

**Thermo Scientific  
HyperSep Dispersive  
SPE Products**



*Efficient sample preparation and clean-up  
using the QuEChERS Method*

**The QuEChERS method overcomes the problems associated with time consuming, expensive and labor intensive multiresidue methods (MRM).**



## benefits

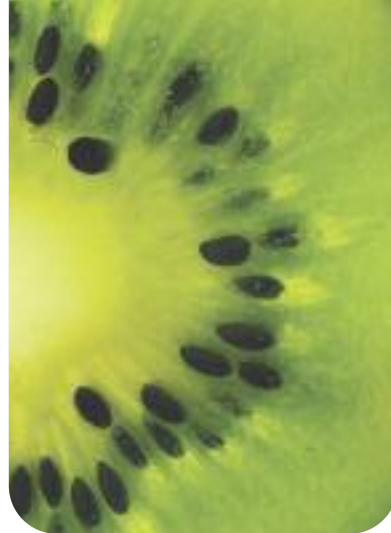
QuEChERS stands for Quick, Easy, Cheap, Effective, Rugged and Safe. The method, developed in 2003 by Anastassiades and Lehotay, is becoming the method of choice by many for food analysis.

- High sample throughput
- Determination of a large number of pesticide compounds
- No laborious steps and no need for automation
- Less solvent usage than conventional MRM's
- Detection of wide pesticide range (polars, pH-dependent compounds)
- Extraction in acetonitrile – GC and LC amenable
- High recovery levels and accurate results



Our comprehensive range of Dispersive SPE products contain the proper sorbents for optimum extraction, clean-up and separation of analytes from complex matrices such as food using QuEChERS methods.

- Save valuable time in preparation – products are supplied pre-prepared
- Reduced variability due to consistency in products and rigorous quality control
- Cleaner extracts from cleaner, pre-prepared products
- Lower peak counts as a result of using pre-prepared products



**For non-base sensitive compounds, such as bendiocarb and diuron**

- 1 Add 15 mL of acetonitrile to QuEChERS centrifuge tube
- 2 Shake to mix contents.
- 3 Add surrogate or internal standards if necessary\*
- 4 Add 15 g of homogenised hydrated sample and shake for 1 minute
- 5 Centrifuge tube for 1 minute at 3700 rcf
- 6 Add an aliquot of the supernatant to the appropriate clean-up tube (and shake for 1 minute)
- 7 Centrifuge for 1 minute at 3700 rcf
- 8 Analyse extract

- 50 mL PP centrifuge tube: 60105-211
- 2mL or 15 mL clean-up tubes: 60105-202, 60105-203, 60105-204, 60105-205, 60105-206

**For base sensitive compounds such as folpet and fungicides**

- 1 Add 15 mL of 1% acetic acid in acetonitrile to QuEChERS centrifuge tube
- 2 Shake to mix contents
- 3 Add surrogate or internal standards if necessary\*
- 4 Add 15 g of homogenised hydrated sample and shake for 1 minute
- 5 Centrifuge tube for 1 minute at 3700 rcf
- 6 Add an aliquot of the supernatant to the appropriate clean-up tube and shake for 1 minute
- 7 Centrifuge for 1 minute at 3700 rcf
- 8 Analyse extract

- 50 mL PP centrifuge tube: 60105-210
- 2 mL or 15 mL clean-up tubes: 60105-202, 60105-203, 60105-204, 60105-205, 60105-206

**For polar aromatic (planar) compounds such as matrix plant pigments**

- 1 Pre-rinse the cartridge with 5mL of toluene
- 2 Add an aliquot of the supernatant to the cartridge
- 3 Start collection
- 4 Elute with 6-12 mL of 3:1 acetone:toluene
- 5 Concentrate for GC/MS analysis - or -
- 6 Concentrate to dryness and reconstitute in mobile phase for LC analysis

- 6 -mL columns: 60105-207, 60105-208, 60105-209

\* Surrogate or internal standards may be required if subsequent analysis is required. We offer a complete range of standards — visit [thermo.com](http://thermo.com) for more information



## Pesticides in Strawberries

A study was carried out to investigate the number of pesticide compounds in strawberry samples by LC/MS analysis. The samples were first extracted and cleaned up using HyperSep dispersive SPE products. They were subsequently analysed using the Thermo Scientific ACCELA system/TSQ Quantum LC/MS system, with a Thermo Scientific Hypersil GOLD column

The sample clean-up procedure was carried out by using a 50 mL centrifuge tube with 4g Anhydrous Magnesium Sulfate and 1g NaCl (part no 60105-211). The subsequent dispersive step was carried out using a 2mL centrifuge tube with 150 mg Anhydrous Magnesium Sulfate and 50 mg PSA (part no 60105-203).

**After extraction, the raw extract was injected onto the LCMS system without further concentration.**

### ACCELA™ LC CONDITIONS

<b>Phase A:</b>	Water/10mM Ammonium Acetate
<b>Phase B:</b>	Methanol
<b>Column:</b>	1.9 $\mu$ , 50 x 2.1 mm Hypersil GOLD (Part number 25002-052130)
<b>Flow:</b>	500 $\mu$ l/min
<b>Inj. Volume:</b>	10 $\mu$ l
<b>Column Temperature:</b>	30 °C

### GRADIENT PROGRAM

Time	Flow Rate	Composition
0.00 (min)	0.400 (mL/min)	A=95.0% B=5.0%
6.00 (min)	0.400 (mL/min)	A=5.0% B=95.0%
8.00 (min)	0.400 (mL/min)	A=5.0% B=95.0%
8.50 (min)	0.400 (mL/min)	A=95.0% B=5.0%
12.00 (min)	0.400 (mL/min)	A=95.0% B=5.0%

### TARGET ANALYTES

In total 70 different compounds were detected in under 11 minutes including –

- Imazalil
- Methiocarb
- Metoxuron
- Thiodicarb

## Thermo Scientific benchtop centrifuges

Providing outstanding processing power, unique safety features and a broad array of rotors and accessories, our benchtop centrifuge solutions deliver the capabilities to accelerate your preparation processes.

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[www.thermo.com/centrifuge](http://www.thermo.com/centrifuge)



Thermo Scientific HyperSep Dispersive SPE products are available in a range of sorbent material combinations. Each of the sorbent materials is used to remove different interferences from the starting sample. The table below shows the different sorbent materials used and the compounds they are used to target.

Polypropylene Centrifuge Tubes				
Size	Contents	Application	Quantity	Part No.
50mL	6g Anhydrous Magnesium Sulfate, 1.5g Anhydrous Sodium Acetate	This product is listed in the AOAC for the extraction of pesticide residues using the QuEChERS method. Primarily designed to preserve base sensitive compounds such as chlorothalonil, dichloofluanid, tolyluanid, folpet, captafol, captan from non-acidic matrices	250 per pack	60105-210
50mL	4g Anhydrous Magnesium Sulfate, 1g Sodium Chloride	This product is used for the extraction of pesticide residues using the QuEChERS method. It is preferred when base sensitive compounds are not present or are not of analytical interest. Eliminating the buffer allows a cleaner extract, and sodium chloride aids in the extraction of the analytes.	250 per pack	60105-211
50mL	6g Anhydrous Magnesium Sulfate, 1.5g Sodium Chloride, 1.5g Sodium Citrate Tribasic Dihydrate, 750mg Sodium Citrate Dibasic Sesquihydrate	This product is the European version of 60105-210 and is used for the extraction of pesticide residues. It is preferred when base sensitive compounds are not an issue.	250 per pack	60105-212

Centrifuge Tubes				
Size	Contents	Application	Quantity	Part No.
2mL	150mg Anhydrous Magnesium Sulfate, 50mg PSA & 50mg Carbon	Removing polar organic acids, some sugars and lipids which may cause some loss of planar pesticides. Designed for use with a 2mL aliquot of supernatant.	100 per pack	60105-202
2mL	150mg Anhydrous Magnesium Sulfate, 50mg PSA	Removing polar organic acids, some sugars and lipids. Designed for use with a 2mL aliquot of supernatant.	100 per pack	60105-203
2mL	150mg Anhydrous Magnesium Sulfate, 50mg PSA & 50mg endcapped C18	Removing polar organic acids, sterols, some sugars and lipids. Designed for use with a 2mL aliquot of supernatant.	100 per pack	60105-204
15mL	900mg Anhydrous Magnesium Sulfate, 300mg PSA & 150mg Carbon	Removing polar organic acids, some sugars and lipids. This product will cause the loss of planar pesticides. Designed for use with a 10mL aliquot of supernatant.	50 per pack	60105-205
15mL	900mg Anhydrous Magnesium Sulfate, 300mg PSA & 150mg endcapped C18	Removing polar organic acids, sterols, some sugars and lipids for a 10mL aliquot.	50 per pack	60105-206

Columns				
Size	Contents	Application	Quantity	Part No.
6mL	200mg graphitized carbon on top, 400mg PSA on bottom, separated by a Teflon frit	Used in the Schenck variation of QuEChERS, this product removes pigments, polar organic acids, some sugars and lipids from an aliquot of extract	30	60105-207
6mL	250mg graphitized carbon on top, 500mg PSA on bottom, separated by a Teflon frit	Schenck variation of QuEChERS, but with a different quantity of sorbents. When in doubt, use 60105-208	30	60105-208
6mL	500mg graphitized carbon on top, 500mg PSA on bottom, separated by a Teflon frit	Schenck variation of QuEChERS, but with a different quantity of sorbents. When in doubt, use 60105-208	30	60105-209

*The Schenck variation of QuEChERS introduces the use of PSA and graphitized carbon block to remove high levels of chlorophyll and plant sterols in the final extract without loss of planar pesticides using an acetone : toluene solvent mix (3:1).*



### LC Columns and Consumables

As a leader in HPLC column technology including silica manufacturing, bonded phase production and column packing, you can rely on Thermo Scientific HPLC products. For over 30 years our innovation has pioneered the market with advanced products such as our Hypersil GOLD columns offering outstanding peak shape and consistent results.



### GC Columns and Consumables

Thermo Scientific TRACE GC Columns offer high temperature stability and exhibit low bleed and long lifetimes. From general purpose non-polar to polar columns, many of which are MS-compatible, TRACE™ GC columns provide excellent quality and performance, with guaranteed results.



### Pierce Reagents

We offer a wide range of high quality GC/HPLC reagents and solvents, which include:

- Silylation, Alkylation and Acylation reagents for GC derivatisation
- HPLC/GC Grade Solvents
- HPLC detection reagents for pre- and post-chromatographic techniques. All compounds and formulations are purified for chromatography, minimizing artefact formation

[www.thermo.com/columns](http://www.thermo.com/columns)

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