

The Resprep logo features the word "Resprep" in a blue, sans-serif font, enclosed within a white oval. A blue curved arrow starts above the 'R', loops around the top and left, and ends below the 'p', suggesting a cycle or process.

Resprep

## Keep Your Instruments Up and Running with CarboPrep Plus SPE Cartridges

- Maximum Contaminant Removal
- Less Instrument Downtime
- Higher Sample Throughput



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# Four Words No Environmental Lab Manager Wants to Hear: “The Instrument is Down.”

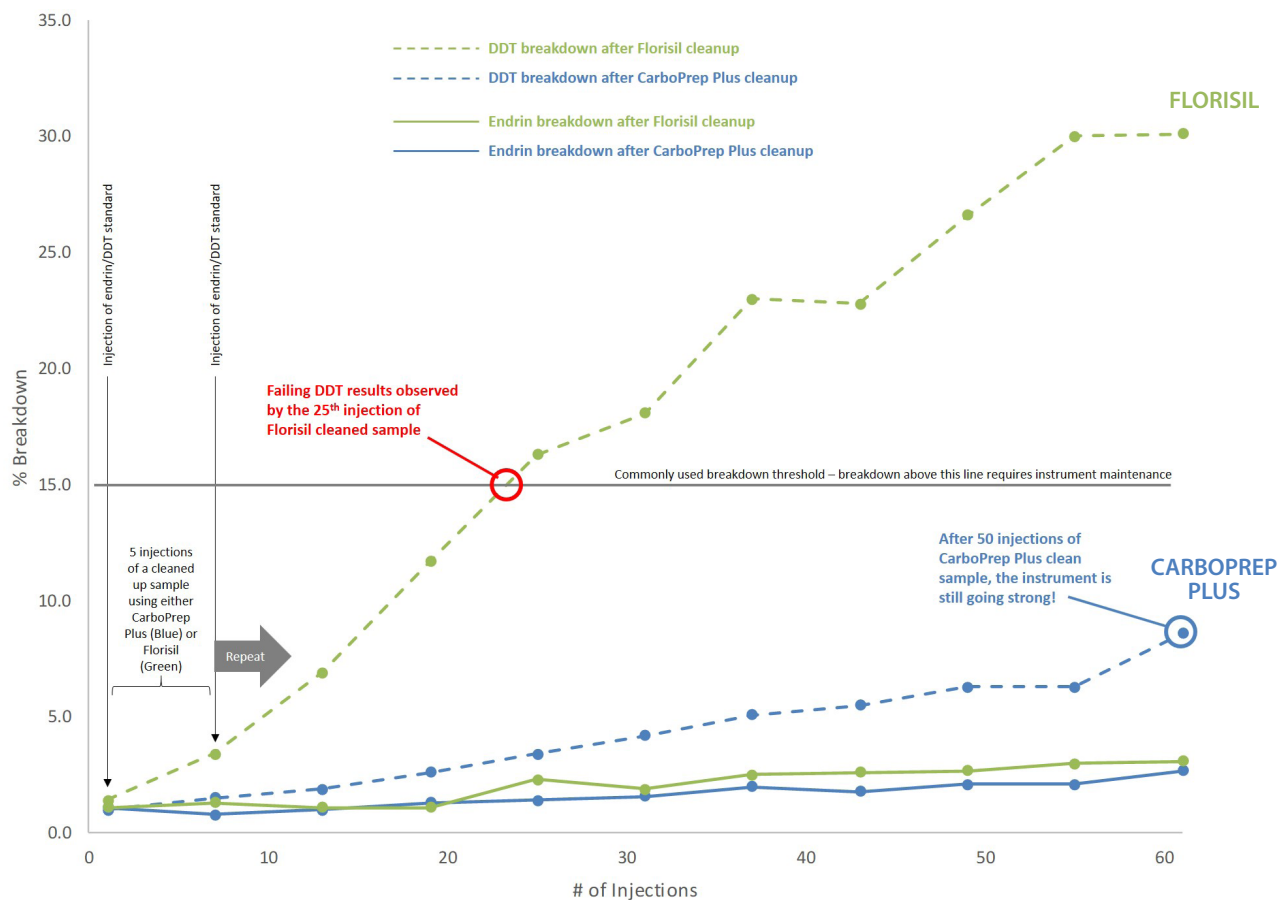
If you are in charge of an environmental lab, you know that instruments that are down for unscheduled maintenance due to inlet or column contamination are not only costing money instead of making it, but are also jeopardizing your ability to meet your customers’ deadlines and performance requirements.

Chances are, you are also in charge of the lab that prepares samples for analysis, so you appreciate the value in making that process simple, reproducible, and effective, mitigating the chance for error and providing a clean extract that won’t shut an instrument down in the analytical lab because of inlet-fouling matrix components that made their way through the sample cleanup process.

Unfortunately, for the analysis of organochlorine pesticides in soil and water, the industry standard sample preparation product—activated Florisil SPE cartridges—just isn’t up to the job of removing the worst of those sample matrix contaminants that condense inside inlet liners or coat the inlet side of your analytical column. Florisil is great for stopping polar compounds, but those usually aren’t the compounds that cause instruments to fail their calibration checks, requiring unscheduled maintenance, delaying processing new samples, and adding the expense of replacing consumables ahead of schedule.

If your samples may contain those relatively high molecular weight sample matrix compounds that are the bane of injection ports and sensitive analytes, you’ll need something different. Fortunately, new Resprep CarboPrep Plus SPE cartridges outperform Florisil cartridges in removing these troublesome compounds, protecting your system and keeping samples running through your lab efficiently.

**Figure 1:** CarboPrep Plus cartridges kept the instrument running more than twice as long as the instrument analyzing samples cleaned with Florisil cartridges.



Endrin (50 ppb) and DDT (100 ppb) breakdown measured between injections of an environmental sample extract cleaned up using either Florisil or CarboPrep Plus cartridges.

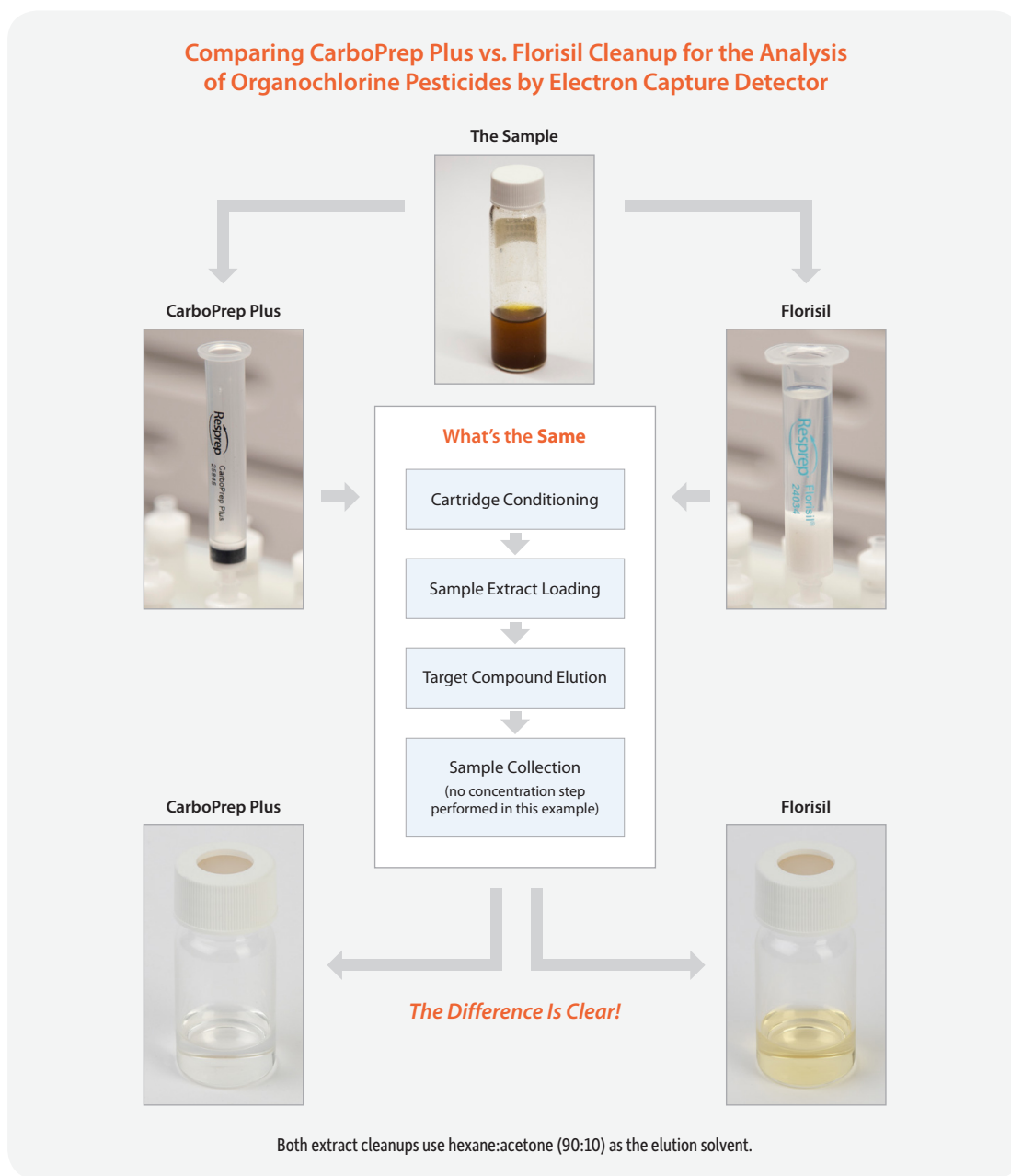
## An Easy Change for the Sample Prep Lab

To remove the matrix components that contaminate your inlets and degrade your analytes of interest, you need a sample prep product with a different selectivity than Florisil that still allows all the target analytes to elute. But, chances are, your lab is set up to run a standard Florisil cleanup and switching to a new process can be a logistical challenge.

To make the switch to another SPE product easier, Restek's CarboPrep Plus cartridges use the same equipment, solvents, and solvent volumes that work for Florisil, but the specially treated carbon in the CarboPrep Plus tubes will do a much better job of removing those inlet-contaminating matrix components that may be present in your customers' samples.

While the CarboPrep Plus SPE cartridges have different selectivity than activated Florisil cartridges, they will still elute the compounds of interest and remove contaminating compounds using the same procedure. Change doesn't get easier than that.

**Figure 2:** CarboPrep Plus SPE cartridges use the same solvents, solvent volumes, and extraction manifolds used in a standard Florisil procedure, but the difference in cleanup is obviously improved visually and chromatographically.



## Rock-Solid Reliability Also Benefits the Analytical Lab

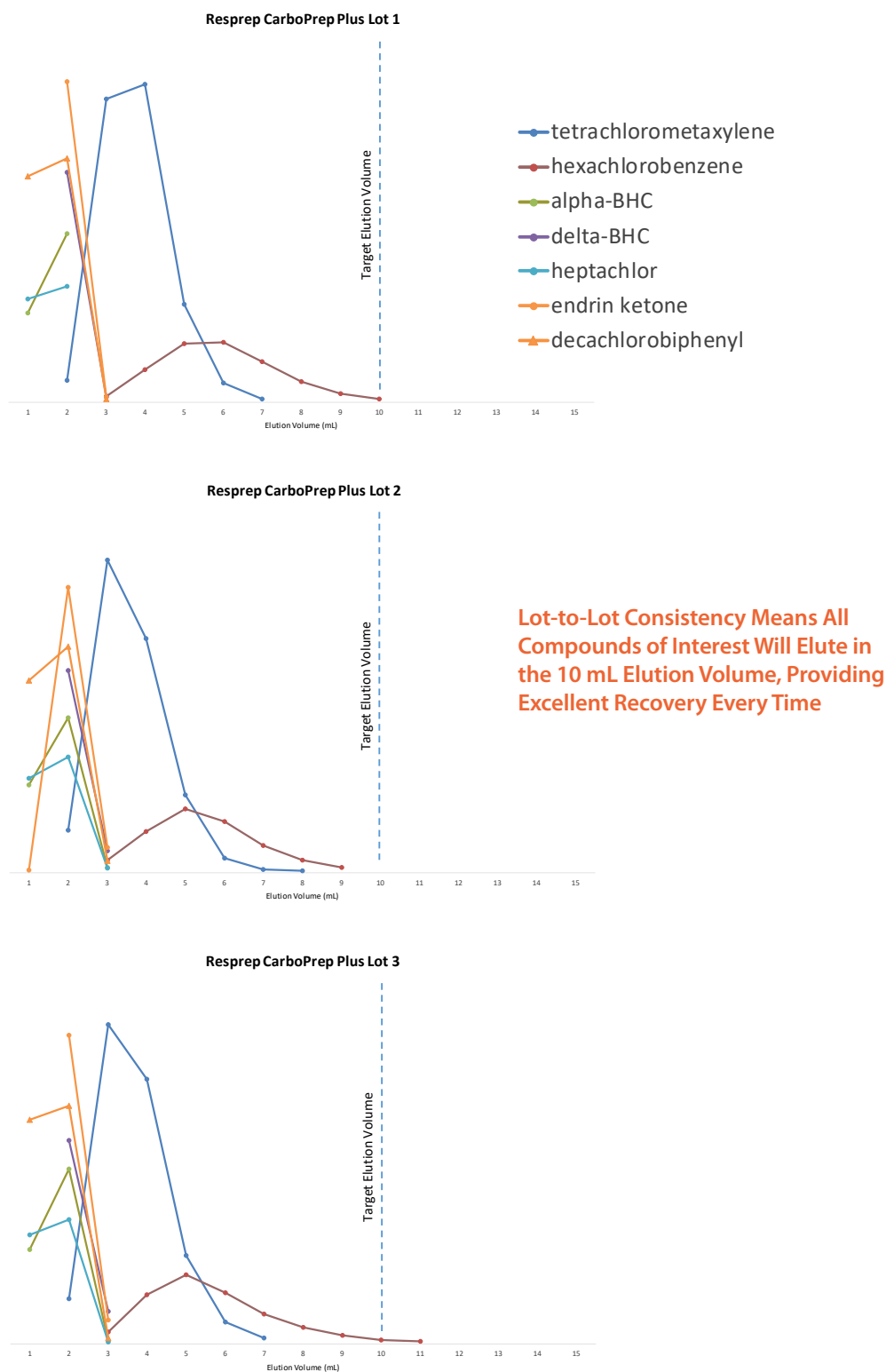
A proprietary treatment renders the carbon in CarboPrep Plus SPE cartridges clean and consistent, allowing you to standardize on an extraction protocol and not have to optimize elution volumes for every new batch of cartridges. This simplifies workflow in the sample prep lab and provides confidence that the next cartridge will perform exactly the same as the last. The analytical lab also benefits from a CarboPrep Plus cleanup because less downtime is required for maintenance, and high recoveries and low background levels are consistently obtained (Table I). Less maintenance and excellent analytical performance mean higher sample throughput for your lab.

**Table I:** Accurate, consistent recoveries for organochlorine pesticides and surrogate compounds (TCMX and DCB) make switching to CarboPrep Plus cartridges an easy way to improve analytical performance.

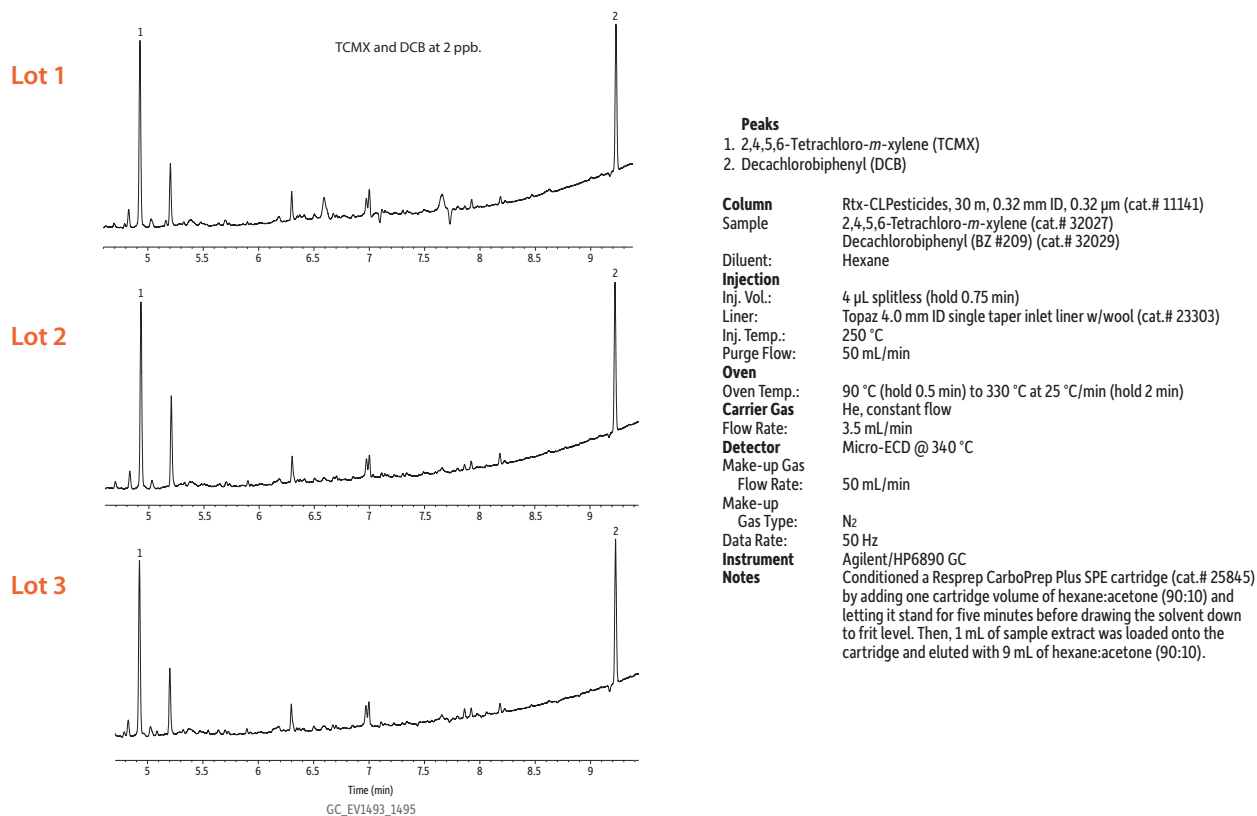
Compound	Average % Recovery*	% RSD
TCMX	99.8	1.3
hexachlorobenzene	97.6	2.3
alpha-BHC	99.2	1.3
gamma-BHC	98.1	1.4
beta-BHC	98.7	1.4
delta-BHC	98.7	1.7
heptachlor	101.2	1.7
aldrin	97.1	1.7
heptachlor epoxide	98.6	1.6
gamma-chlordane	98.2	1.8
alpha-chlordane	96.9	2.2
4,4'-DDE	96.8	1.6
endosulfan I	98.0	1.4
dieldrin	97.8	1.4
endrin	98.4	1.6
4,4'-DDD	97.4	1.4
endosulfan II	94.6	5.5
4,4'-DDT	98.2	1.2
endrin aldehyde	96.1	1.2
methoxychlor	100.2	2.1
endosulfan sulfate	97.1	2.2
endrin ketone	98.1	0.8
DCB	97.8	2.2

\* n = the analysis of 6 cartridges each from 3 different lots for a total of 18 data points

**Figure 3:** Lot-to-lot consistency ensures that all the compounds of interest will elute within the 10 mL collection volume used for typical cleanup procedures, ensuring excellent recoveries time and again. In this figure, you can see a subset of organochlorine pesticides that are retained to different degrees on CarboPrep Plus material, and even hexachlorobenzene, the most highly retained compound, showed consistently high recovery at 97.6% (2.3% RSD, Table I). Note that all compounds listed in Table I elute from CarboPrep Plus cartridges prior to tetrachlorometaxylene (TCMX), so elution volumes can be reduced to save time for labs not analyzing hexachlorobenzene.



**Figure 4:** CarboPrep Plus cartridges are made using proprietary treatment and strict in-house manufacturing controls that result in exceptionally low background, cartridge after cartridge, and lot after lot.



## Make the Simple Switch to CarboPrep Plus SPE Cartridges and Improve Lab Productivity

If you have trouble with samples contaminating your GC inlets and columns, resulting in failing calibration checks for your organochlorine pesticides, unscheduled instrument maintenance, rework, delays, and unexpected expenses, then consider adding CarboPrep Plus cartridges to your toolbox of sample preparation options. While Florisil is excellent at removing polar matrix contaminants, the matrix contaminating compounds that foul inlets and columns pass through and end up in your instruments. To get consistent recoveries, while mitigating the risk that a dirty sample will take an instrument down, choose CarboPrep Plus SPE cartridges for your organochlorine pesticides workflow.



### Resprep CarboPrep Plus SPE Cartridges

- Designed specifically for the cleanup of sample extracts for organochlorine pesticides analysis.
- Excellent alternative to Florisil products, especially for the removal of nonvolatile matrix components that contaminate GC inlets and columns.
- Proprietary treatment renders the carbon consistent and clean, ensuring the same selectivity tube to tube, and lot to lot with no interfering background.
- Uses the same hardware, solvents, and solvent volumes as traditional Florisil cleanup, so switching is simple.

Description	Volume	qty.	cat.#
Resprep CarboPrep Plus SPE Cartridges	3 mL, 95 mg	30-pk.	25845



## Related Products

### Resprep 12- or 24-Port SPE Manifolds

Description	qty.	cat.#
Complete Resprep SPE Manifold, 12-Port (Includes: glass basin with built-in vacuum regulator (1); polypropylene lid with 12 individual control valves (1); 12-position collection rack (1); PTFE sample guides (12); and waste container (1).)	kit	26077
Complete Resprep SPE Manifold, 24-Port (Includes: glass basin with built-in vacuum regulator (1); polypropylene lid with 24 individual control valves (1); 24-position collection rack (1); and PTFE sample guides (24).)	kit	26080
<b>Resprep Manifold Replacement Parts</b>		
Description	qty.	cat.#
Replacement Waste Container, 12-Port	ea.	24014
Replacement Vacuum Valve and Gauge Assembly	ea.	24008
Glass Vacuum Chamber w/gauge & valve for Resprep manifolds, 6 or 12-Port	ea.	25991
<b>Collection Rack</b>		
Collection Rack, 12-Port	ea.	26079
Collection Rack, 24-Port	ea.	26082
<b>Manifold Lid</b>		
Replacement Manifold Lid (sample guides not included), 12-Port	ea.	26078
Replacement Manifold Lid (sample guides not included), 24-Port	ea.	26081
<b>Manifold Lid Replacement Parts</b>		
Valves, 12 or 24-Port	2-pk.	26083
Valve Attachment	48-pk.	26130
Needle Attachment	48-pk.	26131
Sample Guide Needles, 12 or 24-Port	12-pk.	26084
Gasket, 12-port	2-pk.	24011



### Rtx-CLPesticides Columns (fused silica)

Description	temp. limits	qty.	cat.#
Rtx-CLPesticides Column 30 m, 0.25 mm ID, 0.25 $\mu$ m	-60 to 320/340 °C	ea.	11123
Rtx-CLPesticides Column 30 m, 0.32 mm ID, 0.32 $\mu$ m	-60 to 320/340 °C	ea.	11141
Rtx-CLPesticides Column 30 m, 0.53 mm ID, 0.50 $\mu$ m	-60 to 300/320 °C	ea.	11140

### Rtx-CLPesticides2 Columns (fused silica)

Description	temp. limits	qty.	cat.#
Rtx-CLPesticides2 Column 30 m, 0.25 mm ID, 0.20 $\mu$ m	-60 to 320/340 °C	ea.	11323
Rtx-CLPesticides2 Column 30 m, 0.32 mm ID, 0.25 $\mu$ m	-60 to 320/340 °C	ea.	11324
Rtx-CLPesticides2 Column 30 m, 0.53 mm ID, 0.42 $\mu$ m	-60 to 300/320 °C	ea.	11340



Also available in  
money-saving kits!

### 2.0 mL, 9 mm Short-Cap, Screw-Thread Vials (vial only)

Fit all 2.0 mL, 12 x 32 mm, crimp-top vial-based autosamplers.

Description	Color	100-pk. cat.#	1,000-pk. cat.#
Short-Cap Vial w/White Graduated Marking Spot	Clear	21140	21141
Short-Cap Vial w/White Graduated Marking Spot	Amber	21142	21143

### 2.0 mL, 11 mm Crimp-Top Vials, 12 x 32 mm

Choose with or without graduated marking spots.

Description	Color	Material	100-pk. cat.#	1,000-pk. cat.#
Vial w/White Graduated Marking Spot	Clear	Glass	24383	24384
Vial w/White Graduated Marking Spot	Amber	Glass	24385	24386



Other vials available! Find the right one at [www.restek.com/vials](http://www.restek.com/vials)

## 2.0 mL, 9 mm Short-Cap, Screw-Vial Closures (Polypropylene, preassembled)

Cap Color	Septa Material	Type	100-pk. cat.#	1,000-pk. cat.#
Blue	PTFE/Silicone	Screw-Thread	24485	24486

## 2.0 mL, 11 mm Aluminum Crimp Seals With Septa

Seal Color	Septa Material	100-pk. cat.#	1,000-pk. cat.#
Blue	PTFE/Silicone	24361	24362

## 2.0 mL, 9 mm Screw-Thread Vial Convenience Kits

(Vials, Caps, & Septa)

Vials packaged in a clear-lid tray. Caps with septa packaged in a plastic bag.

Description	100-pk. cat.#	1,000-pk. cat.#
Clear Vial w/Graduated Marking Spot, 9 mm, Blue Cap PTFE/Silicone Liner	26592	26593
Amber Vial w/Graduated Marking Spot, 9 mm, Blue Cap PTFE/Silicone Liner	26596	26597

## 2.0 mL, 11 mm Crimp Vial Convenience Kits

(Vials, Caps, & Septa)

Vials packaged in a clear-lid tray. Caps with septa packaged in a plastic bag.

Description	100-pk. cat.#	1,000-pk. cat.#
Clear 2.0 mL Vial, Untreated, Silver Seal, PTFE/Silicone Septa	24646	24647
Amber 2.0 mL Vial, Untreated, Silver Seal, PTFE/Silicone Septa	24648	24649

## Topaz 4.0 mm ID Single Taper Inlet Liner w/ Wool

for Agilent GCs equipped with split/splitless inlets



ID x OD x Length	qty.	cat.#
Single Taper, Premium Deactivation, Borosilicate Glass with Quartz Wool 4.0 mm x 6.5 mm x 78.5 mm	5-pk.	23303

## Topaz 3.5 mm ID Single Taper Inlet Liner w/ Wool

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets



ID x OD x Length	qty.	cat.#
Single Taper, Premium Deactivation, Borosilicate Glass with Quartz Wool 3.5 mm x 5.0 mm x 95 mm	5-pk.	23336

## Topaz 4.0 mm ID Single Taper Inlet Liner w/ Wool

for Thermo TRACE 1300/1310 GCs equipped with SSL inlets



ID x OD x Length	qty.	cat.#
Single Taper, Premium Deactivation, Borosilicate Glass with Quartz Wool 4.0 mm x 6.5 mm x 78.5 mm	5-pk.	23447

## Organochlorine Pesticide Mix AB #2

(20 components)

Aldrin (309-00-2), 8 µg/mL  
 α-BHC (319-84-6), 8 µg/mL  
 β-BHC (319-85-7), 8 µg/mL  
 δ-BHC (319-86-8), 8 µg/mL  
 γ-BHC (Lindane) (58-89-9), 8 µg/mL  
 cis-Chlordane (5103-71-9), 8 µg/mL  
 trans-Chlordane (5103-74-2), 8 µg/mL  
 4,4'-DDD (72-54-8), 16 µg/mL  
 4,4'-DDE (72-55-9), 16 µg/mL  
 4,4'-DDT (50-29-3), 16 µg/mL  
 Dieldrin (60-57-1), 16 µg/mL  
 Endosulfan I (959-98-8), 8 µg/mL  
 Endosulfan II (33213-65-9), 16 µg/mL  
 Endosulfan sulfate (1031-07-8), 16 µg/mL  
 Endrin (72-20-8), 16 µg/mL  
 Endrin aldehyde (7421-93-4), 16 µg/mL  
 Endrin ketone (53494-70-5), 16 µg/mL  
 Heptachlor (76-44-8), 8 µg/mL  
 Heptachlor epoxide (isomer B) (1024-57-3), 8 µg/mL  
 Methoxychlor (72-43-5), 80 µg/mL

In hexane:toluene (1:1), 1 mL/ampul cat.# 32292 (ea.)

## 2,4,5,6-Tetrachloro-*m*-xylene

2,4,5,6-Tetrachloro-*m*-xylene (877-09-8)

200 µg/mL in acetone, 1 mL/ampul cat.# 32027 (ea.)  
 200 µg/mL in acetone, 5 mL/ampul cat.# 32028 (ea.)

## Decachlorobiphenyl, 508A

Decachlorobiphenyl (BZ #209) (2051-24-3)

200 µg/mL in acetone, 1 mL/ampul cat.# 32029 (ea.)  
 200 µg/mL in acetone, 5 mL/ampul cat.# 32030 (ea.)  
 10 µg/mL in isooctane, 1 mL/ampul cat.# 32289 (ea.)

## Hexachlorobenzene

Hexachlorobenzene (118-74-1)

1,000 µg/mL in acetone, 1 mL/ampul cat.# 32231 (ea.)

Certified reference materials (CRMs) manufactured and QC-tested in ISO-accredited labs satisfy your ISO requirements.

Use our Rtx-CLPesticides/Rtx-CLPesticides2 capillary column pair to analyze all twenty organochlorine pesticides and their surrogates simultaneously.

Questions? Contact us or your local Restek representative ([www.restek.com/contact-us](http://www.restek.com/contact-us)).

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