SOLID PHASE EXTRACTION FOR ENVIRONMENTAL SAMPLES

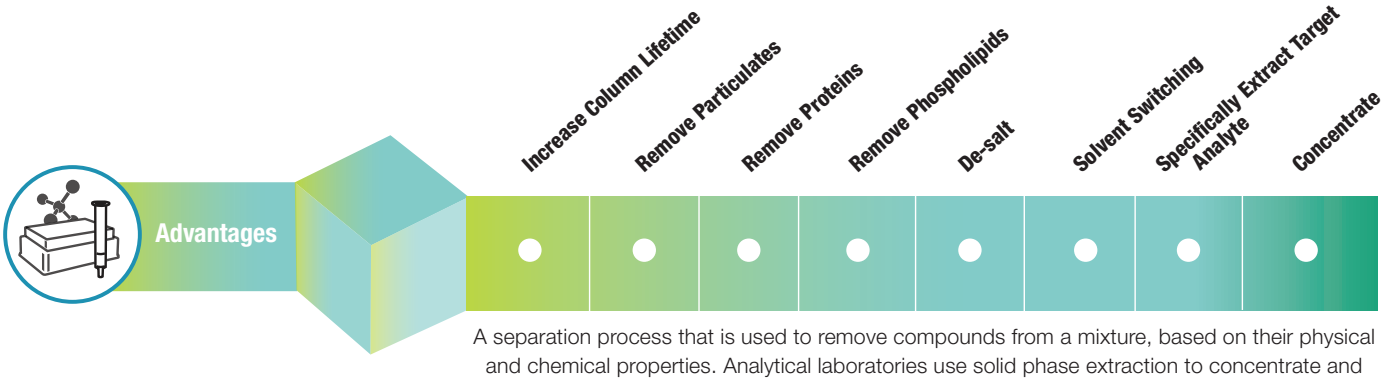
CLEAN | QUICK | ACCURATE

NEW 2-STEP SPE WITH STRATA®-X PRO

phenomenex®
. . . breaking with tradition℠

www.phenomenex.com/SPE

Solid Phase Extraction Overview



A separation process that is used to remove compounds from a mixture, based on their physical and chemical properties. Analytical laboratories use solid phase extraction to concentrate and purify samples for analysis from a wide variety of matrices.

3 Unique Sorbent Platforms

Strata-X PRO
A Rapid Solid Phase Extraction Solution

New reversed phase polymer with matrix removal technology offers a faster, cleaner way to perform SPE.

RAPID 3 STEPS

SUPER EXPRESS 2 STEPS

Strata-X
Polymeric SPE

Polymeric sorbent available in reversed phase and ion-exchange capabilities for wide range of applications.

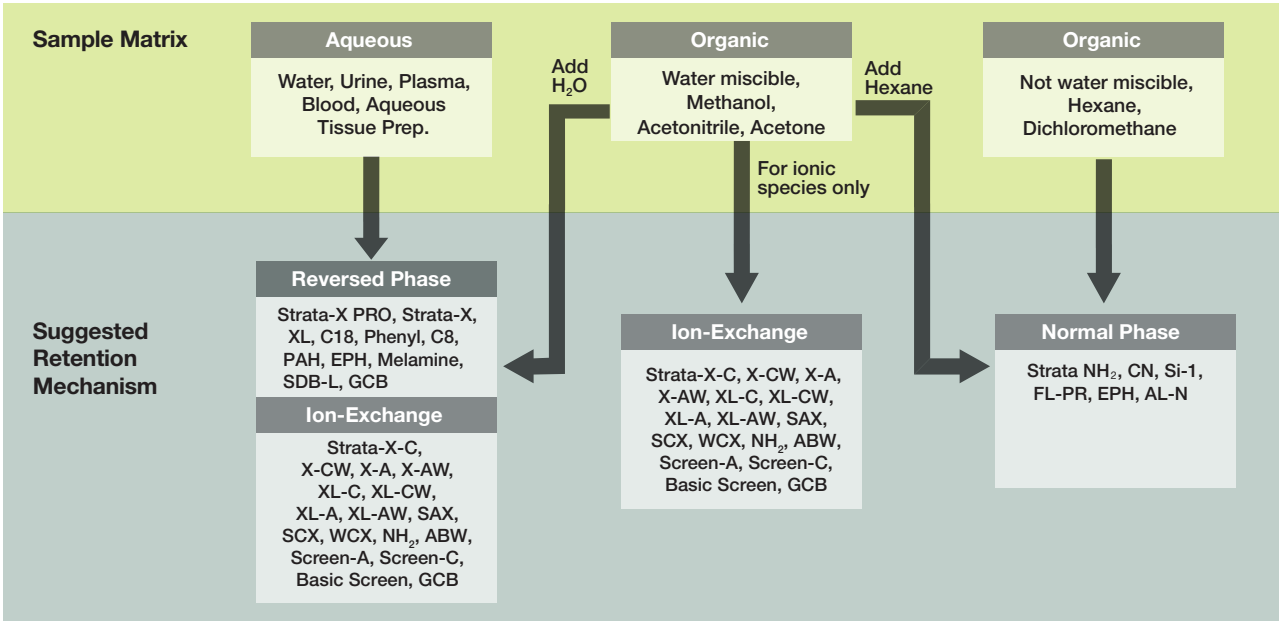
RELIABLE 5 STEPS

Strata
Solid Phase Extraction

Silica-based SPE sorbent provides a reliable and clean extracts with high recoveries for target analytes across all sample matrices.

RELIABLE 5 STEPS

Identify Your SPE Retention Mechanism



Faster and Cleaner Extractions

Strata-X PRO offers a simplified way to perform solid phase extraction by cleaning up difficult and dirty matrices in a 3-step or 2-step SPE method. Ideal with analytes such as pesticides, Strata-X PRO offers an easier way to extract target analytes from drinking water, waste water, or soil. An effortlessly easy recommended starting method means no method development and simple extractions.

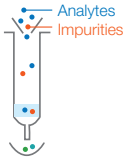
STRATA-X PRO

RAPID 3 STEPS

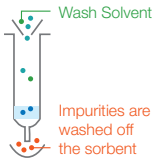
SUPER EXPRESS 2 STEPS

NO CONDITION OR EQUILIBRATION STEPS!

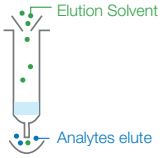
1 LOAD SAMPLE



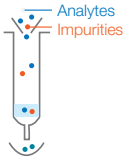
2 WASH IMPURITIES



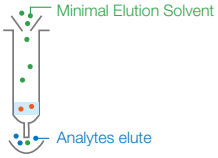
3 ELUTE ANALYTES



1 LOAD SAMPLE



2 RINSE



*Select a buffer that maximizes the hydrophobicity of the analytes. For example, if an analyte is basic, dilute with a base.

Recommended Starting Methods

RAPID 3 STEPS

Load
500 µL Pre-treated sample/buffer* (1:1)
Apply 2-5" Hg vacuum until liquid is no longer visible above top frit

Wash
600 µL 5 % Methanol in Water

Elute
600 µL 0.1 % Formic acid in Acetonitrile/Methanol (90:10)
Apply 2-5" Hg vacuum for 1 minute

SUPER EXPRESS 2 STEPS

Load
1 mL Pre-treated sample/0.1 % Formic acid in Acetonitrile (1:4)
Apply 5" Hg vacuum until all tubes or wells have cleared

Elute
75 µL Water/0.1 % Formic acid in Acetonitrile (1:4)
Apply 5" Hg vacuum until all tubes or wells have cleared

PFAS and GenX from Water

strata® Solid Phase Extraction strataX® Polymeric SPE

Per- and poly-fluorinated alkyl substances (PFAS) are widespread environmental contaminants found in soil, air, biota, and water. PFAS, including perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), are a broad number of compounds representing multiple classes. The goal of this method was to analyze HFPO-DA in a multi-residue method along with 24 other common PFAS. 200 mL water samples were extracted using Strata-XL-AW weak anion-exchange SPE cartridges following the conditions in the ISO 25101:2009 to capture interferences and clean up the sample prior to analysis. Samples were also passed through Strata GCB following the requirements of DOD QSM 5.1.

Solid Phase Extraction Protocol

Cartridge:	Strata XL-AW 500 mg/6 mL
Part No.:	8B-S051-HCH
Condition:	6 mL 0.3 % Ammonium hydroxide in Methanol, followed by 6 mL Methanol
Equilibrate:	6 mL Water
Load:	Add sample at about 10 mL/min Note: use an adapter cap (Part No.: AH0-7191) and large volume sample reservoir (Part No.: AH0-7005)
Wash:	2x 6 mL Water
Elute:	10 mL 0.3 % Ammonium hydroxide in Methanol (this 10 mL will elute PFAS/GenX analytes)
Load:	Pass SPE eluent through Strata GCB 500 mg/6 mL (8B-S528-HCH)
Evaporate:	to dryness and reconstitute to 1.0 mL with Methanol/ Water (96:4) (containing internal standards)

Mass Spec Parameters

Mass Spec Detector: SCIEX® Triple Quad™ 4500

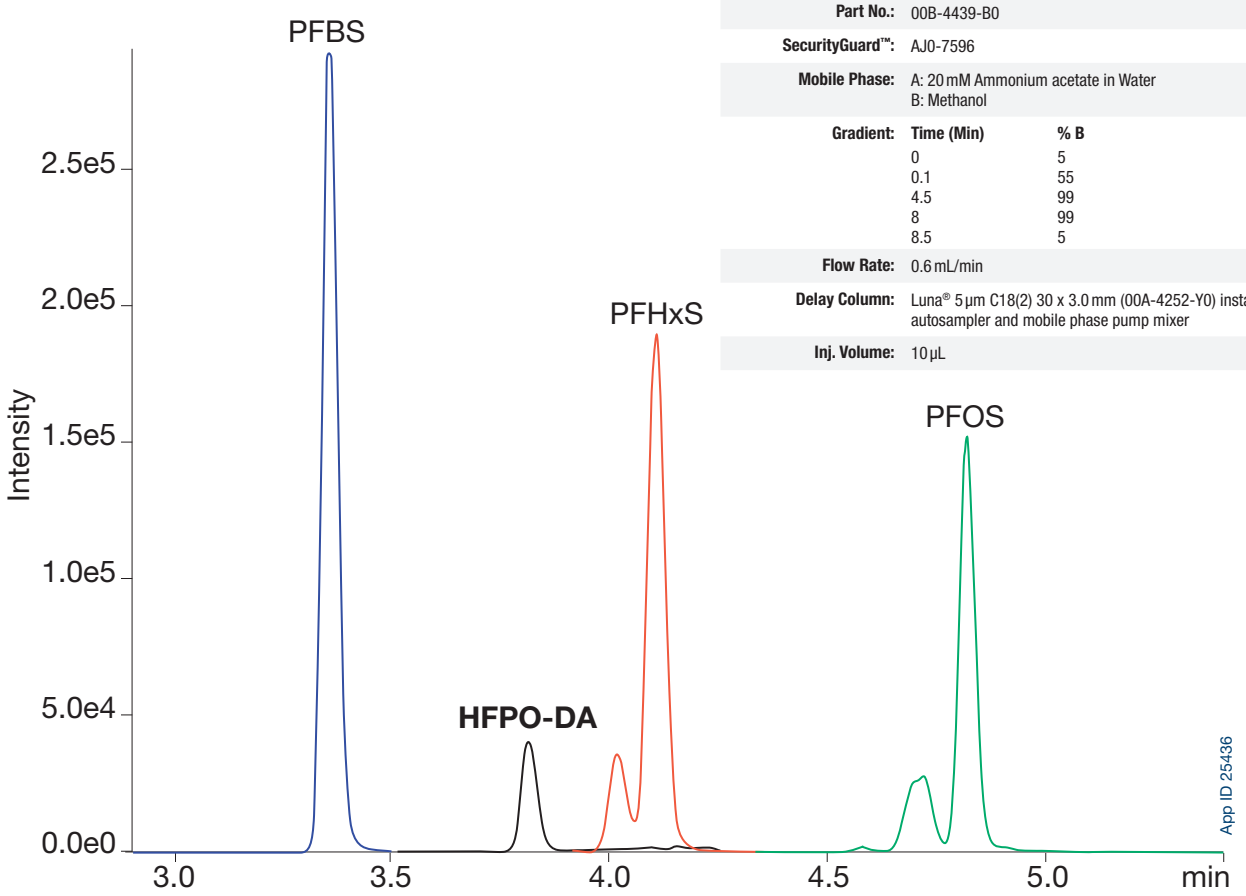
Ion Source Parameters: Samples were ionized using electrospray in negative ion-mode.

Parameter	Value
CAD	9
CUR	30
GS1	40
GS2	60
IS Voltage	-4500
TEM	450

MRM Transitions for HFPO-DA:

Compound	Q1	Q3	RT	DP	CE
HFPO-DA (Quant)	329	185	3.7	-30	-32
HFPO-DA (Qual)	329	169	3.7	-30	-18
13C3-HFPO-DA	332	185	3.7	-30	-32

Chromatography of HFPO-DA in a mixture of PFAS



LC-MS/MS Conditions

Column:	Gemini® 3 µm C18
Dimensions:	50 x 2.0 mm
Part No.:	00B-4439-B0
SecurityGuard™:	AJ0-7596
Mobile Phase:	A: 20 mM Ammonium acetate in Water B: Methanol

Gradient:

Time (Min)	% B
0	5
0.1	55
4.5	99
8	99
8.5	5

Flow Rate:	0.6 mL/min
Delay Column:	Luna® 5 µm C18(2) 30 x 3.0 mm (00A-4252-Y0) installed between the autosampler and mobile phase pump mixer
Inj. Volume:	10 µL

PFCs From Aqueous Matrices

strata®X

Four Perfluorinated Compounds (PFCs) analyte classes were evaluated: Perfluoroalkyl acids (PFAAs), Perfluorosulfonates (PFSAs), Perfluorosulfonamidoacetic acids (FOSAAs), and Fluorotelomersulfonates (FTSs). The Strata-X-AW Solid Phase Extraction provided significant improvements in sensitivity, accuracy, and precision. With the advent of analytical columns like the Kinetex® EVO C18 core-shell that can support a higher pH, it's possible to couple weak anion-exchange online SPE to a suitable analytical column.

Sample Pre-treatment Procedure

1. Samples are collected in polypropylene bottles and preserved with 0.5 g/L Trizma®.
2. A 10mL aliquot is spiked with surrogates at a concentration of 50 ng/L.
3. If necessary, filter using a 10mL syringe fitted to a 1.2 µm glass fiber syringe filter.
4. The filtered sample is spiked with internal standard at 50 ng/L.
5. The filtered sample is loaded and analyzed using a 5.0 mL injection volume.
6. The online SPE is completely automated; it includes a sample wash step (2.1 to 4.1 min) to wash Trizma preservative from the media.

SPE Specifications

Online SPE:	Strata-X-AW 33 µm Polymeric Weak Anion-Exchange
Dimensions:	20 x 2.0 mm
Part No.:	00M-S038-B0-CB
Online SPE Cartridge Holder:	20 mm Cartridge Holder
Part No.:	CH0-5845
Evaporate:	to dryness and reconstitute to 1.0 mL with Methanol/ Water (96:4) (containing internal standards)

Online SPE Program (pump 2)

Time	Water	MeOH	ACN	Flow mL/min	Comments
0.00	100	0	0	2.5	Sample Loading
2.00	100	0	0	2.5	Sample Loading
2.10	100	0	0	2.5	SPE Wash
4.10	100	0	0	2.5	SPE Wash
4.11	30	70	0	0	Idle
9.00	30	70	0	0	Idle
9.01	0	0	100	2.0	ACN Wash
9.49	0	0	100	2.0	ACN Wash
9.50	2.0	98	0	3.0	MeOH Wash
11.50	2.0	98	0	3.0	MeOH Wash
11.51	100	0	0	3.0	Cond: Water
14.00	100	0	0	3.0	Cond: Water

MS Source Parameters:

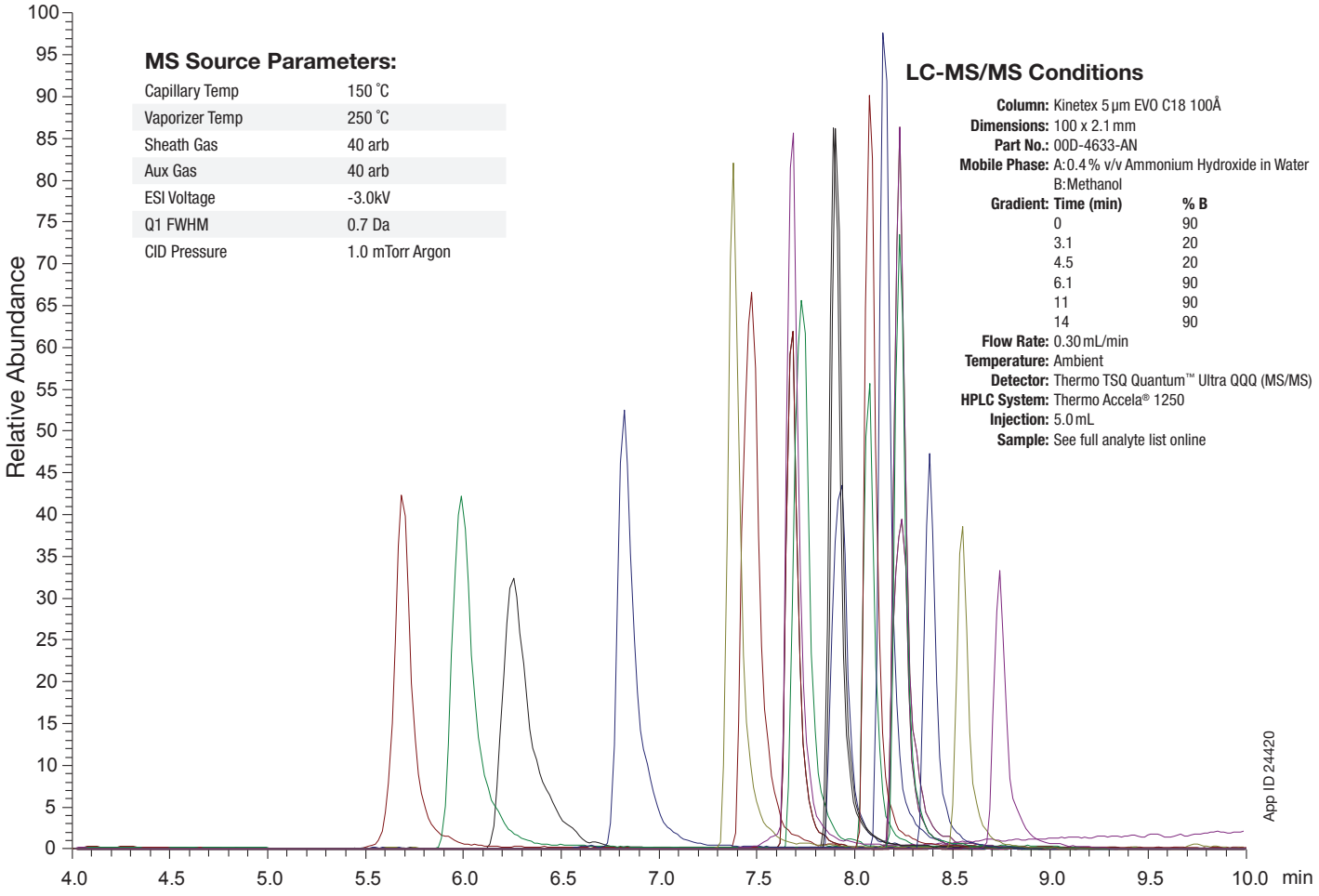
Capillary Temp	150 °C
Vaporizer Temp	250 °C
Sheath Gas	40 arb
Aux Gas	40 arb
ESI Voltage	-3.0kV
Q1 FWHM	0.7 Da
CID Pressure	1.0 mTorr Argon

LC-MS/MS Conditions

Column: Kinetex 5 µm EVO C18 100Å
Dimensions: 100 x 2.1 mm
Part No.: 00D-4633-AN
Mobile Phase: A: 0.4 % v/v Ammonium Hydroxide in Water
B: Methanol

Gradient: Time (min)	**% B**
0	90
3.1	20
4.5	20
6.1	90
11	90
14	90

Flow Rate: 0.30 mL/min
Temperature: Ambient
Detector: Thermo TSQ Quantum™ Ultra QQQ (MS/MS)
HPLC System: Thermo Accela® 1250
Injection: 5.0 mL
Sample: See full analyte list online



Ordering Info

strata™ Solid Phase Extraction

Strata Silica-Based SPE Sorbents

Tubes	3 mL (50/box)		
Phase	**100 mg**	**200 mg**	**500 mg**
C18-E	8B-S001-EBJ	8B-S001-FBJ	8B-S001-HBJ
C18-U	—	8B-S002-FBJ	8B-S002-HBJ
C18-T	—	8B-S004-FBJ	8B-S004-HBJ
C8	—	8B-S005-FBJ	8B-S005-HBJ
Phenyl	—	8B-S006-FBJ	8B-S006-HBJ
SCX	8B-S010-EBJ	8B-S010-FBJ	8B-S010-HBJ
WCX	—	8B-S027-FBJ	8B-S027-HBJ
SAX	8B-S008-EBJ	8B-S008-FBJ	8B-S008-HBJ
ABW	8B-S030-FBJ	8B-S009-FBJ	8B-S009-HBJ
CN	—	8B-S007-FBJ	8B-S007-HBJ
Si-1	—	8B-S012-FBJ	8B-S012-HBJ
Florisil®	—	—	8B-S013-HBJ
EPH	—	—	8B-S031-HBJ
AL-N	—	—	8B-S313-HBJ

Tubes	6 mL (30/box)		
Phase	**200 mg**	**500 mg**	**1 g**
C18-E	8B-S001-FCH	8B-S001-HCH	8B-S001-JCH
C18-U	—	8B-S002-HCH	8B-S002-JCH
C18-T	—	8B-S004-HCH	8B-S004-JCH
C8	—	8B-S005-HCH	8B-S005-JCH
Phenyl	—	8B-S006-HCH	8B-S006-JCH
SCX	—	8B-S010-HCH	8B-S010-JCH
WCX	—	8B-S027-HCH	8B-S027-JCH
SAX	—	8B-S008-HCH	8B-S008-JCH
ABW	—	8B-S009-HCH	8B-S009-JCH
CN	—	8B-S007-HCH	8B-S007-JCH
Si-1	—	8B-S012-HCH	8B-S012-JCH
Florisil®	—	8B-S013-HCH	8B-S013-JCH
SDB-L	—	8B-S014-HCH	8B-S014-JCH
AL-N	—	—	8B-S313-JCH

Giga™ Tubes	12mL		20 mL
Phase	**500 mg**	**1g**	**5mg**
C18			8B-S001-LEG
C8			8B-S005-LEG
WCX			8B-S027-LEG
SAX			8B-S008-LEG
SCX	8B-S008-HDG		8B-S010-LEG
ABW			8B-S030-LEG
Si-1	8B-S012-HDG	8B-S012-JDG	8B-S012-LEG
NH_2	8B-S009-HDG	8B-S009-KDG	8B-S009-LEG
AL-N			8B-S313-LEG

Giga Tubes	60 mL		150 mL	
Phase	**10 mg**	**20 mg**	**50 g**	**70 g**
C18-E	8B-S001-MFF	8B-S001-VFF	8B-S001-YSN	8B-S001-ZSN
C8	8B-S005-MFF			
Si-1	8B-S005-MFF	8B-S012-VFF	8B-S012-YSN	8B-S012-ZSN
FL-PR	8B-S013-MFF			
SDB-L	8B-S014-MFF			
NH_2	8B-S009-MFF	8B-S009-VFF	8B-S009-MFF	8B-S009-MFF
AL-N	8B-S313-MFF			

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Ordering Info

strata-X Polymeric SPE

STRATA-X PRO A Rapid Solid Phase Extraction Solution

Strata-X PRO SPE

Tube			
Format	**Sorbent Mass**	**Part Number**	**Unit**
	30 mg	8B-S536-TBJ	3 mL (50/box)
	60 mg	8B-S536-UBJ	3 mL (50/box)
	200 mg	8B-S536-FBJ	3 mL (50/box)
	100 mg	8B-S536-ECH	6 mL (30/box)
	200 mg	8B-S536-FCH	6 mL (30/box)
	500 mg	8B-S536-HCH	6 mL (30/box)

Strata-X Polymeric SPE Sorbents

Tubes	3 mL (50/box)		
Phase	**60 mg**	**200 mg**	**500 mg**
Strata-X	8B-S100-UBJ	8B-S100-FBJ	8B-S100-HBJ
Strata-X-C	8B-S029-UBJ	8B-S029-FBJ	8B-S029-HBJ
Strata-X-CW	8B-S035-UBJ	8B-S035-FBJ	8B-S035-HBJ
Strata-X-A	8B-S123-UBJ	8B-S123-FBJ	8B-S123-HBJ
Strata-X-AW	8B-S038-UBJ	8B-S038-FBJ	8B-S038-HBJ
Strata-XL	8B-S043-UBJ	8B-S043-FBJ	8B-S043-HBJ
Strata-XL-C	8B-S044-UBJ	8B-S044-FBJ	8B-S044-HBJ
Strata-XL-CW	8B-S052-UBJ	8B-S052-FBJ	8B-S052-HBJ
Strata-XL-A	8B-S053-UBJ	8B-S053-FBJ	8B-S053-HBJ
Strata-XL-AW	8B-S051-UBJ	8B-S051-FBJ	8B-S051-HBJ

Tubes	6 mL (30/box)		
Phase	**100 mg**	**200 mg**	**500 mg**
Strata-X	8B-S100-ECH	8B-S100-FCH	8B-S100-HCH
Strata-X-C	8B-S029-ECH	8B-S029-FCH	8B-S029-HCH
Strata-X-CW	8B-S035-ECH	8B-S035-FCH	8B-S035-HCH
Strata-X-A	8B-S123-ECH	8B-S123-FCH	8B-S123-HCH
Strata-X-AW	8B-S038-ECH	8B-S038-FCH	8B-S038-HCH
Strata-XL	8B-S043-ECH	8B-S043-FCH	8B-S043-HCH
Strata-XL-C	8B-S044-ECH	8B-S044-FCH	8B-S044-HCH
Strata-XL-CW	8B-S052-ECH	8B-S052-FCH	8B-S052-HCH
Strata-XL-A	8B-S053-ECH	8B-S053-FCH	8B-S053-HCH
Strata-XL-AW	8B-S051-ECH	8B-S051-FCH	8B-S051-HCH

Giga™ Tubes	12mL	
Phase	**500 mg**	**1g**
Strata-X	8B-S100-HDG	8B-S100-JDG
Strata-X-C	8B-S029-HDG	8B-S029-JDG
Strata-X-CW	8B-S035-HDG	8B-S035-JDG
Strata-X-A	8B-S123-HDG	8B-S123-JDG
Strata-X-AW	8B-S028-HDG	8B-S038-JDG

BE-HAPPY™ guarantee

Your happiness is our mission. Take 45 days to try our products. If you are not happy, we'll make it right.

www.phenomenex.com/behappy

Giga™ Tubes	20 mL		60 mL
Phase	**1mg**	**2 mg**	**5 mg**
Strata-X	8B-S100-JEG	8B-S100-KEG	8B-S100-LFF
Strata-X-C	8B-S029-JEG	8B-S029-KEG	8B-S029-LFF
Strata-X-CW	8B-S035-JEG	8B-S035-KEG	8B-S035-LFF
Strata-X-A	8B-S123-JEG	8B-S123-KEG	8B-S123-LFF
Strata-X-AW	8B-S038-JEG	8B-S038-KEG	8B-S038-LFF
Strata-XL	-	8B-S043-KEG	8B-S043-LFF
Strata-XL-C	-	8B-S044-KEG	8B-S044-LFF
Strata-XL-CW	-	8B-S052-KEG	-
Strata-XL-A	-	8B-S053-KEG	8B-S053-LFF
Strata-XL-AW	-	8B-S051-KEG	-

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