

Genuine Restek Replacement Parts

for Shimadzu GCs



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RESTEK

Chromatography Products

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From Injector to Detector

Restek is your #1 source for consumables and supplies for Shimadzu GCs!

Genuine Restek Replacement Parts

We take a position of advocacy through quality in the innovative manufactured products and the selected resale products we offer. Our reputation has been built on supplying superior-quality manufactured parts, accessories, and operating supplies for gas chromatography. We do whatever it takes to provide you with the best—from our own innovative designs to original equipment manufacturers' replacement parts. Our consumables and parts will help you maintain optimum system performance, and give you the convenience and economy of one-stop shopping for all your GC needs.



Donna Lidgett

Product Marketing Manager, GC Accessories
20+ Years of Service

Donna Lidgett

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Restek Performance Coatings

As needs for improved performance of system components increase, coatings often are an effective solution. Restek's Performance Coatings Division specializes in innovative surface treatments for steel, stainless steel, alloys, glass, and other materials. Our surface treatments increase resistance to corrosion, reduce interactions between steel surfaces and active compounds, inhibit coking on process system surfaces, and offer many other advantages.



Restek's involvement in coatings began in 1987. The focus of our initial work was to produce a coating on stainless steel that would be inert to low levels of reactive organic compounds, such as explosives and volatile organic compounds (VOCs). The end product from this work was the Silcosteel® surface treatment for stainless steel tubing. Silcosteel® treated tubing currently is used for constructing analytical testing equipment by all major manufacturers of gas chromatography sampling and testing instruments.

Since this initial project, our coatings experts have developed a family of surface treatments to address other specific needs, and thereby enhance the performance of system components. Products of our processes are more correctly described as surface treatments, rather than as coatings, because, unlike coatings, the introduced layer permeates and chemically bonds to the treated surface. And unlike coatings, this layer cannot chip, flake, or blister. In brief, these treatments are:

- **Silcosteel®**—A general purpose passivation layer for steel and stainless steel. US Patent 6,511,760.
- **Siltek®**—The ultimate passivation of treated surfaces, from glass to high nickel alloys of steel. US Patent 6,444,326.
- **Silcosteel®-AC**—Dramatically reduces carbon buildup on stainless steel components. US Patent 6,444,326.
- **Silcosteel®-CR**—A corrosion resistant layer that increases the lifetime of system components in acidic environments containing hydrochloric acid, nitric acid, or seawater. US Patent 7,070,833.
- **Silcosteel®-UHV**—Greatly reduces outgassing from components of ultra-high vacuum systems. US Patent 7,070,833.
- **Sulfinert®**—A required treatment for metal components when analyzing for parts-per-billion levels of organo-sulfur compounds. US Patent 6,444,326.

it's a fact

All treatments are **total and uniform**: all pockets, holes, corners, and channels are coated evenly.

Restek surface treatments are now used in many applications, spanning multiple industries and market areas. Restek coated components increase the lifetime of stack monitoring equipment. Treated injector nozzles have longer service life because coking is inhibited. Sulfinert® treated sampling equipment increases the reliability of process measurements in refineries and petrochemical plants. A mass spectrometer manufacturer demands Silcosteel® treated parts to increase instrument sensitivity for analyzing pesticides. Restek coated air sampling equipment is used in applications as diverse as sampling city air and monitoring submarine cabins.

Siltek®/Sulfinert® Treatment

Feature	Benefit
Inert.	Sample, transfer, and analyze sulfur compounds and other active compounds at parts-per-billion levels.
Durable and flexible layer, incorporated into the surface.	Items can be worked after treatment—no flaking, chipping, or cracking.
Stable in acidic or weakly basic (pH 8-9) environments.	Sample sulfur compounds without compromising compound stability.
Tested thermal stability to 450°C in an inert atmosphere.	Effectively bake-out contaminants.
Non-polymeric.	No memory effects, as seen with Teflon®-coated parts.
Treated tubing and fittings in stock for immediate delivery.	Parts are available when you need them.



Siltek® treatment provides the ultimate passivation for many surfaces, from glass to high nickel alloys of steel.



Restek Electronic Leak Detector



Small, compact unit—easy to hold and operate.

Restek Electronic Leak Detector

- Reliable thermal conductivity leak detector.
- Responds to leaks in less than 2 seconds.
- Audible alarm plus LED readout.
- Auto zeros with the touch of a button.
- Built-in rechargeable 9 volt battery.

Improve GC Performance; Save Your Column!

Avoid poor chromatography caused by leaks—leak check your GC system with the Restek Electronic Leak Detector, the affordable, reliable tool for detecting leaks. Features include internal battery charge capability, a low-battery indicator, a battery charge indicator light, yellow lights to signal a nitrogen leak, a repositioned on/off switch to eliminate accidentally powering on the unit, and a probe tip design that prevents debris from entering the unit. The leak detector's microchip technology enables high sensitivity in a compact unit, the autozero feature allows instantaneous zeroing with the touch of a button, and the ergonomic design puts all controls at your fingertips, for maximum ease of use.

Leaks can cause detector noise and baseline instability, waste carrier gas, and shorten column lifetimes, so leak checks should be a regular part of a GC maintenance program. The Restek Electronic Leak Detector responds in less than 2 seconds to leaks of gases with thermal conductivities different from air, indicating leaks with both an audible alarm and an LED readout. The leak detector detects minute gas leaks that can go undetected by liquid leak detectors. Never use liquid leak detectors on a capillary GC system; liquids drawn into the system through the leaks will contaminate the system.

How does the Restek Electronic Leak Detector work?

The Restek Electronic Leak Detector detects minute leaks of any gas with a thermal conductivity different from air. The reference gas inlet draws in ambient air for comparison to air drawn into the sample probe. A thermal conductivity difference between the two indicates a leak, and the leak is revealed to the user by both an LED bar graph and an audible tone. The leak detector operates on one rechargeable 9-volt Ni-MH battery (included).

Leak Detector Facts

Detectable gases:	helium, nitrogen, argon, carbon dioxide
Battery:	Rechargeable Ni-MH, 9 volt
Operating Temperature Range:	32°-120°F (0°-48°C)
Humidity Range:	0-97%
CE Approved:	Yes



Easy-to-clean probe assembly

tech tip

Avoid poor chromatography caused by leaks—leak check with the Restek Electronic Leak Detector.

Description	qty.	cat.#
Leak Detector with 110Volt Battery Charger	ea.	22451
Leak Detector with 220Volt European Battery Charger	ea.	22451-EUR
Leak Detector with 220Volt UK Battery Charger	ea.	22451-UK

Caution: The Restek Electronic Leak Detector is NOT designed for determining leaks of combustible gases. A combustible gas detector should be used for determining combustible gas leaks under any condition. The Restek Electronic Leak Detector may be used for determining trace amounts of hydrogen in a GC environment only.

Leak Detector Accessory Kit

The kit includes an adaptor fitting to detect leaks in hard-to-reach locations, and a mounting bracket that can be affixed to the wall or GC.



Verify hard-to-reach leaks with the adaptor fitting.



Leak Detector is easily accessed when stored in the mounting bracket.

Description	qty.	cat.#
Leak Detector Accessory Kit (adaptor fitting for probe, mounting bracket)	kit	22453

tech tip

Avoid using liquid leak detectors on a capillary system! Liquids can be drawn into the system.

Liner Deactivations

Intermediate Polarity (IP) Deactivation

- Phenylmethyl-deactivated surface for better recovery of polar and nonpolar compounds.
- Compatible with most common solvents.
- Our standard deactivation—every Restek liner is IP deactivated unless otherwise requested.

Siltek® Deactivation

- Revolutionary deactivation for difficult matrices and reactive compounds.
- Inertness retained over a wide sample pH range.
- Minimal bleed.
- Ideal for chlorinated pesticide analysis; lowers endrin breakdown to less than 1%.
- Recommended for use with Rtx®-CLPesticides, Stx™-CLPesticides, Stx™-1HT, and Rtx®-TNT columns.

Base Deactivation

- Excellent inertness for basic compounds.
- Recommended for use with Rtx®-5 Amine, Rtx®-35 Amine, and Stabilwax®-DB columns.

All liners are
100%
deactivated

All liners are shipped intermediate polarity (IP) deactivated unless otherwise requested.

Siltek® Deactivation—The Next Generation

- Maximizes the inertness of the sample pathway.
- Minimizes breakdown.
- Low bleed.
- Thermally stable.
- “Clean and green”—manufactured without the use of harmful organic solvents.



Our Siltek® deactivation process (US Patent 6,444,326) produces a highly inert glass surface that features high temperature stability, extreme durability, and low bleed. Try Siltek® liners, guard columns, and connectors for better recovery of sample analytes.

For Siltek® deactivated inlet liners, add the corresponding suffix number to the liner catalog number.

qty.	Siltek® Liner		Siltek® Liner w/Wool		Siltek® Liner w/CarboFrit™	
		addl. cost		addl. cost		addl. cost
each	-214.1		-213.1		-216.1	
5-pk.	-214.5		-213.5		-216.5	
25-pk.	-214.25		-213.25		-216.25	

Base-Deactivated Inlet Liners

For base-deactivated inlet liners, add the corresponding suffix number to the liner catalog number.

qty.	Base-Deactivated Liner		Base-Deactivated Liner w/Base-Deactivated Wool		Base Deactivated Liner w/CarboFrit™	
		addl. cost		addl. cost		addl. cost
each	-210.1		-211.1		-229.1	
5-pk.	-210.5		-211.5		-229.5	
25-pk.	-210.25		-211.25		-229.25	

← Ideal for amines and basic compounds!

a plus 1 story

“I installed Siltek® liners on one of our GCs to replace standard quartz liners that required deactivating daily. I found the results to be excellent, saving many hours of instrument time with no detrimental effects on the analysis.”

Matthew Turner, Laboratory Manager—food contaminants, Global Analysis (UK)



Inlet Liner Packing Materials & Accessories

Why Use Deactivated Wool for a Liner Packing?

- Ensure uniform vaporization in split or splitless liners.
- Prolong column life by trapping septum particles.
- Recommended for autosamplers with fast injection rates.
- Inertness tested for endrin breakdown.

Deactivated Wool

Further improving our proprietary deactivation process, we make this deactivated wool more inert than our traditional fused silica wool, yet it is as flexible as our traditional borosilicate glass wool.

Description	qty.	cat.#
Deactivated Wool	10 grams	24324



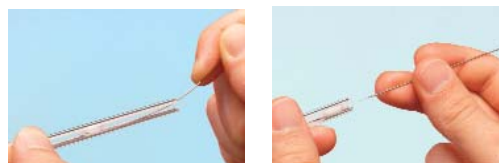
Base-Deactivated Wool

Ideal for amines and other basic compounds.

Description	qty.	cat.#
Base-Deactivated Wool	10 grams	20999

Mini Wool Puller/Inserter

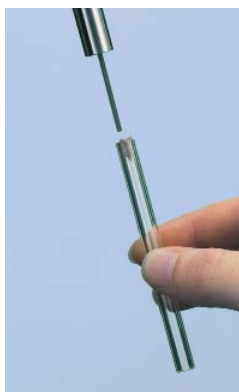
Insert and remove wool plugs easily. Order a spare pack so you'll always have one available.



Description	qty.	cat.#
Mini Wool Puller/Inserter	2-pk.	20114

Inlet Liner Packing Tool

- Easy to use—position wool reproducibly every time.
- Accurate to a specific, measured depth.



Eliminates user variation!



Description	qty.	cat.#
Inlet Liner Packing Tool	ea.	20339

Prepacked Inlet Liners

Let Restek do the work! Just add the appropriate suffix to the liner catalog number.

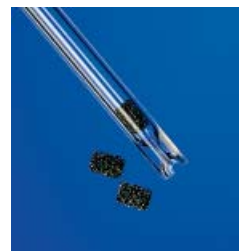
	Wool	FS Beads	CarboFrit [†]
ea.	-200.1	-201.1	-209.1
5-pk.	-200.5	-201.5	-209.5
25-pk.	-200.25	-201.25	-209.25

[†]CarboFrit[™] inserts require a neck greater than 2mm.



CarboFrit™ Inlet Liner Packing Material

- Highly inert.
- Extends analytical column lifetime.
- Enhances reproducibility of split and splitless injection.
- Uniform pore size and consistent packing density guarantee consistent flow through the liner.
- Easy to install in any liner with an ID >3.5mm when using puller-inserter tool listed below.*



Add the corresponding suffix number to the liner catalog number.

Description	suffix	
each	-209.1	addl. cost
5-pk.	-209.5	addl. cost
25-pk.	-209.25	addl. cost

*Liners with IDs less than 3.5mm are difficult to pack. We will pack them on a custom basis (minimum neck ID of 2mm required).

Replacement CarboFrit™ Inserts

Description	qty.	cat. #
Frits for liner ID ≤4mm	10-pk.	20295
Frits for liner ID >4mm	10-pk.	20294

CarboFrit™ Puller/Inserter Tool

- Hook end for removing CarboFrit™ inserts.
- Bent end (90°) for inserting CarboFrit™ inserts.

Description	qty.	cat. #
CarboFrit™ Puller/Inserter Tool	ea.	21642



a plus 1 story

“Restek sent us some carbon material (CarboFrit™) packing) with the suggestion to test it as liner packing. Initially, I didn’t even want to try it because carbon is usually highly retentive and catalytically active. As we nevertheless gave it a chance, we were highly surprised...it exhibited low retentive power and good inertness.”

excerpt from: *Sample Evaporation in Hot GC Injectors*,
Dr. Konrad Grob, *The Restek Advantage*, Winter 1996.

Deactivated Fused Silica Beads

- Increase sample vaporization surface and minimize splitter discrimination to improve quantitation of compounds having dissimilar boiling points.
- Trap non-volatile or inorganic residue to prevent column inlet contamination.
- Deactivated, heat-treated, and tested to ensure complete inertness.

Description	Mesh	qty.	cat. #
Deactivated Fused Silica Beads	60-80	25 grams	20791



Inlet Liner Removal Tool

- Easily remove liner from injector—no more burned fingers.
- Made from high-temperature silicone.
- Won’t chip or crack the liner.



No more burned fingers!

Description	qty.	cat. #
Inlet Liner Removal Tool	3-pk.	20181



tech tip

Use of Packings with Splitless Liners

We recommend using an injection port liner with wool or CarboFrit™ packing when making splitless injections with an autosampler. If there is no packing material in the liner, the solvent droplets act like water on a hot iron: they bounce around until vaporized (Leidenfrost phenomenon). Because autosamplers make rapid injections, samples can be incompletely vaporized, leading to non-reproducible peak response and tailing. You can prevent this by using wool or CarboFrit™ packing material in the splitless liner, to provide a surface for the solvent droplets to “sit” on until the heat from the injector vaporizes them.

