SXE	WSM-3S	WSM-5E	WSM-5
Porvair	WSM-2FBE WSM-2E	WSM-2FB WSM-2	WSM-3SXE	WSM-3S	WSM-5E	WSM-5
Whatman	WSM-2FBE WSM-2E	WSM-2	WSM-3SXE	WSM-3S		



WebSeal Technical Information

The following section provides properties of the WebSeal product range:

Physical Properties and Resistance

	Low	High
Operating Temperature	-80°C	260°C
Specific Gravity	1.15	
Shore Hardness	57	
Tear Strength	Fair	

Sterilization

WebSeal may be sterilized but is produced in a chromatographically clean form and is suitable for use straight from the packet.

Property	Method	Comment
Sterilization methods	Autoclave recommended	160°C
	Chemical	All common disinfectants may be suitable
	Radiation	Gamma

Evaporation Study

An evaporation study was performed using water, acetonitrile and DMSO at two different volumes (100µL and 200µL) at three different temperatures (28°C, 4°C and -20°C for 24 hours). Plates were filled with solvent, weighed, then sealed with MicroMats. The sealed plates were incubated at their respective temperatures for 24 hours. Mats were removed and the plates were reweighed to determine evaporation of sample content.

Results

Temperature	Solvent	% loss after 24 hours
-20°C	Water	0.15%
	Acetonitrile	12.0%
	DMSO	-1.1%
4°C	Water	0.4%
	Acetonitrile	19.2%
	DMSO	0.8%
20°C	Water	1.0%
	Acetonitrile	34.3%
	DMSO	-1.2%

WebSeal Sealing Mat Properties

Material	Properties
Blue Silicone/PTFE Mat	Soft silicone with sprayed clear PTFE layer to give resistance against a wide range of organic solvents. Suitable for injection with a wide range of autosampler and sample processing units. Pre-slit versions allow use of blunt probes and pipette tips.
Clear Silicone Mat	Soft silicone without protective spray. Cannot be used for extended periods with strong solvents. May be used under aqueous conditions for storage.

WebSeal Chemical Resistance

The chemical resistance has been tested with long-term exposure of mats to filled plates with measurement of solvent integrity and observation of mat sealing performance over periods of 2-3 months.

Resistance to attack and application suitability	PTFE coated for glass vials	PTFE coated for square or round well plates	Pre-Slit PTFE coated for square or round well plates	Solvents
No permeation of mat elastomer or mat coating. Suitable for long-term storage, sample transfer and autosampler use.	Excellent	Excellent	Excellent	Water & Inorganic Buffers Methanol/Water IPA Acetonitrile/Water Hexane Heptane Cyclohexane
No permeation of mat elastomer by solvent with intact PTFE surface. Suitable for sample transfer and autosampler use. Suitable for elevated temperature use.	Excellent under most conditions	Excellent under most conditions	Excellent under most conditions	Acetone Acetonitrile Dichloromethane (DCM) Dimethylformamide (DMF) Trifluoroacetic Acid
Permeation of the elastomer after 3-5 days may lead to solvent collection on upper face of mat. Suitable for short-term sample transfer and autosampler use only.	Fair but alternative may be preferred	Not recommended for this application	Not recommended for this application	Dimethylsulphoxide (DMSO)

WebSeal 500µL Kit and Accessories

Mid-depth polypropylene 96 well microtiter plate, pre-inserted 500µL glass vials and WebSeal silicone/PTFE mats

WebSeal 500µL Kit

Description	Cat. No.	Quantity
96 well microtiter plate with 500µL glass vials and sealing mats	05-MTPVC-96	5 Pack
Accessories		
96 well mid-depth polypropylene plate for 500µL vials	05-MTP-96	5 Pack
500µL clear glass replacement vials for kit	05-MTV-96	500 Pack
96 round well silicone/PTFE sealing mat	WSM-1	5 Pack
96 round well silicone/PTFE sealing mat, pre-slit	WSM-1X	5 Pack

WebSeal 700µL Kit and Accessories

700µL kits available with clear glass, amber glass and PTFE vials pre-inserted into 96 well polypropylene microtiter plates

WebSeal 700µL Kit

Description	Cat. No.	Quantity
96 well plate, 700µL clear glass vials, sealing mat and cutting tool	MTPVC-96	5 Pack
96 well plate, 700µL amber glass vials, sealing mat and cutting tool	MTPVC(A)-96	5 Pack
96 well plate, 700µL PTFE vials, sealing mat and cutting tool	MTPVC-96	1 Each
Accessories		
700µL clear glass vials for kit	1-MTV-96	500 Pack
700µL amber glass vials for kit	1-MTV(A)-96	500 Pack
700µL PTFE vials for kit	1-MTTV-96	100 Pack
96 well polypropylene plate for 700µL vials	MTP-96	5 Pack
96 round well silicone/PTFE sealing mat	WSM-1	5 Pack
96 round well silicone/PTFE sealing mat, pre-slit	WSM-1X	5 Pack
Cutting tool	MTPC-1	1 Each

WebSeal 1.1mL Kit and Accessories

1.1mL kits available as 8mm crimp top standard vials or with WebSeal silicone/PTFE sealing mats

WebSeal 1.1mL Kit and Accessories

Description	Cat. No.	Quantity
96 well PP plate with 1.1mL glass vials, sealing mats	1.1-MTPVC-96	5 Pack
96 well PP plate with 1.1mL, 8mm crimp top vials	1.1-CMTPVC-96	5 Pack
Accessories		
1.1mL clear glass vials for kit	1.1-MTV-96	500 Pack
1.1mL clear glass crimp top vials for kit	1.1-CRV	500 Pack
96 deep well PP plate for 1.1mL shell vial	1.1-MTP-96	5 Pack
96 square deep well PP plate for 1.1mL crimp top vials	1.1-MTPS-96	5 Pack
Silicone/PTFE sealing mat	WSM-6	5 Pack
Silicone/PTFE sealing mat pre-slit	WSM-6X	5 Pack

WebSeal 1.5mL Kit and Accessories

1.5mL kit available in 96 well polypropylene microtiter plate pre-inserted with 1.5mL clear glass vials and WebSeal silicone/PTFE sealing mats

WebSeal 1.5mL Kit and Accessories

Description	Cat. No.	Quantity
96 well polypropylene plate, 1.5mL glass vials, sealing mat	1.5-MTPVC-96	5 Pack
Accessories		
1.5mL clear glass vials for kit	1.5-MTV-96	500 Pack
96 well polypropylene plate for 1.5mL glass vials	1.5-MTP-96	5 Pack
Silicone/PTFE sealing mat	WSM-6	5 Pack
Silicone/PTFE sealing mat pre-slit	WSM-6X	5 Pack

MicroMat CLR Sealing Mats

Designed to fit 96 well plates to eliminate cross-contamination from well to well

MicroMat CLR Sealing Mats

Description	Cat. No.	Quantity
96 round well; 7mm domed base	WSM-2E	5 Pack
96 round well sealing mat, 7mm domed base, silicone only pre-slit	WSM-2XE	5 Pack
384 square well sealing mat; silicone only	WSM-5E	5 Pack
384 square well sealing mat; silicone only pre-slit	WSM-5XE	5 Pack
96 square well sealing mat; silicone only	WSM-3SE	5 Pack
96 square well sealing mat; silicone only pre-slit	WSM-3SXE	5 Pack
96 round well sealing mat; 8mm flat base, silicone	WSM-2FBE	5 Pack
96 round well sealing mat; 8mm flat base, silicone pre-slit	WSM-2FBXE	5 Pack

WebSeal MicroMat CLR Sealing Strips

Use where only partial plate capacity is required

WebSeal MicroMat CLR Sealing Strips

Description	Cat. No.	Quantity
96 round well sealing strips; 8mm strips; silicone pre-slit	WSMS-2XE	12 Pack

WebSeal Mats

Superior resealability after multiple injections

WebSeal Mats

Description	Cat. No.	Quantity
96 round well silicone/PTFE sealing mat	WSM-1	5 Pack
96 round well silicone/PTFE sealing mat, pre-slit	WSM-1X	5 Pack
Silicone/PTFE sealing mat	WSM-6	5 Pack
Silicone/PTFE sealing mat pre-slit	WSM-6X	5 Pack

WebSeal Mat Applicator

Handheld applicator for easy sealing of WebSeal mats

WebSeal Mat Applicator

Description	Cat. No.	Quantity
Handheld mat applicator	WSA-1	1 Each

WebSeal Silicone/PTFE Mats

Manufactured from silicone with PTFE coating on underside

WebSeal Silicone/PTFE Mats

Description	Cat. No.	Quantity
96 round well; 7mm dome base; Dark Blue	WSM-2	5 Pack
96 round well; 7mm flat base; Light Blue	WSM-2FB	5 Pack
96 round well; 7mm flat base; Light Blue, pre-slit	WSM-2FBX	5 Pack
96 square well; 8mm square well; Light Blue	WSM-3S	5 Pack
96 square well; 8mm square well; Light Blue, pre-slit	WSM-3SX	5 Pack
96 square well; 8mm square well; Yellow, pre-slit	WSM-3SXY	5 Pack
384 round well; 4mm square well; Red	WSM-5	5 Pack
384 square well; 4mm square well; Light Blue, pre-slit	WSM-5RX	5 Pack

Mini-Vap Sample Concentrator

Evaporates 500µL methanol in less than 10 minutes

Mini-Vap Sample Concentrator

Description	Cat. No.	Quantity
Minivap Sample Concentrator, Spiral Needle Design (110 volt)	CLS-229203	1 Each



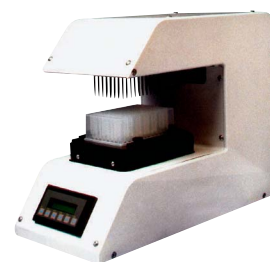
WebSeal UltraVap High-Speed Sample Concentrator

Programmable high speed sample concentrator with patented spiral needles

- Evaporating 500µL methanol in 6 minutes

WebSeal UltraVap High Speed Sample Concentrator

Description	Cat. No.	Quantity
UltraVap 96 Well High Speed Sample Concentrator	CLS-229070	1 Each
Replacement Spiral Needle Kit with Fitting Tool	CLS-229074	1 Each



WebSeal Glass-Coated Microplates

Lightweight, precision molded, cost-effective alternative to solid glass plates

- Polypropylene microplates coated with 200nm thick layer of silicone dioxide
- Chemically resistant with the qualities of glass and advantages of polypropylene
- Operating temperatures of -80° to +80°C

WebSeal Glass-coated Microplates

Description	Cat. No.	Quantity
96 Well PP Plate 350µL Volume V-Bottom	CLS-210003	100 Pack
96 U deep-well design; 1mL glass-coated PP plate	CLS-400042	10 Pack
96 flat well design; 2mL glass-coated PP plate	CLS-400046	10 Pack
96 V-design 190µL; Glass coated PP plate	CLS-400058	10 Pack
384 square-rounded; 180µL glass-coated PP plate	CLS-400156	10 Pack
96 U-well design; 250µL glass-coated PP plate	CLS-400054	10 Pack
96 well flat bottom; 300µL glass-coated PP plate	CLS-400062	10 Pack
384 square/rounded well design; 90µL glass-coated PP plate	CLS-400150	10 Pack

Thermo Scientific Automated SPE

Dionex AutoTrace Systems

Provides fast and reliable automated solid phase extraction of organic pollutants from samples

The Thermo Scientific Dionex AutoTrace 280 instrument provides reliable automated SPE for analytical chemists determining organic pollutants in large volume liquid samples (10mL to 20L). Compared to liquid-liquid extraction, the Dionex AutoTrace 280 saves time, solvent, and labor, ensuring high reproducibility and productivity for analytical labs. The system uses powerful pumps (no check valves) and positive-pressure constant-flow technology to process the most difficult samples and can process up to six samples. Features include:

- SPE technology for liquid-liquid extraction: Reduces solvent usage and eliminates glassware.
- No technician involvement is required to maintain a liquid reservoir or to control the flow.
- Provides constant flow of liquids through SPE cartridges resulting in superior reproducibility.
- Closed systems with fan to vent solvent vapors: No hood required, conserves valuable hood space.
- The instrument can store 24 methods on board and the software used for editing methods is easy to use.
- USB cable connection to PC. Methods to run can be chosen from those stored in the instrument memory.
- Multi-port switching valve ensures the systems reliability.

Note: Contact your local sales representative to confirm part numbers.

Dionex AutoTrace 280

Description	Cat. No.	Quantity
Dionex AutoTrace 280 Automated Large Volume SPE for 47mm Disks	071386	1 Each
Dionex AutoTrace 280 Automated Large Volume SPE for Cartridges with 6mL Plungers	071385	1 Each
Dionex AutoTrace 280 Automated Large Volume SPE for Cartridges with 1mL Plungers	072604	1 Each
Dionex AutoTrace 280 Automated Large Volume SPE for Cartridges with 3mL Plungers	072605	1 Each
Dionex AutoTrace 280 Automated Large Volume SPE for Cartridges with 6mL Glass Plungers	072606	1 Each



The Dionex AutoTrace 280 instrument provides automated solid-phase extraction with a choice of cartridge or disk formatting.



Dionex AutoTrace Accessories

The Dionex AutoTrace 280 parts and accessories are designed to be used specifically with the AutoTrace 280 solid-phase extraction system. Each part and accessory meets strict Dionex quality standards.

SolEx SPE Cartridges

SolEx SPE Cartridges

Description	Cat. No.	Quantity
SolEx C18 6mL Cartridge with 1.0g of Packing	074410	30 Pack
SolEx C18 6mL Cartridge with 0.5g of Packing	074417	30 Pack
SolEx C8 6mL Cartridge with 1.0g of Packing	074411	30 Pack
SolEx C18 3mL Cartridge with 0.5g of Packing	074412	30 Pack
SolEx C8 3mL Cartridge with 0.5g of Packing	074413	30 Pack
SolEx C18 1mL Cartridge with 0.1g of Packing	074623	100 Pack
SolEx C8 1mL Cartridge with 0.1g of Packing	074415	100 Pack
SolEx C18 Unendcapped 6mL Cartridge with 1.0g of Packing	074416	30 Pack
SolEx 6mL Cartridge Silica (unbonded) with 0.5g Silica	074589	50 Pack
SolEx Carbon-521, with 2g Packing	074590	20 Pack
SolEx C18 with 1g Endcapped C18, clean	075895	30 Pack
SolEx C18 with 1.5g C18 Clean	075896	30 Pack
SolEx C8 Cartridge with 0.5g Endcapped, Clean	075897	50 Pack
SolEx Carbon-535 6mL Cartridge with 0.5g of Packing	075898	30 Pack

Plunger Assemblies

Plunger Assemblies

Description	Cat. No.	Quantity
Plunger Assembly for 1mL Columns	071078	1 Each
Plunger Assembly for 3mL Columns	071079	1 Each
Plunger Assembly for 6mL Columns	071080	1 Each
Plunger Assembly for 6mL Glass Cartridges	071081	1 Each

Elution Racks

Elution Racks

Description	Cat. No.	Quantity
Elution Rack for 11mm GC vials	071068	1 Each
Elution Rack for 15mL Conical Tubes	071069	1 Each
Elution Rack for 16 x 100mL Test Tubes	071070	1 Each
Elution Rack for 17 x 60mm Vials	071071	1 Each
Elution Rack for 4mL Vials	071072	1 Each
15mL Conical Tubes	071056	Case of 12

Sample Rack

The Dionex AutoTrace 280 sample rack will hold six 60mL vials, 250mL bottles or 1L bottles. The rack is angled to ensure all the sample is retrieved from the sample vessels.

Sample Rack

Description	Cat. No.	Quantity
Sample Rack for 60, 250, and 1000mL Bottles for Dionex AutoTrace 280	071333	1 Each

Glass-Coated Solvent Bottles

Glass-coated solvent bottles are available in 1 and 2L sizes.

Glass-Coated Solvent Bottles

Description	Cat. No.	Quantity
Bottle, 1L, Coated Glass	045900	1 Each
Bottle, 2L, Coated Glass, GL45	045901	1 Each

Preventative Maintenance Kit

The preventative maintenance kit contains new tubing, seals and rotors.

Preventative Maintenance Kit

Description	Cat. No.	Quantity
Preventative Maintenance Kit	072598	1 Each

Dionex OnGuard II Cartridges

- Dionex OnGuard II Cartridges remove matrix interferences such as phenolics compounds, metals, cations, anions, or hydrophobic substances encountered in many IC and HPLC applications.
- Cartridges are available in 1 cc and 2.5 cc high-capacity formats.



Related Literature

For detailed specifications and applications, see the following PDF documents under Literature on www.thermoscientific.com/dionex

Product Data Sheets

Dionex OnGuard II Sample Pretreatment Cartridges and Workstation

Application Notes

- AN 101: Trace Level Determination of Bromate in Ozonated Drinking Water Using Ion Chromatography
- AN 136: Determination of Inorganic Oxyhalide Disinfection Byproduct Anions and Bromide in Drinking Water Using Ion
- Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis
- AN 37: The Determination of Iodide in Milk Products

Application Updates

- AU 140: The Determination of Iodide in Urine

Dionex OnGuard II A

- The Dionex OnGuard II A is used in the removal of anionic contaminants from sample matrices and for the neutralization of highly acidic samples
- Cartridges contain styrene-based, anion exchange resin in the bicarbonate form

Key Specifications

- Functionality: anion-exchange, bicarbonate form
- Capacity ($\mu\text{eq}/\text{cartridge}$): 0.7 (1 cc cartridge); 1.75 (2.5 cc cartridge)
- Solvents: 0-100% HPLC
- pH stability: 0-14
- Mode: removal of anions; pH adjustments of acidic samples

Dionex OnGuard II A

Description	Cat. No.	Quantity
Dionex OnGuard II A Cartridges, 1 cc	057091	48 Pack
Dionex OnGuard II A Cartridges, 2.5 cc	057092	48 Pack

Dionex vOnGuard II Ag

- The Dionex OnGuard II Ag contains a silver-form, high-capacity, sulfonated, cation-exchange resin similar to the OnGuard II H packing
- Cartridges remove chloride, bromide, and iodide from sample matrices
- Dionex OnGuard II H cartridge should be used after the Dionex OnGuard II Ag cartridge to remove dissolved Ag⁺

Key Specifications

- Functionality: cation-exchange, silver form
- Capacity (µeq/cartridge): 2.0-2.2 (1cc); 5.0-5.5 (2.5cc)
- Solvents: 0-100% HPLC
- pH Stability: 0-14
- Mode: removal of chloride, bromide, iodide by precipitation

Dionex OnGuard II Ag

Description	Cat. No.	Quantity
Dionex OnGuard II Ag Cartridges, 1cc	057089	48 Pack
Dionex OnGuard II Ag Cartridges, 2.5cc	057090	48 Pack

Dionex OnGuard II Ag/H

The Dionex OnGuard II Ag/H is a layered cartridge that contains both OnGuard II Ag and Dionex OnGuard II H resins.

- Easily removes chloride, bromide, and iodide from concentrated matrices such as brines
- Traps soluble silver and other cations
- Removes high levels of alkaline earth and transition metals
- Neutralizes caustic samples
- Removes carbonate
- The two-layer cartridge replaces two cartridges in series, and provides greater silver capacity

Dionex OnGuard II Ag/H

Description	Cat. No.	Quantity
Dionex OnGuard II Ag-H Cartridge, 2.5cc, Pkg. of 48	057410	48 Pack

Dionex OnGuard II Ba

- The Dionex OnGuard II Ba resin is a styrene-based, sulfonic acid resin in the barium form, designed for the removal of high concentrations of sulfate from sample matrices
- For reproducible, quantitative determinations in low-ionic strength samples, activate these cartridges by adding sodium chloride or other sodium salt
- Samples treated with NaCl should be passed through an Dionex OnGuard II Ag cartridge to remove the added chloride, followed by the Dionex OnGuard II H cartridge or MetPac™ CC-1 chelating column to remove residual silver counterions

Key Specifications

- Functionality: cation-exchange, barium form
- Capacity (µeq/cartridge): 2.0-2.2 (1cc); 5.0-5.5 (2.5cc)
- Solvents: 0-100% HPLC
- pH Stability: 0-14
- Mode: removal of sulfate by precipitation

Dionex OnGuard II Ba

Description	Cat. No.	Quantity
Dionex OnGuard II Ba Cartridges, 1cc	057093	48 Pack
Dionex OnGuard II Ba Cartridges, 2.5cc	057094	48 Pack

Dionex OnGuard II Ba/Ag/H

The Dionex OnGuard II Ba/Ag/H is a layered cartridge containing Dionex OnGuard II Ba, Ag, and H styrene-based, sulfonic acid resins.

- The Ba resin removes high concentrations of sulfate from sample matrices
- The Ag form easily removes chloride, bromide, and iodide from concentrated matrices
- The H form is highly selective for polyvalent cations such as calcium and transition metals
- Ideal for the removal of high levels of alkaline earth and transition metals from sample matrices, neutralization of caustic samples, and removal of carbonate
- Three-layer cartridge can be used in place of three single cartridges in series and has the added advantage of higher silver capacity

Dionex OnGuard II Ba/Ag/H

Description	Cat. No.	Quantity
Dionex OnGuard II Ba/Ag/H Cartridges, 2.5cc	063955	48 Pack

Dionex OnGuard II H

- The Dionex OnGuard II H removes high levels of alkaline earth and transition metals from sample matrices and neutralizes highly alkaline samples such as sodium hydroxide or sodium carbonate. Carbonate can then be removed by sparging the sample
- Cartridges contain 16% crosslinked, styrene-based, sulfonic acid resin in the hydrogen form. This resin is designed to have very high selectivity for multivalent cations such as calcium and transition metals

Key Specifications

- Functionality: cation-exchange hydronium form
- Capacity ($\mu\text{eq}/\text{cartridge}$): 2.0-2.2 (1cc); 5.0-5.5 (2.5cc)
- Solvents: 0-100% HPLC
- pH Stability: 0-14
- Mode: removal of alkaline earth and transition metals; pH adjustment of basic samples

Dionex OnGuard II H

Description	Cat. No.	Quantity
Dionex OnGuard II H Cartridges, 1cc	057085	48 Pack
Dionex OnGuard II H Cartridges, 2.5cc	057086	48 Pack

OnGuard II M

- The OnGuard II M is used for the removal of transition metals and for matrix elimination of alkali and alkaline earth metals
- Cartridges contain an iminodiacetate resin in the ammonium form, ready to use with no lengthy preparation required

Key Specifications

- Functionality: iminodiacetate, ammonium form
- Capacity ($\mu\text{eq}/\text{cartridge}$): 0.4 (1cc); 1.0 (2.5cc)
- Solvents: 0-100% HPLC
- pH Stability: 0-14 (resin shrinks in acid form)
- Mode: concentration of transition metals by chelation (2.5cc format); removal of transition metals (1cc format)

Dionex OnGuard II M

Description	Cat. No.	Quantity
Dionex OnGuard II M Cartridges, 1cc	057137	48 Pack
Dionex OnGuard II M Cartridges, 2.5cc	057095	48 Pack

Dionex OnGuard II Na

- The Dionex OnGuard II Na removes high levels of alkaline earth and transition metals from sample matrices without acidifying the sample. This ensures good recovery of acid-labile analytes such as nitrite
- Cartridges contain 16% crosslinked, styrene-based, sulfonic acid resin in the sodium form
- This resin has very high selectivity for multivalent cations such as calcium, magnesium and transition metals

Key Specifications

- Functionality: cation-exchange, sodium form
- Capacity ($\mu\text{eq}/\text{cartridge}$): 2.0-2.2 (1cc); 5.0-5.5 (2.5cc)
- Solvents: 0-100% HPLC
- pH Stability: 0-14
- Mode: removal of alkaline earth and transition metals without acidifying the sample

Dionex OnGuard II Na

Description	Cat. No.	Quantity
Dionex OnGuard II Na Cartridges, 1cc	062948	48 Pack
Dionex OnGuard II Na Cartridges, 2.5cc	062962	48 Pack

Dionex OnGuard II P

- The Dionex OnGuard II P is recommended for removing the phenolic fraction of humic acids, tannic acids, lignins, anthocyanins, and azo dyes from samples prior to analysis by anion or cation exchange
- Cartridges contain polyvinylpyrrolidone (PVP) polymer with very high selectivity for phenolics, azo-containing compounds, aromatic carboxylic acids, aromatic aldehydes, and iodine as the triiodide complex

Key Specifications

- Functionality: polyvinylpyrrolidone
- Capacity ($\mu\text{eq}/\text{cartridge}$): 6.0 (1 cc); 2.5cc format not available
- Solvents: 0-100% HPLC
- pH Stability: 1-10
- Mode: removal of phenols, azo dyes, humic acids by complexation

Dionex OnGuard II P

Description	Cat. No.	Quantity
Dionex OnGuard II P Cartridges, 1cc	057087	48 Pack

Dionex OnGuard II RP

- The Dionex OnGuard II RP cartridge is recommended for removing hydrophobic substances such as aromatic dyes, some aromatic carboxylic acids, hydrocarbons, and surfactants from sample matrices
- Cartridges contain a macroporous divinylbenzene resin that has a very high selectivity for hydrophobic substances, especially unsaturated or aromatic organic substances

Key Specifications

- Functionality: polydivinylbenzene
- Capacity ($\mu\text{eq}/\text{cartridge}$): 0.3g resin (1cc); 0.75g resin (2.5cc)
- Solvents: 0-100% HPLC
- pH Stability: 0-14
- Mode: removal of surfactants, high-molecular weight carboxylic acids, aromatic dyes by adsorption

Dionex OnGuard II RP

Description	Cat. No.	Quantity
Dionex OnGuard II RP Cartridges, 1cc	057083	48 Pack
Dionex OnGuard II RP Cartridges, 2.5cc	057084	48 Pack

Dionex OnGuard Accessories

The Dionex OnGuard Sample Prep Station

- Enables simultaneous pretreatment of multiple samples with Dionex OnGuard sample pretreatment cartridges
- When used with 0.5mL PolyVials and a vacuum source, the Dionex OnGuard Sample Prep Station supports semi-automatic pretreatment of up to 12 samples
- Samples may also be treated manually using standard luer tip syringes
- Individual stopcock valves on each sample tube to allow control of individual flow rates
- The station will hold six 10mL volumetric flasks

Dionex OnGuard Accessories

Description	Cat. No.	Quantity
Dionex OnGuard Sample Prep Workstation	039599	1 Each
Dionex OnGuard Needle, 18 Gauge, 1.25/Luer	039996	1 Each
Dionex OnGuard Valve, Stopcock Luer	040896	1 Each

Dionex InGuard Cartridges

The Dionex InGuard line of sample pretreatment cartridges is designed to remove matrix interferences such as anions, cations, transition metals, or hydrophobic substances encountered in many IC and HPLC applications. The Dionex InGuard cartridge is installed inline between the autosampler and the IC injection valve facilitating immediate, automated sample pretreatment.

- Eliminates manual sample pretreatment steps
- Facilitates better separations
- Increases lifetimes of analytical columns
- Solves major matrix problems
- Achieves reproducible ppm-level determinations in concentrated matrices
- Convenient and easy to use



The InGuard cartridge is optimized for the best performance in matrix removal applications and can be used singly or in series. Designed to eliminate leaks and channeling, the cartridges use standard 10-32 fittings for easy installation into an IC or HPLC system. The unique sample distribution frit maximizes complete resin bed usage.

Note: Depending on the chemistry and samples treated, some cartridges can be regenerated.

Related Literature

For detailed product specifications and applications, see the following, available under Literature on www.thermoscientific.com/dionex

Product Datasheets

InGuard In-Line Sample Pretreatment Cartridges Data Sheet

Dionex InGuard Ag Cartridge

- Removes chloride, bromide, and iodide from concentrated sample matrices such as brines
- Styrene-based sulfonic acid resin in the silver form, the same material used in Dionex OnGuard II Ag cartridges
- For the removal of any residual silver ions, an Dionex InGuard H or Dionex InGuard Na cartridge should be placed after the Dionex InGuard Ag cartridge

Note: The Dionex InGuard H or Dionex InGuard Na cartridge should be placed after the Dionex InGuard Ag cartridge to remove any residual silver ions.

Key Specifications

- Functionality: Cation-exchange, silver form
- Capacity: 5-5.5meq
- Solvents: 0-100% HPLC
- pH: 0-14
- Mode: Removal of halides by precipitation

Dionex InGuard Ag

Description	Cat. No.	Quantity
Dionex InGuard Ag	074038	4 Pack

Dionex InGuard H Cartridge

- The Dionex InGuard H cartridge is ideal for the removal of high levels of alkaline earth metals and transition metals from sample matrices. It is also used for the neutralization of highly alkaline samples such as sodium hydroxide or sodium carbonate
- Carbonate can be reduced to very low levels following this pH reduction by passing the sample through a Thermo Scientific Dionex CRD 200
- Contains styrene-based, sulfonic acid resin in the hydronium form, the same as that used in Dionex OnGuard II H cartridges
- Resin is designed to have very high selectivity for polyvalent cations, such as calcium and transition metals

Key Specifications

- Functionality: Cation-exchange, hydronium form
- Capacity: 5-5.5meq
- Solvents: 0-100% HPLC
- pH: 0-14
- Mode: Removal of alkaline earth and transition metals; pH adjustment of basic samples

Dionex InGuard H

Description	Cat. No.	Quantity
Dionex InGuard H	074037	4 Pack

Dionex InGuard Na

- The Dionex InGuard Na cartridge is used for the removal of high levels of alkaline earths and transition metals from sample matrices without acidifying the sample, ensuring good recovery of acid labile analytes such as nitrite
- Contains styrene-based, sulfonic acid in the sodium form, designed to have high selectivity for multivalent cations

Key Specifications

- Functionality: Cation-exchange, sodium form
- Capacity: 5-5.5meq
- Solvents: 0-100% HPLC
- pH: 0-14
- Mode: Removal of alkaline earth and transition metals

Dionex InGuard Na

Description	Cat. No.	Quantity
Dionex InGuard Na	074036	4 Pack

Dionex InGuard HRP Cartridge

- The Dionex InGuard HRP cartridge can be used to remove organic matrix material over a wide range of hydrophobicity, including fats from whole milk
- Contains a hydrophilic reversed-phase resin based on divinylbenzene. The material is water-wettable, thus 100% aqueous samples can be pretreated without disruption of the column bed

Key Specifications

- Functionality: Hydrophilic divinylbenzene
- Capacity: 2g
- Solvents: 0-100% HPLC
- pH: 0-14
- Mode: Adsorption, π - π bonding. Removal of hydrophobic species, azo-, and cyano-containing species

Dionex InGuard HRP

Description	Cat. No.	Quantity
Dionex InGuard HRP	074034	4 Pack

Dionex InGuard Na/HRP

- The Dionex InGuard Na/HRP cartridge is designed to provide general purpose clean-up of samples, such as foods, for anion analysis
- Contains a blend of sulfonated resin in the sodium form and HRP resin to provide the dual functionality of removing both organic contaminants and cations, including metals, from a sample

Key Specifications

- Functionality: Dual Functionality
- Capacity: 50% Na/50% HRP
- Solvents: 0-100% HPLC
- pH: 0-14
- Mode: Ion-exchange (Na) and adsorption remove Ca^{2+} (Na^{+}) and lipids (HRP) from dairy

Dionex InGuard Na/HRP

Description	Cat. No.	Quantity
Dionex InGuard Na/HRP	074035	4 Pack