Resprep

Improve Productivity for Pesticides Analysis with

Resprep FL + CarboPrep Plus SPE

- Dual-bed Florisil and carbon cartridge removes more coextracted matrix components than Florisil alone.
- Cleaner extracts mean less GC downtime and >10x higher sample throughput.

Dual-Bed Format Only Available from Restek

RESTEK Pure Chromatography www.restek.com

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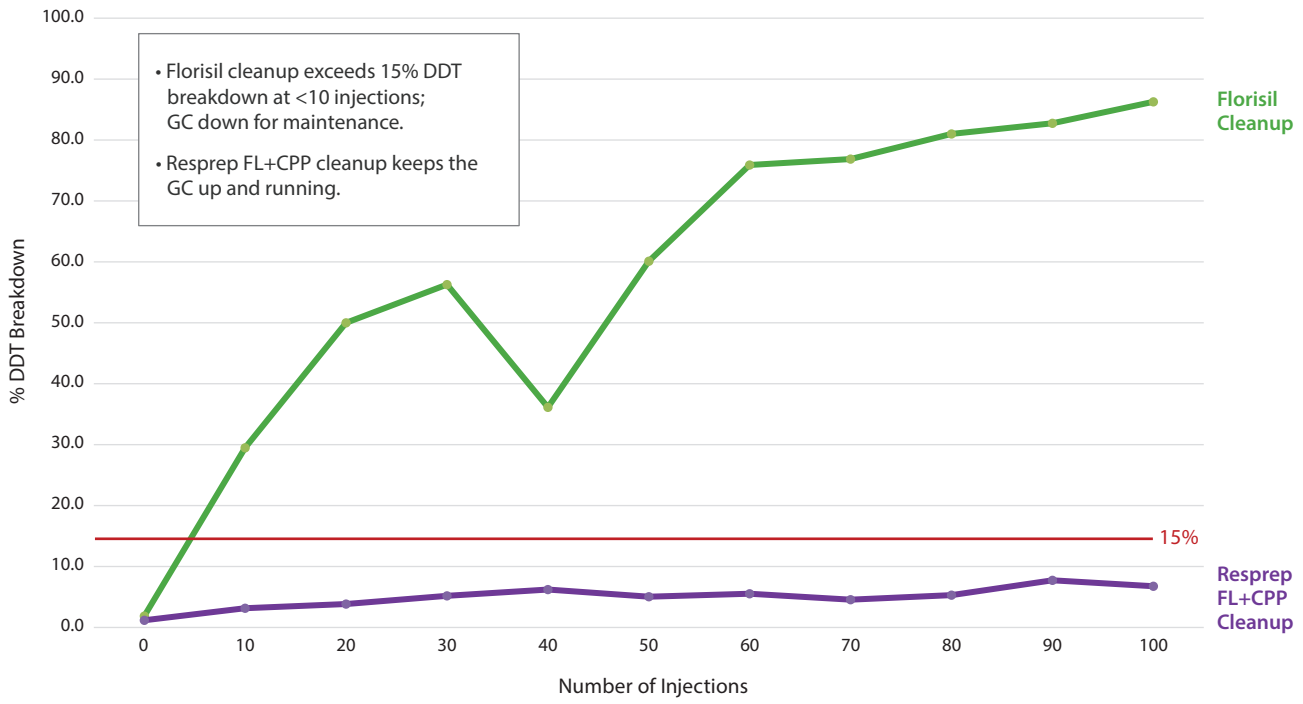
When analyzing complex soil and water samples for organochlorine pesticides, coextracted matrix components can contaminate the inlet and column, forcing analysts to take instruments offline for time-consuming, unplanned maintenance. Effective sample extract cleanup is the key to keeping your instruments running and generating accurate, reliable data. Pass-through SPE using Florisil cartridges (e.g., EPA Method 3620) is a common cleanup technique, but Resprep FL + CarboPrep Plus SPE cartridges (Resprep FL+CPP)—which contain both Florisil and carbon in a dual-bed, single-cartridge format—provide a much more effective cleanup. Better cleanup means that columns last longer and instruments stay running, which increases sample throughput and lab profitability.

The Florisil used in Resprep FL + CarboPrep Plus SPE cartridges undergoes special moisture-control processing to ensure full activation of the sorbent material and effective removal of polar contaminants. While it is quite good for capturing polar compounds, Florisil does not remove the high molecular weight contaminants that typically foul GC inlets and bring instruments down for maintenance.

Fortunately, the CarboPrep Plus sorbent bed is extremely efficient at removing the most troublesome coextracted matrix components. For example, if humic acids from the sample remain in the final extract, they cause DDT to break down and fail performance requirements for inlet degradation (<15% breakdown) and continuing calibration checks. The high-quality carbon in Resprep FL + CarboPrep Plus SPE cartridges removes these acids, producing visibly cleaner extracts that meet performance requirements longer and allow many more sample injections compared to extracts cleaned with Florisil alone (Figure 1).

Figure 1: Resprep FL + CarboPrep Plus SPE cleanup allowed >10x more samples to be analyzed compared to Florisil alone.

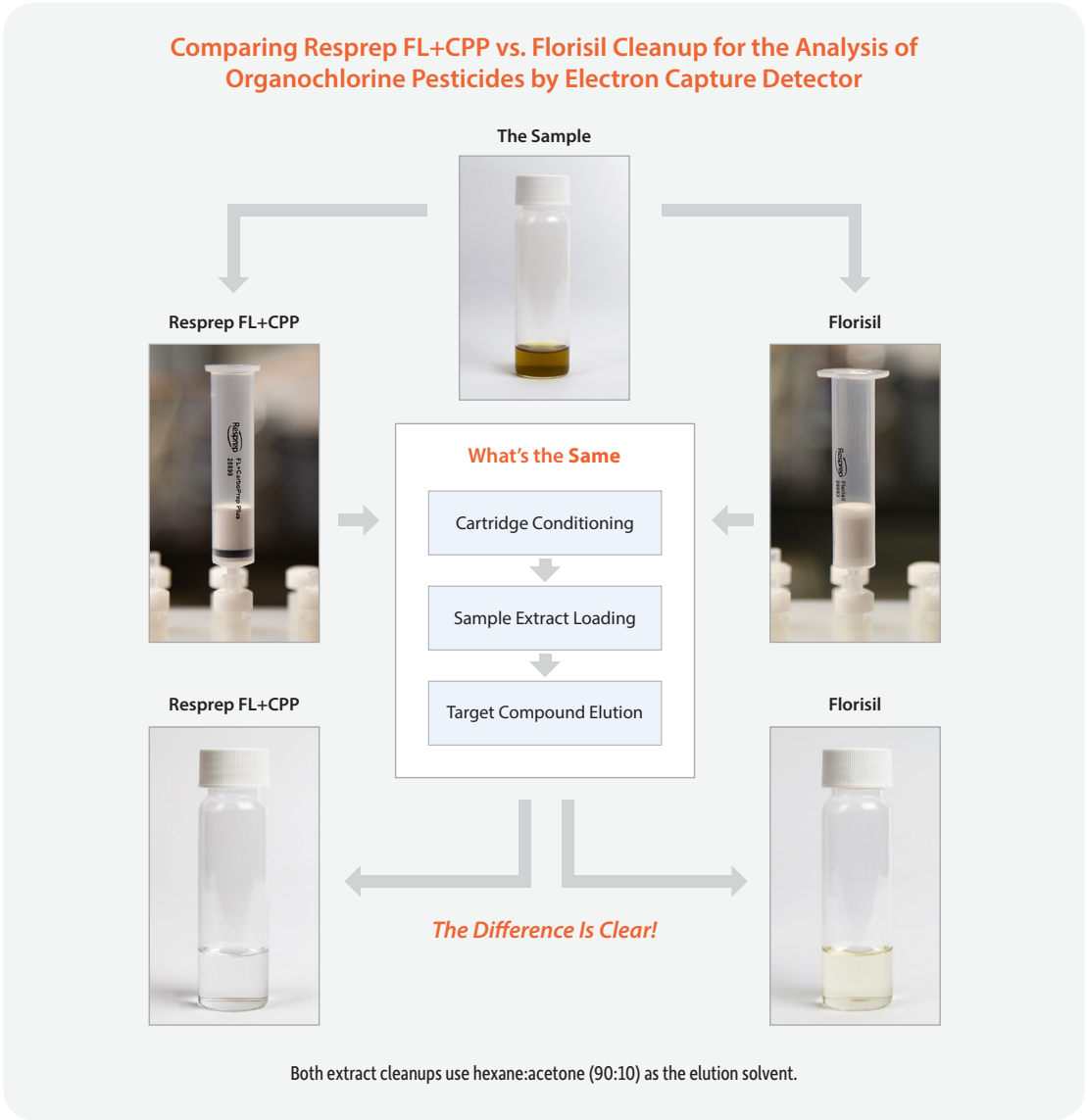


Experimental Design: DDT (100 ppb) breakdown was measured between every ten injections of a soil sample extract cleaned up using either Florisil SPE or Resprep FL + CarboPrep Plus SPE.

Same Procedure, Cleaner Extracts

Not only do Resprep FL + CarboPrep Plus SPE cartridges remove more coextracted sample matrix contaminants but they also do so using the same solvents and volumes that are commonly used in Florisil cleanup methods. As shown in Figure 2, the same cartridge conditioning; sample loading; and 10 mL hexane:acetone (90:10) elution steps were performed, and the Resprep FL + CarboPrep Plus SPE cartridges produced visibly cleaner final extracts that produced excellent chromatography. In addition to being a drop-in replacement for Florisil cleanup procedures, Reprep FL + CarboPrep Plus SPE cartridges further simplify workflows because the same cartridge effectively cleans most sample types— there is no need to decide whether to use Florisil or carbon for potentially dirty samples.

Figure 2: Resprep FL + CarboPrep Plus SPE cartridges give cleaner final extracts following the same procedure used in a typical Florisil cleanup.



Improve Data Quality and Reporting Accuracy

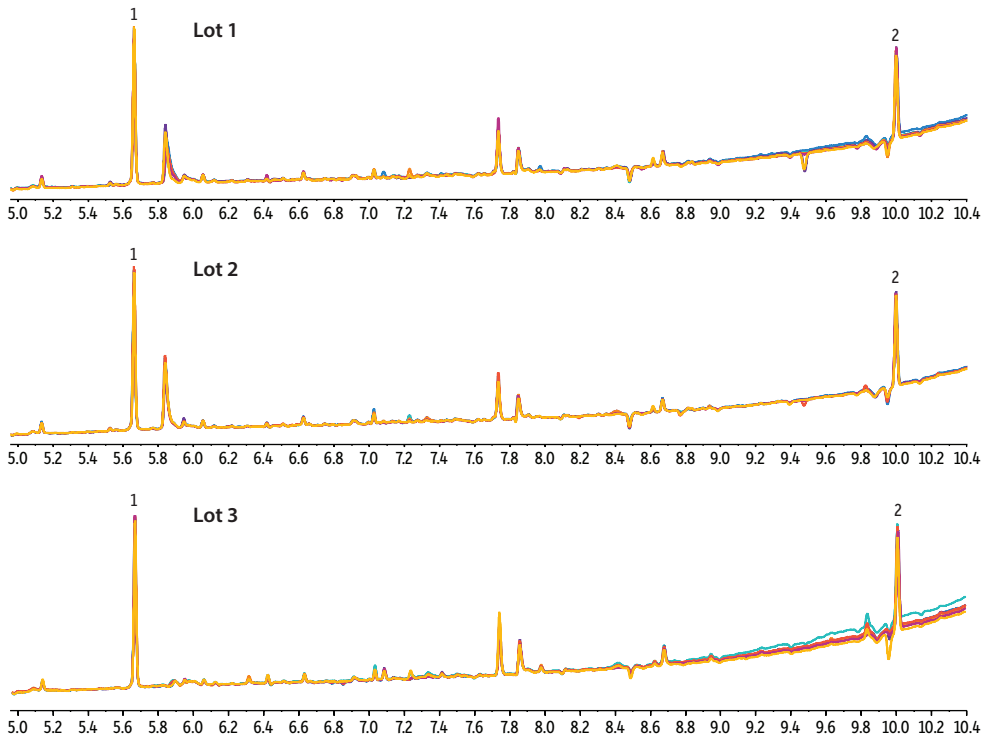
In addition to reducing downtime, improving sample throughput, and simplifying workflows, Resprep FL + CarboPrep Plus SPE cartridges help improve analytical performance, so you can be confident that you are reporting accurate results. Powerful, effective removal of coextracted matrix components eliminates sample-based interferences and prevents them from reducing quantitative accuracy. As shown in Table I, recoveries for all compounds in laboratory control samples were within the acceptance range of 80-110%. In addition, due to the presence of Florisil, no breakthrough of trichlorophenol (TCP) was observed. Method requirements are reliably met because the ultra-clean sorbents and tightly controlled manufacturing procedures ensure low background and consistent lot-to-lot performance (Figure 3).

Table I: Effective cleanup with Resprep FL + Carboprep Plus SPE cartridges helps ensure accurate, reliable results (n=8).

Compound	Concentration (ng/mL)	Average Recovery (%)	%RSD
TCP	100	<1*	-
TCMX	20	98	1.8
Hexachlorobenzene	5	89	1.3
alpha-BHC	5	100	1.4
gamma-BHC	5	99	1.3
beta-BHC	5	102	3.6
delta-BHC	5	103	4.6
Heptachlor	5	91	4.1
Aldrin	5	98	1.8
Heptachlor epoxide	5	103	1.1
gamma-Chlordane	5	105	3.4
alpha-Chlordane	5	96	2.0
4,4'-DDE	10	99	1.6
Endosulfan I	5	101	2.3
Dieldrin	10	98	2.6
Endrin	10	97	5.1
4,4'-DDD	10	97	2.9
Endosulfan II	10	99	3.9
4,4'-DDT	10	97	2.2
Endrin aldehyde	10	92	4.6
Methoxychlor	50	95	4.1
Endosulfan sulfate	10	100	2.1
Endrin ketone	10	98	1.3
DCB	20	101	2.4

*Meets requirement of <5% breakthrough.

Figure 3: Resprep FL + CarboPrep Plus cartridges have consistently low background due to proprietary manufacturing procedures and strict quality controls. (Eight injections per lot are shown.)



Peaks	t_R (min)
1. 2,4,5,6-Tetrachloro-*m*-xylene	5.65
2. Biphenyl, decachloro-	10.00

Column	Rtx-CLPesticides, 30 m, 0.32 mm ID, 0.32 µm (cat.# 11141)
Standard/Sample	2,4,5,6-Tetrachloro-meta-xylene (cat.# 32027) Decachlorobiphenyl (BZ #209) (cat.# 32029)
Diluent:	Hexane
Conc.:	5 ng/µL
Injection	
Inj. Vol.:	4 µL pulsed splitless
Liner:	Topaz single taper inlet liner w/wool (cat.# 23303)
Inj. Temp.:	250 °C
Pulse Pressure:	35 psi (241.3kPa)
Pulse Time:	0.74 min
Purge Flow:	50 mL/min
Oven	
Oven Temp.:	70 °C (hold 0.5 min) to 320 °C at 25 °C/min (hold 2 min)
Carrier Gas	He, constant flow
Flow Rate:	3.5 mL/min
Detector	Micro-ECD @ 330 °C
Make-up Gas Flow Rate:	60 mL/min
Make-up Gas Type:	N_2
Data Rate:	50 Hz
Instrument	Agilent 7890B GC
Sample Preparation	Conditioned a Resprep FL + CarboPrep Plus SPE cartridge (cat.# 28899) by adding one cartridge volume of hexane:acetone (90:10) and letting it stand for five minutes before drawing the solvent down to frit level. Then, 1 mL of sample extract was loaded onto the cartridge and eluted with 9 mL of hexane:acetone (90:10).

Enhance Your Florisil Cleanup—Switch to Resprep FL+CPP SPE Cartridges to Reduce Downtime, Improve Data Quality, and Increase Lab Productivity!

28899

Resprep FL + CarboPrep Plus SPE Cartridge

- Meet method criteria longer and improve lab productivity for organochlorine pesticides analysis.
- Dual-bed Florisil and carbon cartridge removes more coextracted matrix components than Florisil alone.
- Cleaner extracts mean less downtime for inlet maintenance and >10x higher sample throughput.
- Drop-in replacement; uses same solvents, volumes, and steps as Florisil cleanup procedures.

Catalog No.	Product Name	Sorbent Phase	Volume (mL)	Units
28899	Resprep FL + CarboPrep Plus SPE Cartridge	Florisil 1000 mg/GCB 95 mg	6	30-pk.

28995

Resprep Florisil SPE Cartridge

Catalog No.	Product Name	Sorbent Phase	Volume (mL)	Units
28995	Resprep Florisil SPE Cartridges	Florisil 2000 mg	15	15-pk.

25845

Resprep CarboPrep Plus SPE Cartridge

Catalog No.	Product Name	Sorbent Phase	Volume (mL)	Units
25845	Resprep CarboPrep Plus SPE Cartridges	CarboPrep Plus 95 mg	3	30-pk.

28298

Vacuum Manifold

Catalog No.	Product Name	Includes	Size	Units
28298-VM	Resprep QR-12 Vacuum Manifold	Cover with flow control valves & gasket (cat.# 28316-VM); Collection Rack (cat.# 28318-VM); Plate for 16 mm test tubes (cat.# 28319-VM); 100-pk. Quick Replace liners, PTFE (cat.# 28310-VM); 12-pk. Liner guide (cat.# 28312-VM); 12-pk. Test tubes (cat.# 28315-VM)	12-port	kit
28299-VM	Resprep QR-24 Vacuum Manifold	Cover with flow control valves & gasket (cat.# 28323-VM); Collection Rack (cat.# 28325-VM); Plate for 16 mm test tubes (cat.# 28326-VM); 100-pk. Quick Replace liners, PTFE (cat.# 28310-VM); 2, 12-pk. Liner guides (cat.# 28312-VM); 2, 12-pk. Test tubes (cat.# 28315-VM)	24-port	kit

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