

Siltek™ D

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ECHnology Pty Ltd

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Siltek

deactivation

from

**RESTEK**

The Next Generation of Surface Deactivation

- ✓ Maximizes the inertness of sample pathway
- ✓ Minimizes breakdown and bleed
- ✓ Thermally stable



What is Siltek™ Deactivation?

The Siltek™ process (patent pending) produces a highly inert glass surface that features high-temperature stability, extreme durability, and virtually no bleed.

Siltek™ deactivation is not susceptible to cleavage or formation of active silanols like traditional deactivations can be; and, therefore, greatly reduce bleed, breakdown, and adsorption of active components.

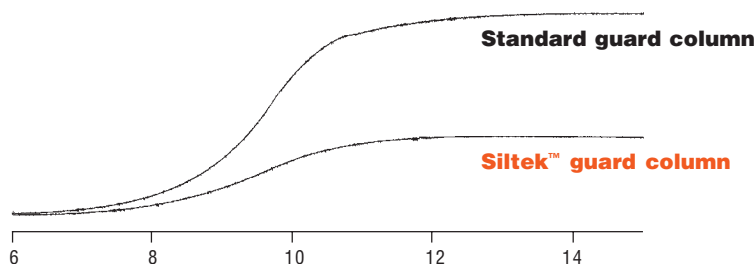
Lower Limits of Detection for High Molecular Weight Compounds

Traditional deactivated surfaces thermally degrade at the elevated temperatures used in GC analysis. As the temperature increases, so does the rate of thermal degradation of the column phase, which is reflected by an increase in the baseline of a detection system. This undesirable phenomena, called bleed, can interfere with the accurate quantitation of analytes. Although deactivated guard columns are not coated with stationary phase, their surface treatment can still show a measurable bleed level.

Siltek™ deactivation, however, results in extremely low bleed levels at elevated temperatures. A Siltek™ guard column has 60% less bleed than a standard deactivated guard column (Figure 1). Lower bleed translates to lower limits of detection for high molecular weight compounds. Better deactivation provides better analytical results!

Figure 1

An expanded bleed plot shows the Siltek™ guard column exhibits 60% less bleed than the standard deactivated guard column at 330°C.



LOW BLEED

The Next Generation of Surface Deactivation

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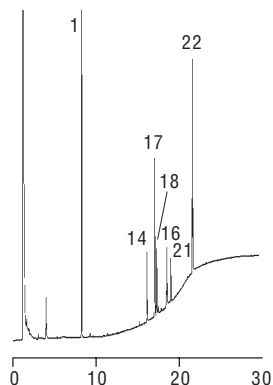
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Figure 2

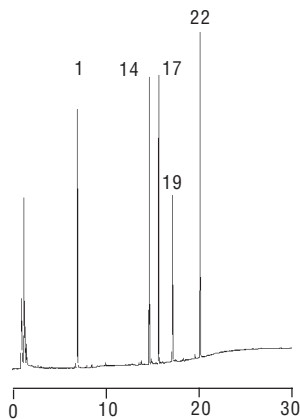
a) Before

A chromatographic system that is inadequately deactivated will cause poor linearity, a loss of reproducibility, and costly analytical downtime.



b) After

Siltek™-deactivated Uniliner® inlet liners result in less than 1% endrin breakdown, and undetectable DDT and methoxychlor breakdown.



Conditions for Figure 2

30m, 0.53mm ID, 0.42µm Rtx-CLPesticides2 (cat.#11340) with open-top Siltek™ Uniliner® w/o wool (cat.# 20843-214.1)

Inj.: 1µL of 50pg/µL standard of tetrachloro-meta-xylene (IS), endrin, 4,4'-DDT, methoxychlor, and decachlorobiphenyl (IS); **Oven temp.:** 120°C (hold 1 min.) to 300°C @ 9°C/min. (hold 10 min.)

Inj. temp.: 250°C; **Det.:** ECD, 300°C
Carrier gas: helium

INERTNESS

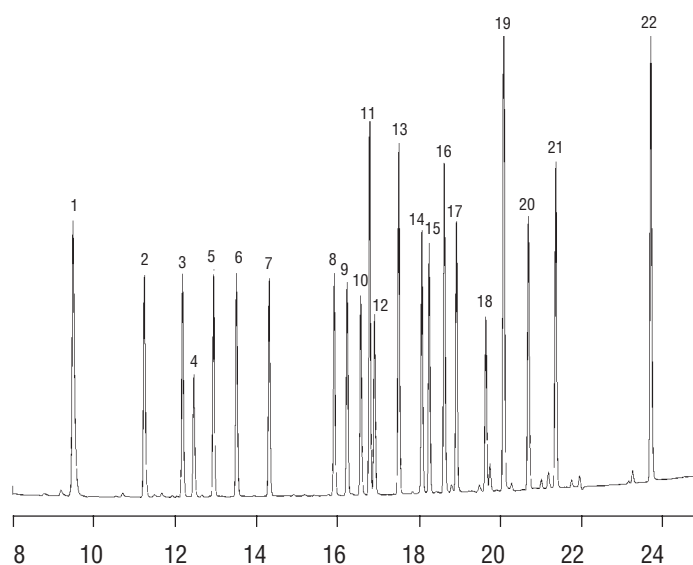
Enhanced Recovery of Trace-Level Chlorinated Pesticides

US Environmental Protection Agency (EPA) Method 8081A is a challenging analysis that requires gas chromatographic (GC) separation and detection of chlorinated pesticides in low ppb levels. Three compounds listed in the 8081A Method—endrin, DDT, and methoxychlor—are highly susceptible to breakdown on a variety of active surfaces, making accurate analysis difficult. A typical configuration for this analysis includes a direct injection sleeve and a guard column connected to one or two analytical columns via a press-tight connector. This entire chromatographic system needs to be optimized to prevent breakdown and ensure accurate results.

In Figure 2a, an on-column analyte concentration of 50ppb shows 62% endrin breakdown on an inadequately deactivated liner, as indicated by the integrated decomposition products of endrin aldehyde (peak 18) and endrin ketone (peak 21). Use of a Siltek™ inlet liner results in less than 1% endrin breakdown, and undetectable DDT and methoxychlor breakdown (Figure 2b). A completely deactivated GC system shows unsurpassed response and resolution of the complete list of 8081A analytes using a Siltek™ liner, Siltek™ Press-Tight® connector, Siltek™ guard column, and an Rtx®-CLPesticides analytical column (Figure 3).

Figure 3

A completely deactivated GC system shows excellent resolution of the complete list of US EPA Method 8081A analytes at very low levels.



Peak List for Figures 2 and 3

- 2,4,5,6-tetrachloro-m-xylene (IS)
- α-BHC
- γ-BHC
- β-BHC
- δ-BHC
- heptachlor
- aldrin
- heptachlor epoxide
- γ-chlordane
- α-chlordane
- 4,4'-DDE
- endosulfan I
- dieldrin
- endrin
- 4,4'-DDE
- endosulfan II
- 4,4'-DDT
- endrin aldehyde
- methoxychlor
- endosulfan sulfate
- endrin ketone
- decachlorobiphenyl (IS)

Conditions for Figure 3

30m, 0.32mm ID, 0.5µm (cat.# 11139) Rtx®-CLPesticides with a 5m, 0.32mm ID Siltek™ guard column (cat.# 10027) and a Siltek™ gooseneck liner (cat.# 20798-214.1)

On-column conc.: 16-160pg

Oven temp.: 120°C (hold 1 min.) to 300°C @ 9°C/min. (hold 10 min.)

Inj. temp.: 250°C, splitless (hold for 0.75 min.)

Det.: ECD, 300°C with anode purge
Carrier gas: helium, 31cm/sec.

Restek trademarks: Siltek, CarboFrit, Press-Tight, Uniliner, Rtx, and the Restek logo.

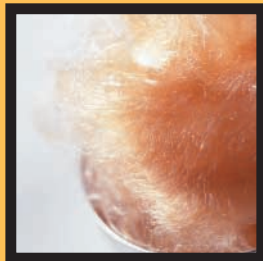
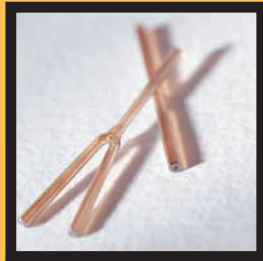
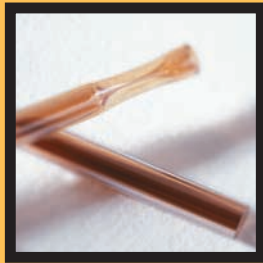
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Siltek™ Inlet Liners

For Siltek™ inlet liners, add the corresponding suffix number to your Restek liner catalog number.

Qty.	Siltek™		Siltek™ with Siltek™ wool		Siltek™ with CarboFrit™	
each	-214.1	addl. cost	-213.1	addl. cost	-216.1	addl. cost
5-pk.	-214.5	addl. cost	-213.5	addl. cost	-216.5	addl. cost
25-pk.	-214.25	addl. cost	-213.5	addl. cost	-216.25	addl. cost

Siltek™ Press-Tight® Connectors

Type	Ea.	3-Pk.	5-Pk.	25-Pk.	100-Pk.
straight	—	—	20480	20449	20481
angled	—	—	20482	20483	20484
“Y”	20485	20486	—	—	—
angled “Y”	20487	20469	—	—	—

Siltek™ Borosilicate Wool

Qty.	cat.#
10 g	21100

Siltek™ Guard Columns

Nominal ID	Nominal OD	5-Meter	10-Meter
0.25mm	0.37 ±0.04mm	10026	10036
0.28mm	0.37 ±0.04mm	10016	10017
0.32mm	0.45 ±0.04mm	10027	10037
0.45mm	0.69 ±0.05mm	10018	10019
0.53mm	0.69 ±0.05mm	10028	10038

Rtx®-CL Pesticides Column Kits

Kits include a universal angled “Y” Siltek™ Press-Tight® connector, 5m Siltek™ guard column, and columns listed.

Nominal ID	cat.#
30m, 0.53mm ID, 0.50µm Rtx®-CL Pesticides column	
30m, 0.53mm ID, 0.42µm Rtx®-CL Pesticides2 column	11197
30m, 0.32mm ID, 0.50µm Rtx®-CL Pesticides column	
30m, 0.32mm ID, 0.25µm Rtx®-CL Pesticides2 column	11198
30m, 0.25mm ID, 0.25µm Rtx®-CL Pesticides column	
30m, 0.25mm ID, 0.20µm Rtx®-CL Pesticides2 column	11199

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