

Accurately Detect and Quantify 204 Pesticides of Global Concern by LC-MS/MS

With Our New Certified Reference Materials Kit



Stop spending your time and money developing LC-MS/MS multi-residue pesticide methods and mixing reference standards when you could be running samples! Restek's trusted food safety experts have already done the work for you—with guaranteed accuracy and at a lower cost. Restek's new certified reference materials (CRMs) for LC-MS/MS multi-residue pesticide analysis eliminate the need to source, purchase, and store individual materials along with the need to prepare your own mixes.

- Full kit contains 204 compounds of interest, covering many LC-determined pesticides listed by government agencies; individual ampuls also sold separately.
- Formulated and grouped for maximum long-term stability and well-balanced chromatographic performance, even for early eluting compounds.
- Quantitatively tested to confirm composition; detailed support documentation provided.
- Optimized multi-residue pesticide method is offered free of charge; downloadable XLS file includes conditions and transition tables.
- Ideal for a wide range of fruits, vegetables, and other commodities.
- Certified reference material (CRM) manufactured and QC-tested in Restek's ISO-accredited labs satisfies your ISO requirements.

Set up, verify, and validate your pesticide-screening methods in less time, with proven confidence, and at a significantly reduced cost by turning to Restek's ISO-accredited labs for your LC-MS/MS multi-residue pesticide certified reference materials. For added convenience and unbeatable results, also consider our internal standards, Ultra and Pinnacle® DB LC columns, and Q-sep™ QuEChERS sample prep products.

Learn more at www.restek.com/LC-multi-residue



Innovative Chromatography Products

www.restek.com • 1-800-356-1688 • 1-814-353-1300

Perform Quantitative LC-MS/MS Multi-Residue Pesticide Analysis of 204 Compounds With 1 Reference Standards Kit (cat.# 31971)

Std #**	Compound (100 µg/mL each)	CAS #	Std #**	Compound (100 µg/mL each)	CAS #	Std #**	Compound (100 µg/mL each)	CAS #
4	Abamectin	71751-41-2	5	Fenamidone	161326-34-7	4	Myclobutanil (Systhane)	88671-89-0
1	Acephate	30560-19-1	6	Fenarimol	60168-88-9	3	Neburon	555-37-3
4	Acetamiprid	135410-20-7	4	Fenazaquin	120928-09-8	4	Nitenpyram	120738-89-8
5	Acibenzolar-S-methyl	135158-54-2	6	Fenbuconazole	114369-43-6	3	Novaluron	116714-46-6
2	Alanycarb	83130-01-2	4	Fenhexamid	126833-17-8	6	Nuarimol	63284-71-9
2	Aldicarb	116-06-3	3	Fenobucarb (BPMC)	3766-81-2	1	Omethoate	1113-02-6
2	Aldicarb sulfone	1646-88-4	3	Fenoxycarb	79127-80-3	4	Oxadixyl	77732-09-3
2	Aldicarb sulfoxide	1646-87-3	7	Fenpropimorph	67564-91-4	2	Oxamyl	23135-22-0
4	Ametryn	834-12-8	4	Fenpyroximate	111812-58-9	6	Paclobutrazol	76738-62-0
9	Aminocarb	2032-59-9	3	Fenuron	101-42-8	6	Penconazole	66246-88-6
4	Amitraz	33089-61-1	5	Fipronil	120068-37-3	9	Phenmedipham	13684-63-4
4	Azoxystrobin	131860-33-8	4	Flonicamid	158062-67-0	4	Picoxystrobin	117428-22-5
6	Baycor (Bitteranol)	55179-31-2	4	Fluazinam	79622-59-6	4	Piperonyl butoxide	51-03-6
4	Benalaxyl	71626-11-4	5	Flubendiamide	272451-65-7	3	Pirimicarb	23103-98-2
3	Bendiocarb	22781-23-3	4	Fludioxonil	131341-86-1	4	Prochloraz	67747-09-5
2	Benfuracarb	82560-54-1	5	Flufenacet (Fluthiamide)	142459-58-3	3	Promecarb	2631-22-0
4	Benzoximate	29104-30-1	3	Flufenoxuron	101463-69-8	4	Prometon	1610-18-0
3	Bifenazate	149877-41-8	3	Fluometuron	2164-17-2	5	Prometryne	7287-19-6
4	Boscalid	188425-85-6	4	Fluoxastrobil	361377-29-9	9	Propamocarb	24579-73-5
6	Bromuconazole	116255-48-2	6	Fluquinconazole	136426-54-5	5	Propargite (Omite)	2312-35-8
5	Bupirimate	41483-43-6	6	Flusilazole	85509-19-9	3	Propham	122-42-9
5	Buprofezin	69327-76-0	4	Flutolanil	66332-96-5	6	Propiconazole (Tilt)	60207-90-1
4	Butafenacil	134605-64-4	6	Flutriafol	76674-21-0	3	Propoxur (Baygon)	114-26-1
2	Butocarbonyl	34681-10-2	3	Fenchlorfenuron	68157-60-8	5	Prothioconazole	178928-70-6
2	Butoxycarboxim	34681-23-7	9	Formetanate hydrochloride	23422-53-9	4	Pymetrozine	123312-89-0
1	Carbaryl (Sevin)	63-25-2	6	Fuberidazole	3878-19-1	4	Pyracarbolid	24691-76-7
10	Carbendazim	10605-21-7	4	Furalaxyl	57646-30-7	3	Pyraclostrobin	175013-18-0
4	Carbetamide	16118-49-3	2	Furathiocarb	65907-30-4	5	Pyridaben	96489-71-3
3	Carbofuran	1563-66-2	4	Halofenozide	112226-61-6	4	Pyrimethanil	53112-28-0
5	Carboxin	5234-68-4	6	Hexaconazole	79983-71-4	4	Pyriproxyfen	95737-68-1
4	Carfentrazone ethyl	128639-02-1	3	Hexaflumuron	86479-06-3	4	Quinoxifen	124495-18-7
4	Chloanthraniliprole	500008-45-7	5	Hexythiazox	78587-05-0	4	Rotenone	83-79-4
3	Chlorfluazuron	71422-67-8	8	Hydramethylnon	67485-29-4	4	Sebumeton	26259-45-0
3	Chlorotoluron	15545-48-9	3	3-Hydroxycarbofuran	16655-82-6	3	Siduron	1982-49-6
3	Chloroxuron	1982-47-4	4	Imazalil	35554-44-0	5	Simetryn	1014-70-6
5	Clethodim	99129-21-2	4	Imidacloprid	138261-41-3	7	Spinetoram (J&L)	187166-40-1
4	Clofentezine	74115-24-5	3	Indoxacarb	144171-61-9	7	Spinosad	168316-95-8
5	Clothianidin	210880-92-5	6	Ipconazole	125225-28-7	7	Spirodiclofen	148477-71-8
5	Cyazofamid	120116-88-3	3	Iprovalicarb	140923-17-7	7	Spiromesifen	283594-90-1
3	Cycluron	2163-69-1	1	Isocarboxipos	24353-61-5	7	Spirotetramat	203313-25-1
4	Cymoxanil	57966-95-7	3	Isoprocab	2631-40-5	4	Spiroxamine	118134-30-8
6	Cyproconazole	94361-06-5	3	Isoproturon	34123-59-6	5	Sulfentrazone	122836-35-5
4	Cyprodinil	121552-61-2	4	Ivermectin	70288-86-7	6	Tebuconazole (Folicur)	107534-96-3
4	Cyromazine	66215-27-8	4	Kresoxim methyl	143390-89-0	4	Tebufenozide	112410-23-8
9	Desmedipham	13684-56-5	3	Linuron	330-55-2	4	Tebufenpyrad	119168-77-3
6	Dichlobutrazol	75736-33-3	3	Lufenuron	103055-07-8	2	Tebuthiuron	34014-18-1
1	Diclotophos	141-66-2	4	Mandipropamid	374726-62-2	3	Teflubenzuron	83121-18-0
3	Diethofencarb	87130-20-9	5	Mefenacet	73250-68-7	1	Temephos (Abate)	3383-96-8
6	Difenoconazole	119446-68-3	4	Mepanipyrim	110235-47-7	4	Terbutryn	886-50-0
3	Diflubenzuron	35367-38-5	4	Meproline	55814-41-0	5	Tetraconazole	112281-77-3
1	Dimethoate	60-51-5	5	Mesotrione	104206-82-8	5	Thiabendazole	148-79-8
1	Dimethomorph	110488-70-5	4	Metaflumizone	139968-49-3	5	Thiacloprid	111988-49-9
4	Dimoxystrobin	149961-52-4	4	Metalaxyl	57837-19-1	5	Thiamethoxam	153719-23-4
6	Diniconazole	83657-24-3	6	Metconazole	125116-23-6	2	Thidiazuron	51707-55-2
4	Dinotefuran	165252-70-0	2	Methabenzthiazuron	18691-97-9	3	Thiobencarb	28249-77-6
3	Dioxacarb	6988-21-2	1	Methamidophos	10265-92-6	5	Thiofanox	39196-18-4
3	Diuron	330-54-1	2	Methiocarb	2032-65-7	2	Thiophanate-methyl	23564-05-8
4	Doramectin	117704-25-3	2	Methomyl	16752-77-5	4	Triadimefon	43121-43-3
7	Emamectin benzoate (Proclaim)	155569-91-8	5	Methoprotrene	841-06-5	6	Triadimenol (Baytan)	55219-65-3
6	Epoxiconazole	106325-08-0	4	Methoxyfenozide	161050-58-4	1	Trichlorfon (Dylox)	52-68-6
4	Eprinomectin	123997-26-2	3	Metobromuron	3060-89-7	5	Tricyclazole (Beam)	41814-78-2
6	Etaconazole	60207-93-4	5	Metribuzin	21087-64-9	4	Trifloxystrobin	141517-21-7
2	Ethiofencarb	29973-13-5	1	Mevinphos (Phosdrin)	7786-34-7	6	Triflumuron	64628-44-0
5	Ethiprole	181587-01-9	9	Mexacarbate (Zectran)	315-18-4	6	Triticonazole	131983-72-7
6	Ethirimol	23947-60-6	9	Monceren (Pencycuron)	66063-05-6	1	Vamidothion (Vamidoate)	2275-23-2
5	Ethofumesate	26225-79-6	1	Monocrotophos	6923-22-4	4	Zoxamide	156052-68-5
6	Etoazole	153233-91-1	3	Monolinuron	1746-81-2			
4	Famoxadone	131807-57-3	4	Moxidectin	113507-06-5			

Figure 1: LC Multi-Residue Pesticide Standard #1 (cat.# 31972) on Ultra Aqueous C18 by LC-MS/MS.

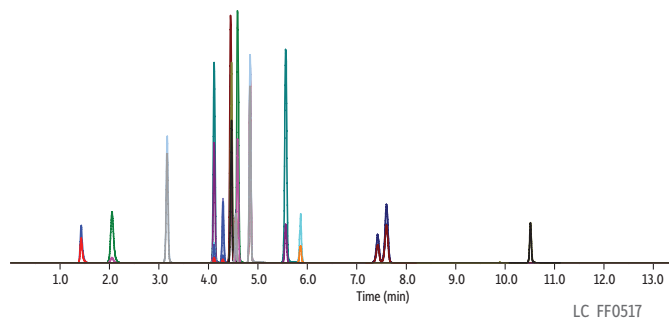


Figure 2: LC Multi-Residue Pesticide Standard #2 (cat.# 31973) on Ultra Aqueous C18 by LC-MS/MS.

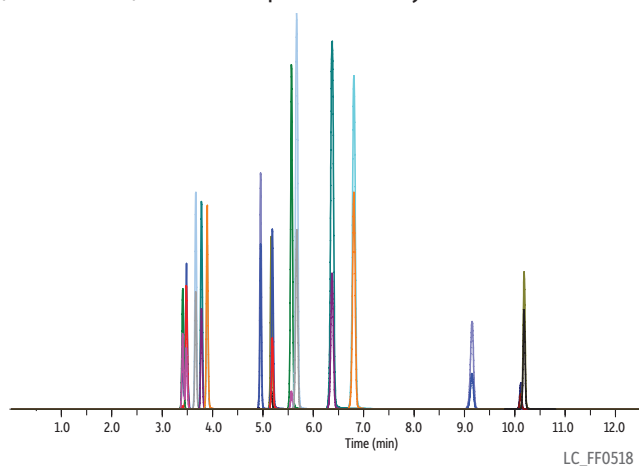


Figure 3: LC Multi-Residue Pesticide Standard #3 (cat.# 31974) on Ultra Aqueous C18 by LC-MS/MS.

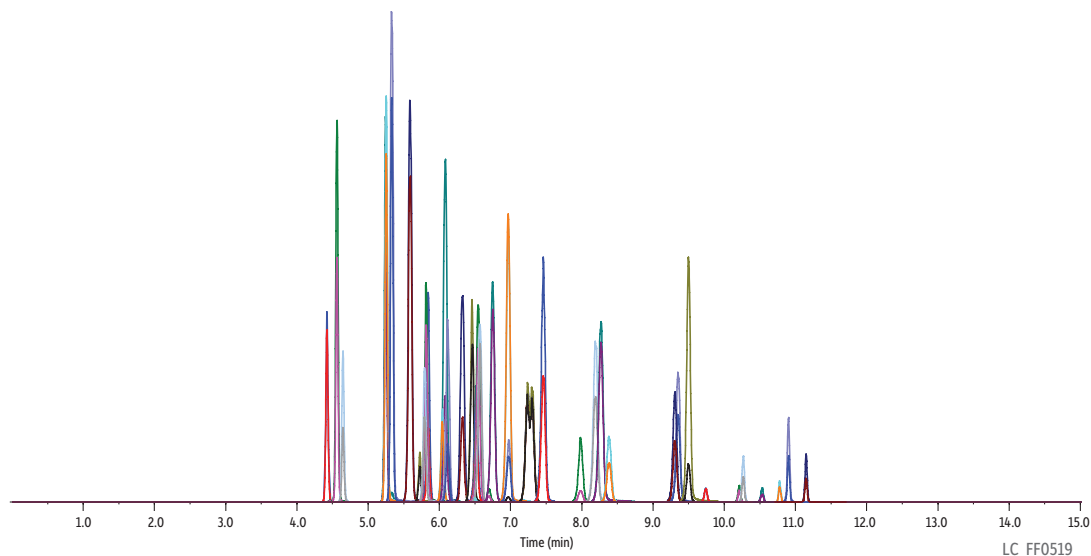
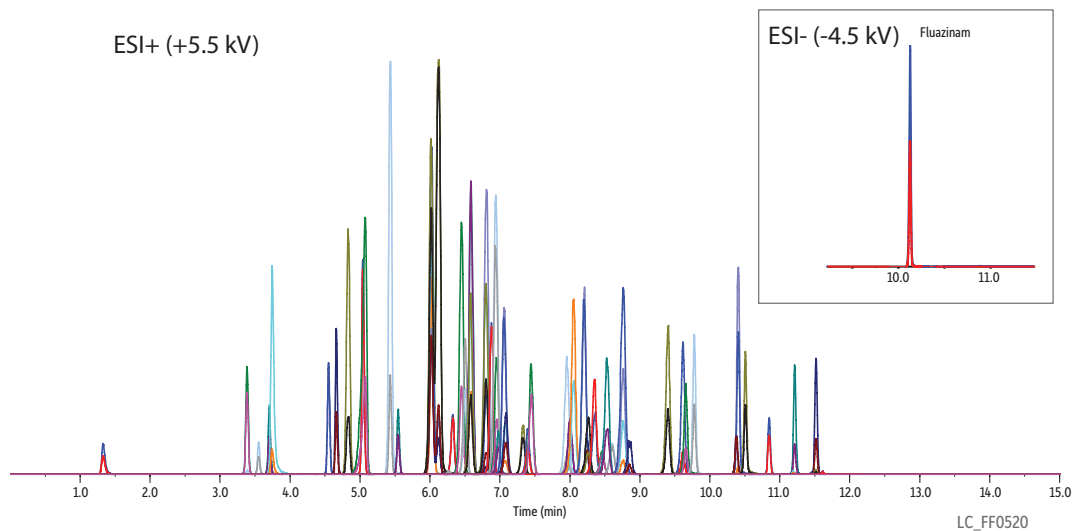


Figure 4: LC Multi-Residue Pesticide Standard #4 (cat.# 31975) on Ultra Aqueous C18 by LC-MS/MS.



For notes, see page 5.

Figure 5: LC Multi-Residue Pesticide Standard #5 (cat.# 31976) on Ultra Aqueous C18 by LC-MS/MS.

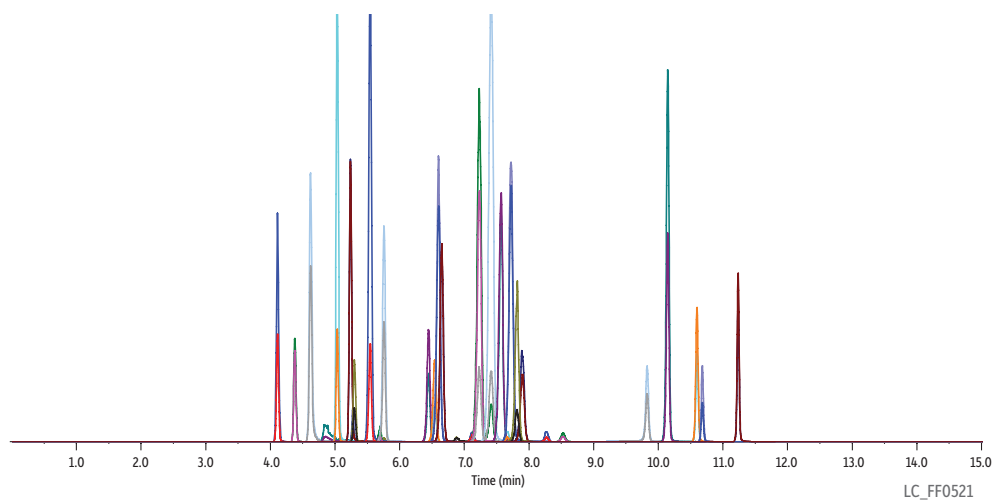


Figure 6: LC Multi-Residue Pesticide Standard #6 (cat.# 31977) on Ultra Aqueous C18 by LC-MS/MS.

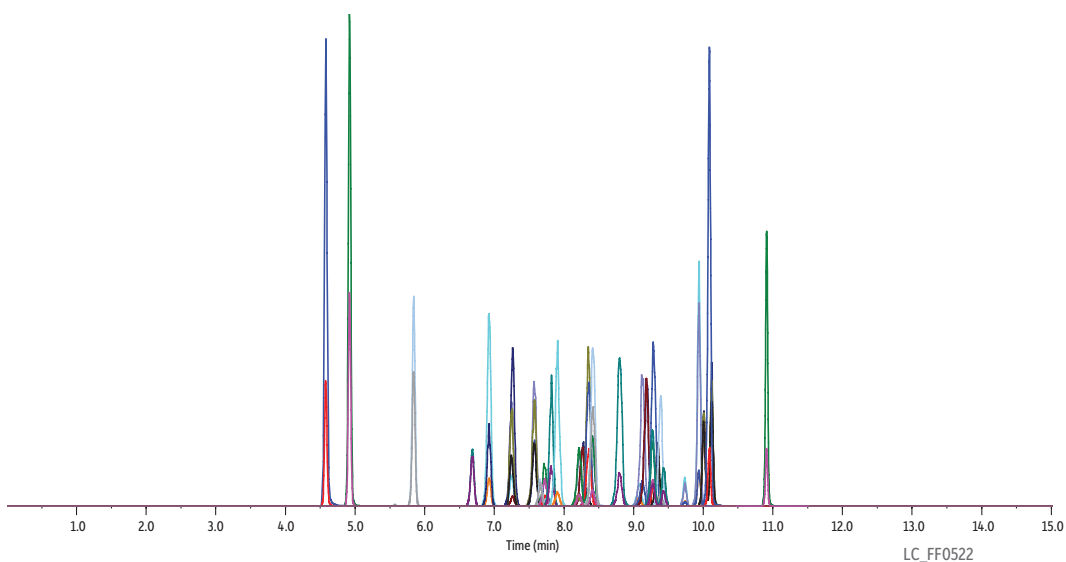


Figure 7: LC Multi-Residue Pesticide Standard #7 (cat.# 31978) on Ultra Aqueous C18 by LC-MS/MS.

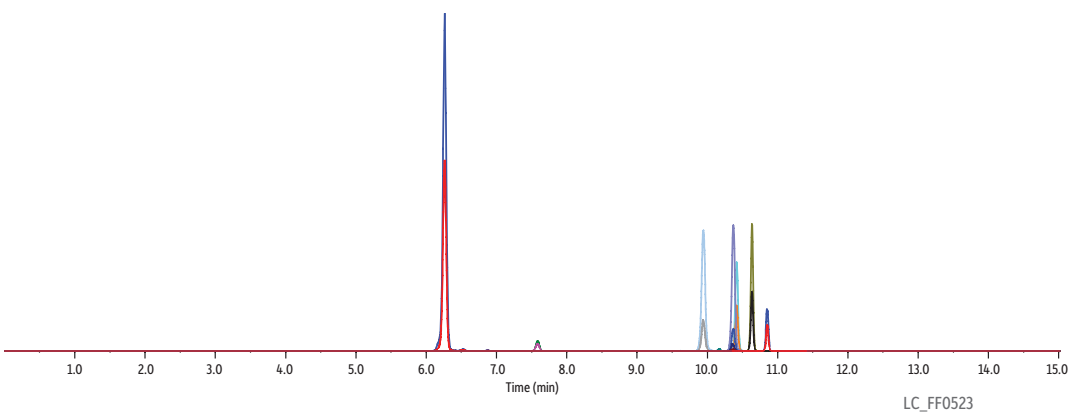


Figure 8: LC Multi-Residue Pesticide Standard #8 (cat.# 31979) on Ultra Aqueous C18 by LC-MS/MS.

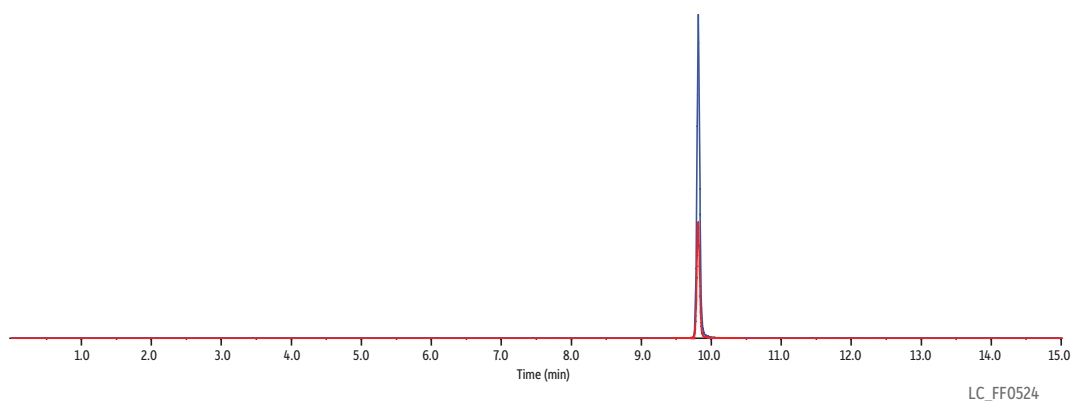


Figure 9: LC Multi-Residue Pesticide Standard #9 (cat.# 31980) on Ultra Aqueous C18 by LC-MS/MS.

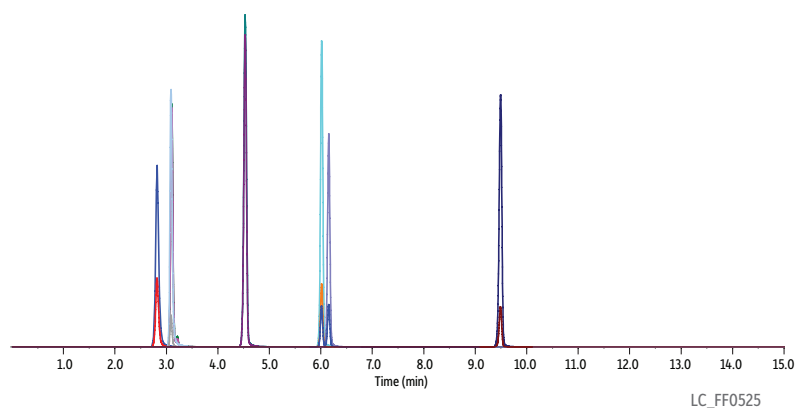
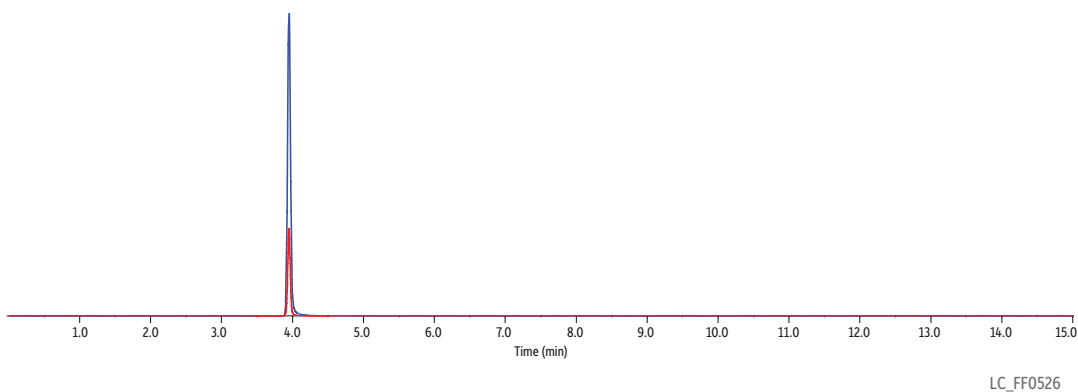


Figure 10: LC Multi-Residue Pesticide Standard #10 (cat.# 31981) on Ultra Aqueous C18 by LC-MS/MS.



NOTES:

* For compound list, see page 2. For conditions, retention times, and transitions, visit www.restek.com/LC-multi-residue

** When combining a large number of compounds with different chemical functionalities, mix stability can be an issue. In formulating these standards, we extensively studied the 204 compounds involved, then grouped them into as few mixes as possible while still ensuring maximum long-term stability and reliability. For quantitative analysis, we recommend analyzing each mix separately to ensure accurate results for every compound.

For Multi-Residue Pesticide Analysis by LC-MS/MS, Restek Recommends...

Certified Reference Materials (CRMs)

LC Multi-Residue Pesticide Kit

- Accurately detect and quantify pesticides of global food safety concern in a wide range of fruits, vegetables, and other commodities by LC-MS/MS.
- Full kit contains 204 compounds of interest, covering many LC-determined pesticides listed by government agencies; individual ampuls also sold separately.
- Formulated and grouped for maximum long-term stability* and well-balanced chromatographic performance, even for early eluting compounds.
- Quantitatively tested to confirm composition; detailed support documentation provided.
- Optimized multi-residue pesticide method is offered free of charge; downloadable XLS file includes conditions and transition tables.
- Certified reference material (CRM) manufactured and QC-tested in Restek's ISO-accredited labs satisfies your ISO requirements.
- For complete compound list, see page 2.

Contains 1 mL each of these mixtures.

cat.# 31971 (kit)

kit

Quantity discounts not available.



LC Multi-Residue Pesticide Standard #1 (13 components)

100 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 31972 (ea.)

LC Multi-Residue Pesticide Standard #2 (16 components)

100 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 31973 (ea.)

LC Multi-Residue Pesticide Standard #3 (38 components)

100 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 31974 (ea.)

LC Multi-Residue Pesticide Standard #4 (63 components)

100 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 31975 (ea.)

LC Multi-Residue Pesticide Standard #5 (30 components)

100 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 31976 (ea.)

LC Multi-Residue Pesticide Standard #6 (28 components)

100 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 31977 (ea.)

LC Multi-Residue Pesticide Standard #7 (7 components)

100 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 31978 (ea.)

LC Multi-Residue Pesticide Standard #8

100 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 31979 (ea.)

LC Multi-Residue Pesticide Standard #9 (7 components)

100 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 31980 (ea.)

LC Multi-Residue Pesticide Standard #10

100 µg/mL each in methanol, 1 mL/ampul

cat.# 31981 (ea.)

Labeled Pesticide Residue Internal Standards for Food Analysis

- Isotopically labeled to provide the best approach for pesticide residue quantification.
- Multiple options let you choose internal and surrogate standards that will mitigate matrix effects.
- Economically priced and compatible with both LC-MS and GC-MS applications; even helpful for optimizing LC-MS/MS system performance.
- Certified reference material (CRM) manufactured and QC-tested in Restek's ISO-accredited labs—satisfy your ISO requirements.

Compound	CAS #	Solvent	Conc.	cat.#
atrazine-d5	163165-75-1	ACN	100	31984
carbaryl-d7	362049-56-7	ACN	100	31985
diazinon-d10 (diethyl-d10)	100155-47-3	ACN	100	31986
dichlorvos-d6	203645-53-8	A	100	31987
dimethoate-d6	1219794-81-6	ACN	100	31988
diuron-d6	1007536-67-5	ACN	100	31989
linuron-d6	330-55-2	ACN	100	31990

A = acetone; ACN = acetonitrile

Volume is 1 mL/ampul. Concentration is µg/mL.

QuEChERS Products

Restek Q-sep™ QuEChERS Products

- Ready-to-use tubes, no glassware required.
- Preweighed, ultra-pure sorbents.
- Support original unbuffered, AOAC (2007.01), European (EN 15662), and mini-multiresidue QuEChERS methods.

QuEChERS methods are fast, easy, and cost-effective, and Restek Q-sep™ products make QuEChERS procedures even simpler. All extraction salts, sorbents, and sample tubes are included—no specialized equipment or glassware is required. Prepare samples more efficiently with a complete line of QuEChERS supplies from Restek.



Q-sep™ QuEChERS Extraction Salts

Fast, Simple Sample Prep for Multi-Residue Pesticide Analysis

- Salt packets eliminate the need for a second empty tube to transfer salts.
- Go green by using packets with reusable tubes.
- Convenient and easy to use.

Description	Material	Methods	qty.	cat.#	price
Q-sep Kit	4 g MgSO ₄ , 1 g NaCl with 50 mL Centrifuge Tube	original unbuffered	50 packets & 50 tubes	23991	
Q-sep Packets	4 g MgSO ₄ , 1 g NaCl	original unbuffered	50 packets	23992	
Q-sep Kit	4 g MgSO ₄ , 1 g NaCl, 1 g TSCD, 0.5 g DHS with 50 mL Centrifuge Tube	European EN 15662	50 packets & 50 tubes	26235	
Q-sep Packets	4 g MgSO ₄ , 1 g NaCl, 1 g TSCD, 0.5 g DHS	European EN 15662	50 packets	26236	
Q-sep Kit	6 g MgSO ₄ , 1.5 g NaOAc with 50 mL Centrifuge Tube	AOAC 2007.01	50 packets & 50 tubes	26237	
Q-sep Packets	6 g MgSO ₄ , 1.5 g NaOAc	AOAC 2007.01	50 packets	26238	
Empty 50 mL Centrifuge Tube, Polypropylene			50-pk.	26239	
Empty 50 mL Centrifuge Tube, FEP			2-pk.	23997	

TSCD—trisodium citrate dihydrate

DHS—disodium hydrogen citrate sesquihydrate

NaOAc—sodium acetate

Q-sep™ QuEChERS dSPE Tubes for Extract Cleanup

Fast, Simple Sample Prep for Multi-Residue Pesticide Analysis

- Packaged in foil subpacks of 10 for enhanced protection and storage stability.

Multiple sorbents are used to extract different types of interferences.

MgSO ₄	removes excess water
PSA	removes sugars, fatty acids, organic acids, and anthocyanine pigments
C18	removes nonpolar interferences
GCB	removes pigments, sterols, and nonpolar interferences

Description	Methods	qty.	cat.#	price
2 mL Micro-Centrifuge Tubes for dSPE (cleanup of 1 mL extract)				
150 mg MgSO ₄ , 25 mg PSA	original unbuffered, mini-multiresidue, European EN 15662	100-pk.	26215	
150 mg MgSO ₄ , 25 mg PSA, 25 mg C18	mini-multiresidue	100-pk.	26216	
150 mg MgSO ₄ , 25 mg PSA, 2.5 mg GCB	mini-multiresidue, European EN 15662	100-pk.	26217	
150 mg MgSO ₄ , 25 mg PSA, 7.5 mg GCB	mini-multiresidue, European EN 15662	100-pk.	26218	
150 mg MgSO ₄ , 50 mg PSA	AOAC 2007.01	100-pk.	26124	
150 mg MgSO ₄ , 50 mg PSA, 50 mg C18	AOAC 2007.01	100-pk.	26125	
150 mg MgSO ₄ , 50 mg PSA, 50 mg GCB	AOAC 2007.01	100-pk.	26123	
150 mg MgSO ₄ , 50 mg PSA, 50 mg C18, 50 mg GCB	AOAC 2007.01	100-pk.	26219	
150 mg MgSO ₄ , 50 mg C18	NA	100-pk.	26242	
150 mg MgSO ₄ , 50 mg PSA, 50 mg C18, 7.5 mg GCB	universal	100-pk.	26243	
15 mL Centrifuge Tubes for dSPE (cleanup of 6 mL and 8 mL extract)				
1,200 mg MgSO ₄ , 400 mg PSA	AOAC 2007.01	50-pk.	26220	
1,200 mg MgSO ₄ , 400 mg PSA, 400 mg C18	AOAC 2007.01	50-pk.	26221	
1,200 mg MgSO ₄ , 400 mg PSA, 400 mg C18, 400 mg GCB	AOAC 2007.01	50-pk.	26222	
1,200 mg MgSO ₄ , 400 mg C18	similar to AOAC 2007.01	50-pk.	26244	
900 mg MgSO ₄ , 150 mg PSA	original unbuffered, European EN 15662	50-pk.	26223	
900 mg MgSO ₄ , 150 mg PSA, 15 mg GCB	European EN 15662	50-pk.	26224	
900 mg MgSO ₄ , 150 mg PSA, 45 mg GCB	European EN 15662	50-pk.	26225	
900 mg MgSO ₄ , 150 mg PSA, 150 mg C18	similar to European EN 15662	50-pk.	26226	
900 mg MgSO ₄ , 300 mg PSA, 300 mg C18, 45 mg GCB	similar to European EN 15662	50-pk.	26245	
900 mg MgSO ₄ , 300 mg PSA, 150 mg GCB	NA	50-pk.	26126	

PSA—primary and secondary amine exchange material

GCB—graphitized carbon black

Aqueous C18 LC Columns

Chromatographic Properties

The Restek Aqueous C18 is a rugged, reversed-phase column with a well-balanced retention profile. It can effectively retain more types of solutes than a conventional C18 and is ideal for multi-component LC-MS analyses. The general-purpose Aqueous C18 boasts high reproducibility and compatibility with many mobile phase conditions—even 100% aqueous and acidic. And when used with a gradient, it eliminates the all-too-common issue of multiple compounds eluting near the column void time.

Ultra Aqueous C18 Columns (USP L1)

Column Characteristics:

particle size:	3 µm or 5 µm, spherical
pore size:	100 Å
carbon load:	15%
end-cap:	no
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase code:	L1
phase category:	modified C18
ligand type:	proprietary polar modified and functionally bonded C18

Description	cat.#
3 µm Columns	
100 mm, 2.1 mm ID	9178312

Pinnacle® DB Aqueous C18 Columns (USP L1)

Column Characteristics:

particle size:	1.9 µm, 3 µm, or 5 µm, spherical
pore size:	140 Å
carbon load:	6%
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase code:	L1
phase category:	modified C18
ligand type:	proprietary polar modified and functionally bonded C18

Description	cat.#
1.9 µm Columns	
50 mm, 2.1 mm ID	9418252



ordering note

For guard cartridges for these columns, visit our website at www.restek.com/lc-guard



Contact your Restek representative and order yours today!

Visit www.restek.com/Contact-Us to find a distributor or representative.

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