

The following is the Technical and Ordering information for:

- **QuEChERS (Quick, Easy, Cheap, Effective, Rugged and Safe)**
- **dSPE (dispersive) Solid Phase Extraction**

These products will enable you to work with the following methods:

- **EN – 15662** – For the analysis of pesticide residues in food using GC-MS and or LC-MS/MS following the acetonitrile extraction / portioning and cleanup by dSPE
- **AOAC 20070.01** – For the analysis of pesticide residues in food by acetonitrile extraction and portioning with MgSO₄
- **Mini Multiresidue** – For the analysis of pesticide residues in low fat products

Our products make it simple to prepare food samples for analysis thereby achieving:

- Higher recoveries
- More accurate results
- Higher sample throughputs
- Minimal solvent use
- Fewer manhours
- And ultimately lower costs

Process Steps

1. Prepare sample – 10g or 15 g
2. Add acetonitrile
3. Select extraction kit – see table 1
4. Choose method
5. Check pH, adjust to between 5 and 5.5
6. Add internal standard
7. Aliquot
8. Select extraction kit – see table 1
9. Choose AQAC 2007.1 or EN 15662 method
10. Shake – 20-120 seconds or centrifuge 3000rpm for 60-300 seconds.
11. Conduct analysis



Phase 1 – Extraction

Select the extraction depending on the type of food and appropriate method. Add solvent and salts to 10g or 15g fruit or vegetable sample, enabling extraction of the pesticide into the organic layer (Table 1)

Phase 1 – Extraction Kit

50mL centrifuge tubes for sample extraction

Table1

Part #	Description	Qty.	Recommended method
Qu-01-50T	4g MgSO ₄ , 1g NaCl, 1g trisodium citrate dihydrate, 0.5g disodium hydrogencitrate sesquihydrate	50	EN – 15662
Qu-02-50T	4g MgSO ₄ , 1g NaCl	50	Mini Multiresidue – (10g sample)
Qu-03-50T	6g MgSO ₄ , 1.5g NaCl, 1.5g sodium citrate dibasic, 0.75g disodium citrate dibasic sesquihydrate	50	
Qu-04-50T	6g MgSO ₄ , 1.5g NaOAc	50	AOAC 20070.01
Qu-05-50T	6g MgSO ₄ , 1.5g NaOAc, 0.75g disodium citrate sesquihydrate	50	
Qu-06-50T	6g MgSO ₄ , 1.5g NaCl	50	Mini Multiresidue (15g sample)

Packet

Part #	Description	Qty.	Recommended method
Qu-01-50P	4g MgSO ₄ , 1g NaCl, 1g trisodium citrate dihydrate, 0.5g disodium hydrogencitrate sesquihydrate	50	EN – 15662
Qu-02-50P	4g MgSO ₄ , 1g NaCl	50	Mini Multiresidue – (10g sample)
Qu-03-50P	6g MgSO ₄ , 1.5g NaCl, 1.5g sodium citrate dibasic, 0.75g disodium citrate dibasic sesquihydrate	50	
Qu-04-50P	6g MgSO ₄ , 1.5g NaOAc	50	AOAC 20070.01
Qu-05-50P	6g MgSO ₄ , 1.5g NaOAc, 0.75g disodium citrate sesquihydrate	50	
Qu-06-50P	6g MgSO ₄ , 1.5g NaCl	50	Mini Multiresidue (15g sample)

Phase 2 – dSPE Cleanup

Select the extraction kit depending on the type of food and appropriate method. One aliquot of Phase 1 is added to either the 2mL or 15mL centrifuge tube that contains a small quantity of SPE sorbent and MgSO₄.

Phase 2 – dSPE kit

2mL centrifuge tubes for sample extraction

Part #	Description	Qty.	Aliquot	Recommended method
Qu-01-2T	150mg MgSO ₄ , 25mg PSA	100	1mL	EN – 15662 Mini Multiresidue
Qu-02-2T	150mg MgSO ₄ , 25mg PSA, 25mg C18	100	1mL	EN – 15662 Mini Multiresidue
Qu-03-2T	150mg MgSO ₄ , 25mg PSA, 2.5mg GCB	100	1mL	EN – 15662 Mini Multiresidue
Qu-04-2T	150mg MgSO ₄ , 25mg PSA, 7.5mg GCB	100	1mL	EN – 15662 Mini Multiresidue
Qu-05-2T	150mg MgSO ₄ , 50mg PSA	100	1mL	AOAC 20070.01
Qu-06-2T	150mg MgSO ₄ , 50mg PSA, 50mg C18	100	1mL	AOAC 20070.01
Qu-07-2T	150mg MgSO ₄ , 50mg PSA, 50mg GCB	100	1mL	AOAC 20070.01
Qu-08-2T	150mg MgSO ₄ , 50mg PSA, 50mg C18, 50mg GCB	100	1mL	AOAC 20070.01
Qu-09-2T	150mg MgSO ₄ , 25mg C18	100	1mL	AOAC 20070.01

PSA = primary / secondary amine

GCB = graphitized carbon black

Phase 2 – dSPE kit

15mL centrifuge tubes for sample extraction

Part #	Description	Qty.	Aliquot	Recommended method
Qu-01-15T	1200mg MgSO ₄ , 400mg PSA	50	8mL	AOAC 20070.01
Qu-02-15T	1200mg MgSO ₄ , 400mg PSA, 400mg C18	50	8mL	AOAC 20070.01
Qu-03-15T	1200mg MgSO ₄ , 400mg PSA, 400mg GCB	50	8mL	AOAC 20070.01
Qu-04-15T	1200mg MgSO ₄ , 400mg PSA, 400 C18, 400mg GCB	50	8mL	AOAC 20070.01
Qu-05-15T	900mg MgSO ₄ , 150mg PSA	50	6mL	EN - 15662
Qu-06-15T	900mg MgSO ₄ , 150mg PSA, 15mg GCB	50	6mL	EN - 15662
Qu-07-15T	900mg MgSO ₄ , 150mg PSA, 45mg GCB	50	6mL	EN - 15662
Qu-08-15T	900mg MgSO ₄ , 150mg PSA, 150 C18	50	6mL	EN - 15662
Qu-09-15T	900mg MgSO ₄ , 150mg PSA, 150mg GCB	50	6mL	EN - 15662
Qu-10-15T	900mg MgSO ₄ , 300mg PSA, 150 C18	50	6mL	EN - 15662
Qu-11-15T	900mg MgSO ₄ , 150 C18	50	6mL	AOAC 20070.01
Qu-12-15T	750mg MgSO ₄ , 250mg PSA, 250 C18, 250mg GCB	50		

PSA = primary / secondary amine

GCB = graphitized carbon black

Phase 2 – dSPE kit

Packets








Part #	Description	Qty.	Recommended method
Qu-01-15P	1200mg MgSO ₄ , 400mg PSA	50	AOAC 20070.01
Qu-02-15P	1200mg MgSO ₄ , 400mg PSA, 400mg C18	50	AOAC 20070.01
Qu-03-15P	1200mg MgSO ₄ , 400mg PSA, 400mg GCB	50	AOAC 20070.01
Qu-04-15P	1200mg MgSO ₄ , 400mg PSA, 400 C18, 400mg GCB	50	AOAC 20070.01
Qu-05-15P	900mg MgSO ₄ , 150mg PSA	50	EN - 15662
Qu-06-15P	900mg MgSO ₄ , 150mg PSA, 15mg GCB	50	EN - 15662
Qu-07-15P	900mg MgSO ₄ , 150mg PSA, 45mg GCB	50	EN - 15662
Qu-08-15P	900mg MgSO ₄ , 150mg PSA, 150 C18	50	EN - 15662
Qu-09-15P	900mg MgSO ₄ , 150mg PSA, 150mg GCB	50	EN - 15662
Qu-10-15P	900mg MgSO ₄ , 300mg PSA, 150 C18	50	EN - 15662
Qu-11-15P	900mg MgSO ₄ , 150 C18	50	AOAC 20070.01
Qu-12-15P	750mg MgSO ₄ , 250mg PSA, 250 C18, 250mg GCB	50	
Qu-13-15P	1200mg MgSO ₄ , 400mg PSA, 400 C18, 60mg GCB	50	

PSA = primary / secondary amine

GCB = graphitized carbon black

Selection Guide for dSPE kits – Phase 2

Chose the Breakwood part number for your application and method.

Types	EN - 15662	AOAC 2007.1	Mini Multiresidue	Other	Qty/pack
General fruits & vegetables – removes polar organic acids, some sugars and lipids					
Ex. - Lettuce 	Qu-01-2T	Qu-05-2T	Qu-01-2T		2mL tubes, 100/pk
Ex. - Fruit 	Qu-05-15T	Qu-01-15T			15mL tubes, 50/pk
Fruits & vegetables with fats & waxes – removes polar organic acids, some sugars more lipids and sterols					
Ex. - Avocado 	Qu-02-2T	Qu-06-2T	Qu-02-2T		2mL tubes, 100/pk
Ex. - Nuts 	Qu-08-15T	Qu-02-15T		Qu-08-15T	15mL tubes, 50/pk
Pigmented fruits & vegetables – removes polar organic acids, some sugars and more lipids, and carotenoids and chlorophyll, not for use with planar pesticides.					
Ex. - Tomatoes 	Qu-03-2T	Qu-07-2T	Qu-03-2T	Qu-07-2T	2mL tubes, 100/pk
Ex. Strawberry 	Qu-06-15T	Qu-03-15T			15mL tubes, 50/pk
Highly pigmented fruits & vegetables – removes polar organic acids, some sugars and lipids, plus high levels of carotenoids and chlorophyll, not for use with planar pesticides.					
Ex. - Peppers 	Qu-04-2T	Qu-08-2T	Qu-04-2T		2mL tubes, 100/pk
Ex. - Broccoli 	Qu-07-15T			Qu-09-15T	15mL tubes, 50/pk
Fruits & vegetables with pigments and fats – removes polar organic acids, some sugars and lipids, plus carotenoids and chlorophyll, not for use with planar pesticides.					
Ex. - Egg plant 		Qu-08-2T			2mL tubes, 100/pk
Ex. - Broccoli 		Qu-04-15T			15mL tubes, 50/pk
Other food methods – remove biological matrix interferences, including hydrophobic substances (fats, lipids) and proteins					
Blank		Qu-09-2T			2mL tubes, 100/pk
Blank		Qu-11-15T			15mL tubes, 50/pk

Thank you for choosing Breakwood Enterprises. We look forward to serving you again. If you have any questions, please contact us.

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