

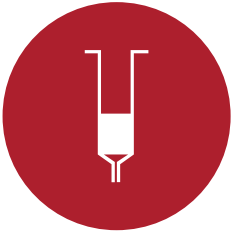
Chromatography consumables

## Connected chromatography solutions

Chromatography consumables catalog

# Comprehensive products to support your chromatography workflows

## Sample preparation solutions



## Sample handling solutions



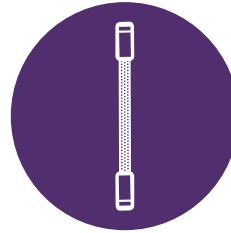
## Low-flow LC columns and accessories



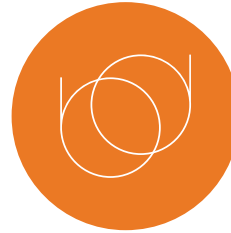
## BioLC columns and accessories



## LC columns and accessories



## GC columns and accessories

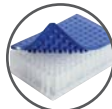


Thermo Scientific™ products:

- SMART Digest™ kits
- SOLA™ SPE products
- HyperSep™ SPE products
- TurboFlow™ and online sample preparation products
- QuEChERS products
- Automated micro solid-phase extraction (μSPE) products
- Syringes and syringe filters



- SureSTART™ AVCS™ closures and SureStop vials
- SureSTART™ Gold grade purity glass vials and vial kits
- SureSTART™ low residual microsampling vials and vial kits
- MS certified vials
- Polyspring vial inserts
- Electronic crimping and decrimping tools
- WebSeal™ well-plates and sealing mats for chromatography



- EASY-Spray™ HPLC columns for top-down and bottom-up proteomics
- Double nanoViper PepMap™ Neo HPLC columns for top-down and bottom-up proteomics
- μPAC™ HPLC columns for bottom-up proteomics



- MAbPac™ size exclusion chromatography
- MAbPac™ and ProPac™ charged variant profiling
- MAbPac™ intact and subunit analysis
- HILIC and mixed-mode glycan analysis
- DNAPac™ oligonucleotide and gene therapy analysis
- Vanquish™ UHPLC peptide analysis



- Accucore™ U/HPLC columns
- Acclaim™ U/HPLC columns
- Hypersil GOLD™ U/HPLC columns
- Hypercarb™ HPLC columns
- Application specific HPLC columns
- Hypersil™ BDS and Hypersil™ classical HPLC columns
- LC accessories
- Preparative HPLC columns



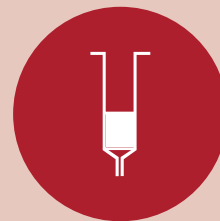
- TracePLOT™ GC columns
- TraceGOLD™ packed GC columns
- GuardGOLD™ capillary GC columns
- LinerGOLD™ liners
- Super Clean™ gas cartridge filters
- GC consumables
- Gas management
- GC equipment
- GC reagents



# Our portfolio

## Sample preparation solutions

Save time, improve reproducibility, and extend the lifetime of your High/Ultra High Performance Liquid Chromatography (HPLC/UHPLC) and gas chromatography (GC) columns with our comprehensive range of sample preparation products. Achieve high sensitivity, selectivity, and recovery with advanced solid-phase extraction (SPE) consumables.



## Sample handling solutions

We provide a broad selection of sample handling and containment solutions from all your chromatography requirements. Our vials, closures and well plates, come with the lowest levels of extractables and leachables, are made from glass that has low compound adsorption, and the highest level of standards and certification available in the marketplace. Whether you have routine and robust samples, or you need to ensure the highest level of confidence and compliance, our market leading portfolio of storage and autosampler vials and closure, well plates and sample handling accessories has everything you'll need.



## Low-flow LC columns and accessories

Low-flow chromatography is ideal when detailed sample information is required from small sample volumes, such as proteomics and intact protein analysis. The Thermo Scientific range of nano-, capillary-, and micro-flow columns offer excellent sensitivity and resolution in easy-to-use formats.



## BioLC columns and accessories

Achieve ultrahigh resolution and high efficiency separations of proteins, peptides, monoclonal antibodies, biosimilars, carbohydrates, oligonucleotides and more. Our unique column chemistries for biological samples have a long-standing reputation for providing excellent reproducibility and durability under a broad range of pH, temperature, and mobile phase compositions.



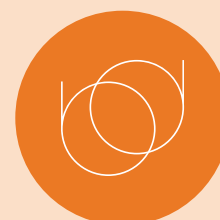
## LC columns and accessories

As a leader in LC column technology including silica, polymer and porous graphitic carbon manufacturing, bonded phase production and column packing for 40 years, you can rely on the quality of Thermo Scientific high performance liquid chromatography (HPLC) products: a comprehensive range of innovative columns, accessories and equipment for fast and reproducible analytical and prep HPLC and ultra-high performance liquid chromatography (UHPLC) analysis.



## GC columns and accessories

We offer a broad portfolio of GC columns and accessories designed to give optimal system performance for today's challenging analyses. Our range of GC accessories include all the tools needed by today's gas chromatographers.



# Product selection tools and additional resources

## Sample handling selection guide

### ? **Need a quick answer?**

Why not use our online product selector guide that includes our entire SureSTART Collection of vials, caps, well plates and mats.



SureSTART™ Selection Guide

Selecting your vial and well plate has never been easier.

**About this guide**

Have you ever struggled with finding the right sample handling solution for your application? You will struggle no longer! This simple guide will find the perfect solution product for you in just a few clicks.

[Get started](#)

- Application specific vials**  
Ensure what goes into the lab comes out... and that the vial you choose is fit for purpose for your application set up. This guide will take you right to your vial.
- Plates for high-throughput**  
If you use a high-throughput lab, you may be interested in finding a plate rather than a vial to speed up your throughput. As plate compatibility is dependent on your instrument this guide will find the plate that works with your instrument type.
- Low cost vials at your fingertips**  
Find the correct vial for your application - and budget. If cost is a key purchasing criteria for you then we've got you covered as this guide takes all your lab requirements into consideration.

## Sample handling cross reference tool

### ? **Already purchasing an existing product from us or someone else?**

Let our cross-reference tool find the equivalent SureSTART product/catalog number for you.



SureSTART Cross Reference Tool

Designed for cross referencing chromatography vials, caps and inserts, finding an equivalent product is easy. Using this cross-reference tool, there are 2 easy options for you to find an equivalent Thermo Scientific SureSTART™ product. All you need to know is your current catalog number part number.

**Option 1: Input SKUs Directly**

Either type or copy/paste a list of SKUs into the text field below.

**Option 2: Upload CSV**

File to upload:  [Choose file](#) [Don't have a data file? Download a sample .csv file](#)

[Search](#)

# Product selection tools and additional resources

## Septa selection tool



### Choosing the right septa can be complex!

There are a number of factors that should be considered including: needle type, vial type, solvents and temperature that the septa will be exposed to. Let us help you find the right septa with this easy-to-use tool.



The screenshot shows the 'Septa Selection Tool' webpage. The header is red with white text: 'Septa Selection Tool' and 'An easy-to-use tool that ensures you find the right septa for your experimental requirements.' Below this is a white box titled 'About this tool' with a 'Get Started' button. The main content area is white and features three columns of text under the heading 'Why use the Septa Selection Guide?'. Each column has a red circular icon with a white symbol (a needle, a septum, and a list) and a title: 'Needle / autosampler issues', 'Septa compatibility with solvents', and 'New experimental parameters'. The background of the page features a pattern of colorful septa.

## LC columns selection guide



### Find your columns with ease!

Finding the correct column can be a challenge, so we have made it easy for you. This guide will take you directly to the right product for you, so that you can start your method today.



The screenshot shows the 'LC Column Selection Guide' webpage. The header is grey with white text: 'LC Column Selection Guide' and 'An easy-to-use tool that ensures you find the right LC column for your experimental requirements.' Below this is a white box titled 'Find your column with ease!' with a 'Get started' button. The main content area is white and features three columns of text under the heading 'Find your column with ease!'. Each column has a red circular icon with a white symbol (a column, a USP method, and a plus sign) and a title: 'Need an equivalent column?', 'Setting up a USP method?', and 'Brand new method?'. The background of the page features a molecular structure graphic and a chromatogram.

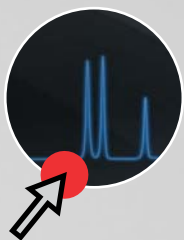
# More information



## Chromatography columns and consumables

For more information on our range of chromatography columns and consumables, including the latest applications, educational resources, selection guides and product literature, please visit

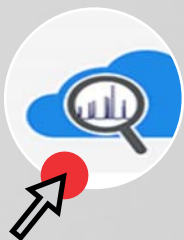
[thermofisher.com/chromatographyconsumables](https://thermofisher.com/chromatographyconsumables)



## Instrumentation and key applications

For more information on our instrumentation and key applications, please visit

[thermofisher.com/chromatography](https://thermofisher.com/chromatography)



## AppsLab

Gain access to our applications expertise on cloud-based Thermo Scientific™ AppsLab library of analytical applications for a comprehensive fully searchable method repository

[appslab.thermofisher.com](https://appslab.thermofisher.com)



## Webinars

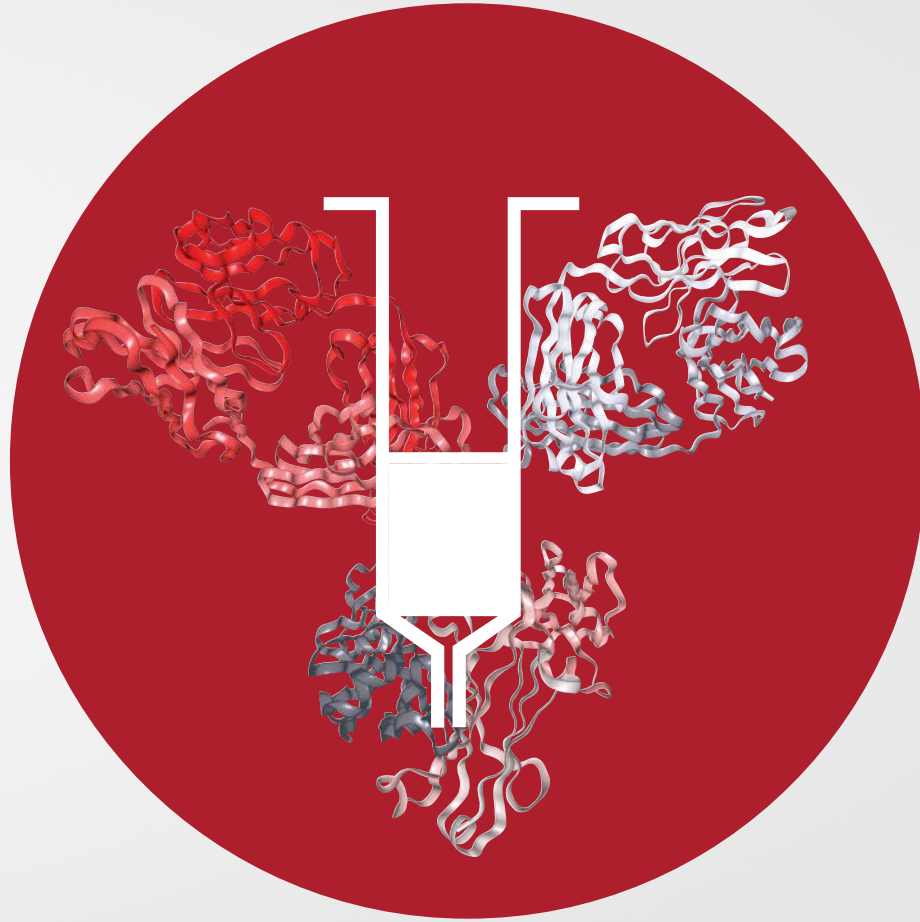
Analytical and life science webinars live and on-demand



## NIBRT collaboration information

A collaboration built for Biopharma between the National Institute for Bioprocessing Research and Training (NIBRT) and Thermo Fisher Scientific

[thermofisher.com/nibr](https://thermofisher.com/nibr)



# Connected chromatography solutions

Sample preparation solutions

# Introduction

## Sample preparation solutions

Save time, improve reproducibility, and extend the lifetime of your High/Ultra High Performance Liquid Chromatography (HPLC/UHPLC) and gas chromatography (GC) columns with our comprehensive range of sample preparation products. Achieve high sensitivity, selectivity, and recovery with advanced solid-phase extraction (SPE) consumables.



### SMART Digest kits

Thermo Scientific™ SMART Digest™ Kits are designed for biopharmaceutical applications that require highly reproducible, sensitive and fast analyses of proteins often in high throughput workflows.



### SOLA SPE products

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



### QuEChERS products

QuEChERS methods offer a convenient and effective approach for extraction and clean-up of pesticide residues in food and other complex matrices. Thermo Scientific™ HyperSep™ Dispersive SPE Clean-Up products contain the proper sorbents for optimum clean-up of analytes extracted using QuEChERS methods.



### Syringes and syringe filters

Provide cleaner sample extracts by removing interfering materials and fine particles.



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Syringes and syringe filters	66

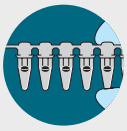
# SMART Digest kits

## Facilitating perfect digestion

**SMART Digest** and **SMART Digest ImmunoAffinity (IA)** kits are designed for biomarker and bio-therapeutic characterization and quantitation.

The kits provide options for the sample preparation of proteins that are:

- Fast
- Simple
- Highly reproducible
- Sensitive
- Compatible with automation

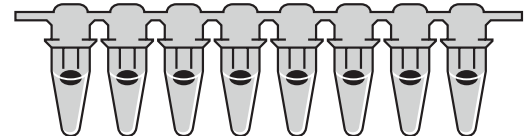


## SMART Digest kits



### Additional reading

Learn more at [thermofisher.com/smartdigest](https://www.thermofisher.com/smartdigest)

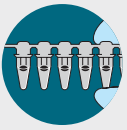


**Compendium:**  
SMART Digest  
peptide mapping  
and quantitation



### SMART Digest webinar series

In this webinar series, four new technologies will be demonstrated that dramatically improve upon established mapping workflows and help increase confidence in biopharma peptide mapping.



# SMART Digest kits

Continued



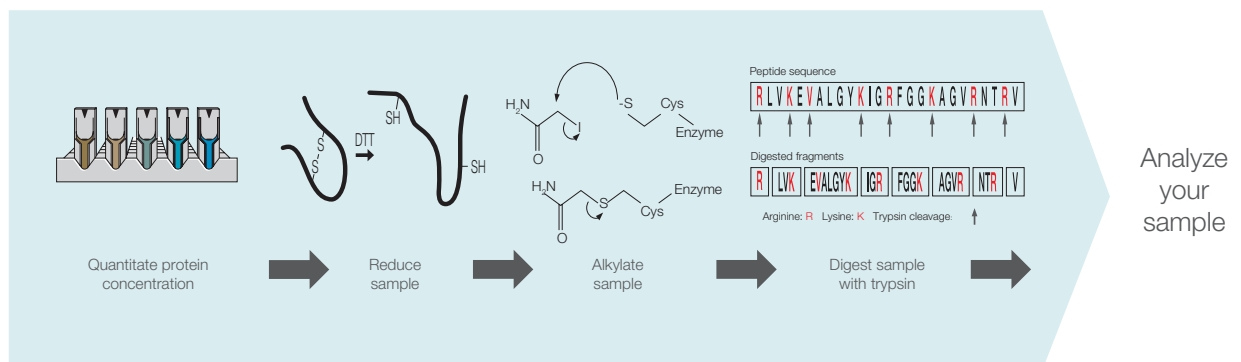
SMART Digest kits improve workflows by quickly and efficiently digesting proteins for characterization and quantitation applications, due to the heat-stable immobilized trypsin design.

## Simplicity of use

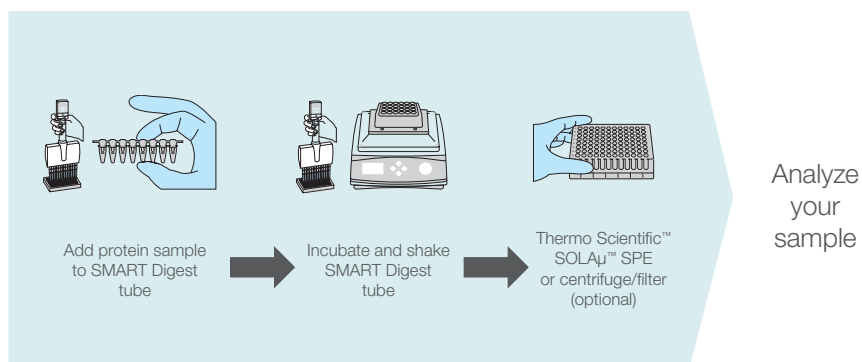
Current sample preparation protocols for the digestion of proteins are multifaceted and laborious. Due to this, errors are far more likely to occur. Therefore, the overall protocol is subject to irreproducibility and significant sample processing time.

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

## Standard digest kit



## SMART Digest kit





# SMART Digest kits

Continued

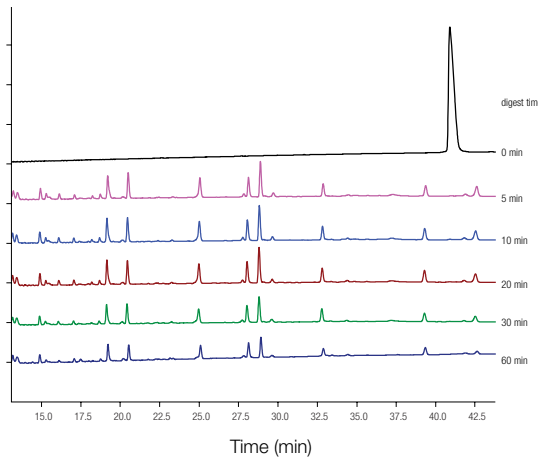


## Fast digestion

The SMART Digest process is not only simple, but significantly reduces the time from sample preparation to analysis. Typically it takes less than 60 minutes, dependent on sample complexity, to achieve full digestion. In the example below, we can see that carbonic anhydrase undergoes complete digestion

### Carbonic anhydrase, 29 KDa

#### Time course experiment for digestion optimization



in less than 5 minutes, as the intact protein peak at around 41 minutes is no longer present, whilst in later chromatograms, no further peaks appear following longer digestion times. The optimized digestion times of some common proteins are shown in the table adjacent.

### Typical digestion times

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

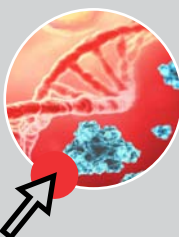
200  $\mu$ L protein solution (100  $\mu$ g/mL) at 70  $^{\circ}$ C  
\*IgG in plasma (17.5 mg/mL total protein) at 70  $^{\circ}$ C

## Automation

Due to their simple workflow, SMART Digest and SMART Digest IA kits are easy to automate with platforms such as the Thermo Scientific™ KingFisher™ Duo Prime Purification System.



KingFisher Duo Prime purification system



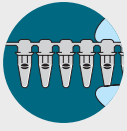
### Brochure:

Your samples, powered by KingFisher instruments. Automated sample preparation for DNA, RNA, protein, or cells.



### Application note:

High-precision, automated peptide mapping of proteins



# SMART Digest kits

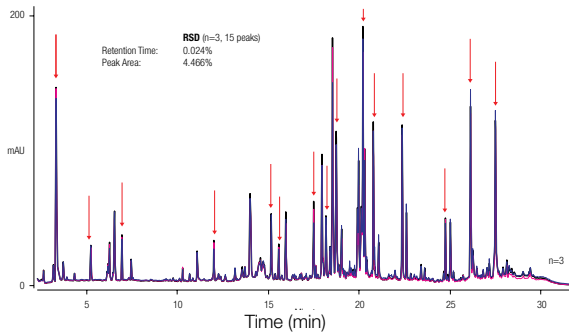
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## Reproducibility of digestion

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

This allows for reproducible results user-to-user, day-to-day and lab-to-lab. The ultra-violet (UV) chromatogram on the right shows overlays from three separate SMART digestions from the same monoclonal antibody (mAb), conducted by three individual operators, with retention time RSD of 0.024%.

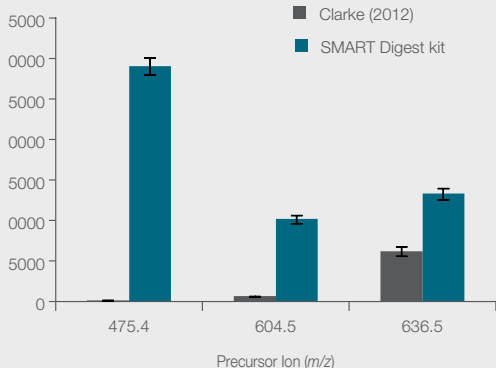
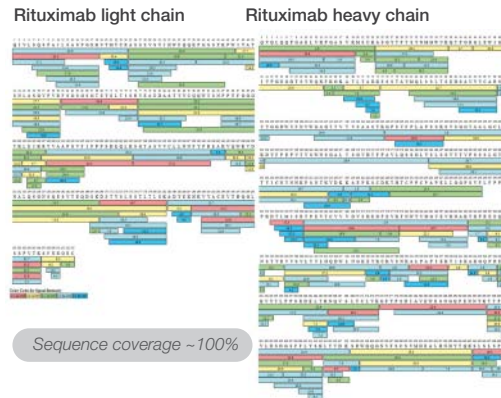


## Mass spectrometry

Thermo Scientific™ Orbitrap Exploris™ 240 and 480 Mass Spectrometers add superior denatured and native mass spectrometry (MS) intact analysis and subunit top/middle-down analysis capabilities to one of the most powerful benchtop peptide mapping instruments available. When combined with Thermo Scientific™ BioPharma Finder™ Software it provides a complete integrated hardware and software solution for biotherapeutic characterization.

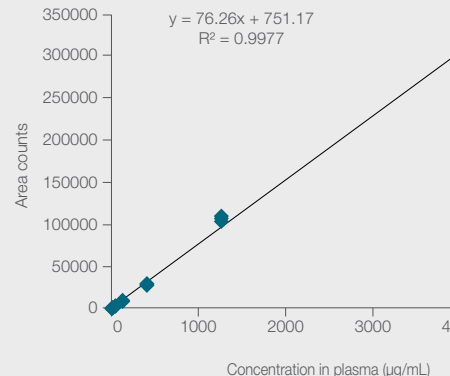
## Quantitation

The SMART Digest kit allows confident detection of biomarkers with high sensitivity within a wide dynamic range, as can be seen below with the example of thyroglobulin. Greater sensitivity is achieved in 3.5 hours compared to an in-solution digest protocol taking 20 hours to complete.

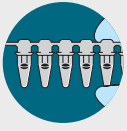


Measurement of serum thyroglobulin after tryptic digestion of serum samples.

- SMART Digest kit: 25% plasma, 3.5 h digestion
  - In-solution digest: 20% plasma, R/A, 4 + 16 h digestion
- Clarke et al. (2012), J. Investigative Medicine, 60(8)



Calibration curve for thyroglobulin signature peptide in murine plasma (4–4000 µg/mL).



# SMART Digest kits

Continued

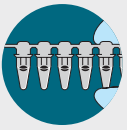


## SMART Digest kits for peptide mapping

Description	Part number
SMART Digest Trypsin Kit with collection plate	<a href="#">60109-101</a>
SMART Digest Trypsin Kit, bulk resin option	<a href="#">60109-101-B</a>
SMART Digest Trypsin Kit, magnetic bulk resin option	<a href="#">60109-101-MB</a>
SMART Digest Trypsin Kit with filter/collection plate	<a href="#">60109-102</a>
SMART Digest Trypsin Kit, bulk resin option with filter/collection plate	<a href="#">60109-102-B</a>
SMART Digest Trypsin Kit, magnetic bulk resin option with filter/collection plate	<a href="#">60109-102-MB</a>
SMART Digest Trypsin Kit with SOLA $\mu$ /collection plate	<a href="#">60109-103</a>
SMART Digest Trypsin Kit, bulk resin option with SOLA $\mu$ /collection plate	<a href="#">60109-103-B</a>
SMART Digest Trypsin Kit, magnetic bulk resin option with SOLA $\mu$ /collection plate	<a href="#">60109-103-MB</a>
SMART Digest Soluble Trypsin Kit	<a href="#">60113-101</a>
SMART Digest Chymotrypsin Kit with collection plate	<a href="#">60109-104</a>
SMART Digest Chymotrypsin Kit, bulk resin option	<a href="#">60109-104-B</a>
SMART Digest Chymotrypsin Kit, magnetic bulk resin option	<a href="#">60109-104-MB</a>
SMART Digest Chymotrypsin Kit with filter/collection plate	<a href="#">60109-105</a>
SMART Digest Chymotrypsin Kit, bulk resin option with filter/collection plate	<a href="#">60109-105-B</a>
SMART Digest Chymotrypsin Kit, magnetic bulk resin option with filter/collection plate	<a href="#">60109-105-MB</a>
SMART Digest Chymotrypsin Kit with SOLA $\mu$ /collection plate	<a href="#">60109-106</a>
SMART Digest Chymotrypsin Kit, bulk resin option with SOLA $\mu$ /collection plate	<a href="#">60109-106-B</a>
SMART Digest Chymotrypsin Kit, magnetic bulk resin option with SOLA $\mu$ /collection plate	<a href="#">60109-106-MB</a>
SMART Digest Proteinase K Kit with collection plate	<a href="#">60109-107</a>
SMART Digest Proteinase K Kit, bulk resin option	<a href="#">60109-107-B</a>
SMART Digest Proteinase K Kit, magnetic bulk resin option	<a href="#">60109-107-MB</a>
SMART Digest Proteinase K Kit with filter/collection plate	<a href="#">60109-108</a>
SMART Digest Proteinase K Kit, bulk resin option with filter/collection plate	<a href="#">60109-108-B</a>
SMART Digest Proteinase K Kit, magnetic bulk resin option with filter/collection plate	<a href="#">60109-108-MB</a>
SMART Digest Proteinase K Kit with SOLA $\mu$ /collection plate	<a href="#">60109-109</a>
SMART Digest Proteinase K Kit, bulk resin option with SOLA $\mu$ /collection plate	<a href="#">60109-109-B</a>
SMART Digest Proteinase K Kit, magnetic bulk resin option with SOLA $\mu$ /collection plate	<a href="#">60109-109-MB</a>
SMART Digest Pepsin Kit with collection plate	<a href="#">60109-110</a>
SMART Digest Pepsin Kit, bulk resin (no collection plate)	<a href="#">60109-110-B</a>
SMART Digest Pepsin Kit with magnetic bead, bulk option (no collection plate)	<a href="#">60109-110-MB</a>
SMART Digest Pepsin Kit with filter and collection plate	<a href="#">60109-111</a>
SMART Digest Pepsin Kit with SOLA $\mu$ collection plate	<a href="#">60109-112</a>

## SMART Digest low pH kits for MAM

Description	Part number
SMART Digest low pH Kit Trypsin	<a href="#">60109-101-LPH</a>
SMART Digest low pH Kit Trypsin magnetic beads	<a href="#">60109-101-MB-LPH</a>
SMART Digest KIT Chymotrypsin magnetic bulk low pH buffer	<a href="#">60109-104-MB-LPH</a>
SMART Digest low pH Kit Trypsin magnetic beads	<a href="#">60109-101-MB-LPH</a>
SMART Digest Kit Chymotrypsin magnetic bulk low pH buffer	<a href="#">60109-104-MB-LPH</a>



# SMART Digest ImmunoAffinity kits



## Additional reading

Learn more at [thermofisher.com/smartdigest](https://www.thermofisher.com/smartdigest)



## A step change in protein affinity capture and digestion

SMART Digest and SMART Digest IA Kits provide a significant change in protein sample preparation, by delivering workflows that are:

- Significantly faster
- Easier to use
- Highly reproducible
- Sensitive
- Compatible with automation

SMART Digest IA kits have all the advantages previously outlined for fast, easy and reproducible protein digestion for quantitation and characterization applications with the added advantage of combining an immunocapture and digestion process into a single well.

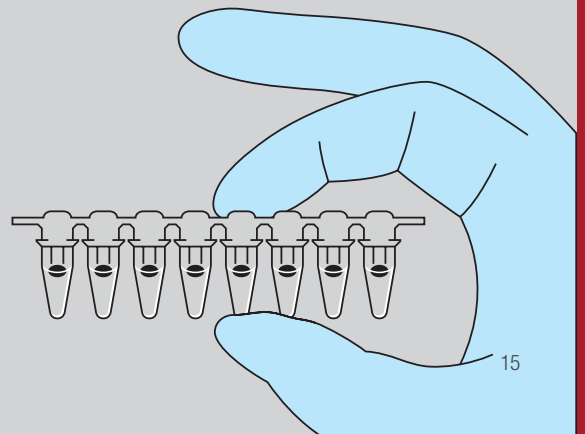
This has significant benefits for quantitation studies where immunoaffinity capture is typically employed to increase sensitivity by purifying low-level proteins from complex biological matrices. This step is then followed by protein digestion.

SMART Digest IA kits achieve this due to their unique design where the immunoaffinity moiety (either streptavidin, protein A or protein G) and heat activated thermally stable trypsin are co-immobilized onto a single bead. Following the binding of a capture reagent to the bead, and enrichment of the target, the enzyme is activated at elevated temperatures for accelerated digestion under protein denaturing conditions. The resulting workflow is as easy as enrich, wash and digest. Magnetic and non-magnetic versions of the beads are available.



### Brochure:

Protein digestion for peptide mapping and quantitation





# SMART Digest ImmunoAffinity kits

Continued

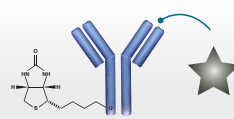


## How does the SMART Digest IA kit work?

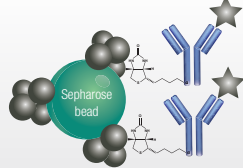
Conventional protein enrichment and digestion

Protein enrichment and digestion using the SMART Digest IA kit

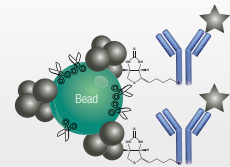
Expose biotinylated capture antibody to biological sample



Incubate with affinity capture resin

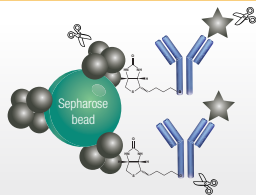


Use SMART Digest IA resin for affinity capture. Incubate at room temperature.

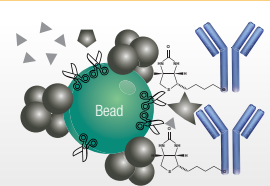


Conventional tryptic digest  
Reduction, TCEP: 60 °C, 30–60 min  
Alkylation, IAA: RT, 30 min  
Quenching, ACC: RT, 15 min  
Digestion: 37 °C, 12–16 h

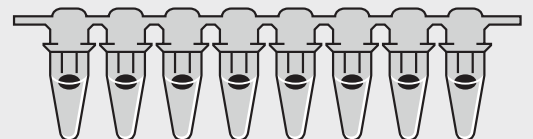
Digestion with SMART Digest IA resin  
70 °C, 1 h



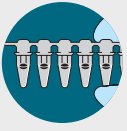
Total time  
15–24 hours



Total time  
3–4 hours







# SMART Digest ImmunoAffinity kits

Continued



## SMART Digest IA and bulk fractionation kits for peptide quantitation

Description	Part number
SMART Digest IA Kit, Streptavidin non-magnetic	<a href="#">60110-101</a>
SMART Digest IA Kit, Streptavidin non-magnetic with SOLA $\mu$ SPE and collection plate	<a href="#">60110-102</a>
SMART Digest IA Kit, Streptavidin magnetic with SOLA $\mu$ SPE and collection plate	<a href="#">60110-103</a>
SMART Digest IA Kit, Streptavidin magnetic	<a href="#">60110-104</a>
SMART Digest IA Kit, Protein A non-magnetic	<a href="#">60111-101</a>
SMART Digest IA Kit, Protein A non-magnetic with SOLA $\mu$ SPE and collection plate	<a href="#">60111-102</a>
SMART Digest IA Kit, Protein A magnetic with SOLA $\mu$ SPE and collection plate	<a href="#">60111-103</a>
SMART Digest IA Kit, Protein A magnetic	<a href="#">60111-104</a>
SMART Digest IA Kit, Protein G non-magnetic	<a href="#">60112-101</a>
SMART Digest IA Kit, Protein G non-magnetic with SOLA $\mu$ SPE and collection plate	<a href="#">60112-102</a>
SMART Digest IA Kit, Protein G magnetic with SOLA $\mu$ SPE and collection plate	<a href="#">60112-103</a>
SMART Digest IA Kit, Protein G magnetic	<a href="#">60112-104</a>
SMART Digest Bulk Protein A Fractionation Kit, non-magnetic, soluble Trypsin	<a href="#">60114-101</a>
SMART Digest Bulk Protein A Fractionation Kit, non-magnetic, with SOLA $\mu$ collection plate, soluble Trypsin	<a href="#">60114-102</a>
SMART Digest Bulk Protein A Fractionation Kit, magnetic, with SOLA $\mu$ collection plate, soluble Trypsin	<a href="#">60114-103</a>
SMART Digest Bulk Protein A Fractionation Kit, magnetic, soluble Trypsin	<a href="#">60114-104</a>
SMART Digest Bulk Protein A Fractionation Kit, magnetic, standalone	<a href="#">60116-101</a>
SMART Digest Bulk Fractionation Kit, Protein G, non-magnetic, soluble Trypsin	<a href="#">60115-101</a>
SMART Digest Bulk Fractionation Kit, Protein G, non-magnetic, with SOLA $\mu$ collection plate, soluble Trypsin	<a href="#">60115-102</a>
SMART Digest Bulk Fractionation Kit, Protein G, magnetic, with SOLA $\mu$ collection plate, soluble Trypsin	<a href="#">60115-103</a>
SMART Digest Bulk Fractionation Kit, Protein G, magnetic, soluble Trypsin	<a href="#">60115-104</a>
SMART Digest Bulk Fractionation Kit, Protein G, magnetic, standalone	<a href="#">60117-101</a>
SMART Digest Bulk Fractionation Kit, Streptavidin, magnetic, without soluble Trypsin	<a href="#">60118-101</a>
SMART Digest Bulk Fractionation Kit, Streptavidin, magnetic, SOLA $\mu$ collection plate, with soluble Trypsin	<a href="#">60119-103</a>
SMART Digest Bulk Fractionation Kit, Streptavidin, magnetic, with soluble Trypsin	<a href="#">60119-104</a>

## Complimentary products

Description	Part number
Thermo Scientific™ HyperSep™ Vacuum Manifold for HyperSep 96-Well Plates	<a href="#">60103-351</a>
Thermo Scientific™ HyperSep™ Glass Block Vacuum Manifold Pump, North American version	<a href="#">60104-243</a>
Thermo Scientific™ HyperSep™ Glass Block Vacuum Manifold Pump, European version	<a href="#">60104-241</a>
Thermo Scientific™ SOLA $\mu$ ™ HRP SPE Plate	<a href="#">60209-001</a>
KingFisher Duo Prime Purification System	<a href="#">5400110</a>
Thermo Scientific™ KingFisher™ Flex Purification System	<a href="#">5400630</a>

# SOLA SPE products

## Delivering consistent excellence for bioanalysis

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

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

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



### SOLA SPE products



#### Additional reading

Learn more at [thermofisher.com/solaspe](https://thermofisher.com/solaspe)



#### Compendium:

SOLA Solid-Phase Extraction (SPE) application note compendium. Prevent sample failures in bioanalytical workflows



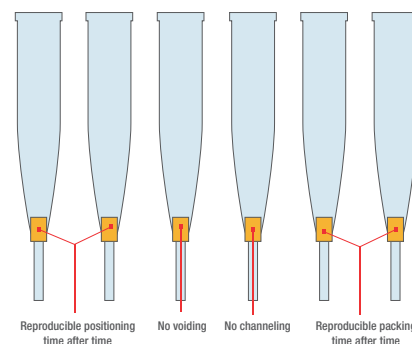
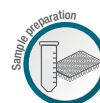
#### Flyers and posters:

SOLA SPE method development flyers and posters



#### Brochure:

Consistent excellence for bioanalysis. SOLA Solid-Phase Extraction products



**SOLA and SOLA $\mu$  SPE fritless design – limiting issues associated with conventional SPE formats**



# SOLA SPE products

Continued

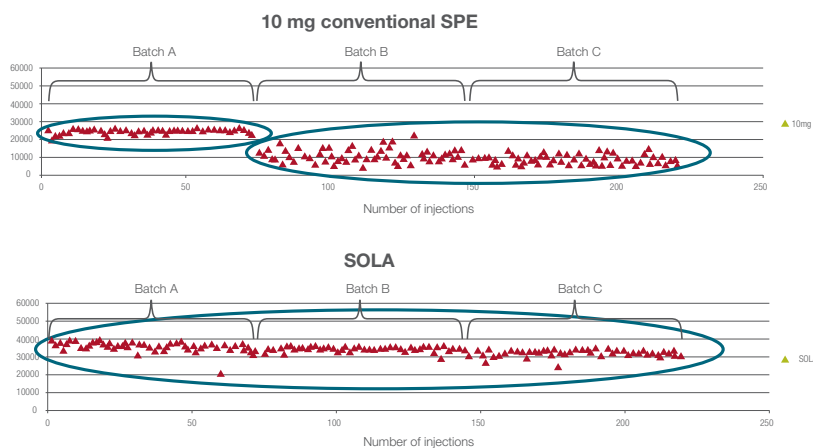


## Unique and innovative technology

The SOLA SPE range is designed to meet these demands with the unique and innovative fritless SPE technology, which eliminates the issues with traditional loose-packed SPE formats. The combination of the support material and active media components into a solid, uniform sorbent bed delivers stable and controllable flow-through characteristics and provides an added advantage

when dealing with viscous biological samples – it reduces blocking and enables high throughput processing.

The manufacturing process also allows for high levels of reproducibility, not only from cartridge-to-cartridge or well-to-well but also batch-to-batch.

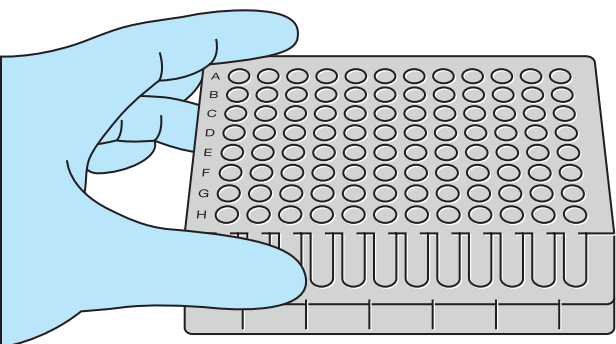


## Batch-to-batch reproducibility of SOLA product compared to a conventional SPE product

SOLA 10 mg SPE products are the flexible, go-to option for many applications, while SOLA 30 mg has increased loading capacities to handle large volumes of sample at low concentrations.

The SOLA $\mu$  SPE range has the added benefit of being able to provide:

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





# SOLA SPE products

Continued



## Increase your MS sensitivity

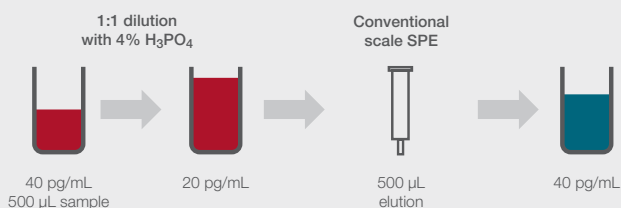
Sensitivity can be increased by loading a large volume of sample and eluting in a low volume.

niflumic acid. The compound was eluted in 25  $\mu$ L, delivering up to 20 times increase in concentration whilst maintaining excellent precision.

In the following example, 500  $\mu$ L of human plasma was loaded onto the SOLA $\mu$  plate for the analysis of

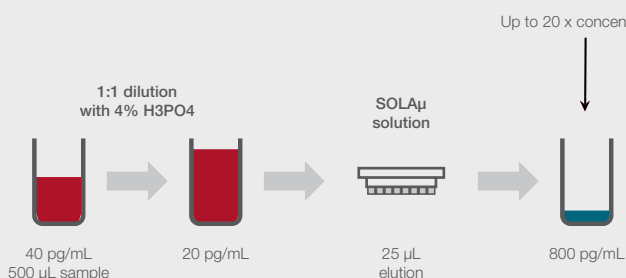
### The problem:

Improvement in assay sensitivity required

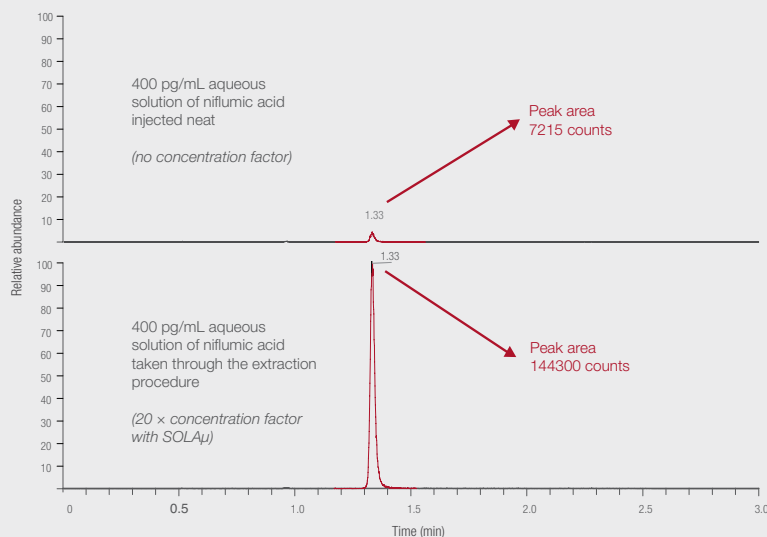


### The SOLA $\mu$ product solution:

Delivers up to 20 times increase in concentration of sample without changes to workflow



	Precision data for niflumic acid peak area ratio (%RSD) n = 18	Recovery of niflumic acid (%)	Matrix effects (%)
QC low (0.4 ng/mL)	1.31	89.9	8.63
QC high (30 ng/mL)	1.06	94.0	3.21



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



# SOLA SPE products

Continued

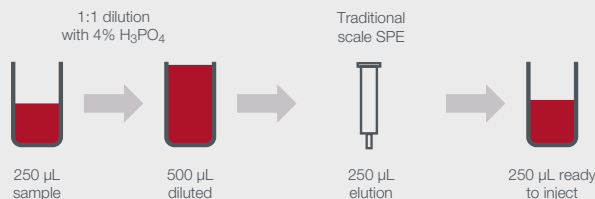


## Sample limited assays

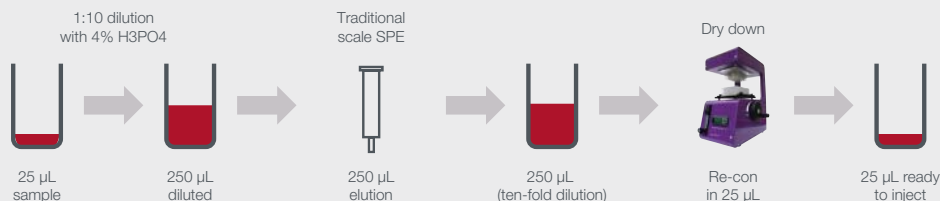
SOLA $\mu$  allows you to directly scale down the volumes used in analytical methods, allowing for a reduction in sample usage and eliminating issues caused by evaporation, without compromising the sensitivity of your assay. This is also an important consideration when sample volumes are limited.

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

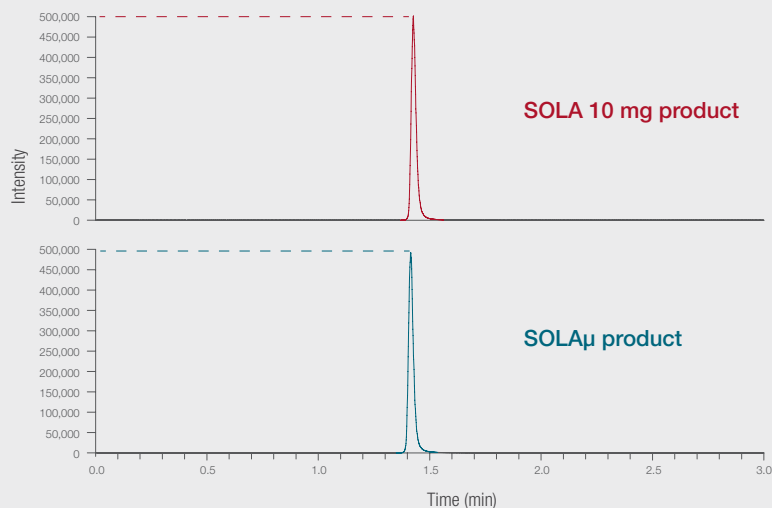
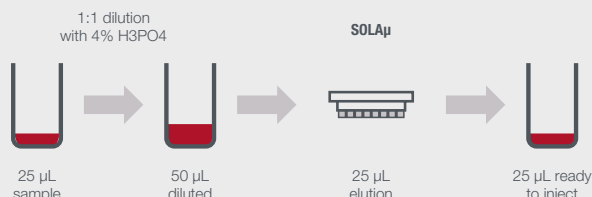
**The problem:**  
Large sample volume requires reduction



**The solution:**  
Introduce additional steps with associated issues



**The SOLA $\mu$  product solution:**  
Scale volume directly with no other method changes



Precision data for niflumic acid		
	Analyte peak area (%RSD)	Peak area ratio (%RSD)
Low QC	7.32	0.356
High QC	5.33	0.195

Equivalent peak response achieved for niflumic acid with SOLA $\mu$  using 25  $\mu$ L of sample compared with 250  $\mu$ L of sample with a 10 mg SOLA SPE product



# SOLA SPE products

Continued



## Increased workflow efficiency

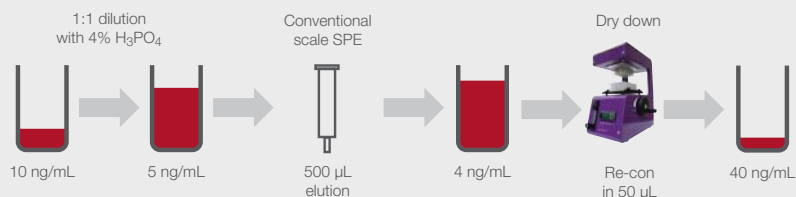
With traditional SPE the eluted sample is typically dried down to increase the concentration of the sample and thus improve the sensitivity. This can cause an issue for certain compound types which can be lost during this step, resulting in reduced sensitivity.

SOLA $\mu$  products allow the sample to be extracted without the need for dry down and reconstitution. Not only does this maximize recovery of the analytes,

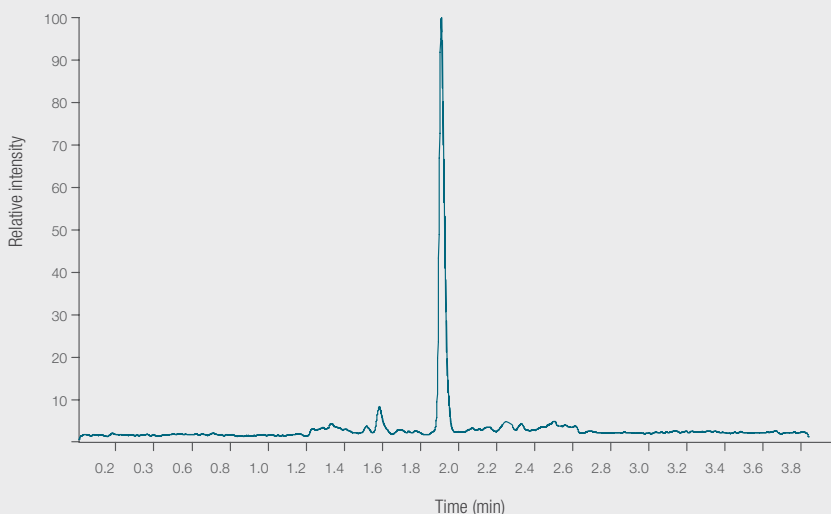
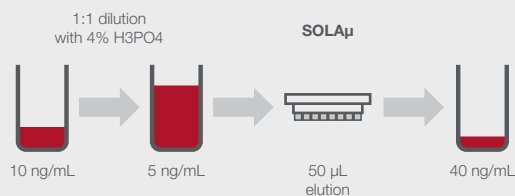
it also improves workflow efficiency and increases productivity.

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

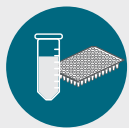
**The problem:**  
Workflow requires dry down to achieve sensitivity



**The SOLA $\mu$  product solution:**  
Low elution volume allows removal of dry down



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



# SOLA SPE products

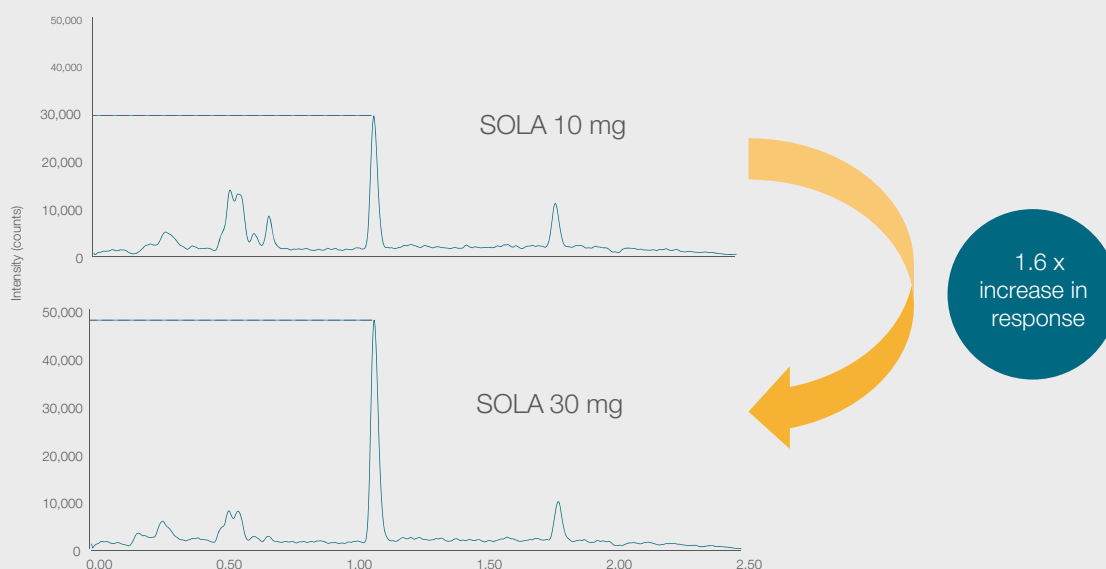
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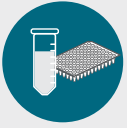
## Method scaling for SOLA 30 mg: concentrating large sample volumes to achieve low quantitation limits

Another simple way to increase the sensitivity of your assay from the very beginning of the workflow is to increase your sample loading volumes during SPE. Using larger sample volumes means more analyte is available to be retained by the SPE sorbent, and this in turn can boost the analyte signal response during later analysis. Boosts in signal response are particularly useful when trying to quantify low concentrations, and by combining large sample volumes with lower elution volumes, the final sample can be even more concentrated.

In order to increase loading volumes, an SPE bed weight with a high loading capacity should be used. SOLA 30 mg products are ideal for this purpose, as they have higher loading capacities than the equivalently sized silica-based products. They can be used for large sample volumes with low concentrations of analytes, as is often the case with many urine analyses. Additionally, high bed weight, polymeric SPE devices such as SOLA 30 mg are ideal compounds that are difficult to retain with smaller bed weights or when experiencing analyte breakthrough.



**The high loading capacity of SOLA HRP 30 mg improves signal response when compared to smaller bed weights.** The chromatograms above show an improved signal response of OH-Vit D<sub>3</sub> (150 ng/mL) when using SOLA HRP 30 mg to load 1 mL spiked human plasma compared to a 10 mg sorbent.



# SOLA SPE products

Continued



## SOLA SPE cartridges

Description	HRP	SCX	SAX	WCX	WAX
10 mg/1 mL (100/pk)	<a href="#">60109-001</a>	<a href="#">60109-002</a>	<a href="#">60109-003</a>	<a href="#">60109-004</a>	<a href="#">60109-005</a>
30 mg/3 mL (50/pk)	<a href="#">60409-001</a>	<a href="#">60409-002</a>	<a href="#">60409-003</a>	<a href="#">60409-004</a>	<a href="#">60409-005</a>

## SOLA SPE 96-well plates

Description	HRP	SCX	SAX	WCX	WAX
2 mg/1 mL (SOLA $\mu$ format) (1/pk)	<a href="#">60209-001</a>	<a href="#">60209-002</a>	<a href="#">60209-003</a>	<a href="#">60209-004</a>	<a href="#">60209-005</a>
10 mg/2 mL (1/pk)	<a href="#">60309-001</a>	<a href="#">60309-002</a>	<a href="#">60309-003</a>	<a href="#">60309-004</a>	<a href="#">60309-005</a>
30 mg/2 mL (1/pk)	<a href="#">60509-001</a>	<a href="#">60509-002</a>	<a href="#">60509-003</a>	<a href="#">60509-004</a>	<a href="#">60509-005</a>

## Complementary products

Description	Part number
HyperSep Vacuum Manifold for HyperSep 96-Well Plates	<a href="#">60103-351</a>
HyperSep Glass Block Vacuum Manifold Pump, North American version	<a href="#">60104-243</a>
HyperSep Glass Block Vacuum Manifold Pump, European version	<a href="#">60104-241</a>





# HyperSep SPE products

## Removing uncertainty by applying science to SPE

A diverse range of polymer- and silica-based SPE phases with a large variety of chemistries to suit any application area.



### HyperSep SLE cartridges and plates



#### Compendium:

Removing uncertainty by applying science to SPE

### HyperSep SLE cartridges and plates



#### Comments

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

Greater reproducibility and recoveries compared to LLE techniques

- Prevents emulsification often associated with LLE
- Reduces solvent requirements compared to LLE
- Can be completely automated unlike LLE
- Improves cleanliness of sample extract compared to protein precipitation techniques
- Improves sensitivity compared to protein precipitation techniques

Learn more at [thermofisher.com/hypersep](https://thermofisher.com/hypersep)





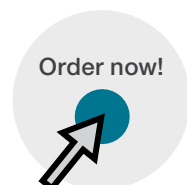
# HyperSep SLE cartridges and plates

Continued



## HyperSep SLE cartridges

Special treated diatomite SLE	Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
pH 7	200	3	50	<a href="#">60109-200-3-7</a>
	500			<a href="#">60109-500-3-7</a>
	1,000	6	30	<a href="#">60109-500-6-7</a>
	2,000			<a href="#">60109-1000-6-7</a>
	4,000	12	20	<a href="#">60109-2000-12-7</a>
	20,000	25	15	<a href="#">60109-4000-25-7</a>
	20,000	60	10	<a href="#">60109-20000-60-7</a>
pH 9	200	3	50	<a href="#">60109-200-3-9</a>
	500			<a href="#">60109-500-3-9</a>
	1,000	6	30	<a href="#">60109-500-6-9</a>
	2,000			<a href="#">60109-1000-6-9</a>
	4,000	12	20	<a href="#">60109-2000-12-9</a>
	20,000	25	15	<a href="#">60109-4000-25-9</a>
	20,000	60	10	<a href="#">60109-20000-60-9</a>
HyperSep SLE 96-well plates				
pH 7	200	2	1	<a href="#">60109-200-2-7W</a>
	300			<a href="#">60109-300-2-7W</a>
	400			<a href="#">60109-400-2-7W</a>
	500			<a href="#">60109-500-2-7W</a>
pH 9	200	2	1	<a href="#">60109-200-2-9W</a>
	400			<a href="#">60109-400-2-9W</a>
	500			<a href="#">60109-500-2-9W</a>





# HyperSep SLE cartridges and plates

Continued

## HyperSep protein precipitation plates



### Comments

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

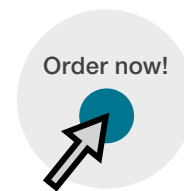
- Dual frit design
- Hydrophobic/oleophobic frits to enable only precipitation of proteins
- Pore size optimized for ideal flow rate
- Specially selected polypropylene for low extractables

Learn more at [thermofisher.com/hypersep](https://thermofisher.com/hypersep)



### HyperSep protein precipitation plates

Description	Quantity	Part number
Protein precipitation plate	1 each	60304-201



### Compendium:

Removing uncertainty by applying science to SPE



# Microscale SPE plates and tips

## HyperSep lab plates



### Comments

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

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

### Applications

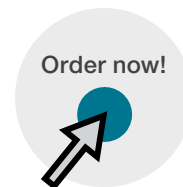
- Tissue culture and separation of products
- Sample concentration
- Sample clean-up
- Collection of sample after chromatography

Learn more at [thermofisher.com/hypersep](https://thermofisher.com/hypersep)



### HyperSep lab plates

Description	Quantity (pack)	Polystyrene	Polypropylene
C18	5	<a href="#">60110-201</a>	<a href="#">60110-301</a>
Zirconium Dioxide		<a href="#">60110-206</a>	—
Titanium Dioxide		<a href="#">60110-207</a>	<a href="#">60110-307</a>
SAX		<a href="#">60110-209</a>	—





# Microscale SPE plates and tips

Continued

## HyperSep filter plates



### Comments

For effective clean-up of small-scale samples

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

Learn more at [thermofisher.com/hypersep](https://thermofisher.com/hypersep)



### HyperSep filter plates

Description	Quantity (pack)	5-7 $\mu$ L bed volume	40 $\mu$ L bed volume
C18		<a href="#">60110-401</a>	<a href="#">60110-501</a>
C8		—	<a href="#">60110-502</a>
C4		—	<a href="#">60110-503</a>
Hypercarb		—	<a href="#">60110-504</a>
Hypercarb and C18 (mixed-mode)	1	—	<a href="#">60110-505</a>
Zirconium Dioxide		<a href="#">60110-406</a>	—
Titanium Dioxide		<a href="#">60110-407</a>	—
SCX		—	<a href="#">60110-508</a>
SAX		—	<a href="#">60110-509</a>

Order now!





# Microscale SPE plates and tips

Continued

## HyperSep Tip Microscale SPE Extraction Tips



### Comments

Revolutionary micropipette tip for sample preparation

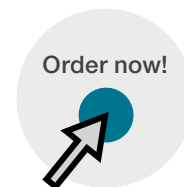
- Faster sample preparation with minimal sample loss
- Patented micropipette tip in which the chromatographic material is directly attached to its inner surface
- No contamination from the supporting matrix
- Separation in volumes as low as 100 nL
- Applications include mass spectrometry, desalting,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

Learn more at [thermofisher.com/hypersep](https://thermofisher.com/hypersep)



### HyperSep Tip Microscale SPE Extraction Tips

Description	Quantity (pack)	1-10 $\mu$ L capacity	10-200 $\mu$ L capacity
BioBasic 18		<a href="#">60109-201</a>	<a href="#">60109-209</a>
BioBasic 8		<a href="#">60109-202</a>	<a href="#">60109-210</a>
BioBasic 4		<a href="#">60109-203</a>	<a href="#">60109-211</a>
Hypercarb		<a href="#">60109-204</a>	<a href="#">60109-212</a>
Hypercarb and C18 (mixed-mode)	96	<a href="#">60109-205</a>	<a href="#">60109-213</a>
HILIC		<a href="#">60109-206</a>	<a href="#">60109-214</a>
Trypsin		<a href="#">60109-207</a>	<a href="#">60109-215</a>
Titanium Dioxide		<a href="#">60109-208</a>	<a href="#">60109-216</a>
Zirconium Dioxide		<a href="#">60109-217</a>	<a href="#">60109-218</a>





# Microscale SPE plates and tips

Continued

## HyperSep SpinTip Microscale SPE Extraction Tips



### Comments

Revolutionary micropipette tip for sample preparation

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

Learn more at [thermofisher.com/hypersep](https://thermofisher.com/hypersep)



### HyperSep SpinTip Microscale SPE Extraction Tips

Description	Quantity (pack)	1-10 $\mu\text{L}$ capacity	10-200 $\mu\text{L}$ capacity
C18	96	<a href="#">60109-401</a>	<a href="#">60109-412</a>
C8		<a href="#">60109-402</a>	<a href="#">60109-413</a>
C4		<a href="#">60109-403</a>	<a href="#">60109-414</a>
Hypercarb		<a href="#">60109-404</a>	<a href="#">60109-415</a>
Hypercarb and C18 (mixed-mode)		<a href="#">60109-405</a>	<a href="#">60109-416</a>
HILIC		<a href="#">60109-406</a>	<a href="#">60109-417</a>
Trypsin		<a href="#">60109-407</a>	<a href="#">60109-418</a>
POROS Weak Anion Exchanger		<a href="#">60109-408</a>	<a href="#">60109-419</a>
POROS Strong Anion Exchanger		<a href="#">60109-409</a>	<a href="#">60109-420</a>
POROS Strong Cation Exchanger		<a href="#">60109-410</a>	<a href="#">60109-421</a>
Titanium Dioxide		<a href="#">60109-411</a>	<a href="#">60109-422</a>
Zirconium Dioxide		<a href="#">60109-424</a>	<a href="#">60109-425</a>

Order now!





# HyperSep SPE cartridges and plates

## HyperSep Retain SPE cartridges and plates



### Comments

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

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

### Retain PEP applications

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

### Retain CX applications

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

### Retain AX applications

- Analysis of THC and its metabolites

Learn more at [thermofisher.com/hypersep](https://thermofisher.com/hypersep)



### Compendium:

Removing uncertainty by applying science to SPE





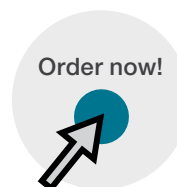
# HyperSep SPE cartridges and plates

Continued



## HyperSep Retain PEP/CX/AX SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Retain PEP	Retain CX	Retain AX
30	1	100	<a href="#">60107-201</a>	<a href="#">60107-301</a>	<a href="#">60107-401</a>
			<a href="#">60107-202</a>	<a href="#">60107-302</a>	<a href="#">60107-402</a>
60	3	50	<a href="#">60107-203</a>	<a href="#">60107-303</a>	<a href="#">60107-403</a>
			<a href="#">60107-208</a>	<a href="#">60107-308</a>	<a href="#">60107-408</a>
100	3	50	<a href="#">60107-217</a>	—	<a href="#">60107-417</a>
150	6	30	<a href="#">60107-211</a>	<a href="#">60107-311</a>	<a href="#">60107-411</a>
200	3	50	<a href="#">60107-204</a>	<a href="#">60107-304</a>	<a href="#">60107-404</a>
			<a href="#">60107-212</a>	<a href="#">60107-314</a>	<a href="#">60107-412</a>
500	3	50	<a href="#">60107-205</a>	<a href="#">60107-305</a>	<a href="#">60107-405</a>
			<a href="#">60107-206</a>	<a href="#">60107-306</a>	<a href="#">60107-406</a>
1,000	15	20	—	—	<a href="#">60107-419</a>
			<a href="#">60107-215</a>	<a href="#">60107-315</a>	<a href="#">60107-415</a>
2,000	6	30	<a href="#">60107-218</a>	—	—
2,000	25	20	<a href="#">60107-214</a>	<a href="#">60107-312</a>	<a href="#">60107-414</a>
<b>HyperSep Retain PEP/CX/AX 96 fixed well plates</b>					
30	1	1	<a href="#">60306-207</a>	<a href="#">60306-303</a>	<a href="#">60306-403</a>
60			<a href="#">60306-208</a>	<a href="#">60306-304</a>	<a href="#">60306-404</a>
<b>HyperSep Retain PEP/CX/AX 96 removable well plate</b>					
30	1	1	<a href="#">60303-207</a>	<a href="#">60303-307</a>	<a href="#">60303-407</a>





# HyperSep SPE cartridges and plates

Continued

## HyperSep Hypercarb SPE cartridges and plates



### Comments

Unique material for retention of highly polar compounds

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

### Applications

- Provides total pH stability retention and separation of highly polar species especially in environmental samples
- Ideal for problem analytes in SPE applications

Learn more at [thermofisher.com/hypersep](http://thermofisher.com/hypersep)



### HyperSep Hypercarb SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
25	1	50	<a href="#">60106-304</a>
50			<a href="#">60106-303</a>
100			<a href="#">60106-302</a>
200	3	30	<a href="#">60106-301</a>
500			<a href="#">60106-402</a>
1,000	6	20	<a href="#">60106-403</a>
2,000			<a href="#">60106-404</a>

### HyperSep Hypercarb 96 removable well plates

10	1	1	<a href="#">60302-606</a>
25			<a href="#">60302-607</a>
50			<a href="#">60302-608</a>



# HyperSep SPE cartridges and plates

Continued

## HyperSep C18 SPE cartridges and plates



Comments
Features a highly retentive alkyl-bonded phase for extraction of non-polar to moderately polar compounds
Applications
<ul style="list-style-type: none"> <li>Retentive for non-polar compounds</li> <li>Retains most organic analytes from aqueous matrices</li> </ul>
Learn more at <a href="http://thermofisher.com/hypersep">thermofisher.com/hypersep</a>



### HyperSep C18 SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
25			<a href="#">60108-376</a>
50	1	100	<a href="#">60108-390</a>
100			<a href="#">60108-302</a>
200	3	50	<a href="#">60108-303</a>
500	6	30	<a href="#">60108-305</a>
	10	50	<a href="#">60108-786</a>
1,000	6	30	<a href="#">60108-301</a>
	15		<a href="#">60108-776</a>
2,000	15	20	<a href="#">60108-701</a>
5,000	25		<a href="#">60108-780</a>
10,000	75	10	<a href="#">60108-702</a>
			<a href="#">60108-703</a>
HyperSep C18 96 fixed/removable well plates			
10			<a href="#">60300-425</a>
25			<a href="#">60300-426</a>
50	1	1	<a href="#">60300-427</a>
100			<a href="#">60300-428</a>



# HyperSep SPE cartridges and plates

Continued

## HyperSep C8 SPE cartridges and plates



### Comments

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

### Applications

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

Learn more at [thermofisher.com/hypersep](https://thermofisher.com/hypersep)

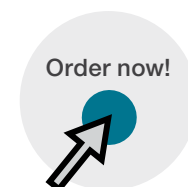


### HyperSep C8 SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
50	1	100	<a href="#">60108-391</a>
100			<a href="#">60108-392</a>
200	3	50	<a href="#">60108-393</a>
500			<a href="#">60108-309</a>
1,000			<a href="#">60108-394</a>
2,000	6	30	<a href="#">60108-427</a>
5,000			<a href="#">60108-705</a>
10,000	15	20	<a href="#">60108-704</a>
	25		<a href="#">60108-706</a>
	75	10	<a href="#">60108-706</a>

### HyperSep C8 96 fixed/removable well plates

Bed weight (mg)	Well volume (mL)	Fixed part number	Removable part number
10	1	<a href="#">60307-211</a>	<a href="#">60300-445</a>
25		<a href="#">60307-212</a>	<a href="#">60300-446</a>
50		<a href="#">60307-213</a>	<a href="#">60300-447</a>
100		—	<a href="#">60300-448</a>





# HyperSep SPE cartridges and plates

Continued

## HyperSep Silica SPE cartridges and plates



Comments
A polar sorbent primarily used to retain analytes in non-polar matrices
Applications
<ul style="list-style-type: none"> <li>Extraction of polar compounds including aldehydes, amines, drugs, pesticides and herbicides</li> <li>Extraction of carotenoids, fat-soluble vitamins, aflatoxins in food matrices</li> <li>Extraction of fatty acids and phospholipids</li> </ul>
Learn more at <a href="https://thermofisher.com/hypersep">thermofisher.com/hypersep</a>



### HyperSep Silica SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity	Part number
50	1	100 pack	<a href="#">60108-409</a>
100			<a href="#">60108-317</a>
200	3	50 pack	<a href="#">60108-410</a>
500			<a href="#">60108-315</a>
500	6	30 pack	<a href="#">60108-411</a>
	10	50 pack	<a href="#">60108-793</a>
1,000	6	30 pack	<a href="#">60108-426</a>
2,000	15	20 pack	<a href="#">60108-710</a>
5,000	25		<a href="#">60108-711</a>
10,000	75	10 pack	<a href="#">60108-853</a>
	150		<a href="#">60108-712</a>
50,000	75	10 pack	<a href="#">60108-850</a>
20,000	150		<a href="#">60108-851</a>
70,000	150	10 pack	<a href="#">60108-852</a>

### HyperSep Silica 96 fixed/removable well plates

Bed weight (mg)	Well volume (mL)	Quantity	Fixed part number	Removable part number
10	1	1 each	<a href="#">60307-231</a>	<a href="#">60300-485</a>
25			<a href="#">60307-232</a>	<a href="#">60300-486</a>
50			<a href="#">60307-233</a>	<a href="#">60300-487</a>
100			<a href="#">60307-234</a>	<a href="#">60300-488</a>



# HyperSep SPE cartridges and plates

Continued

## HyperSep Acid Wash Silica SPE cartridges and plates



Comments
A hydrophilic sorbent for extraction of polar compounds
Applications
<ul style="list-style-type: none"> <li>• Extraction of polar compounds from ground, waste and drinking water</li> <li>• Extraction of polar compounds from food and beverages</li> </ul>
Learn more at <a href="https://thermofisher.com/hypersep">thermofisher.com/hypersep</a>



### HyperSep Acid Wash Silica SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
50	1	100	60108-901
100			60108-902
200	10	50	60108-903
	3		60108-904
500	10	30	60108-905
	3		60108-906
	6		60108-907
1,000	10	50	60108-908
	6	30	60108-909
2,000	15	20	60108-910
5,000	25	20	60108-911
10,000	75	10	60108-912

### HyperSep Acid Wash Silica 96 fixed/removable well plates

Bed weight (mg)	Well volume (mL)	Quantity	Fixed part number	Removable part number
10	1	1 each	60307-321	60300-831
25			60307-322	60300-832
50			60307-323	60300-833
100			60307-324	60300-834



# HyperSep SPE cartridges and plates

Continued

## HyperSep Phenyl SPE cartridges and plates

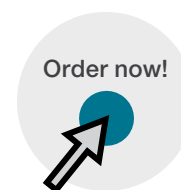


Comments
Offers alternative selectivity for retention of basic compounds
Applications
<ul style="list-style-type: none"> <li>Extraction of aromatic compounds</li> <li>Extraction of basic analytes</li> </ul>
Learn more at <a href="http://thermofisher.com/hypersep">thermofisher.com/hypersep</a>



### HyperSep Phenyl SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
50	1	100	<a href="#">60108-516</a>
100			<a href="#">60108-386</a>
200	3	50	<a href="#">60108-387</a>
500			<a href="#">60108-388</a>
1,000	6	30	<a href="#">60108-389</a>
2,000			<a href="#">60108-517</a>
5,000	25	20	<a href="#">60108-707</a>
10,000			<a href="#">60108-708</a>
	75	10	<a href="#">60108-709</a>





# HyperSep SPE cartridges and plates

Continued

## HyperSep Diol SPE cartridges and plates



Comments
Ideal for the extraction of polar compounds
Applications
<ul style="list-style-type: none"> <li>• Normal phase extraction of polar compounds</li> <li>• Purification of polar compounds</li> </ul>
Learn more at <a href="https://thermofisher.com/hypersep">thermofisher.com/hypersep</a>

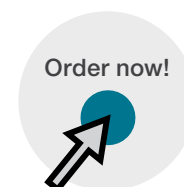


### HyperSep Diol SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
50	1	100	<a href="#">60108-571</a>
100			<a href="#">60108-572</a>
200	3	50	<a href="#">60108-573</a>
500			<a href="#">60108-574</a>
1,000			<a href="#">60108-575</a>
2,000	6	30	<a href="#">60108-576</a>
5,000			<a href="#">60108-576</a>
10,000	75	10	<a href="#">60108-757</a>

### HyperSep Diol 96 fixed/removable well plates

Bed weight (mg)	Well volume (mL)	Quantity	Fixed part number	Removable part number
10	1	1 each	<a href="#">60307-311</a>	<a href="#">60300-630</a>
25			<a href="#">60307-312</a>	<a href="#">60300-631</a>
50			—	<a href="#">60300-632</a>
100			—	<a href="#">60300-633</a>







# HyperSep SPE cartridges and plates

Continued

## HyperSep Verify CX SPE cartridges and plates



Comments
Mixed-mode SPE features non-polar and ionic characteristics for improved analysis of drugs of abuse
Applications
<ul style="list-style-type: none"> <li>Analysis of a wide range of drugs of abuse from biological matrices, including basic and neutral drugs</li> </ul>
Learn more at <a href="http://thermofisher.com/hypersep">thermofisher.com/hypersep</a>



### HyperSep Verify CX SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
50	1	100	<a href="#">60108-741</a>
130	10		<a href="#">60108-719</a>
	3		<a href="#">60108-777</a>
200	6	50	<a href="#">60108-722</a>
	10		<a href="#">60108-742</a>
300	3		<a href="#">60108-720</a>
500			<a href="#">60108-721</a>
	6	30	<a href="#">60108-723</a>
1,000			<a href="#">60108-724</a>

### HyperSep Verify CX 96 fixed/removable well plates

Bed weight (mg)	Well volume (mL)	Quantity	Fixed part number
25			<a href="#">60307-262</a>
50	1	1 each	<a href="#">60307-263</a>
100			<a href="#">60307-264</a>



# HyperSep SPE cartridges and plates

Continued

## HyperSep Verify AX SPE cartridges and plates



### Comments

Mixed-mode SPE features non-polar and ionic characteristics for improved analysis of acidic drugs and metabolites

### Applications

- Analysis of acidic and neutral drug e.g. THC and its metabolites

Learn more at [thermofisher.com/hypersep](https://thermofisher.com/hypersep)

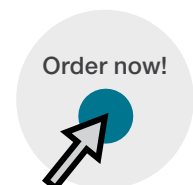


### HyperSep Verify AX SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
130	1	100	<a href="#">60108-727</a>
	10	50	<a href="#">60108-767</a>
200	3	30	<a href="#">60108-768</a>
	6	50	<a href="#">60108-730</a>
	10		<a href="#">60108-764</a>
300	3	50	<a href="#">60108-728</a>
500			<a href="#">60108-729</a>
500	6	30	<a href="#">60108-731</a>
1,000			<a href="#">60108-732</a>

### HyperSep Verify AX 96 fixed/removable well plates

Bed weight (mg)	Well volume (mL)	Quantity	Fixed part number
25	1	1 each	<a href="#">60307-272</a>
50			<a href="#">60307-273</a>





# HyperSep SPE cartridges and plates

Continued

## HyperSep Strong Cation Exchanger (SCX) SPE cartridges and plates



Comments
A strong cation exchange sorbent for extraction of charged basic compounds
Applications
<ul style="list-style-type: none"> <li>Isolation of cationic compounds from complex samples</li> <li>Removal of basic drugs</li> <li>Organic bases</li> <li>Nucleic acid bases, nucleotides and surfactants</li> </ul>
Learn more at <a href="https://thermofisher.com/hypersep">thermofisher.com/hypersep</a>



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

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
50	1	100	<a href="#">60108-420</a>
100			<a href="#">60108-421</a>
200	3	50	<a href="#">60108-422</a>
500			<a href="#">60108-423</a>
1,000	6	30	<a href="#">60108-520</a>
2,000			<a href="#">60108-433</a>
5,000	15	20	<a href="#">60108-716</a>
10,000			<a href="#">60108-717</a>
20,000	75	10 pack	<a href="#">60108-718</a>
50,000			<a href="#">60108-857</a>
	150		<a href="#">60108-858</a>

### HyperSep Strong Cation Exchanger (SCX) 96 fixed/removable well plates

Bed weight (mg)	Well volume (mL)	Quantity	Fixed part number	Removable part number
10	1	1 each	—	<a href="#">60300-585</a>
25			<a href="#">60307-252</a>	—
50			<a href="#">60307-253</a>	<a href="#">60300-587</a>
100			—	<a href="#">60300-588</a>



# HyperSep SPE cartridges and plates

Continued

## HyperSep Strong Anion Exchanger (SAX) SPE



Comments
Strong anion exchange sorbent for extraction of weak acids
Applications
<ul style="list-style-type: none"> <li>• Isolation of anionic compounds from complex samples</li> <li>• Removal of acidic food pigments</li> <li>• Isolation of phenolic compounds</li> <li>• Nucleic acids, nucleotides and surfactants</li> </ul>
Learn more at <a href="https://thermofisher.com/hypersep">thermofisher.com/hypersep</a>



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

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
50	1	100	<a href="#">60108-417</a>
100		100	<a href="#">60108-418</a>
200	3	50	<a href="#">60108-419</a>
500		50	<a href="#">60108-521</a>
1,000	6	30	<a href="#">60108-360</a>
2,000		30	<a href="#">60108-434</a>
5,000	15	20	<a href="#">60108-713</a>
10,000	25	20	<a href="#">60108-714</a>
	75	10	<a href="#">60108-715</a>

### HyperSep Strong Anion Exchanger (SAX) 96 fixed/removable well plates

Bed weight (mg)	Well volume (mL)	Quantity	Fixed part number	Removable part number
10	1	1 each	—	<a href="#">60300-565</a>
25			<a href="#">60307-242</a>	60300-566
50			<a href="#">60307-243</a>	<a href="#">60300-567</a>
100			—	<a href="#">60300-568</a>



# HyperSep SPE cartridges and plates

Continued

## HyperSep Carboxylic Acid (WCX) SPE cartridges and plates



Comments
Weak cation exchange sorbent for extraction of strong bases
Applications
<ul style="list-style-type: none"> <li>• Drugs and metabolites in biological fluids</li> <li>• Peptides in serum, plasma or biological fluids</li> <li>• Pesticides in water, food and beverages</li> <li>• Nucleic acids, nucleotides and surfactants</li> </ul>
Learn more at <a href="https://thermofisher.com/hypersep">thermofisher.com/hypersep</a>



### HyperSep Carboxylic Acid (WCX) SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
50	1	100	60108-201
100	1	100	60108-202
200	3	50	60108-203
	10	50	60108-207
500	3	50	60108-204
	6	30	60108-205
1,000	6	30	60108-206
2,000	15	20	60108-208
5,000	25	20 pack	60108-209

### HyperSep Carboxylic Acid (WCX) 96 fixed/removable well plates

Bed weight (mg)	Well volume (mL)	Quantity	Fixed part number	Removable part number
10	1	1 each	60307-331	60300-841
25			60307-332	60300-842
50			60307-333	60300-843
100			60307-334	60300-844



# HyperSep SPE cartridges and plates

Continued

## HyperSep Aminopropyl (WAX) SPE cartridges and plates



Comments
Weak anion exchange sorbent for extraction of strong acids
Applications
<ul style="list-style-type: none"> <li>• Separation of structural isomers</li> <li>• Drugs and metabolites in biological fluids</li> <li>• Separation of saccharides, phenols and petroleum products</li> </ul>
Learn more at <a href="https://thermofisher.com/hypersep">thermofisher.com/hypersep</a>



### HyperSep Aminopropyl (WAX) SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
50	1	100	<a href="#">60108-424</a>
	3	50	<a href="#">60108-429</a>
100	1	100	<a href="#">60108-364</a>
	3	50	<a href="#">60108-425</a>
500	6	30	<a href="#">60108-518</a>
	15	20	<a href="#">60108-738</a>
1,000	25	10	<a href="#">60108-739</a>
	75	10	<a href="#">60108-740</a>

### HyperSep Aminopropyl (WAX) 96 fixed/removable well plates

Bed weight (mg)	Well volume (mL)	Quantity	Fixed part number	Removable part number
10	1	1 each	<a href="#">60307-291</a>	<a href="#">60300-505</a>
25			<a href="#">60307-292</a>	<a href="#">60300-506</a>
50			<a href="#">60307-293</a>	<a href="#">60300-507</a>
100			<a href="#">60307-294</a>	—



# HyperSep SPE cartridges and plates

Continued

## HyperSep Florisil SPE cartridges and plates



Comments
Ideal for the isolation of polar compounds from non-polar matrices
Applications
<ul style="list-style-type: none"> <li>Extraction of pesticides using official methods</li> <li>Polychlorinated biphenyls in transformer oil</li> <li>Alcohol, aldehydes, amines and drugs</li> </ul>
Learn more at <a href="http://thermofisher.com/hypersep">thermofisher.com/hypersep</a>



### HyperSep Florisil SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
50	1	100	<a href="#">60108-402</a>
100			<a href="#">60108-403</a>
200	3	50	<a href="#">60108-404</a>
500			<a href="#">60108-405</a>
1,000	6	30	<a href="#">60108-500</a>
2,000			<a href="#">60108-431</a>
5,000	25	20	<a href="#">60108-735</a>
10,000			<a href="#">60108-736</a>
	75	10	<a href="#">60108-737</a>



#### Compendium:

Removing uncertainty by applying science to SPE



# HyperSep SPE cartridges and plates

Continued

## HyperSep Cyano SPE cartridges and plates



### Comments

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

### Applications

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

Learn more at [thermofisher.com/hypersep](https://thermofisher.com/hypersep)



### HyperSep Cyano SPE cartridges

Bed weight (mg)	Column volume (mL)	Quantity (pack)	Part number
50	1	100	<a href="#">60108-746</a>
100		100	<a href="#">60108-745</a>
200	3	50	<a href="#">60108-747</a>
500		50	<a href="#">60108-748</a>
1,000	6	30	<a href="#">60108-749</a>
2,000		30	<a href="#">60108-750</a>
5,000	15	20	<a href="#">60108-751</a>
10,000	25	20	<a href="#">60108-752</a>
	75	10	<a href="#">60108-753</a>

### HyperSep Cyano 96 fixed/removable well plates

Bed weight (mg)	Well volume (mL)	Quantity	Fixed part number	Removable part number
10	1	1 each	—	<a href="#">60300-821</a>
25			—	<a href="#">60300-822</a>
50			—	<a href="#">60300-823</a>
100			<a href="#">60307-304</a>	<a href="#">60300-824</a>

Order now!





# SPE manifolds and accessories

Improving your sample preparation workflow with a comprehensive range of accessories



## HyperSep manifolds and accessories

### HyperSep Positive Pressure Manifold



#### Comments

Improve productivity of SPE sample preparation by simultaneously processing up to 48 samples. The Thermo Scientific™ HyperSep™ Positive Pressure Manifold can hold 48 SPE cartridges of various sizes: 1, 3, 6, 10 and 15 mL.

Learn more at [thermofisher.com/spemanifolds](https://thermofisher.com/spemanifolds)



Description	Part number
Positive Pressure Manifold with 13 mm collection rack	<a href="#">60104-236</a>
Positive Pressure Manifold with 16 mm collection rack	<a href="#">60104-274</a>
Adaptor Plate for 1 mL cartridges for PP Manifold	<a href="#">60104-265</a>
Adaptor Plate for 3 mL cartridges for PP Manifold	<a href="#">60104-266</a>
Adaptor Plate for 6 mL cartridges for PP Manifold	<a href="#">60104-267</a>
Adaptor Plate for 10 mL/15 mL cartridges for PP Manifold	<a href="#">60104-271</a>
Collection Rack for 13 mm tubes	<a href="#">60104-268</a>
Collection Rack for 16 mm tubes	<a href="#">60104-269</a>
Pre-Drilled Waste Container	<a href="#">60104-270</a>
Installation Kit	<a href="#">60104-272</a>
In Line Air Filter	<a href="#">60104-273</a>



# HyperSep manifolds and accessories

Continued

## HyperSep Universal Vacuum Manifold



### Comments

Process your samples in SPE cartridges or 96-Well plates by using the flexible Thermo Scientific™ HyperSep™ Universal Vacuum Manifold. The manifold is supplied with a base and vacuum gauge, flask and stopper tubing and spigots.

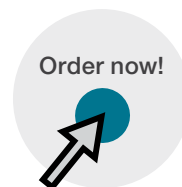
Learn more at [thermofisher.com/spemanifolds](https://thermofisher.com/spemanifolds)



Universal Vacuum Manifold Base/Gauge



Description	Part number
Universal Vacuum Manifold	<a href="#">60104-230</a>
Glass Block Vacuum Manifold Pump, European version	<a href="#">60104-241</a>
Glass Block Vacuum Manifold Pump, North American version	<a href="#">60104-243</a>
24 Well Extraction Plate	<a href="#">60104-284</a>
48 Well Extraction Plate	<a href="#">60104-289</a>
24-position Extraction Plate Plugs	<a href="#">60104-234</a>
48-position Extraction Plate Plugs	<a href="#">60104-235</a>





## HyperSep Vacuum Manifold for HyperSep 96-Well Plates

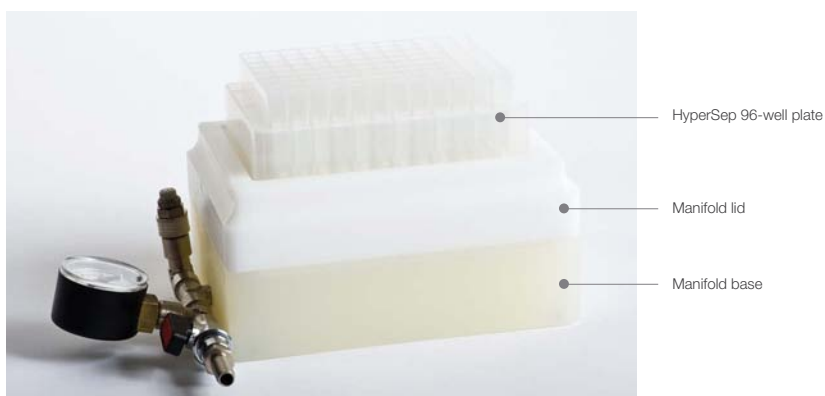


### Comments

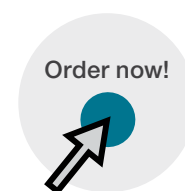
Thermo Scientific™ HyperSep™ Vacuum Manifolds are designed for use with HyperSep SPE columns and the HyperSep 96-Well plates. The HyperSep 96-well plate is not included and available for purchase separately. Included with system:

- Base
- Lid
- Waste collection tray

Learn more at [thermofisher.com/spemanifolds](https://thermofisher.com/spemanifolds)



Description	Part number
Vacuum Manifold for HyperSep 96-Well Plates	<a href="#">60103-351</a>
Glass Block Vacuum Manifold Pump, European version	<a href="#">60104-241</a>
Glass Block Vacuum Manifold Pump, North American version	<a href="#">60104-243</a>
Glass Block Vacuum Manifold Pump, UK version	60104-441





# HyperSep manifolds and accessories

Continued

## HyperSep Glass Block Vacuum Manifold

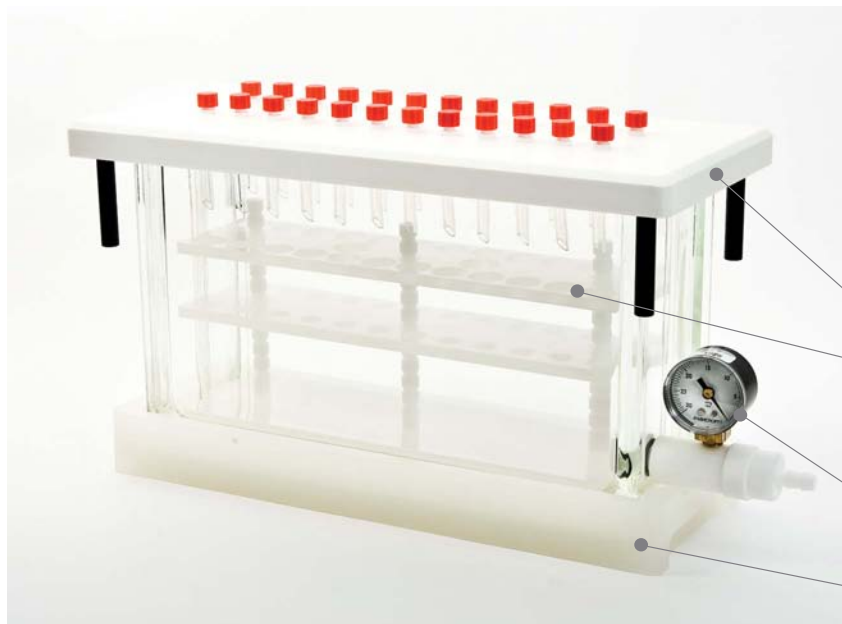


### Comments

Thermo Scientific™ HyperSep™ Glass Block Vacuum Manifolds offer a simple way to quickly process multiple samples. The manifold's rigid lid resists warping, and permits samples to elute directly into disposable test tubes. The design allows visible inspection of the extraction process and facilitates cleaning.

Glass block, manifold lid, cover gasket, vacuum gauge and valve assembly, 24 tips, adjustable collection rack, bulkhead luer fittings, 24 plugs and manifold safety tray.

Learn more at [thermofisher.com/spemanifolds](https://thermofisher.com/spemanifolds)



Manifold lid

Collection rack

Vacuum gauge and valve assembly

Manifold safety tray



Luer-Lock Plugs  
(60104-258)



Retaining Clips for  
collection rack  
(60104-255)



Bulkhead Luer Fittings  
(60104-256)



Collection Rack  
(60104-251 (16 port),  
60104-252 (24 port))



Vacuum Gauge  
(60104-240)



Valve Assembly  
(60104-261)



Tips  
(60104-245)



Manifold Lid Legs  
(60104-257)



# HyperSep manifolds and accessories

Continued



Description	Part number
16-port Vacuum Manifold	<a href="#">60104-232</a>
24-port Vacuum Manifold	<a href="#">60104-233</a>
Glass Block Vacuum Pump, European version	<a href="#">60104-241</a>
Glass Block Vacuum Pump, North American version	<a href="#">60104-243</a>
Replacement parts	
Vacuum gauge	<a href="#">60104-240</a>
Stopcocks for 16-port glass block vacuum manifold	<a href="#">60104-242</a>
Stopcocks for 24-port glass block vacuum manifold	<a href="#">60104-244</a>
Teflon tips for glass block vacuum manifold	<a href="#">60104-245</a>
Lid for 24-port glass block manifold	<a href="#">60104-248</a>
Gasket for 16-port glass block vacuum manifold	<a href="#">60104-249</a>
Gasket for 24-port glass block vacuum manifold	<a href="#">60104-250</a>
Collection Rack for 16-port glass block vacuum manifold	<a href="#">60104-251</a>
Collection Rack for 24-port glass block vacuum manifold	<a href="#">60104-252</a>
Glass Block for 16-port Vacuum Manifold	<a href="#">60104-253</a>
Glass Block for 24-port Vacuum Manifold	<a href="#">60104-254</a>
Retaining Clips for collection rack	<a href="#">60104-255</a>
Bulkhead Luer Fittings	<a href="#">60104-256</a>
Manifold Lid Legs	<a href="#">60104-257</a>
Luer Lock Plugs	<a href="#">60104-258</a>
Column Adaptors	<a href="#">60104-259</a>
Manifold Safety Tray	<a href="#">60104-260</a>
Vacuum Gauge and Valve Assembly	<a href="#">60104-261</a>
Collection Rack Posts	<a href="#">60104-264</a>

# TurboFlow and online SPE products

## Enabling your automated online sample preparation, and effectively removing large molecules

Thermo Scientific™ TurboFlow™ columns enable automated online sample preparation in conjunction with Thermo Scientific™ Aria™, Transcend™ TLX, and Prelude™ LC-MS systems. Turboflow columns allow users to inject complex matrices such as food, plasma, urine and (other biological matrices) directly into the mass spectrometer – without prior sample pre-treatment.

- Minimize sample preparation – simplifies complex sample preparation protocols
- Simplify method development – uses the same method for different matrices
- Save time – injects samples directly into the LC-MS system

Turboflow columns effectively remove large molecules, which are the primary interference in biological matrices. These columns are highly efficient at removing proteins based on their size, resulting in high quality data and can be used with Aria, Transcend TLX, and Prelude LC-MS systems.



## TURBOFLOW columns



### Comments

Learn more at [thermofisher.com/turboflow](https://thermofisher.com/turboflow)



### TurboFlow columns compatible with Aria, Transcend TLX, and Prelude LC-MS systems

Description	1.0 x 50 mm	0.5 x 50 mm
TURBOFLOW Cyclone Column	<a href="#">CH-952434</a>	<a href="#">CH-953288</a>
TURBOFLOW Cyclone-P Column	—	<a href="#">CH-953289</a>
TURBOFLOW Cyclone MAX Column	<a href="#">CH-952979</a>	<a href="#">CH-953286</a>
TURBOFLOW Cyclone MCX Column	<a href="#">CH-952813</a>	<a href="#">CH-953287</a>
TURBOFLOW Cyclone MCX-2 Column	<a href="#">CH-953456</a>	<a href="#">CH-953457</a>
TURBOFLOW Cyclone C18 Column	<a href="#">CH-953244</a>	<a href="#">CH-953280</a>
TURBOFLOW Cyclone C18-P Column	<a href="#">CH-953275</a>	<a href="#">CH-953281</a>
TURBOFLOW Cyclone C8 Column	<a href="#">CH-953276</a>	<a href="#">CH-953282</a>
TURBOFLOW Cyclone C2 Column	<a href="#">CH-953279</a>	<a href="#">CH-953285</a>
TURBOFLOW Cyclone Fluoro Column	<a href="#">CH-953277</a>	<a href="#">CH-953283</a>



# HyperSep online SPE products



## Comments

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

Learn more at [thermofisher.com/spemanifolds](http://thermofisher.com/spemanifolds)



## HyperSep Javelin Direct-Connect Online SPE columns

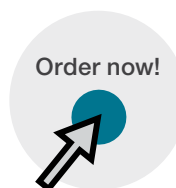
ID (mm)	Length (mm)	Retain PEP	Retain CX	Retain AX	Hypercarb
2.1	10	<a href="#">60310-201</a>	<a href="#">60310-301</a>	<a href="#">60310-401</a>	<a href="#">60310-501</a>
3.0		<a href="#">60310-202</a>	<a href="#">60310-302</a>	<a href="#">60310-402</a>	<a href="#">60310-502</a>

## HyperSep UniGuard Direct-Connect Online SPE cartridges

ID (mm)	Length (mm)	Retain PEP	Retain CX	Retain AX	Hypercarb
2.1	10	<a href="#">60311-201</a>	<a href="#">60311-301</a>	<a href="#">60311-401</a>	<a href="#">60311-501</a>
3.0		<a href="#">60311-202</a>	<a href="#">60311-302</a>	<a href="#">60311-402</a>	<a href="#">60311-502</a>

## HyperSep HPLC columns for Online SPE products

ID (mm)	Length (mm)	Retain PEP	Retain CX	Retain AX	Hypercarb
2.1	20	<a href="#">60312-201</a>	<a href="#">60312-301</a>	<a href="#">60312-401</a>	<a href="#">60312-501</a>
3.0		<a href="#">60312-202</a>	<a href="#">60312-302</a>	<a href="#">60312-402</a>	<a href="#">60312-502</a>





# QuEChERS products

## Simple, proven, sample extraction and clean-up

Fast, easy, and cost-effective, QuEChERS is a robust, reproducible approach for extracting and cleaning up pesticides and other low-level contaminants in complex matrices. It is often used as a sample preparation step prior to GC-MS or LC-MS analysis, and can be automated for higher throughput.



### QuEChERS products



**Originally developed in 2003 for the determination of multiple pesticide residues in food, QuEChERS applications have evolved to include:**

- Pesticide residues
- Veterinary drug residues
- Pharmaceutical residues
- Environmental contaminants
- Mycotoxins
- Drugs of abuse
- Traditional Chinese medicines
- Forensic analysis







# QuEChERS products

Continued



## Pre-packaged, ready-weighed kits make QuEChERS easier and more convenient

Thermo Scientific™ QuEChERS kits give you reproducible results and excellent recoveries for a wide variety of analytes, and save time and money, too. Pre-packaged, ready-weighed salts, solid-phase extraction (SPE) sorbents and buffers streamline your workflow, and minimize the potential for error.

Kits are available in several formats to meet all your application requirements. Depending on your analytes of interest, your sample matrix, and your preferred method—Original, AOAC, or EN—you can choose the appropriate volume option, and select the right combination of salts, sorbents, and consumables.



### Comments

Learn more at [thermofisher.com/quechers](http://thermofisher.com/quechers)



### Video:

An introduction to the pesticide explorer collection



### Brochure:

QuEChERS solutions in all your favorite flavors





# QuEChERS products

Continued



**Three flavors of QuEChERS  
Kits and products to support them all**

Whichever QuEChERS method you're using, we've got you covered

## Original

(Anastassiades et al, 2003):

developed for non-base-sensitive compounds, using sodium chloride to reduce polar interferences and enhance extraction

## AOAC

(AOAC 2007.01):

uses sodium acetate as a buffer instead of sodium chloride and is compatible with base-sensitive compounds

## European

(EN 15662):

similar to the AOAC method, but uses sodium chloride to minimize polar interferences, and sodium citrate dihydrate and disodium citrate sesquihydrate instead of sodium acetate

### Thermo Scientific QuEChERS Extraction Pouch EN Method

4 g Magnesium Sulfate 1 g Sodium Chloride  
1 g Trisodium Citrate Dihydrate  
0.5 g Disodium Hydrogencitrate Sesquihydrate





# QuEChERS products

Continued



## QuEChERS workflow

Sample

### 1. HOMOGENIZE/GRIND

Grinding

10–15 g subsample



### 2. EXTRACT

- Spike with pesticides
- ▼
- Add solvent; mix/vortex for 30 seconds
- ▼
- Add salts
- ▼
- Shake
- ▼
- Add internal standard
- ▼
- Centrifuge
- ▼

Aliquot of supernatant



### 3. CLEAN-UP

- Add sorbents and salt
- ▼
- Shake
- ▼
- Centrifuge
- ▼

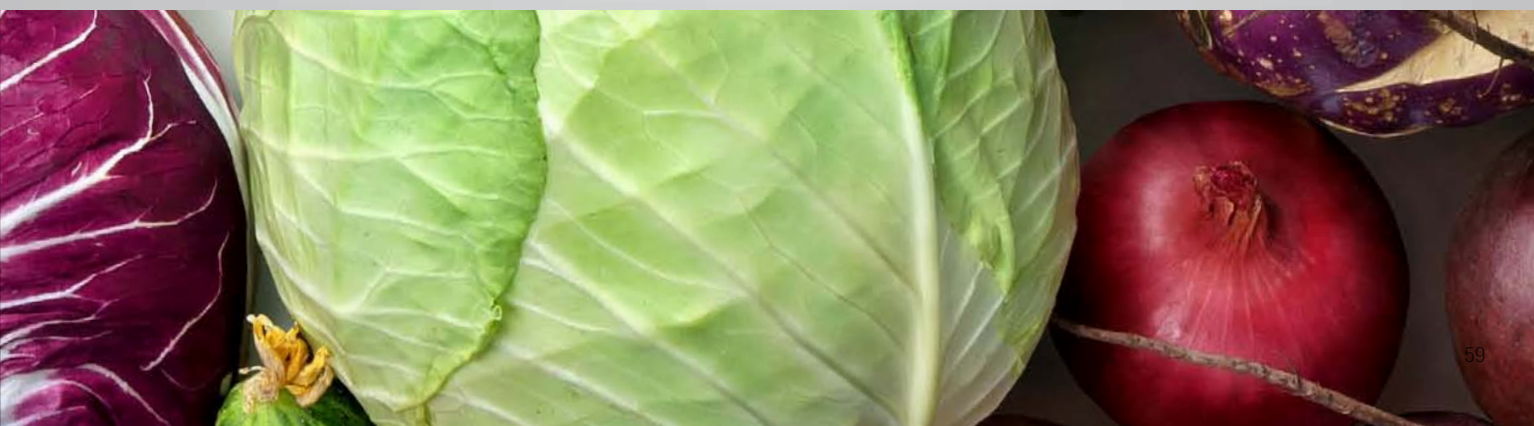
Aliquot of supernatant

### 4. ANALYZE

Injection  
(GC-MS or LC-MS)

Analytical report

The QuEChERS workflow is typically a four-step process: sample homogenization, extraction with salts, followed by SPE clean-up, and analysis by GC-MS or LC-MS. While the basic procedure is more or less standardized, there are an increasing number of chemistry variations to meet different application requirements.







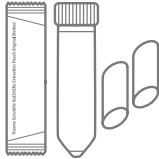
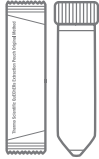

## Original method kits



Comments
<p><b>Application note:</b> Validated method for the analysis of lipophilic marine biotoxins in bivalves by liquid chromatography</p> <p><b>Application note:</b> Rapid analysis of fipronil and fipronil sulfone in eggs by liquid chromatography and triple quadrupole mass spectrometry</p> <p><b>Application note:</b> Determination of multiple mycotoxins in grain using a QuEChERS sample preparation approach and LC-MS/MS detection</p>
Learn more at <a href="http://thermofisher.com/quechers">thermofisher.com/quechers</a>






### Original method extraction kits\*

	Description	Capacity	Quantity	Part number
Extract	 <p>Original extraction kit</p> <ul style="list-style-type: none"> <li>Extraction salts (in pouch): 4 g MgSO<sub>4</sub>, 1 g NaCl</li> <li>50 mL tubes (empty)</li> <li>Ceramic homogenizers</li> </ul>	10 g samples	50/PK	<a href="#">S1-10-ORIG-CH-KIT</a>
	 <p>Original extraction kit</p> <ul style="list-style-type: none"> <li>Extraction salts (in pouch): 4 g MgSO<sub>4</sub>, 1 g NaCl</li> <li>50 mL tubes (empty)</li> </ul>	10 g samples	50/PK	<a href="#">S1-10-ORIG-KIT</a>
	 <p>Original extraction kit</p> <ul style="list-style-type: none"> <li>Extraction salts (in pouch): 4 g MgSO<sub>4</sub>, 1 g NaCl</li> </ul>	10 g samples	50/PK	<a href="#">S1-10-ORIG-POT</a>

\*Original method extraction kits are also available in 15 g sample capacity.

### Bulk ceramic homogenizers — all methods

	Description	Quantity	Part number
Homogenize/Grind	 <p>Ceramic homogenizers for 2 mL tubes</p>	100/PK	<a href="#">60106-CH-2</a>
	 <p>Ceramic homogenizers for 15 mL tubes</p>	100/PK	<a href="#">60106-CH-15</a>
	 <p>Ceramic homogenizers for 50 mL tubes</p>	100/PK	<a href="#">60106-CH-50</a>



# QuEChERS products

Continued

## AOAC method kits



### Comments

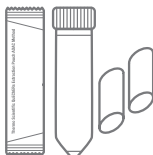


**Application note:** Trace-level quantitation of pesticide residues in red chili powder using LC-(HESI)-MS/MS

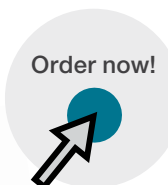
**Application note:** Trace level quantitation of pesticide residues in fresh fruits using LC-MS/MS

Learn more at [thermofisher.com/quechers](http://thermofisher.com/quechers)



### AOAC method extraction kits

	Description	Capacity	Quantity	Part number
Extract	 <p>AOAC extraction kit</p> <ul style="list-style-type: none"> <li>Extraction salts (in pouches): 6 g MgSO<sub>4</sub>, 1.5 g NaOAc</li> <li>50 mL tubes (empty)</li> <li>Ceramic homogenizers</li> </ul>	15 g samples	50/PK	<a href="#">S1-15-AOAC-CH-KIT</a>
	 <p>AOAC extraction kit</p> <ul style="list-style-type: none"> <li>Extraction salts (in pouches): 6 g MgSO<sub>4</sub>, 1.5 g NaOAc</li> <li>50 mL tubes (empty)</li> </ul>	15 g samples	50/PK	<a href="#">S1-15-AOAC-KIT</a>
	 <p>AOAC extraction kit</p> <ul style="list-style-type: none"> <li>Extraction salts (in pouches): 6 g MgSO<sub>4</sub>, 1.5 g NaOAc</li> </ul>	15 g samples	50/PK	<a href="#">S1-15-AOAC-POT</a>





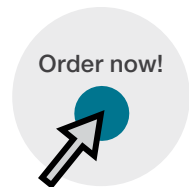
## AOAC method kits

Continued



### AOAC method clean-up kits

	Description	Quantity	Part number
Clean-up	<b>General fruits and vegetables</b>		
	AOAC clean-up kit, prefilled 2 mL tubes with 50 mg PSA, 150 mg MgSO <sub>4</sub>	100/PK	<a href="#">S2-2-GFV-AOAC-KIT</a>
	AOAC clean-up kit, prefilled 15 mL tubes with 400 mg PSA, 1200 mg MgSO <sub>4</sub>	50/PK	<a href="#">S2-15-GFV-AOAC-KIT</a>
	<b>Pigmented fruits and vegetables</b>		
	AOAC clean-up kit, prefilled 2 mL tubes with 50 mg PSA, 50 mg GCB, 150 mg MgSO <sub>4</sub>	100/PK	<a href="#">S2-2-P-AOAC-KIT</a>
	AOAC clean-up kit, prefilled 15 mL tubes with 400 mg PSA, 400 mg C18, 1200 mg MgSO <sub>4</sub>	50/PK	<a href="#">S2-15-P-AOAC-KIT</a>
	<b>Fruits and vegetables with fats and waxes</b>		
	AOAC clean-up kit, prefilled 2 mL tubes with 50 mg PSA, 50 mg C18, 150 mg MgSO <sub>4</sub>	100/PK	<a href="#">S2-2-FW-AOAC-KIT</a>
	AOAC clean-up kit, prefilled 15 mL tubes with 400 mg PSA, 400 mg C18, 1200 mg MgSO <sub>4</sub>	50/PK	<a href="#">S2-15-FW-AOAC-KIT</a>
	<b>Fruits and vegetables with pigments and fats</b>		
	AOAC clean-up kit, prefilled 2 mL tubes with 50 mg PSA, 50 mg C18, 50 mg GCB, 150 mg MgSO <sub>4</sub>	100/PK	<a href="#">S2-2-PF-AOAC-KIT</a>
	AOAC clean-up kit, prefilled 15 mL tubes with 400 mg PSA, 400 mg C18, 400 mg GCB, 1200 mg MgSO <sub>4</sub>	50/PK	<a href="#">S2-15-PF-AOAC-KIT</a>
	<b>All food types</b>		
	AOAC clean-up kit, prefilled 2 mL tubes with 50 mg PSA, 50 mg C18, 7.5 mg GCB, 150 mg MgSO <sub>4</sub>	100/PK	<a href="#">S2-2-ALL-AOAC-KIT</a>
	AOAC clean-up kit, prefilled 15 mL tubes with 400 mg PSA, 400 mg C18, 45 mg GCB, 1200 mg MgSO <sub>4</sub>	50/PK	<a href="#">S2-15-ALL-AOAC-KIT</a>
	<b>Other foods</b>		
AOAC clean-up kit, prefilled 2 mL tubes with 25 mg C18, 150 mg MgSO <sub>4</sub>	100/PK	<a href="#">S2-2-OTH-AOAC-KIT</a>	
AOAC clean-up kit, prefilled 15 mL tubes with 150 mg C18, 900 mg MgSO <sub>4</sub>	50/PK	<a href="#">S2-15-OTH-AOAC-KIT</a>	





# QuEChERS products

Continued

## EN method kits



### Comments


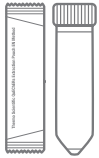

**Application note:** Simultaneous screening and quantification of pesticide residues in potatoe using GC-Orbitrap MS

**Application note:** Pesticide residues screening and quantitation analysis in olive oil using an Orbitrap Exploris 240 HRMS

**Application note:** Large-scale screening and quantitation of pesticide residues in milk using GC-(EI)-MS/MS

Learn more at [thermofisher.com/quechers](http://thermofisher.com/quechers)

### EN method extraction kits

	Description	Capacity	Quantity	Part number
Extract	 <p>EN extraction kit</p> <ul style="list-style-type: none"> <li>Extraction salts (in pouches): 4 g MgSO<sub>4</sub>, 1 g NaCl, 0.5 g disodium hydrogencitrate sesquihydrate, 1 g trisodium citrate dihydrate</li> <li>50 mL tubes (empty)</li> <li>Ceramic homogenizers</li> </ul>	10 g samples	50/PK	<a href="#">S1-10-EN-CH-KIT</a>
	 <p>EN extraction kit</p> <ul style="list-style-type: none"> <li>Extraction salts (in pouches): 4 g MgSO<sub>4</sub>, 1 g NaCl, 0.5 g disodium hydrogencitrate sesquihydrate, 1 g trisodium citrate dihydrate</li> <li>50 mL tubes (empty)</li> </ul>	10 g samples	50/PK	<a href="#">S1-10-EN-KIT</a>
	 <p>EN extraction kit</p> <ul style="list-style-type: none"> <li>Extraction salts (in pouches): 4 g MgSO<sub>4</sub>, 1 g NaCl, 0.5 g disodium hydrogencitrate sesquihydrate, 1 g trisodium citrate dihydrate</li> </ul>	10 g samples	50/PK	<a href="#">S1-10-EN-POT</a>





## EN method kits

Continued

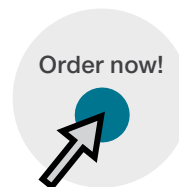


### EN method clean-up kits

	Description	Quantity	Part number
Clean-up	<b>General fruits and vegetables</b>		
	EN clean-up kit, prefilled 2 mL tubes with 150 mg MgSO <sub>4</sub> , 25 mg PSA	100/PK	<a href="#">S2-2-GFV-EN-KIT</a>
	EN clean-up kit, prefilled 15 mL tubes with 900 mg MgSO <sub>4</sub> , 150 mg PSA	50/PK	<a href="#">S2-15-GFV-EN-KIT</a>
	<b>Pigmented fruits and vegetables</b>		
	EN clean-up kit, prefilled 2 mL tubes with 150 mg MgSO <sub>4</sub> , 25 mg PSA, 2.5 mg GCB	100/PK	<a href="#">S2-2-P-EN-KIT</a>
	EN clean-up kit, prefilled 15 mL tubes with 900 mg MgSO <sub>4</sub> , 150 mg PSA, 15 mg GCB	50/PK	<a href="#">S2-15-P-EN-KIT</a>
	<b>Highly pigmented fruits and vegetables</b>		
	EN clean-up kit, prefilled 2 mL tubes with 150 mg MgSO <sub>4</sub> , 25 mg PSA, 7.5 mg GCB	100/PK	<a href="#">S2-2-HP-EN-KIT</a>
	EN clean-up kit, prefilled 15 mL tubes with 900 mg MgSO <sub>4</sub> , 150 mg PSA, 45 mg GCB	50/PK	<a href="#">S2-15-HP-EN-KIT</a>
	<b>Fruits and vegetables with fats and waxes</b>		
EN clean-up kit, prefilled 2 mL tubes with 150 mg MgSO <sub>4</sub> , 25 mg PSA, 25 mg C18	100/PK	<a href="#">S2-2-FW-EN-KIT</a>	
EN clean-up kit, prefilled 15 mL tubes with 900 mg MgSO <sub>4</sub> , 150 mg PSA, 150 mg C18	50/PK	<a href="#">S2-15-FW-EN-KIT</a>	

### What is the purpose of the chemicals?

- **MgSO<sub>4</sub>**: removes residual water, and induces phase separation between water content in sample and acetonitrile layer
- **NaCl**: removes residual water, and induces phase separation between water content in sample and acetonitrile layer
- **NaOAc**: buffers the sample to stabilize pH
- **Disodium hydrogentricrate sesquihydrate**: buffers the sample to stabilize pH
- **Trisodium citrate dihydrate**: buffers the sample to stabilize pH
- **PSA**: removes free fatty acids and other acidic co-extractives
- **C18**: removes fats, sterols, and other non-polar interferences from sample
- **GCB**: removes pigment (not recommended for use with planar pesticides)





# Automated micro Solid-Phase Extraction ( $\mu$ SPE) products

Achieve reliable and high-throughput analysis by automating cleanup of QuEChERS extracts using the cartridge based Thermo Scientific™ micro Solid-Phase Extraction ( $\mu$ SPE) products. The QuEChERS sample preparation method is used to extract pesticides and organic contaminants from

food matrices with subsequent analysis by GC or liquid chromatography-mass spectrometry (LC-MS). This  $\mu$ SPE capability, which is available for the Thermo Scientific™ TriPlus™ RSH Autosampler and LC systems.



## $\mu$ SPE QuEChERS blend



### Comments

- Replaces the manual dispersive SPE (dSPE) procedure
- Enables reliable and high-throughput extract cleanup
- Is suitable for a wide variety of food matrices, even those with high lipid contents
- Offers a unified method for GC or LC-MS analysis of hundreds of pesticides and organic contaminants
- Enables scale down of sample volume and solvent usage

**Application note:** Multi-pesticide residues analyses of QuEChERS extracts using an automated online  $\mu$ SPE clean-up coupled to LC-MS/MS

Learn more at [thermofisher.com/automatedspe](http://thermofisher.com/automatedspe)



### For GC and LC-MS analysis

Description	Material	Unit size	Part number
GC $\mu$ SPE Cartridge	$\mu$ SPE QuEChERS Blend for GC, 45 mg (MgSO <sub>4</sub> , PSA, C18EC, Carbon)	108	<a href="#">60101-45GC</a>
LC $\mu$ SPE Cartridge	$\mu$ SPE QuEChERS Blend for LC, 30 mg (C18, Z-Sep, CarbonX)		<a href="#">60101-30LC</a>



### Webinar:

Automated online  $\mu$ SPE cartridge clean-up of QuEChERS extracts before LC-MS/MS and GC-MS/MS analysis of pesticides in foods

# Syringes and syringe filters

## Providing high quality filtration solutions

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

### High quality filtration

Low extractable membranes and solvent-resistant housing

### Titan3 color coded ring

For easy selection of correct membrane and pore size

### High burst pressures

For enhanced robustness in sample processing



## Syringes and syringe filters



## Thermo Scientific™ Titan3™ syringe filters



### Comments

High performance HPLC syringe filters

- Low extractable membranes and housing
- HPLC performance tested
- Color coding for easy selection of the correct membrane and pore size
- Enhanced Luer Lock inlet which prevents leakage
- Most 30 mm 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
- 30 mm products pressure rated to 120 psi
- Packed in reusable rigid transparent color coded containers

Learn more at [thermofisher.com/syringefilters](https://thermofisher.com/syringefilters)





# Syringes and syringe filters

Continued

## Titan3 syringe filters

Continued



### Titan3 nylon syringe filters

Diameter (mm)	Pore size (µm)	Pre-filter	Quantity (pack)	Part number	Applications
4	0.2	No	100	<a href="#">42204-NN</a>	<ul style="list-style-type: none"> <li>HPLC and organic solvent sample preparation and clean up</li> <li>Dissolution sample analysis</li> <li>General sample preparation prior to analytical analysis</li> <li>Mixed sample matrix of aqueous or organic dissolved analytes</li> </ul>
	0.45			<a href="#">44504-NN</a>	
17	0.2	No	200	<a href="#">42213-NN</a>	
	0.45			<a href="#">44513-NN</a>	
30	0.2	Yes	100	<a href="#">42225-NN</a>	
	0.45			<a href="#">44525-NN</a>	
	1.5	No		<a href="#">44526-NN</a>	
	5	No		<a href="#">41225-NN</a>	
				<a href="#">45025-NN</a>	

### Titan3 PTFE (hydrophobic) syringe filters

4	0.2	No	100	<a href="#">42204-NP</a>	<ul style="list-style-type: none"> <li>Filtration of aggressive organic, highly basic or hot solutions, transducer protectors</li> <li>Filter aqueous solutions after prewetting with an alcohol</li> </ul> <p>Note: PTFE hydrophobic membranes require pre-treatment with alcohol before being suitable for aqueous or high aqueous/organic samples. Do not use directly with aqueous solutions.</p>
	0.45			<a href="#">44504-NP</a>	
17	0.2	No	200	<a href="#">42213-NP</a>	
	0.45			<a href="#">44513-NP</a>	
30	0.2	Yes	100	<a href="#">42225-NP</a>	
	0.45	No		<a href="#">44525-NP</a>	
	1.0	No		<a href="#">41025-NP</a>	

### Titan3 PTFE (hydrophilic) syringe filters

17	0.2	No	200	<a href="#">42213-NPL</a>	<ul style="list-style-type: none"> <li>Filtration of aggressive organic, highly basic or hot solutions, without the need pre-wet membrane</li> <li>Filter aqueous solutions without prewetting with an alcohol</li> </ul>
	0.45			<a href="#">44513-NPL</a>	
30	0.2	No	100	<a href="#">42225-NPL</a>	

### Titan3 PVDF syringe filters

4	0.2	No	100	<a href="#">42204-PV</a>	<ul style="list-style-type: none"> <li>General biological filtration</li> <li>Filtration of samples where high protein recovery is desired</li> </ul>
	0.45			<a href="#">44504-PV</a>	
17	0.2	Yes	200	<a href="#">42213-PV</a>	
	0.45	No		<a href="#">44513-PV</a>	
30	0.2	Yes	1000	<a href="#">42225-PV</a>	
	0.45	No		<a href="#">44525-PV</a>	



# Syringes and syringe filters

Continued

## Titan3 syringe filters

Continued



### Titan3 regenerated cellulose syringe filters

Diameter (mm)	Pore size (µm)	Pre-filter	Quantity (pack)	Part number	Applications
4	0.2	No	100	<a href="#">52204-RC</a>	<ul style="list-style-type: none"> <li>• Low non-specific binding applications</li> <li>• Tissue culture media filtration and general biological sample filtration</li> </ul>
	0.45			<a href="#">54504-RC</a>	
17	0.2	Yes	200	<a href="#">52213-RC</a>	
	0.45	No		<a href="#">54513-RC</a>	
30	0.2	Yes	100	<a href="#">52225-RC</a>	
	0.45	No		<a href="#">54525-RC</a>	

### Titan3 PES (polyethersulfone) syringe filters

17	0.2	No	200	<a href="#">42213-PS</a>	<ul style="list-style-type: none"> <li>• Ion chromatography</li> <li>• Tissue culture filtration, filtration of proteins and nucleic acids</li> <li>• High-temperature liquids</li> </ul>
	0.45			<a href="#">44513-PS</a>	
30	0.2	Yes	100	<a href="#">42225-PS</a>	
	0.45	No		<a href="#">44525-PS</a>	

### Titan3 GMF (Glass MicroFiber) syringe filters

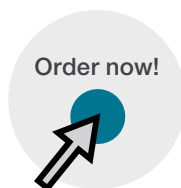
30	0.7	No	100	<a href="#">40725-GM</a>	<ul style="list-style-type: none"> <li>• Dissolution testing</li> <li>• General filtration</li> </ul>
	1.2			<a href="#">41225-GM</a>	
	3.1			<a href="#">42725-GM</a>	

### Titan3 polypropylene syringe filters

17	0.2	No	200	<a href="#">42213-PP</a>	<ul style="list-style-type: none"> <li>• Filtration of biological samples</li> <li>• Filtration of aggressive organic solutions</li> </ul>
	0.45			<a href="#">44513-PP</a>	
30	0.2	100	<a href="#">42225-PP</a>		
	0.45		<a href="#">44525-PP</a>		

### Titan3 cellulose acetate syringe filters

4	0.2	No	100	<a href="#">42204-CA</a>	<ul style="list-style-type: none"> <li>• Tissue culture media filtration, sensitive biological samples</li> </ul>
	0.2			<a href="#">42213-CA</a>	
17	0.45	No	100	<a href="#">44513-CA</a>	
	0.2			<a href="#">42225-CA</a>	
30	0.2	No	100	<a href="#">42225-CA</a>	
	0.45			<a href="#">44525-CA</a>	





# Syringes and syringe filters

Continued

## Thermo Scientific™ Titan2™ syringe filters



### Comments

HPLC perforce syringe filters

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

Learn more at [thermofisher.com/syringefilters](http://thermofisher.com/syringefilters)



### Target2 nylon syringe filters

Diameter (mm)	Pore size (µm)	Pre-filter	Quantity (pack)	Part number	Applications
4	0.2			<a href="#">F2504-2</a>	
	0.45			<a href="#">F2504-1</a>	
17	0.2	No		<a href="#">F2513-2</a>	
	0.45			<a href="#">F2513-1</a>	
30	0.2	No	100	<a href="#">F2500-2</a>	<ul style="list-style-type: none"> <li>• General laboratory filtration</li> <li>• Filtration for most HPLC samples</li> </ul>
		Yes		<a href="#">F2502-2</a>	
	No	<a href="#">F2500-1</a>			
	Yes	<a href="#">F2502-1</a>			
	1.5	No		<a href="#">F2500-12</a>	
	5.0	No		<a href="#">F2500-50</a>	

### Target2 PTFE (hydrophobic) syringe filters

4	0.2			<a href="#">F2504-4</a>	<ul style="list-style-type: none"> <li>• Filtration of aggressive organic, highly basic or hot solutions, transducer protectors</li> </ul>
	0.45			<a href="#">F2504-3</a>	
17	0.2	No	100	<a href="#">F2513-4</a>	<ul style="list-style-type: none"> <li>• Filter aqueous solutions after prewetting with an alcohol</li> </ul> <p>Note: PTFE hydrophobic membranes require pre-treatment with alcohol before being suitable for aqueous or high aqueous/organic samples. Do not use directly with aqueous solutions</p>
	0.45			<a href="#">F2513-3</a>	
30	0.2	No		<a href="#">F2500-4</a>	
		Yes		<a href="#">F2500-3</a>	
	1.0	Yes		<a href="#">F2502-3</a>	
		No		<a href="#">F2500-13</a>	

### Target2 PVDF syringe filters

4	0.2			<a href="#">F2504-6</a>	<ul style="list-style-type: none"> <li>• General biological filtration</li> <li>• Filtration of samples where high protein recovery is desired</li> </ul>
	0.45			<a href="#">F2504-5</a>	
17	0.2	No	100	<a href="#">F2513-6</a>	
	0.45			<a href="#">F2513-5</a>	
30	0.2			<a href="#">F2500-6</a>	
	0.45			<a href="#">F2500-5</a>	



# Syringes and syringe filters

Continued

## Titan2™ syringe filters

Continued



### Target2 regenerated cellulose syringe filters

Diameter (mm)	Pore size (µm)	Pre-filter	Quantity (pack)	Part number	Applications
4	0.2	No	100 pack	<a href="#">F2504-8</a>	<ul style="list-style-type: none"> <li>• Low non-specific binding applications</li> <li>• Tissue culture media filtration and general biological sample filtration</li> </ul>
	0.45			<a href="#">F2504-7</a>	
17	0.2			<a href="#">F2513-8</a>	
	0.45			<a href="#">F2513-7</a>	
30	0.2			<a href="#">F2500-8</a>	
	0.45			<a href="#">F2500-7</a>	

### Target2 PES (polyethersulfone) syringe filters

17	0.2	No	100 pack	<a href="#">F2513-17</a>	<ul style="list-style-type: none"> <li>• Ion chromatography</li> <li>• Tissue culture filtration, filtration of proteins and nucleic acids</li> <li>• High-temperature liquids</li> </ul>
	0.45			<a href="#">F2513-14</a>	
30	0.2			<a href="#">F2500-17</a>	
	0.45			<a href="#">F2500-14</a>	

### Target2 GMF (Glass MicroFiber) syringe filters

30	0.7	No	100 pack	<a href="#">F2500-18</a>	<ul style="list-style-type: none"> <li>• Dissolution testing</li> <li>• General filtration</li> </ul>
	1.2			<a href="#">F2500-19</a>	
	3.1			<a href="#">F2500-20</a>	

### Target2 polypropylene syringe filters

4	0.2	No	100 pack	<a href="#">F2504-10</a>	<ul style="list-style-type: none"> <li>• Filtration of biological samples</li> <li>• Filtration of aggressive organic solutions</li> </ul>			
	0.45			<a href="#">F2504-9</a>				
17	0.2			<a href="#">F2513-10</a>				
	0.45			<a href="#">F2513-9</a>				
30	0.2			<a href="#">F2500-10</a>				
	0.45			<a href="#">F2500-9</a>				
				Yes			<a href="#">F2502-9</a>	

### Target2 cellulose acetate syringe filters

4	0.2	No	100	<a href="#">F2504-16</a>	<ul style="list-style-type: none"> <li>• Tissue culture media filtration, sensitive biological samples</li> </ul>
	0.45			<a href="#">F2504-15</a>	
17	0.2			<a href="#">F2513-16</a>	
	0.45			<a href="#">F2513-15</a>	
30	0.2			<a href="#">F2500-16</a>	
	0.45			<a href="#">F2500-15</a>	



# Syringes and syringe filters

Continued

## Thermo Scientific™ Choice Syringe filters



### Comments

Economic, high-quality filtration products

- Use to remove particles and microorganisms in the sample preparation process, enabling to provide consistent and reliable experimental results
- Available in a range of membrane types, pore sizes and dimensions to meet application requirements
- Use in combination with Thermo Scientific™ All-Plastic Disposable Syringes

### Applications

HPLC and organic solvent sample preparation and clean up

- Dissolution sample analysis
- General sample preparation prior to analytical analysis
- Mixed sample matrix of aqueous or organic dissolved analytes

Learn more at [thermofisher.com/syrefilters](https://thermofisher.com/syrefilters)



### Choice Nylon syringe filters

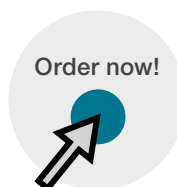
Diameter (mm)	Pore size (µm)	Pre-filter	Quantity	Part number
13	0.2	No	100 pack	<a href="#">CH2213-NN</a>
	0.45			<a href="#">CH2225-NN</a>
25	0.2			<a href="#">CH4513-NN</a>
	0.45			<a href="#">CH4525-NN</a>

### Choice PTFE (Hydrophilic) syringe filters

13	0.2	No	100 pack	<a href="#">CH2213-NPL</a>
	0.45			<a href="#">CH4513-NPL</a>
25	0.2			<a href="#">CH2225-NPL</a>
	0.45			<a href="#">CH4525-NPL</a>

### Choice PTFE (Hydrophobic) syringe filters

13	0.2	No	100 pack	<a href="#">CH2213-NP</a>
	0.45			<a href="#">CH4513-NP</a>
25	0.2			<a href="#">CH2225-NP</a>
	0.45			<a href="#">CH4525-NP</a>





# Syringes and syringe filters

Continued

## Choice Syringe filters

Continued



### Choice Regenerated Cellulose syringe filters

Diameter (mm)	Pore size (µm)	Pre-filter	Quantity (pack)	Part number
13	0.2	No	100	<a href="#">CH2213-RC</a>
	0.45			<a href="#">CH4513-RC</a>
25	0.2			<a href="#">CH2225-RC</a>
	0.45			<a href="#">CH4525-RC</a>

### Choice Polypropylene (PP) syringe filters

13	0.2	No	100	<a href="#">CH2213-PP</a>
	0.45			<a href="#">CH4513-PP</a>
25	0.2			<a href="#">CH2225-PP</a>
	0.45			<a href="#">CH4525-PP</a>

### Choice PVDF (Hydrophilic) syringe filters

13	0.2	No	100	<a href="#">CH2213-PV</a>
	0.45			<a href="#">CH4513-PV</a>
25	0.2			<a href="#">CH2225-PV</a>
	0.45			<a href="#">CH4525-PV</a>

### Choice PVDF (Hydrophobic) syringe filters

13	0.2	No	100	<a href="#">CH2213-PVH</a>
	0.45			<a href="#">CH4513-PVH</a>
25	0.2			<a href="#">CH2225-PVH</a>
	0.45			<a href="#">CH4525-PVH</a>

### Choice Cellulose Acetate (CA) syringe filters

13	0.2	No	100	<a href="#">CH2213-CA</a>
	0.45			<a href="#">CH4513-CA</a>
25	0.2			<a href="#">CH2225-CA</a>
	0.45			<a href="#">CH4525-CA</a>

### Choice PES (Polyethersulfone) syringe filters

13	0.2	No	100	<a href="#">CH2213-PES</a>
	0.45			<a href="#">CH4513-PES</a>
25	0.2			<a href="#">CH2225-PES</a>
	0.45			<a href="#">CH4525-PES</a>





# Syringes and syringe filters

Continued

## All-plastic disposable syringes



### Comments

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 50 mL

Learn more at [thermofisher.com/syringefilters](http://thermofisher.com/syringefilters)

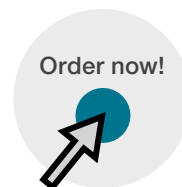


### Luer-slip syringes

Capacity (mL)	Quantity (pack)	Part number
1	100	<a href="#">S7510-1</a>
3		<a href="#">S7510-3</a>
5		<a href="#">S7510-5</a>
10		<a href="#">S7510-10</a>
20		<a href="#">S7510-20</a>

### Luer-lock syringes

3	100	<a href="#">S7515-3</a>
5		<a href="#">S7515-5</a>
10		<a href="#">S7515-10</a>
20		<a href="#">S7515-20</a>





# Syringes and syringe filters

Continued

## 750 µL micro-centrifugal filters, non-sterile



### Comments

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

Learn more at [thermofisher.com/syringefilters](https://thermofisher.com/syringefilters)



### 750 µL micro-centrifugal filters, non-sterile

Material	Pore size (µm)	Quantity (pack)	Part number
Cellulose acetate	0.2	100	<a href="#">F2517-1</a>
Cellulose acetate	0.45		<a href="#">F2517-2</a>
Nylon	0.2		<a href="#">F2517-3</a>
Nylon	0.45		<a href="#">F2517-4</a>
PVDF	0.2		<a href="#">F2517-5</a>
PVDF	0.45		<a href="#">F2517-6</a>
Regenerated cellulose	0.2		<a href="#">F2517-7</a>
Regenerated cellulose	0.45		<a href="#">F2517-8</a>
PTFE	0.2		<a href="#">F2517-9</a>
PTFE	0.45		<a href="#">F2517-10</a>

Order now!





# Syringes and syringe filters

Continued

## 2 mL centrifugal filters, non-sterile



### Comments

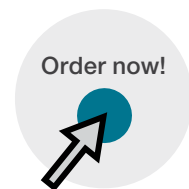
- Filter sample volumes up to 2 mL
- Virgin polypropylene filter housing with tapered 5 mL, capped receiver tube
- Use with benchtop or floor model centrifuges
- 5,000 x G maximum centrifugal force

Learn more at [thermofisher.com/syringefilters](https://thermofisher.com/syringefilters)



### 2 mL centrifugal filters, non-sterile

Material	Pore size (µm)	Quantity (pack)	Part number
Cellulose acetate	0.2	25	<a href="#">F2520-1</a>
Cellulose acetate	0.45		<a href="#">F2520-2</a>
Nylon	0.2		<a href="#">F2520-3</a>
Nylon	0.45		<a href="#">F2520-4</a>
PVDF	0.2		<a href="#">F2520-5</a>
PVDF	0.45		<a href="#">F2520-6</a>
PTFE	0.2		<a href="#">F2520-7</a>
PTFE	0.45		<a href="#">F2520-8</a>





# Syringes and syringe filters

Continued

## 25 mL centrifugal filters, non-sterile



### Comments

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

Learn more at [thermofisher.com/syringefilters](https://thermofisher.com/syringefilters)



### 25 mL centrifugal filters, non-sterile

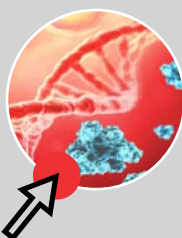
Material	Pore size (µm)	Quantity (pack)	Part number
Cellulose acetate	0.2	50	<a href="#">F2519-1</a>
Cellulose acetate	0.45		<a href="#">F2519-2</a>
Nylon	0.2		<a href="#">F2519-3</a>
Nylon	0.45		<a href="#">F2519-4</a>
PVDF	0.2		<a href="#">F2519-5</a>
PVDF	0.45		<a href="#">F2519-6</a>



**Compendium:**  
SMART Digest peptide mapping and quantitation



**SMART Digest webinar series**  
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Your samples, powered by KingFisher instruments. Automated sample preparation for DNA, RNA, protein, or cells.



**Application note:**  
High-precision, automated peptide mapping of proteins



**Brochure:**  
Protein digestion for peptide mapping and quantitation



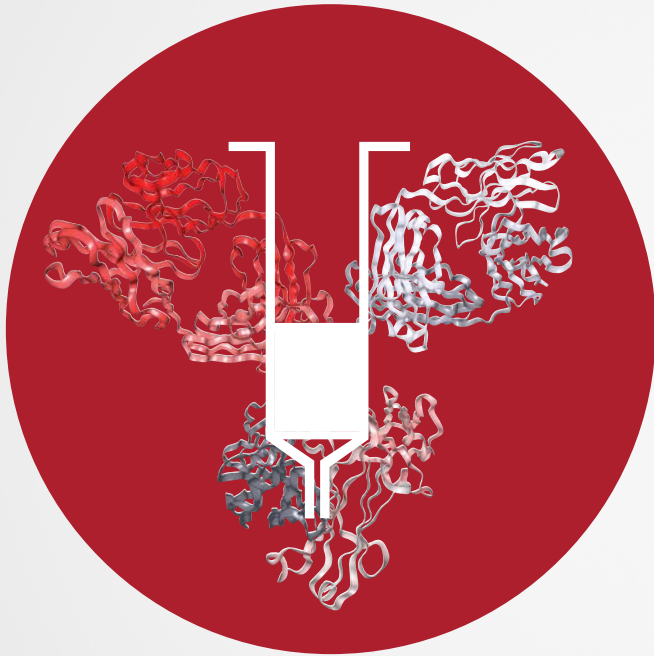
**Compendium:**  
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**Webinar:**  
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