

SOLID PHASE EXTRACTION FOR FOOD SAMPLES

CLEAN | QUICK | ACCURATE



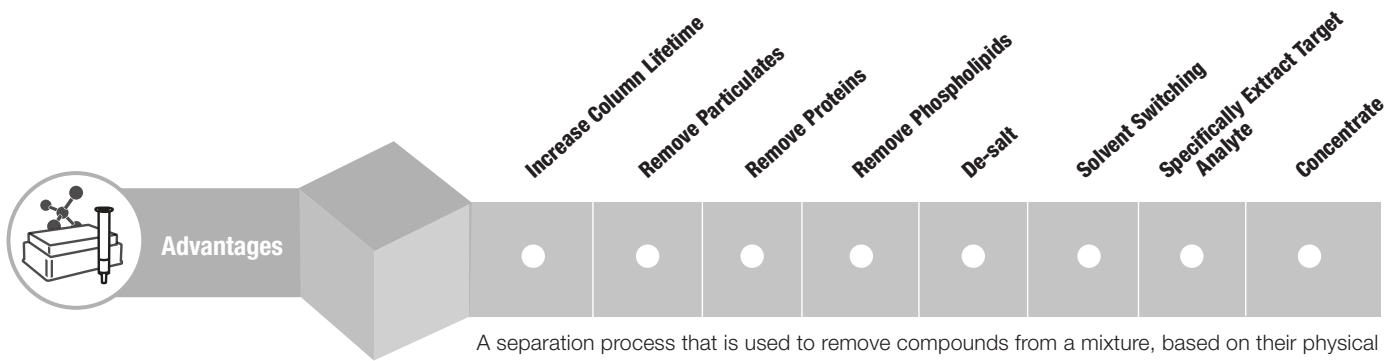
NEW 2-STEP SPE
WITH STRATA[®]-X PRO



 **phenomenex**[®]
...breaking with traditionSM

 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.

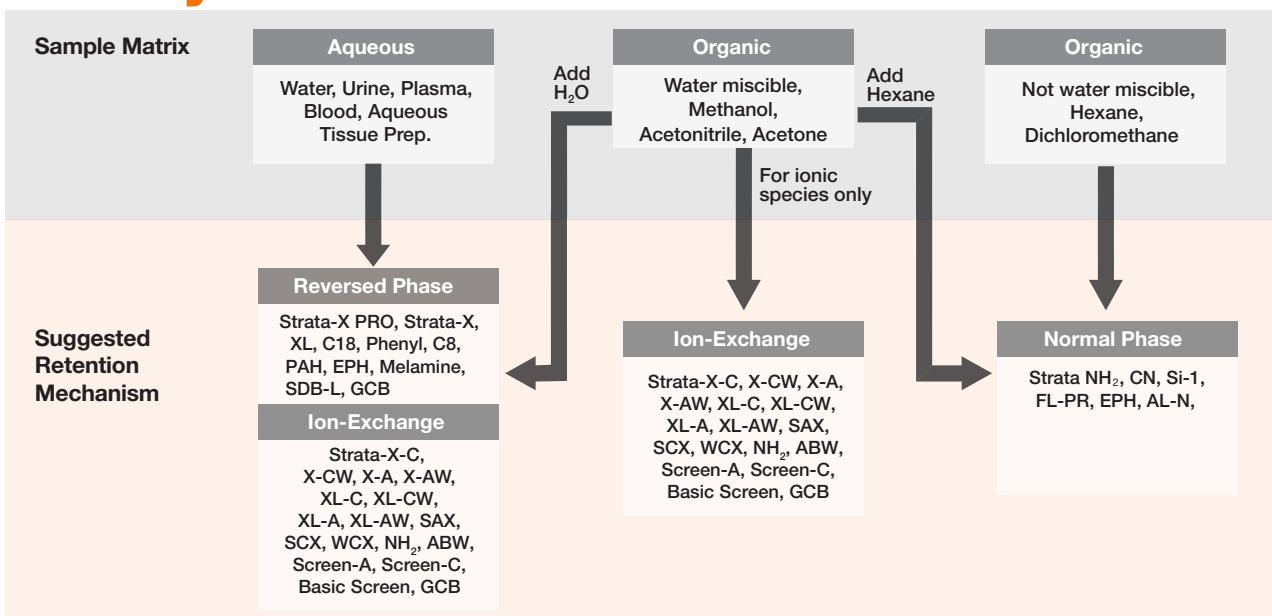
RELIABLE 5 STEPS

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



FAME Analysis from Olive Oil



Olive oil is one of the most adulterated food products in the world. Understanding the profile of fatty acids present in oil helps the marketplace provide an authentic and reliable product to the tables of consumers across the globe. This is why the International Olive Council created method COI/T.20/Doc. No 25, which is the global method for the detection of extraneous oils in olive oils. In this method, oil extraction is performed by Strata Si-1 SPE and a Zebron™ [ZB-FAME](#) GC column to achieve good accuracy and fast run times.

SPE Protocol

Cartridge: Strata Si-1, 1g/6 mL (on vacuum or positive pressure manifold)

Part No.: [8B-S012-JCH](#)

Condition: 6 mL Hexane

Load: Oil solution (0.12 g of oil in 0.5 mL of Hexane)

Elute: 10 mL of Hexane/Diethyl ether (87:13)

Dry Down: Evaporate eluate under a steady stream of Nitrogen

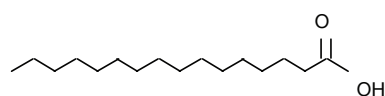
Dissolve: Purified oil residue in 1 mL Hexane

Add: 0.1 mL 2 N Potassium hydroxide in Methanol

Shake: Cap tube and shake vigorously for 15 seconds; leave to separate until upper layer becomes clear

Extract: Upper layer for analysis (the heptane solution is suitable for injection into the GC)

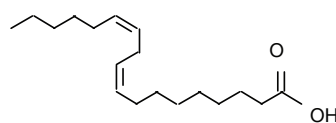
Structures of various fatty acid compounds found in olive oil



Hexadecanoic Acid

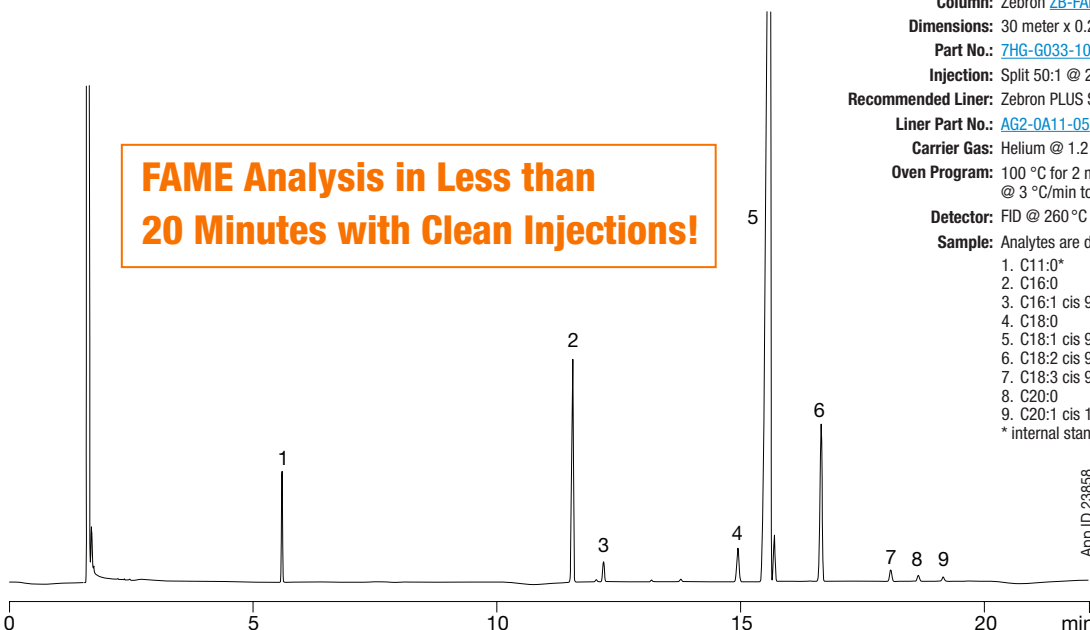


Oleic Acid



Linoleic Acid

Extra Virgin Olive Oil FAMES



GC-FID Conditions

Column: Zebron [ZB-FAME](#)

Dimensions: 30 meter x 0.25 mm x 0.20 µm

Part No.: [7HG-G033-10](#)

Injection: Split 50:1 @ 240 °C, 1 µL

Recommended Liner: Zebron PLUS Single Taper with Wool

Liner Part No.: [AG2-0A11-05](#) (for Agilent® system)

Carrier Gas: Helium @ 1.2 mL/min (constant flow)

Oven Program: 100 °C for 2 min to 140 °C @ 10 °C/min to 190 °C @ 3 °C/min to 260 °C @ 30 °C/min for 2 min

Detector: FID @ 260 °C

Sample: Analytes are diluted 5:1 in heptane

1. C11:0*
 2. C16:0
 3. C16:1 cis 9
 4. C18:0
 5. C18:1 cis 9
 6. C18:2 cis 9,12
 7. C18:3 cis 9,12,15
 8. C20:0
 9. C20:1 cis 11
- * internal standard

App ID 23858

Aflatoxins From Grain

A rapid and sensitive method for mycotoxins utilizing both SPE and LC-MS/MS on either HPLC/UHPLC platforms. Specifically, Aflatoxin B1, B2, G1, and G2 in grain are extracted using reversed phase Strata-X SPE for the successful removal of interferences from the grain, resulting in great recoveries and meeting the assay acceptance criteria. Following the clean-up, a rapid LC-MS/MS method using a Kinetex[®] 1.7 µm C18 core-shell LC column takes advantage of high efficiency and selectivity to produce an excellent baseline separation of the 4 aflatoxins for more accurate quantitation.

Sample Pre-treatment

1. Grind the grain sample using a grinder until a homogeneous powder is formed
2. Sift the powder through a 2 mm sieve and store in a dark room at 4°C
3. Weigh 2.5 g of sample powder into a 50 mL centrifuge tube
4. Add 30 µL working IS solution (Aflatoxin B1 – 13C17/ Aflatoxin G1 – 13C17, 100/100 ng/mL in acetonitrile)
5. Add 10 mL of 0.1% Formic Acid in 85:15 Acetonitrile/Water to the sample tube and mix for 1 min
6. Sonicate samples for 30 min under 30 °C.
7. Centrifuge sample tubes at 4000 rpm for 10 min
8. Transfer the sample supernatant to 20 mL glass vial
9. Aliquot 1 mL sample supernatant and dilute with 1 mL DI water

SPE Conditions

SPE Cartridge: Strata-X, 60 mg/3 mL

Part No.: 8B-S100-UBJ

Condition: 2 mL Methanol

Equilibrate: 2 mL Methanol/Water (10:90)

Load: 2 mL Diluted sample supernatant with DI water (1:1)

Wash: 1 mL Methanol/Water (20:80)

Elute: 1 mL 2 % Formic Acid in Methanol

Dry: 40 °C under N₂

Reconstitute: 300 µL 0.1% Formic Acid in Acetonitrile/Water (5:95)

Filter: 0.2 µm Phenex™ Syringe Filter*

Inject: 10 µL

* Filtering sample is optional depending on the sample matrix

Accuracy and Precision

Sample ID	QCL (n=3)	QCH (n=3)
Nominal Concentration (ng/mL)		
	0.500	5.00
Aflatoxin B₁		
1	0.443	4.99
2	0.442	5.26
3	0.449	5.43
Mean	0.445	5.23
S.D.	0.00	0.22
% CV	0.85	4.25
% Theoretical	88.9	105
Aflatoxin B₂		
1	0.416	4.96
2	0.448	5.04
3	0.450	5.56
Mean	0.438	5.19
S.D.	0.02	0.33
% CV	4.36	6.28
% Theoretical	87.6	104
Aflatoxin G₁		
1	0.557	4.67
2	0.529	4.98
3	0.543	4.90
Mean	0.543	4.85
S.D.	0.01	0.16
% CV	2.58	3.32
% Theoretical	109	97.0
Aflatoxin G₂		
1	0.467	4.72
2	0.448	5.21
3	0.529	5.32
Mean	0.481	5.08
S.D.	0.04	0.32
% CV	8.80	6.28
% Theoretical	96.3	102

LC-MS/MS Conditions

Column: Kinetex 1.7 µm C18

Dimensions: 100 x 3.0 mm

Part No.: 00D-4475-YO

SecurityGuard™ ULTRA: AJ0-8775

Mobile Phase: A: 5 mM Ammonium acetate in Water
B: Acetonitrile/Methanol (50:50)

Gradient:

Time (min)	%B
0.01	40
0.5	40
3	70
4	70
4.2	100
5	100
5.01	40
7	40

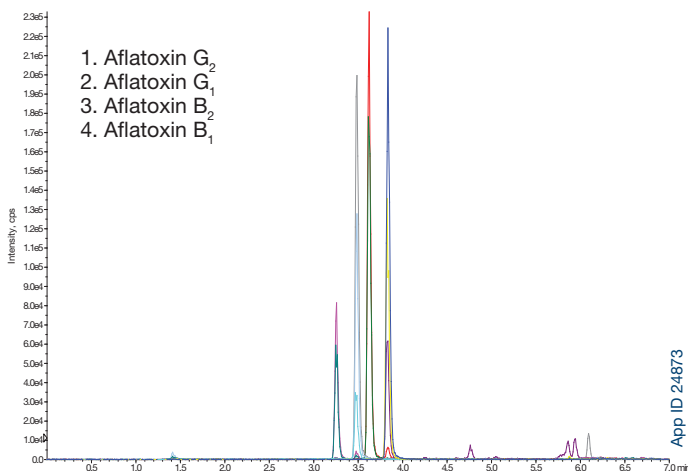
Flow Rate: 0.3 mL/min

Col. Temp.: 40 °C

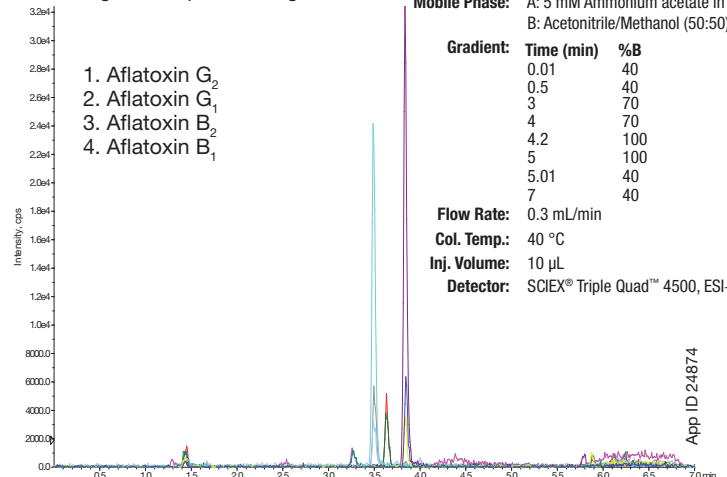
Inj. Volume: 10 µL

Detector: SCIEX® Triple Quad™ 4500, ESI+

Grain sample at 2 ng/mL



LLOQ in grain sample at 0.1 ng/mL



Veterinary Drugs from Milk

When working with milk as a matrix, phospholipids from milk fat must be removed to reduce any ion suppression that could occur during LC-MS/MS analysis for veterinary drugs. To overcome these obstacles, Strata-X PRO, offers a fast, 2-step sample preparation method to remove phospholipids prior to MS analysis. This shows an improved solution over traditional protein precipitation methods and other types of SPE, due to greater clean-up efficiency while maintaining a rapid and fast workflow time.

Pre-treatment

To 1 mL of milk add 3 mL of 0.2% Formic acid in Acetonitrile/Methanol (90:10) and mix or vortex for 15-20 seconds. Centrifuge for 5 minutes at 10,000 RPM and collect supernatant.

SPE Protocol

Cartridge: Strata-X PRO, 60 mg/ 3 mL

Part No.: [8B-S536-UBJ](#)

Load: Pass the pre-treated sample through the SPE cartridge and collect

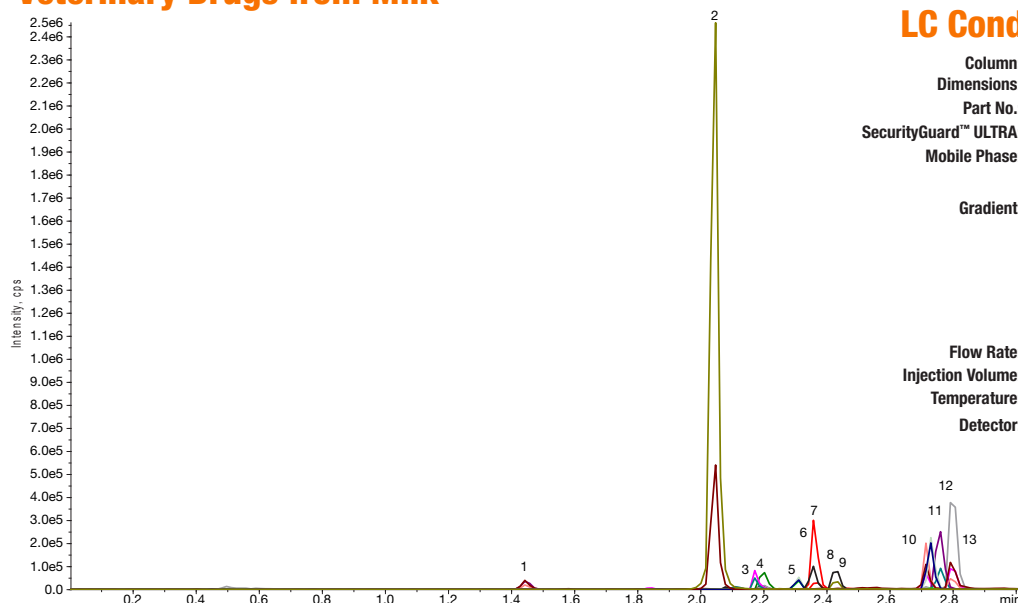
Dry: Evaporate the extract to dryness under a gentle stream of nitrogen at room temperature

Reconstitute: The dried sample in 1 mL of initial mobile phase (0.1% Formic acid in Water/0.1% Formic acid in Methanol (95:5)) spiked with deuterated internal standard.

% Recovery and % CVs for Veterinary Drugs from Milk Using Strata-X PRO

Peak No.	Analyte Name	Retention Time (min)	% Recovery	% CV	Q1	Q3
1	Sulfaguanidine	1.48	46	5	215	156.1
2	Lincomycin	2.07	92	5	407.1	126
3	Sulfadiazine	2.19	38	7	251	156
4	Cephapirin	2.22	76	7	424	292.1
5	Sulfamerazine	2.32	44	5	265.1	155.8
6	Sulfamethoxazole	2.36	53	13	254.1	156.1
7	Sulfamethizole	2.36	45	8	271.1	92
8	Cefalexin	2.39	66	4	348.2	174.2
9	Sulfamethazine	2.44	59	13	279.1	186.1
10	Cortisone	2.72	83	8	361.2	163.2
11	Cortisol	2.73	95	6	363.4	120.9
12	β -methasone	2.76	97	3	393.4	355.2
13	Prednisolone	2.81	92	10	361.2	147.2

Veterinary Drugs from Milk



LC Conditions

Column:	Kinetex [®] 2.6 μ m Biphenyl 100 Å												
Dimensions:	50 x 3.0 mm												
Part No.:	00B-4622-YO												
SecurityGuard[™] ULTRA:	AJ0-9208												
Mobile Phase:	A: 0.1% Formic acid in Water B: 0.1% Formic acid in Methanol												
Gradient:	<table> <thead> <tr> <th>Time (min)</th> <th>% B</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>5</td> </tr> <tr> <td>1.5</td> <td>95</td> </tr> <tr> <td>3</td> <td>95</td> </tr> <tr> <td>3.01</td> <td>5</td> </tr> <tr> <td>4.5</td> <td>5</td> </tr> </tbody> </table>	Time (min)	% B	0	5	1.5	95	3	95	3.01	5	4.5	5
Time (min)	% B												
0	5												
1.5	95												
3	95												
3.01	5												
4.5	5												
Flow Rate:	0.5 mL/min												
Injection Volume:	5 μ L												
Temperature:	45 °C												
Detector:	SCIEX [®] Triple Quad [™] 4500 (ESI, +ve Ionization)												

Strata Silica-Based SPE Sorbents

Tubes	3 mL (50/box)		
	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
NH ₂	—	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
SDB-L	—	8B-S014-HCH	8B-S014-JCH
AL-N	—	—	8B-S313-HBJ



Tubes	6 mL (30/box)		
	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
NH ₂	—	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
EPH	—	—	—
AL-N	—	—	8B-S313-JCH


Giga™ Tubes	12mL		20 mL
	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	
	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			

More part numbers available online!
Go to www.phenomenex.com/SPE

Ordering Info

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)		
	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)		
	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	
	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
	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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