

# rooQ<sup>TM</sup>

## QuEChERS Kits

An Easier QuEChERS Solution  
for Multi-Residue Analysis  
from Food



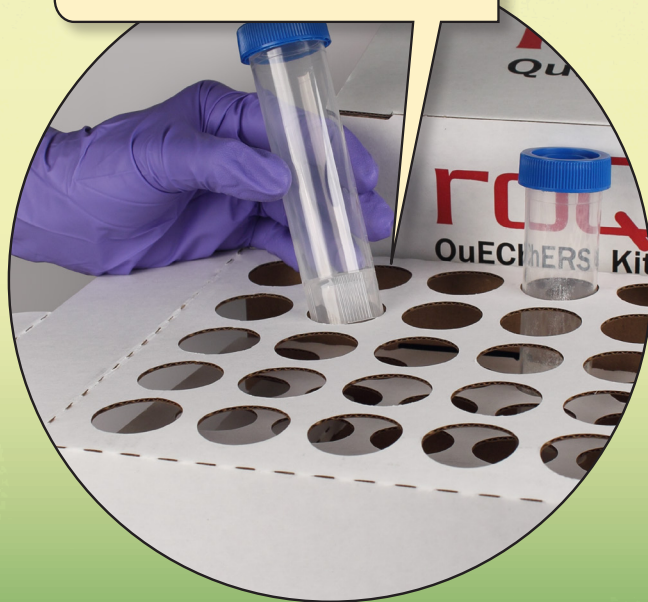
phenomenex<sup>®</sup>  
...breaking with tradition<sup>SM</sup>

## What is roQ™?

roQ QuEChERS Kits were designed with the analyst in mind. By incorporating features such as trays to hold centrifuge tubes, easy pour salt packets, and stand alone centrifuge tubes, roQ QuEChERS Kits make the QuEChERS procedure even easier!

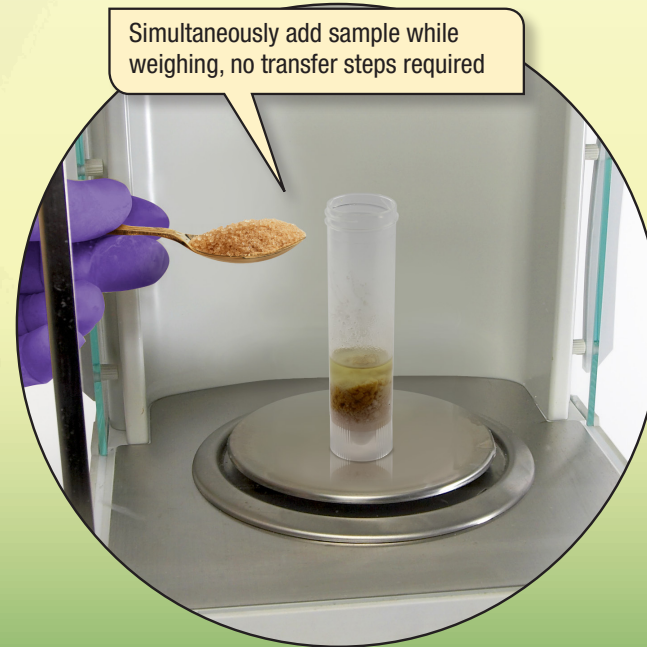
### Stay Organized with Built In Test Tube Racks

roQ boxes are designed with removable racks that can be used as test tube racks



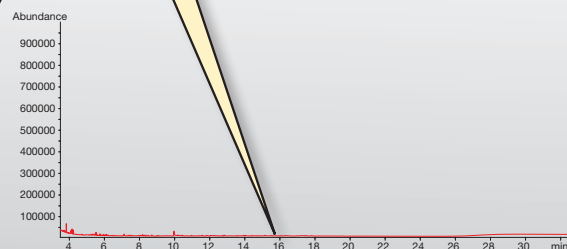
### Easily Weigh Out Samples with Stand Alone Centrifuge Tubes

Simultaneously add sample while weighing, no transfer steps required



## Cleaner Extracts with Low Extractable Tubes

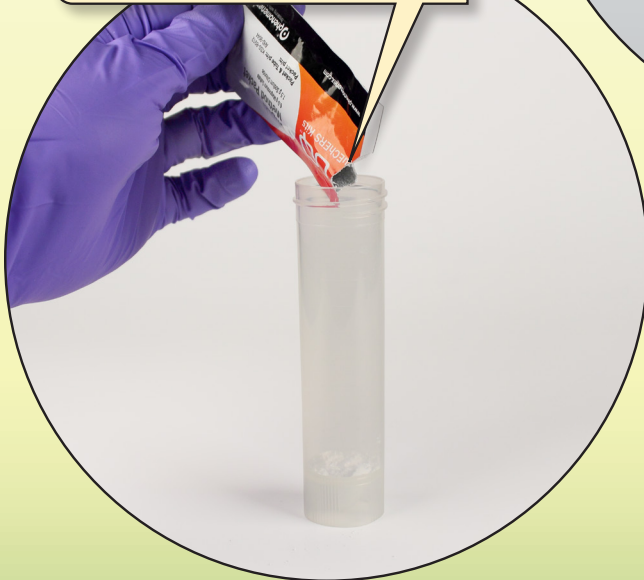
Reduce background noise in chromatograms



15 mL roQ centrifuge tube extracted with 1% Acetic acid in Acetonitrile and then with Toluene.

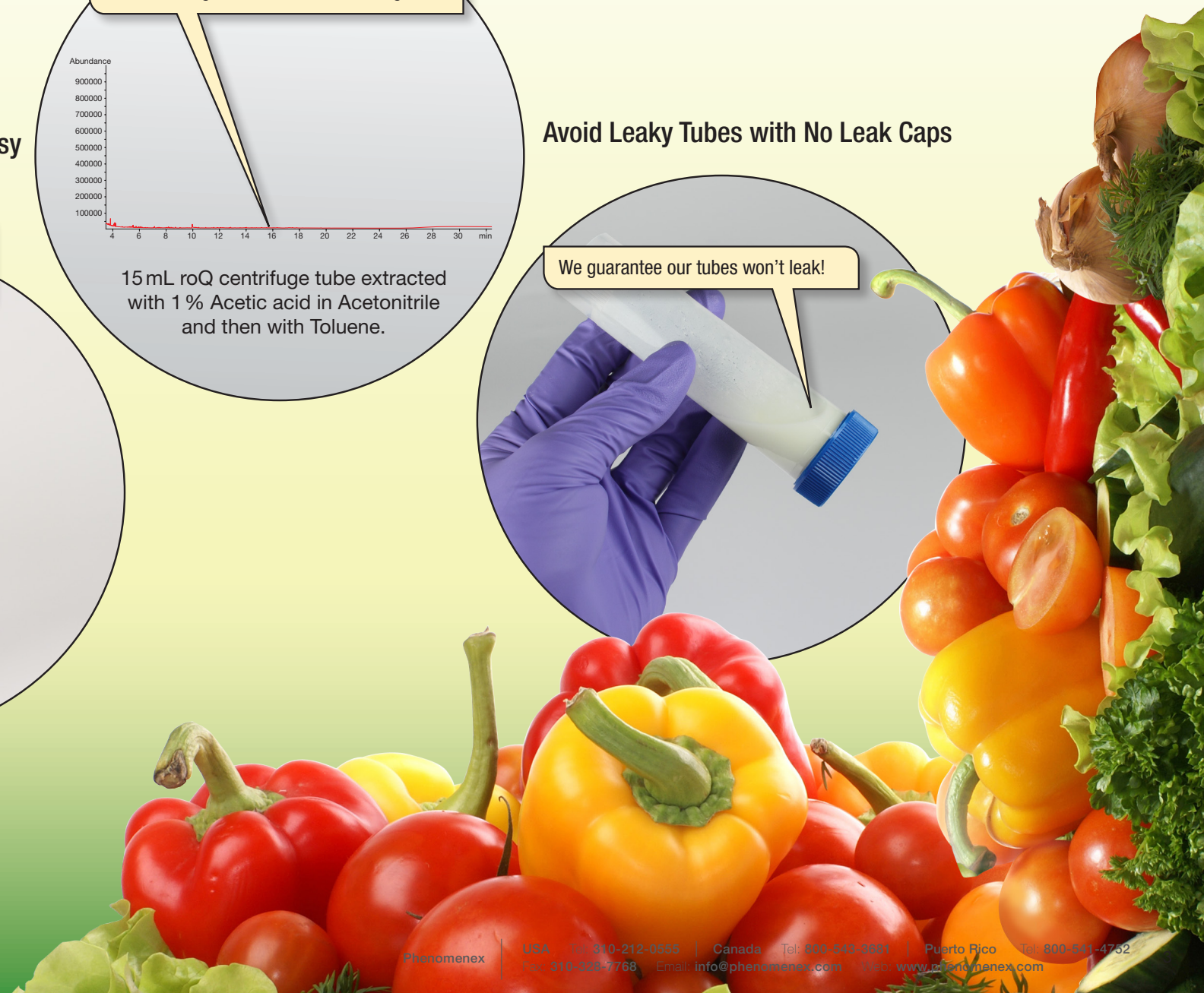
## No Mess Salt Addition with Easy Pour Salt Packets

Our easy open, easy pour salt packets have a narrow spout which makes salt addition easy



## Avoid Leaky Tubes with No Leak Caps

We guarantee our tubes won't leak!



# How does it work?

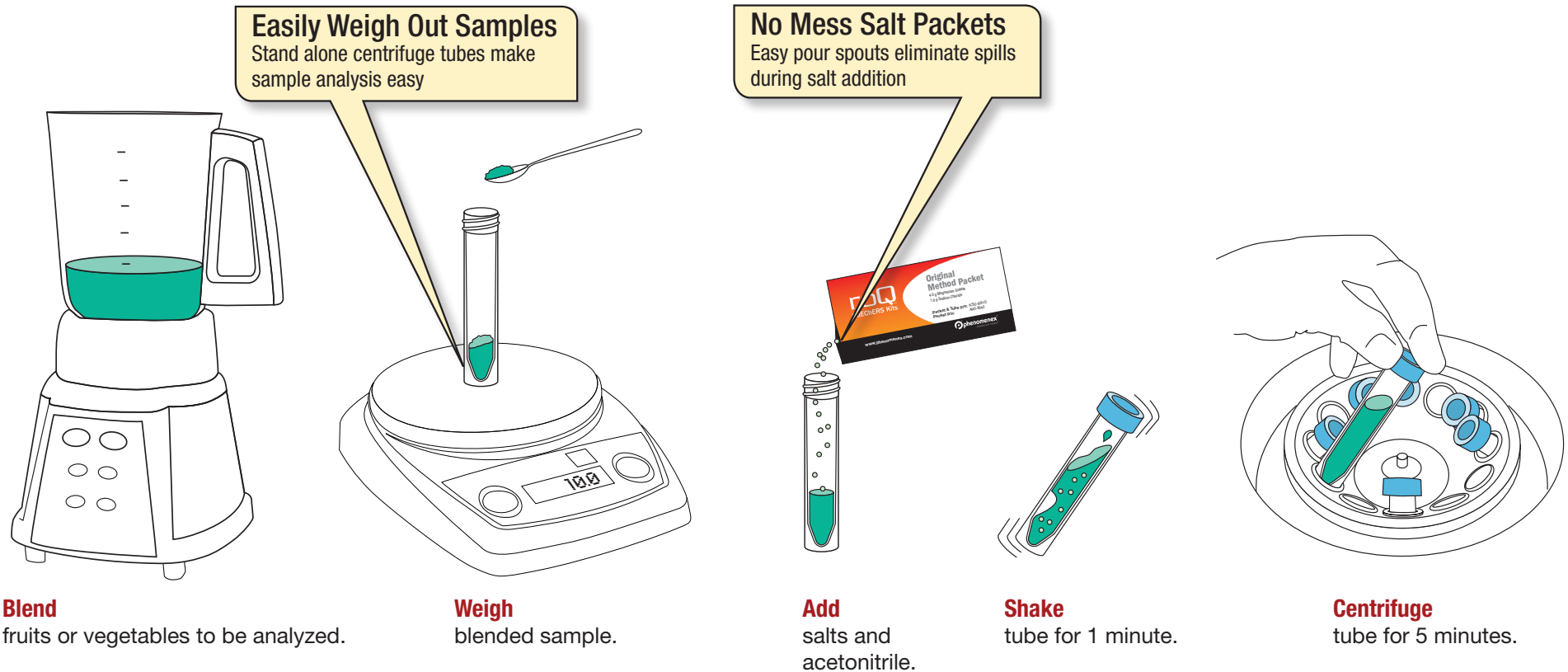
QuEChERS is a descriptive acronym that stands for Quick, Easy, Cheap, Effective, Rugged, and Safe.

The QuEChERS technique addresses shortcomings of traditional sample preparation methods, such as long extraction procedures and the use of hazardous solvents, and radically simplifies multi-residue pesticide analysis in food samples.

The QuEChERS technique consists of two steps; Extraction and Dispersive SPE (dSPE)

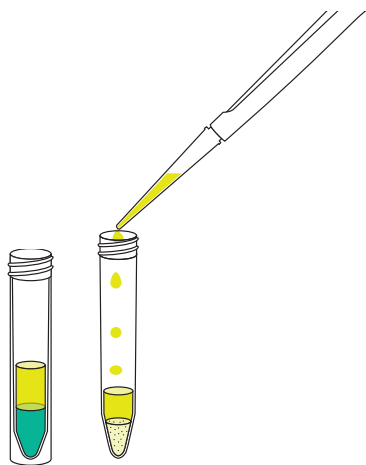
## Step 1: Extraction

Pesticides and analytes of interest must first be extracted from the food sample. This process relies on the combination of organic solvent and various salts to partition the analytes from food samples into an organic layer (typically acetonitrile).



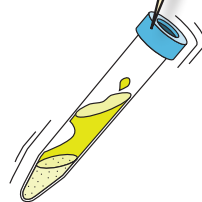
## Step 2: Dispersive SPE (dSPE)

An aliquot of the organic layer from the extraction step is subjected to further clean up by dispersive SPE. This step selectively removes unwanted interferences such as lipids and pigments.

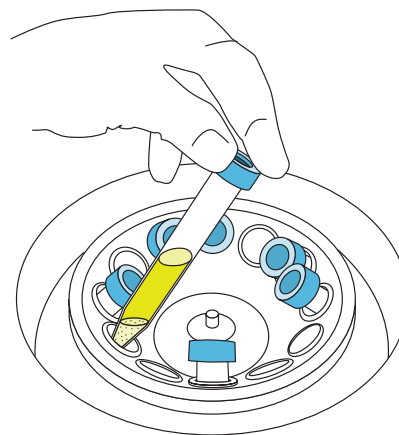


**Add**  
supernatant from extraction procedure into a roQ™ dSPE tube.

**Avoid Leaky Tubes**  
Our tubes are designed to seal completely

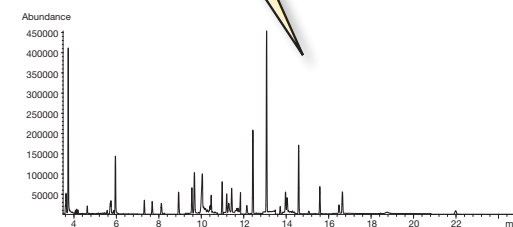


**Shake**  
dSPE tube for 30 seconds.



**Centrifuge**  
dSPE tube for 5 minutes.

**Cleaner Extracts**  
roQ kits contain low extractable centrifuge tubes reducing background noise in chromatograms



**Analyze**  
supernatant by GC or HPLC.

## Step 1

# Select Your roQ™ Extraction Kit

QuEChERS can be performed by following 3 different methods: the AOAC 2007.01 Method, the EN 15662 Method, or the Original Non-Buffered Method.

Use the chart below to select the most appropriate kits for your work and sample size/type.

### AOAC 2007.01 Method

Salts used:

#### **Magnesium Sulfate (MgSO<sub>4</sub>)**

Induces phase separation between water content in sample and acetonitrile layer

#### **Sodium Acetate (NaOAc)**

Buffers the sample to stabilize pH

### Original Non-Buffered Method

Salts used:

#### **Magnesium Sulfate (MgSO<sub>4</sub>)**

Induces phase separation between water content in sample and acetonitrile layer

#### **Sodium Chloride (NaCl)**

Induces phase separation between water content in sample and acetonitrile layer

### EN 15662 Method

Salts used:

#### **Magnesium Sulfate (MgSO<sub>4</sub>)**

Induces phase separation between water content in sample and acetonitrile layer

#### **Sodium Chloride (NaCl)**

Induces phase separation between water content in sample and acetonitrile layer

#### **Sodium Citrate Tribasic Dihydrate (SCTD)**

Buffers the sample to stabilize pH

#### **Sodium Citrate Dibasic Sesquihydrate (SCDS)**

Buffers the sample to stabilize pH

### Sample Size

**15 g**

Part No.: KSO-8911

**15 g**

Part No.: KSO-8912

to be used with AOAC 2007.01 dSPE procedure

or

**10 g**

Part No.: KSO-8910

to be used with EN 15662 dSPE procedure

**10 g**

Part No.: KSO-8909

All roQ Extraction Kits include 50 easy-pour salt packets and fifty 50 mL stand-alone centrifuge tubes.

## Step 2 Select Your roQ™ dSPE Kit

### Fruit and Vegetable Type

Method	Sample Size	General		Fats and Waxes		Pigmented		Highly Pigmented		Pigments and Fats	
		Contents	Part No.	Contents	Part No.	Contents	Part No.	Contents	Part No.	Contents	Part No.
AOAC 2007.01	1 ml	150 mg MgSO <sub>4</sub> 50 mg PSA	KS0-8920	150 mg MgSO <sub>4</sub> 50 mg PSA 50 mg C18E	KS0-8918	150 mg MgSO <sub>4</sub> 50 mg PSA 50 mg GCB	KS0-8919	—	—	150 mg MgSO <sub>4</sub> 50 mg PSA 50 mg GCB 50 mg C18E	KS0-8917
	8 ml	1200 mg MgSO <sub>4</sub> 400 mg PSA	KS0-8928	1200 mg MgSO <sub>4</sub> 400 mg PSA 400 mg C18E	KS0-8926	1200 mg MgSO <sub>4</sub> 400 mg PSA 400 mg GCB	KS0-8927	—	—	1200 mg MgSO <sub>4</sub> 400 mg PSA 400 mg GCB 400 mg C18E	KS0-8925
EN 15662	1 ml	150 mg MgSO <sub>4</sub> 25 mg PSA	KS0-8916	150 mg MgSO <sub>4</sub> 25 mg PSA 2.5 mg C18E	KS0-8913	150 mg MgSO <sub>4</sub> 25 mg PSA 2.5 mg GCB	KS0-8914	150 mg MgSO <sub>4</sub> 25 mg PSA 7.5 mg GCB	KS0-8915	—	—
	6 ml	900 mg MgSO <sub>4</sub> 150 mg PSA	KS0-8924	900 mg MgSO <sub>4</sub> 150 mg PSA 15 mg C18E	KS0-8921	900 mg MgSO <sub>4</sub> 150 mg PSA 15 mg GCB	KS0-8922	900 mg MgSO <sub>4</sub> 150 mg PSA 45 mg GCB	KS0-8923	—	—

### Salts and sorbents used in roQ dSPE kits

<b>Magnesium Sulfate (MgSO<sub>4</sub>)</b>	Removes excess water from sample
<b>Primary/Secondary Amine (PSA)</b>	Removes organic acids, fatty acids, sugars, and anthocyanine pigments from sample
<b>Endcapped C18 Sorbent (C18E)</b>	Removes fats, sterols, and other non-polar interferences from sample
<b>Graphitized Carbon Black (GCB)</b>	Removes pigments from sample <b>NOT FOR USE WITH PLANAR PESTICIDES</b>

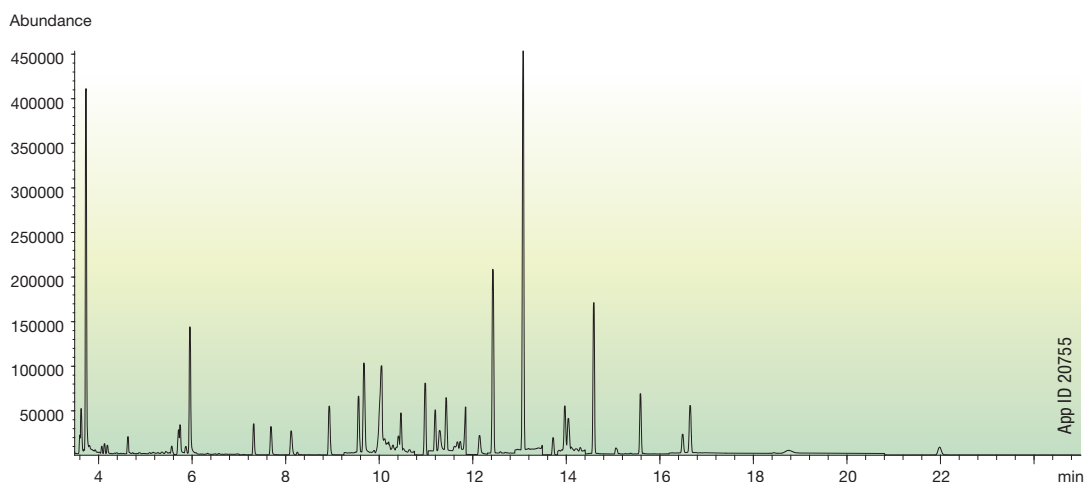
All roQ dSPE Kits include pre-weighed sorbents/salts inside 2 mL or 15 mL centrifuge tubes.

## Extraction of Pesticide Residues from Apple Using roQ™ AOAC 2007.01 QuEChERS Kits GC/MS Analysis

This application outlines the QuEChERS procedure for the extraction of 19 pesticide residues from apple using AOAC 2007.01 methodology. Extracts from the QuEChERS procedure were diverted to GC/MS for analysis.

### roQ kits used:

- Extraction Kit, AOAC 2007.01, 6.0g MgSO<sub>4</sub>, 1.5g NaOAc (part no. KS0-8911)
- dSPE Kit, 15mL, 1,200 mg MgSO<sub>4</sub>, 400 mg PSA (part no. KS0-8928)



**Column :** Zebtron™ ZB-5MSi with 5m Guardian™  
**Dimensions :** 30 meters x 0.25 mm x 0.25 μm  
**Part No. :** 7HG-G018-11-GGA  
**Injection :** Splitless @ 250 °C, 2 μL  
**Carrier Gas :** Helium @ 1 mL/min (constant flow)  
**Oven Program :** 100 °C to 150 °C @ 25 °C/min to 280 °C @ 10 °C/min for 10 min then to 340 °C @ 25 °C/min for 5 min  
**Detector :** MS @ 350 °C

Pesticides	% Recovery 80 ng/g Average	% RSD (n=5)	% Recovery 200 ng/g Average	% RSD (n=5)
Atrazine	106	5	119	10
Azoxystrobin	98	13	103	17
Bifenthrin	101	6	112	6
Carbaryl	102	3	108	7
Chlorothalonil	94	4	93	4
Chlorpyrifos-methyl	108	4	111	6
Cyprodinil	103	3	107	6
Endosulfan Sulfate	98	5	104	6
Ethion	104	4	115	7
Kresoxim-methyl	104	3	115	7
L-Cyhalothrin	96	8	108	8
Methamidophos	96	9	97	16
o,p-DDD	102	4	109	5
o-phenylphenol	110	6	95	13
Permethrins	97	10	102	8
Procymidone	105	3	115	7
Tebuconazole	97	7	108	8
Tolyfluanid	81	7	77	4
Trifluralin	103	4	106	6



**View more application notes**

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

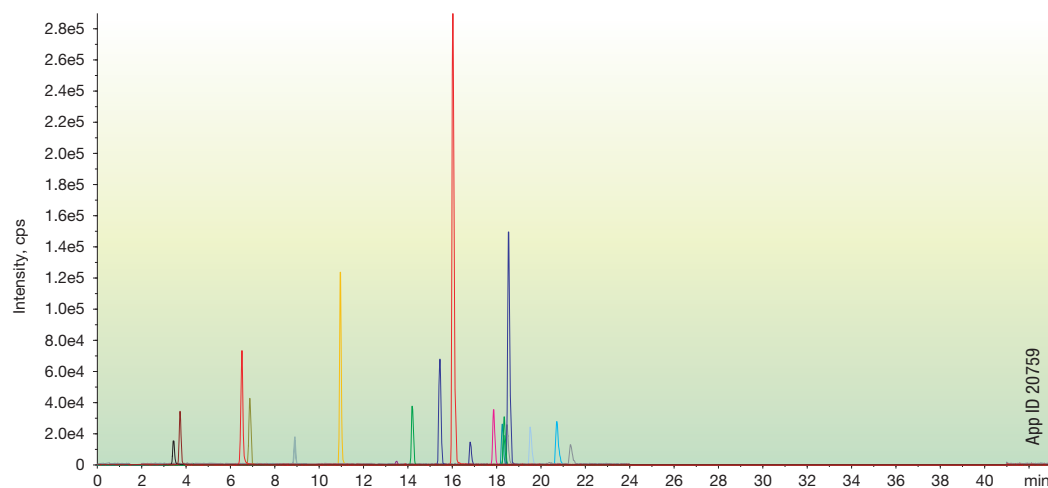
# Extraction of Pesticide Residues from Lettuce Using roQ™ EN 15662 QuEChERS Kits

## LC/MS/MS Analysis

This application outlines the QuEChERS procedure for the extraction of 16 pesticide residues from lettuce using EN 15662 methodology. Extracts from the QuEChERS procedure were diverted to LC/MS/MS for analysis.

### roQ kits used:

- Extraction Kit, EN Method, 4.0g MgSO<sub>4</sub>, 1.0g NaCl, 1.0g SCTD, 0.5g SCDS (part no. KS0-8909)
- dSPE Kit, 15 mL, 900 mg MgSO<sub>4</sub>, 150 mg PSA (part no. KS0-8924)



**Column:** Luna® 3 µm C18(2)  
**Dimensions:** 150 x 3.0 mm  
**Part No.:** 00F-4251-Y0  
**Mobile Phase:** A: 5 mM Formic acid in Water  
 B: 5 mM Formic acid in Methanol  
**Gradient:**

Time (min)	B (%)
0	25
15	90
30	90
30.01	25
43	25

**Flow Rate:** 0.3 mL/min  
**Detection:** API 4000™ MS/MS, ESI positive (ESI+)  
**Temperature:** Ambient

**Source/Gas Parameters (Positive polarity)**  
**CAD:** 5.00  
**CUR:** 20.00  
**GS1:** 55.00  
**GS2:** 50.00  
**IS:** 4000.00  
**TEM:** 550.00  
**ihe:** ON  
**EP:** 10.00

Pesticides	% Recovery 80 ng/g	% RSD (n=5)	% Recovery 200 ng/g	% RSD (n=5)
Atrazine	86	10	90	4
Azoxystrobin	92	9	90	4
Carbaryl	87	10	82	5
Chlorpyrifos	97	10	92	5
Chlorpyrifos-methyl	102	11	88	5
Cyprodinil	85	9	83	4
Ethion	92	9	78	6
Imazalil	94	8	92	4
Imidacloprid	90	9	84	3
Kresoxim-methyl	96	10	84	4
Linuron	86	11	84	4
Methamidophos	81	10	68	5
Methomyl	89	9	98	4
Tebuconazole	95	9	100	3
Thiabendazole	76	9	92	4
Tolyfuanid	82	11	81	7



# Analysis Tools You Can Depend On

Achieve resolution of multi-residues with Phenomenex HPLC, UHPLC, and GC columns.

## HPLC



### Luna® High Performance Silica-based HPLC Columns

Made of ultrapure, metal-free silica (99.99 % purity), Luna is one of the world's leading HPLC columns.

- Industry benchmark for HPLC columns
- Wide pH stability for long column lifetime
- Extensive method validation document for proven reproducibility



Visit [www.phenomenex.com/luna](http://www.phenomenex.com/luna) for more information.

## HPLC/UHPLC

### Kinetex® Core-Shell LC Columns



Leverage the power of Kinetex to achieve ultra-high performance on any LC system.

- Increase resolution, throughput, and sensitivity
- Decrease solvent consumption
- Save time and money
- Transfer methods anywhere



Visit [www.phenomenex.com/kinetex](http://www.phenomenex.com/kinetex) for more information.

## GC

### Zebtron™ High Performance ZB-MultiResidue™ Columns



ZB-MultiResidue-1 & 2 columns are optimized for pesticides, herbicides, and insecticide analysis. These columns have an orthogonal selectivity that allows them to be used together in dual column confirmation analysis.

- Low activity, decreased breakdown of sensitive pesticides such as DDT
- MS Certified phases provide low bleed performance for pesticide confirmation by MS
- Long column lifetimes



Visit [www.phenomenex.com/zebron](http://www.phenomenex.com/zebron) for more information.



# Ordering Info

## roQ™ Extraction Kits

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	\$ 160
<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	\$ 160
<b>Original Non-buffered Method Extraction Kits</b>			
4.0 g MgSO <sub>4</sub> , 1.0 g NaCl	50/pk	KSO-8910	\$ 155
6.0 g MgSO <sub>4</sub> , 1.5 g NaCl	50/pk	KSO-8912	158

## 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	\$ 130
150 mg MgSO <sub>4</sub> , 25 mg PSA, 2.5 mg GCB	100/pk	KSO-8914	140
150 mg, MgSO <sub>4</sub> , 25 mg PSA, 7.5 mg GCB	100/pk	KSO-8915	150
150 mg MgSO <sub>4</sub> , 25 mg PSA	100/pk	KSO-8916	130
150 mg MgSO <sub>4</sub> , 50 mg PSA, 50 mg C18E, 50 mg GCB	100/pk	KSO-8917	170
150 mg MgSO <sub>4</sub> , 50 mg PSA, 50 mg C18E	100/pk	KSO-8918	130
150 mg MgSO <sub>4</sub> , 50 mg PSA, 50 mg GCB	100/pk	KSO-8919	150
150 mg MgSO <sub>4</sub> , 50 mg PSA	100/pk	KSO-8920	130
<b>15 mL dSPE Kits</b>			
900 mg MgSO <sub>4</sub> , 150 mg PSA, 150 mg C18E	50/pk	KSO-8921	\$ 120
900 mg MgSO <sub>4</sub> , 150 mg PSA, 15 mg GCB	50/pk	KSO-8922	135
900 mg MgSO <sub>4</sub> , 150 mg PSA, 45 mg GCB	50/pk	KSO-8923	140
900 mg MgSO <sub>4</sub> , 150 mg PSA	50/pk	KSO-8924	115
1200 mg MgSO <sub>4</sub> , 400 mg PSA, 400 mg C18E, 400 mg GCB	50/pk	KSO-8925	220
1200 mg MgSO <sub>4</sub> , 400 mg PSA, 400 mg C18E	50/pk	KSO-8926	120
1200 mg MgSO <sub>4</sub> , 400 mg PSA, 400 mg GCB	50/pk	KSO-8927	200
1200 mg MgSO <sub>4</sub> , 400 mg PSA	50/pk	KSO-8928	115

## Bulk roQ QuEChERS Sorbents

Phase	10 g	Price	100 g	Price
C18-E	—	—	04G-4348	Inquire
GCB (Graphitized Carbon Black)	04D-4615	Inquire	04G-4615	Inquire
PSA	—	—	04G-4610	Inquire

### Terms and Conditions

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

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## roQ Extraction Salt Packets

Salt packets only. Centrifuge tubes not included.

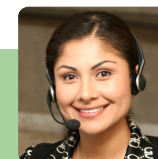
Description	Unit	Part No.	Price
<b>AOAC 2007.01 Method Extraction Packets</b>			
6.0g MgSO <sub>4</sub> , 1.5g NaOAc	50/pk	AHO-9043	\$ 135
<b>EN 15662 Method Extraction Packets</b>			
4.0g MgSO <sub>4</sub> , 1.0g NaCl, 1.0g SCTD, 0.5g SCDS	50/pk	AHO-9041	\$ 135
<b>Original Non-Buffered Method Extraction Packets</b>			
4.0g MgSO <sub>4</sub> , 1.0g NaCl	50/pk	AHO-9042	\$ 125
6.0g MgSO <sub>4</sub> , 1.5g NaCl	50/pk	AHO-9044	132

We're here to help!

Speak with your Sample Preparation Specialist

By phone: **310-212-0555**

By email: **Support@Phenomenex.com**



If roQ QuEChERS Kits do not perform as well or better than your current QuEChERS product, send in your comparative data within 45 days and keep the roQ QuEChERS Kit for FREE.

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