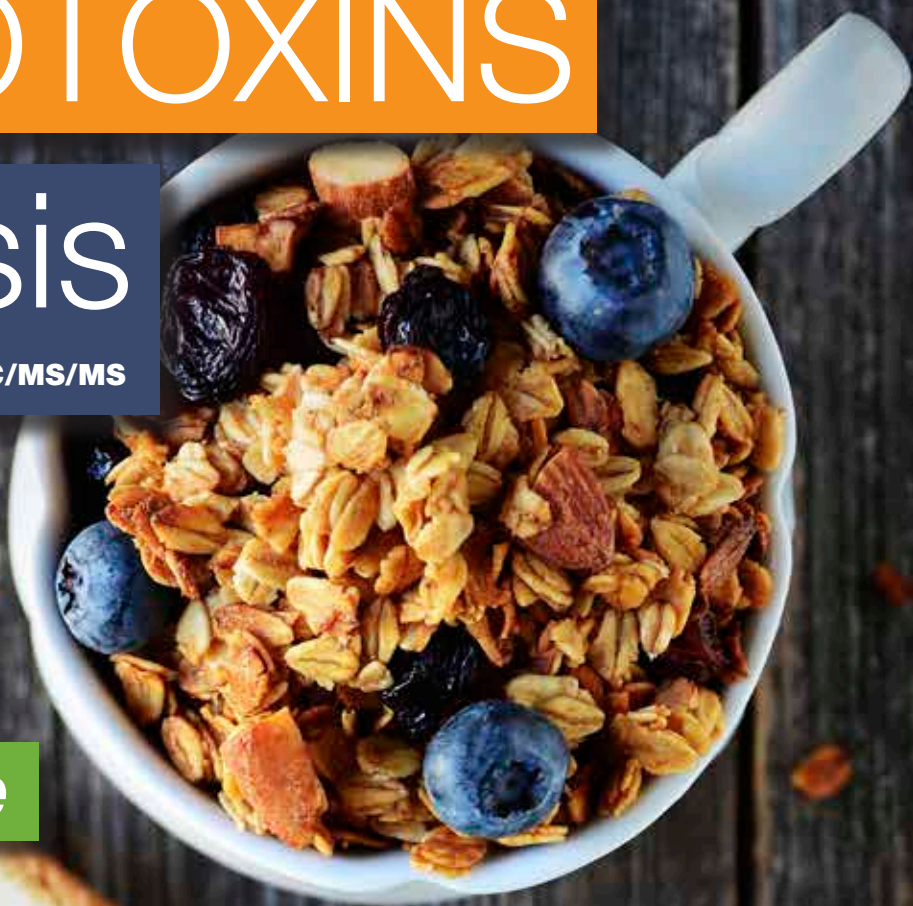


# MYCOTOXINS

## Analysis

Using QuEChERS, SPE & LC/MS/MS

- *Selective*
- *Rapid*
- *Repeatable*



 **phenomenex**<sup>®</sup>  
...breaking with tradition<sup>SM</sup>



[www.phenomenex.com/Food](http://www.phenomenex.com/Food)

# Rapid and Selective Multi-Toxin Screening

Column choices for enhanced retention, selectivity and speed

Column selectivity choices such as Kinetex XB-C18 and Kinetex Biphenyl Core-Shell Technology columns can provide you with a wide range of retention capabilities for Mycotoxin screening.

## LC/MS/MS Conditions

**Column:** Kinetex® 2.6 µm XB-C18 100Å

**Dimensions:** 50 x 2.1 mm

**Part No.:** 00B-4496-AN

**Mobile Phase:** A: Water with 5 mM Ammonium acetate and 0.5% Acetic acid

B: Methanol with 5 mM Ammonium acetate and 0.5% Acetic acid

Gradient Time (min)	% B
0	2
2	2
5	80
5.2	98
8	98

**Flow Rate:** 450 µL/min

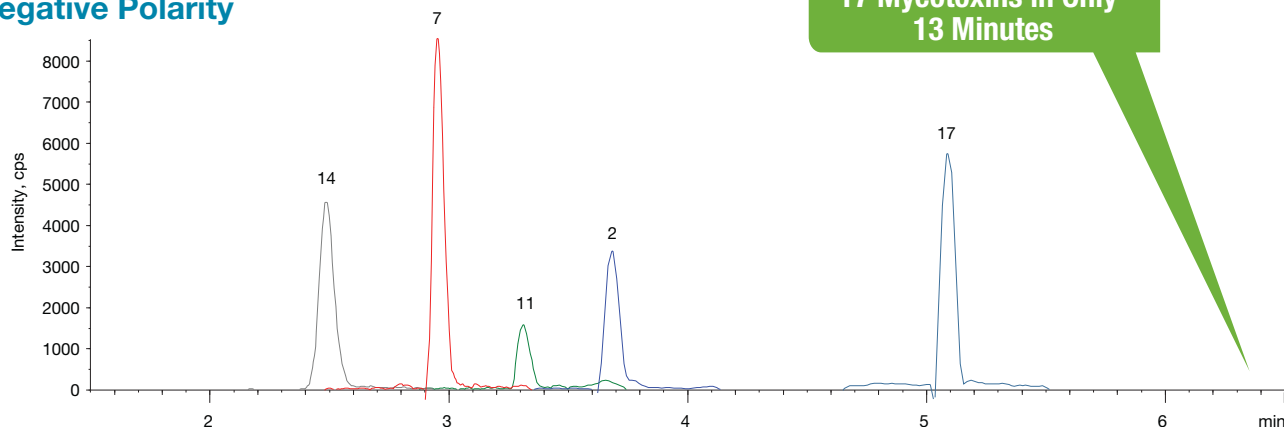
**Temperature:** Ambient

**Detection:** Tandem Mass Spectrometer (MS/MS) (550 °C)

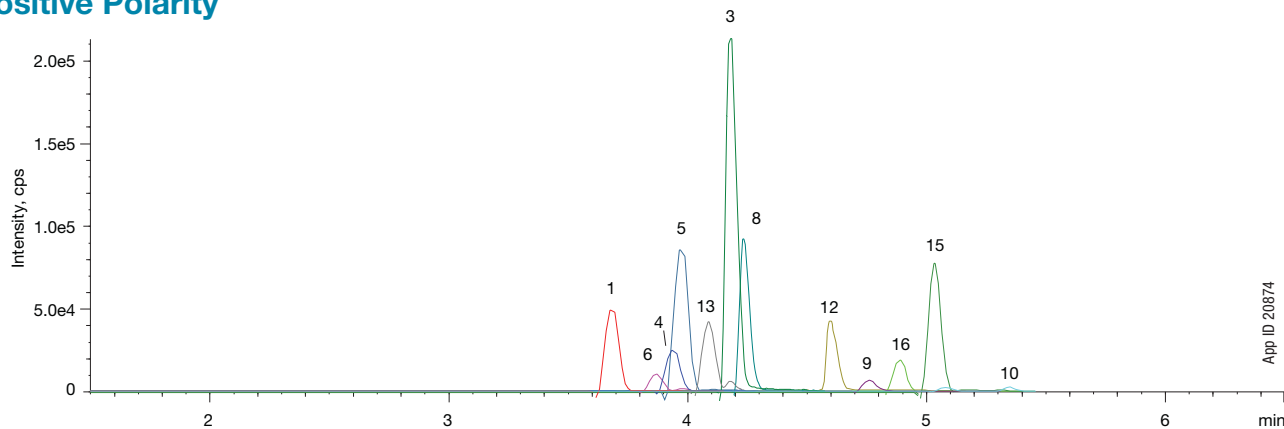
**Detector:** AB SCIEX API 5500™

- Sample:**
- 15-Acetyldeoxynivalenol (15-AcDON)
  - 3-Acetyldeoxynivalenol (3-AcDON)
  - Aflatoxin B1 (AFB1)
  - Aflatoxin B2 (AFB2)
  - Aflatoxin G1 (AFG1)
  - Aflatoxin G2 (AFG2)
  - Deoxynivalenol (DON)
  - Diacetoxyscirpenol (DAS)
  - Fumonisin B1 (FB1)
  - Fumonisin B2 (FB2)
  - Fusarenone-X (FUS X)
  - HT-2 Toxin
  - Monoacetoxyscirpenol (MAS)
  - Nivalenol (NIV)
  - Ochratoxin A (OTA)
  - T-2 Toxin
  - Zearalenone (ZEA)

### Negative Polarity



### Positive Polarity



TIC of all analytes with negative and positive fast polarity switching.

App ID 20874



## LC/MS/MS Conditions

**Column:** Kinetex 2.6µm Biphenyl  
**Dimensions:** 50 x 2.1 mm  
**Part No.:** 00B-4622-AN  
**Mobile Phase:** A: 5 mM Ammonium acetate with 0.1% Acetic acid  
 B: Methanol with 5 mM Ammonium acetate with 0.1% Acetic acid

Gradient:	Time (min)	% B
	0	2
	2	2
	5	80
	5.2	98
	8	98
	8.01	2
	11	2

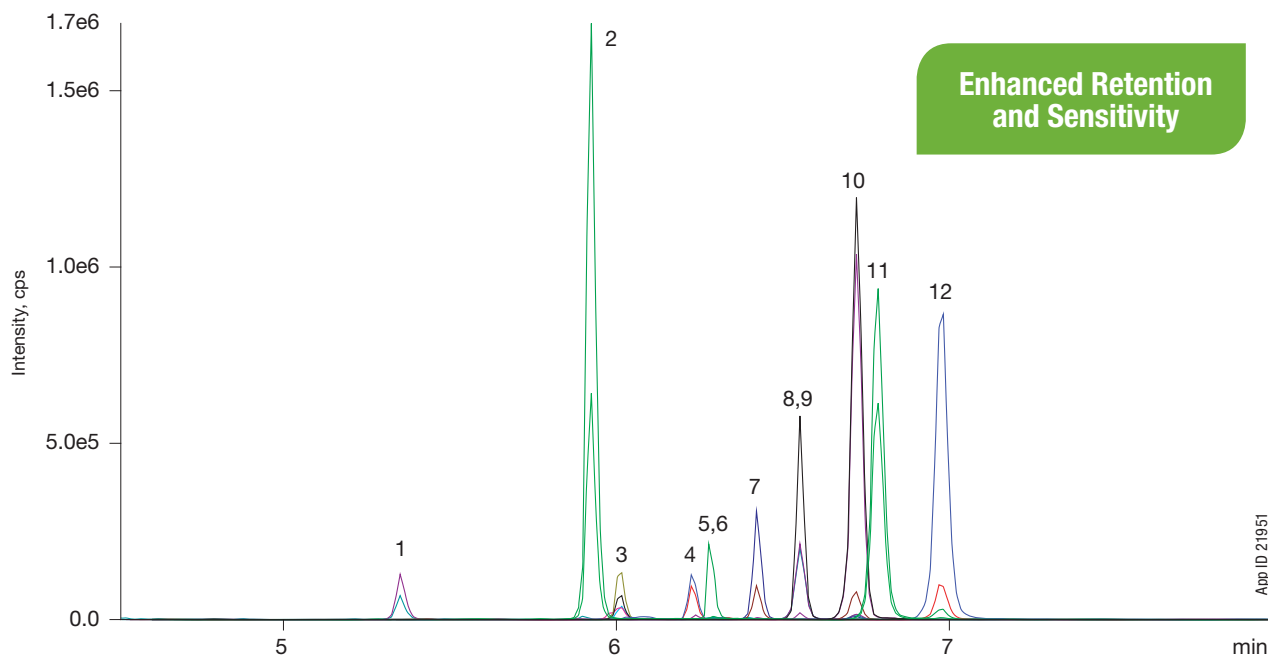
**Flow Rate:** 0.45 mL/min

**Temperature:** Ambient

**Detection:** MS/MS (AB SCIEX API 4000™)

**Sample:**

- 15-Acetyldeoxynivalenol
- DAS
- FB1
- HT2 Toxin
- FB2
- T2 Toxin
- Aflatoxin M1
- Aflatoxin G2
- Ochratoxin A
- Aflatoxin G1
- Aflatoxin B2
- Aflatoxin B1



Expand your Selectivity Options with Kinetex Core-Shell Technology  
[www.phenomenex.com/Kinetex](http://www.phenomenex.com/Kinetex)

# Easy Extraction and Fast Screening from Corn Meal Products

The use of roQ QuEChERS and Kinetex XB-C18 Core-Shell Technology columns deliver a rapid and simple approach for Mycotoxin screening from corn products.

roQ  
QuEChERS Kits



## Sample Preparation

### QuEChERS

#### Extraction from Ground Corn

1. Homogenize sample using a blender or similar apparatus
2. Weigh and transfer 5 g of ground corn-meal to a 50 mL roQ QuEChERS extraction tube
3. Add 10 mL of water and 10 mL of acetonitrile with 1.0 % formic acid
4. Dispense contents of the included roQ QuEChERS extraction packet (KS0-8909) into the 50 mL tube containing homogenized sample
5. Shake vigorously by hand for 1 minute
6. Centrifuge for 5 minutes @ 4000 rpm, making sure that the solid material is at the bottom of the tube and a liquid layer forms on top of the solid material

Quick and Easy  
Procedure

#### Clean up using dispersive Solid Phase Extraction (dSPE)

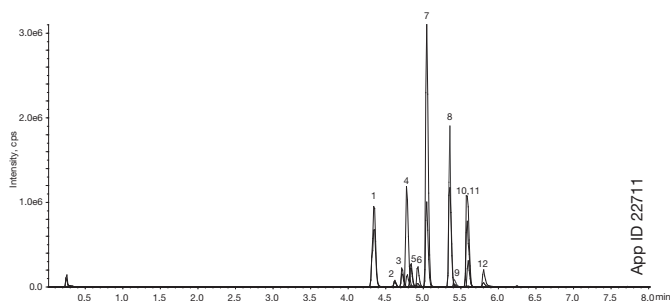
1. Transfer the supernatant from Step 6 of the extraction process into a roQ QuEChERS 15 mL centrifuge tube containing 900 mg  $MgSO_4$  and 150 mg PSA (KS0-8924)
2. Shake vigorously by hand for 30 seconds
3. Centrifuge for 5 minutes at 4000 rpm to separate solid material from the liquid layer
4. Transfer the supernatant to a vessel for evaporation

roQ QuEChERS Simplifies your Sample Preparation  
visit [www.phenomenex.com/roQ](http://www.phenomenex.com/roQ) for details.

## LC/MS/MS Conditions

<b>Column:</b>	Kinetex® 2.6 µm XB-C18												
<b>Dimensions:</b>	50 x 2.1 mm												
<b>Part No.:</b>	00B-4496-AN												
<b>SecurityGuard Cartridge:</b>	AJ0-8782												
<b>Mobile Phase:</b>	A: 5 mM Ammonium acetate with 0.5 % Acetic acid B: 5 mM Ammonium acetate in Methanol with 0.5 % Acetic acid												
<b>Flow Rate:</b>	0.45 mL/min												
<b>Gradient:</b>	<table><thead><tr><th>Time (min)</th><th>% B</th></tr></thead><tbody><tr><td>0.0</td><td>5</td></tr><tr><td>2.0</td><td>5</td></tr><tr><td>5.0</td><td>80</td></tr><tr><td>5.2</td><td>98</td></tr><tr><td>8.0</td><td>98</td></tr></tbody></table>	Time (min)	% B	0.0	5	2.0	5	5.0	80	5.2	98	8.0	98
Time (min)	% B												
0.0	5												
2.0	5												
5.0	80												
5.2	98												
8.0	98												
<b>Injection Volume:</b>	25 µL												
<b>Temperature:</b>	Ambient												
<b>Detection:</b>	API 5000 (AB SCIEX) Tandem Mass Spec (MS/MS)												
<b>System:</b>	Agilent® 1200SL LC system (Agilent Technologies, Palo Alto, CA, USA), equipped with a binary pump autosampler												

Figure 1. Sample Extract Ion Chromatogram  
Positive Mode

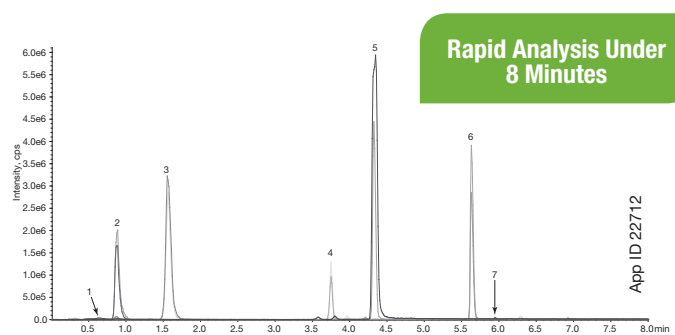


- Sample:**
1. 15-Acetyldeoxynivalenol (15-AcDON)
  2. Aflatoxin G2 (AFG2)
  3. Aflatoxin G1 (AFG1)
  4. Unknown Interference
  5. Aflatoxin B2 (AFB2)
  6. Aflatoxin B1 (AFB1)
  7. Diacetoxyscirpenol (DAS)
  8. HT2 Toxin
  9. Fumonisin B1 (FB1)
  10. T-2 Toxin
  11. Ochratoxin A (OTA)
  12. Fumonisin B2 (FB2)

**Table 1.** MRM Transitions & Retention Times for Mycotoxins

Analyte	Q1	Q3	Retention Time (min)	Mode	% Recovery
Patulin	152.9	108.9/81.0	0.65	-ve	73
Nivalenol (NIV)	371	281.0/59.0	0.88	-ve	87
Deoxynivalenol (DON)	355	295.0/58.6	1.57	-ve	67
Fusarenone-X	413	59.1/353.1	3.76	-ve	93
3-Acetyldeoxynivalenol (3-AcDON)	397	59.0/307.0	4.34	-ve	96
Zearalenone (ZEA)	317	175.0/272.9	5.64	-ve	91
Verruculogen	510.1	166.2/305.9	5.96	-ve	90
Diacetoxyscirpenol (DAS)	384	307.0/349.0	5.05	+ve	79
15-Acetyldeoxynivalenol (15-AcDON)	339	321.0/137.0	4.35	+ve	99
Aflatoxin G2 (AFG2)	331	285.0/245.0	4.64	+ve	8
Aflatoxin G1 (AFG1)	329	243.0/311.0	4.73	+ve	14
Aflatoxin B2 (AFB2)	315.1	287.0/259.1	4.84	+ve	118
Aflatoxin B1 (AFB1)	313	285.1/257.1	4.94	+ve	91
HT2 Toxin	447.1	345.0/285.1	5.36	+ve	80
T2 Toxin	489	387.0/327.2	5.60	+ve	66
Fumonisin B1 (FB1)	722.2	352.2/528.2	5.81	+ve	96
Ochratoxin A (OTA)	404.1	239.0/386.1	5.60	+ve	83
Fumonisin B2 (FB2)	706.2	336.2/512.5	5.81	+ve	81

**Figure 2.** Sample Extract Ion Chromatogram  
*Negative Mode*



- Sample:**
1. Patulin
  2. Nivalenol (NIV)
  3. Deoxynivalenol (DON)
  4. Fusarenone-X
  5. 3-Acetyldeoxynivalenol (3-AcDON)
  6. Zearalenone (ZEA)
  7. Verruculogen



Boost your Analysis Speeds with Kinetex Core-Shell Technology  
See How [www.phenomenex.com/kinetex](http://www.phenomenex.com/kinetex)

# Aflatoxins, Ochratoxin A, Trichothecenes, Zearalenone in Cereal Based Foods

Strata-X solid phase extraction followed by LC/MS/MS offers reliable extraction and identification of key Mycotoxins in cereal based foods.



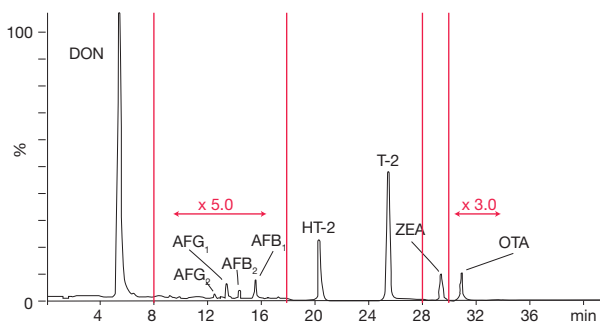
## LC/MS/MS Conditions

**Column:** Kinetex® 2.6 µm C18 100Å  
**Dimensions:** 100 x 2.1 mm  
**Part No.:** 00D-4462-AN  
**Mobile Phase:** A: Water with 0.5% Acetic acid and 1 mM Ammonium acetate  
 B: Methanol with 0.5% Acetic acid and 1 mM Ammonium acetate  
**Gradient:**

Time (min)	% B
0	10
4	40
31	60
36	60

**Flow Rate:** 200 µL/min  
**Temperature:** 40 °C  
**Detection:** Tandem Mass Spectrometer (MS/MS) (350 °C)

Analyte Name	RT (min)
Deoxynivalenol	4.8
Aflatoxin G2	12.8
Aflatoxin G1	13.6
Aflatoxin B2	14.6
Aflatoxin B1	15.8
HT-2 Toxin	20.1
T-2 Toxin	25.3
Zearalenone	29.0
Ochratoxin A	31.4



Total ion chromatogram (sum of MRM transitions) of a wheat based crisp bread sample extract spiked with:  
 750 µg/kg DON; 1 µg/kg AFG2, AFB2; 3 µg/kg AFG1; 5 µg/kg AFB1; 50 µg/kg HT-2, T-2; 75 µg/kg ZEA; 3 µg/kg OTA

**Author reference:**  
 Michele Suman  
 michele.suman@barilla.com  
 Barilla Food Research Labs,  
 via Mantova 166, 43100 Parma, Italy

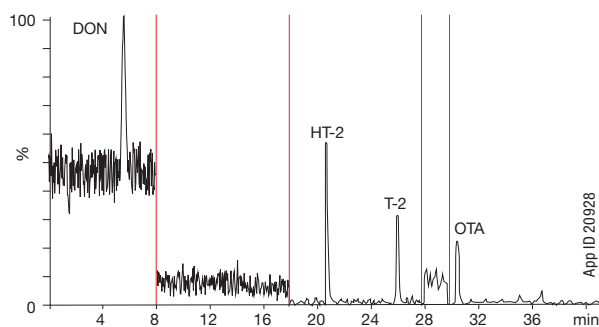
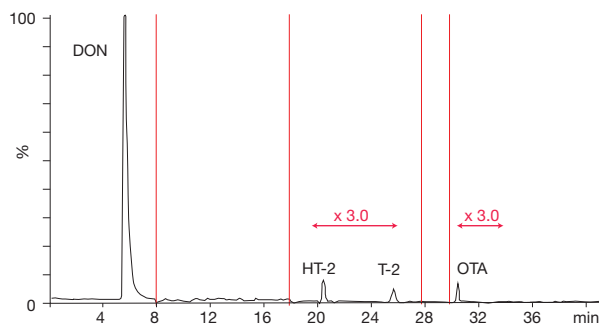


## Sample Preparation

### Solid Phase Extraction

#### Strata-X 60 mg/3 mL

**Part No.:** 8B-S100-UBJ  
**Condition:** 2 mL Methanol  
**Equilibrate:** 2 mL Methanol/Water (10:90)  
**Load:** Pretreated sample  
**Wash:** 1 mL Methanol/Water (20/80, v/v)  
**Elute:** 1 mL of Methanol



Chromatograms (MRM transitions) of flour naturally contaminated with:  
**Top:** 898 µg/kg DON; 9 µg/kg HT2; 2 µg/kg T2; 6 µg/kg OTA (soft wheat)  
**Bottom:** 5.3 µg/kg DON; 5.4 µg/kg HT2; 1.5 µg/kg T2; 0.8 µg/kg OTA (durum wheat)

Veronica M. T. Lattanzio  
 veronica.lattanzio@ispa.cnr.it  
 Institute of Sciences of Food Production (ISPA),  
 National Research Council of Italy (CNR),  
 via Amendola 122/0, 70126 Bari, Italy



# Ordering Information

## Kinetex®

Get the most out of every HPLC/UHPLC analysis. Kinetex Core-Shell Technology produces increased efficiencies over traditional fully porous columns, yielding remarkable chromatographic resolution, higher peak capacities, and greater sensitivity.

5 µm Analytical Columns (mm)					SecurityGuard ULTRA Cartridges <sup>†</sup>
Phases	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	3/pk
Biphenyl	00B-4627-E0	00D-4627-E0	00F-4627-E0	00G-4627-E0	AJO-9207
XB-C18	00B-4605-E0	00D-4605-E0	00F-4605-E0	00G-4605-E0	AJO-8768
C18	00B-4601-E0	00D-4601-E0	00F-4601-E0	00G-4601-E0	AJO-8768

for 4.6 mm ID





2.6 µm Minibore Columns (mm)						SecurityGuard ULTRA Cartridges <sup>†</sup>
Phases	30 x 2.1	50 x 2.1	75 x 2.1	100 x 2.1	150 x 2.1	3/pk
Biphenyl	00A-4622-AN	00B-4622-AN	—	00D-4622-AN	00F-4622-AN	AJO-9209
XB-C18	00A-4496-AN	00B-4496-AN	00C-4496-AN	00D-4496-AN	00F-4496-AN	AJO-8782
C18	00A-4462-AN	00B-4462-AN	00C-4462-AN	00D-4462-AN	00F-4462-AN	AJO-8782
F5	00A-4723-AN	00B-4723-AN	—	00D-4723-AN	00F-4723-AN	AJO-9322

for 2.1 mm ID

<sup>†</sup>SecurityGuard ULTRA Cartridges require holder, Part No.: AJO-9000

## Strata™-X

Versatile polymeric Solid Phase Extraction sorbent for effective retention of any analyte of interest.

Format	Sorbent Mass	Part Number	Unit	Price
<b>Tube</b>				
	30 mg	8B-S100-TAK**	1 mL (100/box)	
	30 mg	8B-S100-TBJ	3 mL (50/box)	
	60 mg	8B-S100-UBJ**	3 mL (50/box)	
	100 mg	8B-S100-EBJ	3 mL (50/box)	
	100 mg	8B-S100-ECH	6 mL (30/box)	
	200 mg	8B-S100-FBJ	3 mL (50/box)	
	200 mg	8B-S100-FCH	6 mL (30/box)	
	500 mg	8B-S100-HBJ	3 mL (50/box)	
	500 mg	8B-S100-HCH	6 mL (30/box)	
<b>Giga™ Tube</b>				
	500 mg	8B-S100-HDG	12 mL (20/box)	
	1 g	8B-S100-JDG	12 mL (20/box)	
	1 g	8B-S100-JEG	20 mL (20/box)	
	2 g	8B-S100-KEG	20 mL (20/box)	
	5 g	8B-S100-LFF	60 mL (16/box)	

\*\*Tab-less and Teflon® tubes available. Contact Phenomenex for details.



## roQ™ Extraction Kits

Wide selection of QuEChERS kits to suit your extraction and clean up needs.

Extraction kits contain fifty easy-pour salt packets and fifty 50 mL stand-alone centrifuge tubes

Description	Unit	Part No.	Price
<b>AOAC 2007.01 Method Extraction Kits</b>			
6.0 g MgSO <sub>4</sub> , 1.5 g NaOAc	50/pk	KSO-8911*	
<b>EN 15662 Method Extraction Kits</b>			
4.0 g MgSO <sub>4</sub> , 1.0 g NaCl, 1.0 g SCTD, 0.5 g SCDS	50/pk	KSO-8909*	
<b>Original Non-buffered Method Extraction Kits</b>			
4.0 g MgSO <sub>4</sub> , 1.0 g NaCl	50/pk	KSO-8910	
6.0 g MgSO <sub>4</sub> , 1.5 g NaCl	50/pk	KSO-8912	

\*AOAC and EN Extraction kits also available in traditional non-collared 50 mL centrifuge tubes, Part No.: KSO-8911-NC and KSO-8909-NC

## roQ dSPE Kits

dSPE kits contain pre-weighed sorbents/salts inside 2 mL or 15 mL centrifuge tubes

Description	Unit	Part No.	Price
<b>2 mL dSPE Kits</b>			
150 mg MgSO <sub>4</sub> , 25 mg PSA, 25 mg C18E	100/pk	KSO-8913	
150 mg MgSO <sub>4</sub> , 25 mg PSA, 2.5 mg GCB	100/pk	KSO-8914	
150 mg, MgSO <sub>4</sub> , 25 mg PSA, 7.5 mg GCB	100/pk	KSO-8915	
150 mg MgSO <sub>4</sub> , 25 mg PSA	100/pk	KSO-8916	
150 mg MgSO <sub>4</sub> , 50 mg PSA, 50 mg C18E, 50 mg GCB	100/pk	KSO-8917	
150 mg MgSO <sub>4</sub> , 50 mg PSA, 50 mg C18E	100/pk	KSO-8918	
150 mg MgSO <sub>4</sub> , 50 mg PSA, 50 mg GCB	100/pk	KSO-8919	
150 mg MgSO <sub>4</sub> , 50 mg PSA	100/pk	KSO-8920	
<b>15 mL dSPE Kits</b>			
900 mg MgSO <sub>4</sub> , 150 mg PSA, 150 mg C18E	50/pk	KSO-8921	
900 mg MgSO <sub>4</sub> , 150 mg PSA, 15 mg GCB	50/pk	KSO-8922	
900 mg MgSO <sub>4</sub> , 150 mg PSA, 45 mg GCB	50/pk	KSO-8923	
900 mg MgSO <sub>4</sub> , 150 mg PSA	50/pk	KSO-8924	
1200 mg MgSO <sub>4</sub> , 400 mg PSA, 400 mg C18E, 400 mg GCB	50/pk	KSO-8925	
1200 mg MgSO <sub>4</sub> , 400 mg PSA, 400 mg C18E	50/pk	KSO-8926	
1200 mg MgSO <sub>4</sub> , 400 mg PSA, 400 mg GCB	50/pk	KSO-8927	
1200 mg MgSO <sub>4</sub> , 400 mg PSA	50/pk	KSO-8928	

# MYCOTOXINS

## Analysis

Using QUENCHERS, SPE & LC/MS/MS

• Selective

• Rapid

• Repeatable

### Australia

t: +61 (0)2-9428-6444  
f: +61 (0)2-9428-6445  
auinfo@phenomenex.com

### Austria

t: +43 (0)1-319-1301  
f: +43 (0)1-319-1300  
anfrage@phenomenex.com

### Belgium

t: +32 (0)2 503 4015 (French)  
t: +32 (0)2 511 8666 (Dutch)  
f: +31 (0)30-2383749  
beinfo@phenomenex.com

### Canada

t: +1 (800) 543-3681  
f: +1 (310) 328-7768  
info@phenomenex.com

### China

t: +86 (0)20 2282-6668  
f: +86 (0)20 2809-8130  
chinainfo@phenomenex.com

### Denmark

t: +45 4824 8048  
f: +45 4810 6265  
nordicinfo@phenomenex.com

### Finland

t: +358 (0)9 4789 0063  
f: +45 4810 6265  
nordicinfo@phenomenex.com

### France

t: +33 (0)1 30 09 21 10  
f: +33 (0)1 30 09 21 11  
franceinfo@phenomenex.com

### Germany

t: +49 (0)6021-58830-0  
f: +49 (0)6021-58830-11  
anfrage@phenomenex.com

### India

t: +91 (0)40-3012 2400  
f: +91 (0)40-3012 2411  
indiainfo@phenomenex.com

### Ireland

t: +353 (0)1 247 5405  
f: +44 1625-501796  
eireinfo@phenomenex.com

### Italy

t: +39 051 6327511  
f: +39 051 6327555  
italiainfo@phenomenex.com

### Luxembourg

t: +31 (0)30-2418700  
f: +31 (0)30-2383749  
nlinfo@phenomenex.com

### Mexico

t: 001-800-844-5226  
f: 001-310-328-7768  
tecnicomx@phenomenex.com

### The Netherlands

t: +31 (0)30-2418700  
f: +31 (0)30-2383749  
nlinfo@phenomenex.com

### New Zealand

t: +64 (0)9-4780951  
f: +64 (0)9-4780952  
nzinfo@phenomenex.com

### Norway

t: +47 810 02 005  
f: +45 4810 6265  
nordicinfo@phenomenex.com

### Puerto Rico

t: +1 (800) 541-HPLC  
f: +1 (310) 328-7768  
info@phenomenex.com

### Sweden

t: +46 (0)8 611 6950  
f: +45 4810 6265  
nordicinfo@phenomenex.com

### United Kingdom

t: +44 (0)1625-501367  
f: +44 (0)1625-501796  
ukinfo@phenomenex.com

### USA

t: +1 (310) 212-0555  
f: +1 (310) 328-7768  
info@phenomenex.com

### All other countries Corporate Office USA

t: +1 (310) 212-0555  
f: +1 (310) 328-7768  
info@phenomenex.com



[www.phenomenex.com](http://www.phenomenex.com)

Phenomenex products are available worldwide. For the distributor in your country, contact Phenomenex USA, International Department at [international@phenomenex.com](mailto:international@phenomenex.com)

#### Terms and Conditions

Subject to Phenomenex Standard Terms and Conditions, which may be viewed at [www.phenomenex.com/TermsAndConditions](http://www.phenomenex.com/TermsAndConditions)

#### Trademarks

Kinetex is a registered trademark, Strata-X, Giga, and roQ are trademarks of Phenomenex. API 5500, API 5000, API 4000 are trademarks of AB Sciex Pte. Ltd AB SCIEX™ is being used under license. Barilla is a registered trademark of Barilla G. s E. Fratelli-Societa per Azioni Joint Stock Company Italy.

#### Disclaimer

Phenomenex is in no way affiliated with Barilla. Comparative separation may not be representative of all applications.

Strata-X is patented by Phenomenex. U. S. Patent No. 7,119,145

© 2015 Phenomenex, Inc. All rights reserved.

BR28511214\_L



# Explore Your Options for Food Testing

## HPLC/UHPLC

- HPLC/UHPLC/PREP  
Core-Shell and Fully Porous Products
- Extensive Range of Stationary Phases
- ISO Certified Quality Management

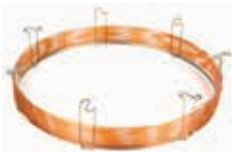
[www.phenomenex.com/HPLC](http://www.phenomenex.com/HPLC)



## GC and GC/MS

- Wide Selection of Phases
- High Temperature Limits
- Low Bleed Performance
- Enhanced Aqueous Stability

[www.phenomenex.com/GC](http://www.phenomenex.com/GC)



## Sample Prep

- Filtration, SPE, and Vials
- Solutions for All Matrices
- Extensive Method Development Support
- Easily Accessible Web Tools

[www.phenomenex.com/SamplePrep](http://www.phenomenex.com/SamplePrep)



guarantee

If Phenomenex products in this guide do not provide at least an equivalent separation as compared to other products of the same phase and dimensions, send in comparative data within 45 days and keep the product for FREE.

# Access the Latest Food Testing Resources



[www.phenomenex.com/Food](http://www.phenomenex.com/Food)

- **Applications**
- **Technical Notes**
- **Online Method Development Tools**
- **On-Demand Webinars**
- **News and Events**