

Reduce Your Risk: Prevent GC Inlet Problems BEFORE they Cost You Time and Money!

Gas chromatography users will reduce the risk of chromatographic problems and instrument downtime through regular, proper maintenance of the GC injection port. Our technical service chemists help GC users solve problems daily that are the direct result of dirty liners, over used septa, or improperly installed ferrules. This article discusses how some simple, routine preventative maintenance of your injection port system will prevent costly problems down the line. Be proactive with your maintenance today or be sorry with your results tomorrow.

Change your Septum Daily

You should routinely inspect and replace your injection port septum to reduce the risk of leaks and septa particle contamination. Change the septum daily, especially if the instrument is in heavy use. Repeated use of the same septum will result in increased coring, which will introduce a leak and result in septa fragments contaminating the injection port. Pieces of septa in the injection port will introduce extra peaks as shown in Figure A. If using a mass spectrometer, you will see a mass spectrum of the septa bleed, as shown in Figure B.

Change Ferrules during System Maintenance and Column Installation

You should always replace the column ferrules when you install a new column or perform column maintenance. A leaking ferrule will allow oxygen into the carrier gas, shortening your column life. A leak can also cause variation in retention times, baseline drift, and sample loss. Be aware that small particles nearly always enter the capillary column during ferrule installation. Ferrule fragments will cause bleed problems or absorb sample components leading to poor results. Be sure to follow our column installation instructions to avoid ferrule fragments from entering the column. Proper ferrule installation and maintenance will minimize your risk of leaks, bleed, and poor reproducibility.

Routinely Inspect and Change Dirty Liners

GC users should routinely inspect and replace the inlet liner to eliminate contaminants and active sites that will lead to poor chromatography. Dirty samples passing through the liner leave behind residue. As residues accumulate, they affect chromatography by adsorbing the sample components of interest to you. This adsorption results in poor peak shapes, and sometimes, extra peaks in

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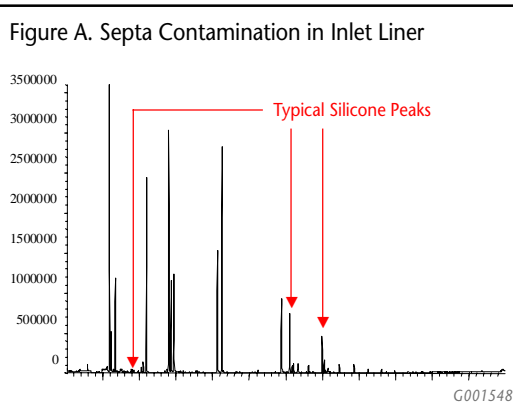


Figure B. Mass Spectrum of Septa Contamination in Inlet Liner

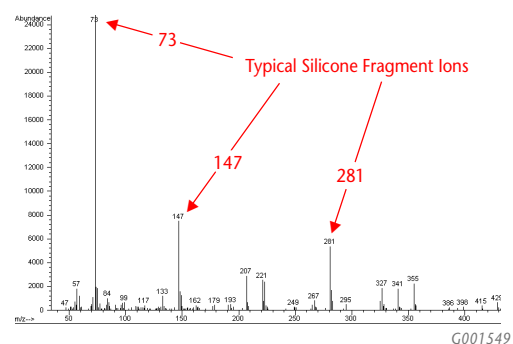
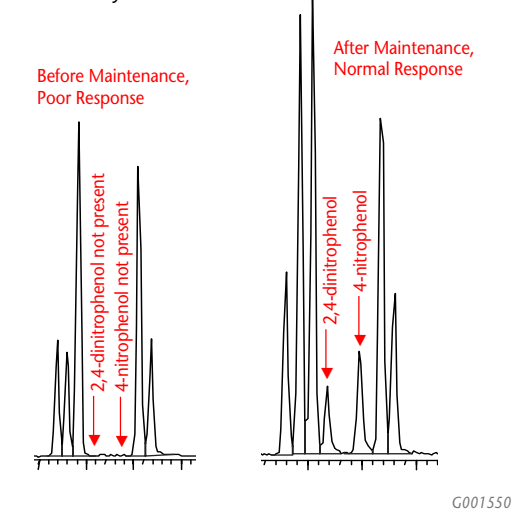


Figure C. Chromatography Problems with a Dirty Liner



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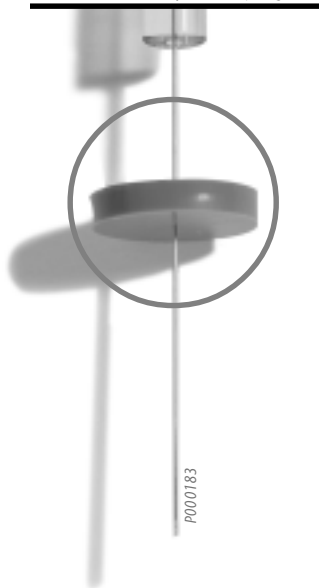
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Injection Port Maintenance Solves Customer Problem

Therm-O-Ring Seals / Inlet Seals for Agilent/HP GCs



P000752

LB-2 Low Bleed Septa on Syringe



P000183

Injection Port Ferrule for Agilent Technologies GC Equipment



P000774

GC/MS Ferrule for Agilent Technologies GC Equipment



P000776

Column Nuts for Agilent Technologies Injection Ports

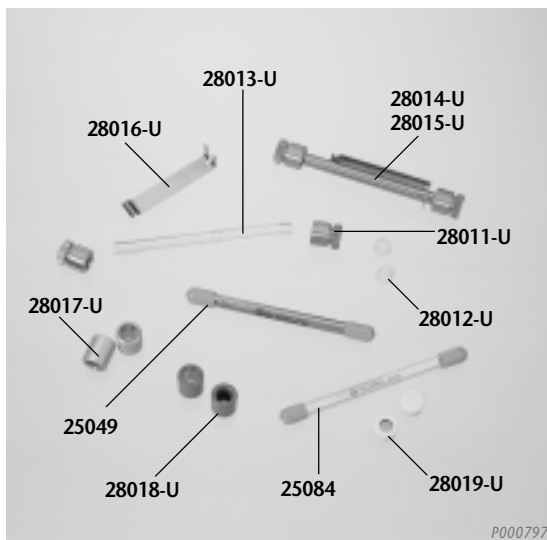


24833-U

P000777

NEW PRODUCTS

Thermal Desorption Tube Accessories for PerkinElmer Equipment



P000797

PerkinElmer and Supelco offer a broad line of adsorption tubes for the PerkinElmer ATD-50 and ATD-400, and TurboMatrix thermal desorption instruments. Supelco now offers the complete line of PerkinElmer accessories. These accessories are manufactured by PerkinElmer and are now available through Supelco. We have all the products you will need for the new TurboMatrix instrument including the new brass end caps, replacement ferrules, clip holders, diffusion caps with and without membranes and empty glass and stainless steel tubes with brass caps. We are also offering for the ATD-50 and ATD-400 the PTFE end caps and empty glass and stainless steel tubes.

For more information on accessories available for PerkinElmer thermal desorption equipment, request T401093.

Accessories for PerkinElmer Thermal Desorption Tubes

	Qty.	Supelco Cat. No.
TurboMatrix Tube Accessories		
Brass Caps	20	28011-U
Replacement Teflon® PFE Ferrules for Caps	20	28012-U
Pen Clips for Tubes	10	28016-U
Diffusion Caps Standard	10	28017-U
Diffusion Caps with Membrane	10	28018-U
Empty Glass Tube with Brass Caps	10	28013-U
Empty SS Tube with Brass Caps	10	28014-U
Empty SS Tube with Brass Caps	50	28015-U
ATD Model 50 and 400 Accessories		
PTFE Storage Caps	20	28019-U
Empty Tube Stainless Steel	1	25049
Empty Tube Glass	1	25084

Bulk Inlet Seals for Agilent™ Technologies GCs

Low cost, replacement stainless steel inlet seals for Agilent Technologies GCs now come in a bulk package size for high volume users. Precise, computerized machining reduces dimensional variation that can occur with other seals. Best value, save 47% on the new bulk package containing 100 stainless steel inlet seals and 50 washers.

For more information request T400006.

Stainless Steel Agilent Inlet Seals

pk. of 100 w/ 50 washers

23363-U

FEATURED PRODUCTS

Capillary Injector Products for Agilent Technologies GCs

Therm-O-Ring™ Seals

High pressure Therm-O-Ring inlet seals for Agilent inlet liners provide superior GC performance at temperatures as high as 375°C. Supelco's proprietary formulation yields O-rings that do not stick to the injection port or fragment during removal. These rings are a superior replacement for Viton O-rings and are available exclusively from Supelco.

For more information request T400003.

Therm-O-Ring Seals, Pk. of 10

21003-U

Therm-O-Ring Seals, Pk. of 25

21004-U

Inlet Seals for Agilent Technologies GCs

Low cost, replacement inlet seals for Agilent GCs from Supelco reduce the need for cleaning and reuse. Supelco metal selection yields a better inlet seal. Seals are available in stainless steel and gold plated versions. Precise, computerized machining reduces dimensional variation that can occur with other seals.

For more information request T400006.

Stainless Steel HP Inlet Seals, Pk. of 2

23316-U

Stainless Steel HP Inlet Seals, Pk. of 10

23317-U

Gold Plated HP Inlet Seals, Pk. of 2

23318-U

Gold Plated HP Inlet Seals, Pk. of 10

23319-U

Exclusive LB-2 Low Bleed Septa

Supelco LB-2 septa are the industry benchmark. These septa are extremely low bleed over a wide range of inlet temperatures (100°C to 350°C). They come already conditioned and ready to use. LB-2 septa offer high puncture tolerance and easy penetration. They are ideal for autosamplers. The LB-2 septa formulation is exclusive to Supelco.

For more information request T395082 and T401027.

Thermogreen LB-2 Septa

Disc Diameter		Qty.	Cat. No.
mm	Inch		
9.5	3/8	50	20652
11.0	7/16	50	20654
11.0	7/16	250	23163

All literature mentioned in this issue can be obtained from the website, sigma-aldrich.com/TheReporter, by completing the Literature Request section on the reply card, or by calling our Technical Service Department.

FEATURED PRODUCTS (contd.)

Ferrules for Agilent Technologies GC Equipment

Use ferrules specially designed for Agilent Technologies instrumentation. They are available in either an M-4 (100% Graphite that have a maximum temperature limit of 450°C) or an M-2A (85% polyimide/15% graphite, maximum temperature limit of 350°C).

☎ For more information request T401027.

Ferrules for Agilent Technologies GCs

Ferrule Type	Qty.	Capillary Column Ferrules (1/16" Fitting)		
		0.53mm Cat. No.	0.32mm Cat. No.	0.20-0.25mm Cat. No.
Injection Port				
M-2A	10	24801-U	24802-U	24803-U
	50	24804-U	24806-U	24807-U
M-4	10	24808-U	24809-U	24811-U
	50	24812-U	24813-U	24819-U
GC/MS				
M-2A	10	24823-U	24824-U	24826-U
	Ferrule ID	0.8mm	0.5mm	0.4mm

Column Nuts for Agilent Technologies GCs
for 1/16" ferrules, Pk of 2

24833-U

Deactivated Glass Liners for Agilent Injection Ports

A regular schedule of inlet liner replacement will help prevent adsorption problems that can otherwise drastically affect your analysis. The following glass liners fit Agilent Technologies Models 4890, 5890, and 6890.

☎ For more information request T401027.

Deactivated Glass Inlet Liners

Split Injection	Cat. No.
78.5 x 6.3mm, 4mm ID, wool packed, Pk. of 5	20486,05
78.5 x 6.3mm, cup design, Pk. of 5	20510,05
78.5 x 6.3mm, cup design, wool packed, Pk. of 5	20482,05
Splitless	
78.5 x 6.5mm, tapered, Pk. of 5	20466,05
78.5 x 6.5mm, tapered, wool packed, Pk. of 5	20478,05
78.5 x 6.5mm, 2mm ID, Pk. of 5	20513,05
78.5 x 6.5mm, dual tapered, Pk. of 5	20485,05
Direct/Wide-Bore	
78.5 x 6.5mm, 1.5mm ID, Pk. of 5	20517,05
78.5 x 6.3mm, 0.75mm ID, Pk. of 5	26375,05

GC PERFORMANCE TIP

Changing the GC Inlet Liner

No sample is perfectly clean and over time nonvolatile sample residues contaminate liners. As these contaminants accumulate they adversely affect chromatography by creating sites that lead to the absorption or decomposition of critical analytes. The principle mechanism is one of acid or base interaction between accumulated residues and the analyte functionality. The result is reduced analyte response, irreproducible quantitation, tailing or even missing peaks.

LITERATURE

Capillary GC Troubleshooting Guide: How to Locate Problems and Solve Them

The systematic approach to troubleshooting described in this guide will enable you to solve many problems yourself. The guide also contains suggestions for maintaining your system, including the column, at optimal performance levels. By following these recommendations, you can reduce repair costs and minimize instrument downtime.

☎ For more information request T112853.

A Practical Guide to Quantitation with Solid Phase Microextraction

The guide presents a practical introduction to quantitation using SPME based on your type of sample. We describe the factors that will influence your accuracy and precision and the different quantitation approaches that you can use. To help further, we provide specific examples for each of the different approaches discussed along with specific references for additional reading.

☎ For more information request T101929.

Solid Phase Microextraction Troubleshooting Guide

The guide presents a systematic approach to troubleshooting SPME problems. The guide will help you find a quick solution to many problems typically encountered. It also contains helpful tips to prevent problems before they occur, as well as, a troubleshooting table listing the symptoms of common problems, the possible causes, and suggested remedies. By following these recommendations, you can save valuable time and money.

☎ For more information request T101928.

SEMINARS

Capillary GC Troubleshooting: A Practical Approach

This presentation contains sections on basic troubleshooting strategy, how to prevent problems, identifying common problems, and recommended references for additional reading.

☎ For more information request T400008.



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☎ For more information request T196899.

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Agilent Technologies - Agilent Technologies

Supelco and Therm-O-Ring - Sigma-Aldrich Co.

Teflon - E.I. du Pont de Nemours & Co., Inc.

Patents:

SPME - Technology licensed exclusively to Supelco. US patent #5,691,206; European patent #523092.

Reduce Your Risk...

(continued from page 1)

the chromatogram. This leads to rework, wasted time, lost money and inaccurate results. You should inspect your liner regularly, if not daily, and replace it with a new, deactivated liner if residue is present or your performance test mix fails. Figure C shows how active sites in a dirty liner can affect your results.

Inexpensive Maintenance Saves Time and Money in the Long Run

GC users often overlook or disregard the importance of preventative maintenance and only act when a problem is obvious. We have highlighted three important injection port

components that require proactive attention to reduce your risk of problems. You should check and replace the inlet liner, septa, and column ferrules regularly, particularly when installing a new column. Supelco can help you prevent the problems discussed. We offer a complete line of high quality, injection port accessories. Choosing Supelco's performance accessories for routine GC system maintenance and new column installation will save you costly downtime, rework, and inaccurate results. Remember that an ounce of prevention is worth a pound of cure.

For more information request T112853, T400008, and T401027.

CASE STUDY 3

Injection Port Maintenance Solves Customer Problem

An analyst was running routine assays on two GCs. She noticed the chromatograms generated by one of the GCs contained tailing peaks; and with each additional sample run, the peak height was diminishing (Figure D). Believing the column had deteriorated, she decided to call Supelco Technical Service to find out if she could buy an equivalent replacement column.

The analyst called to determine the price and delivery time of the capillary column she needed. The Technical Service chemist asked what type of sample the analyst planned to run on the column. She replied it was a routine analysis her laboratory performed, and their current capillary column was producing chromatograms that exhibited tailing peaks and decreasing peak height.

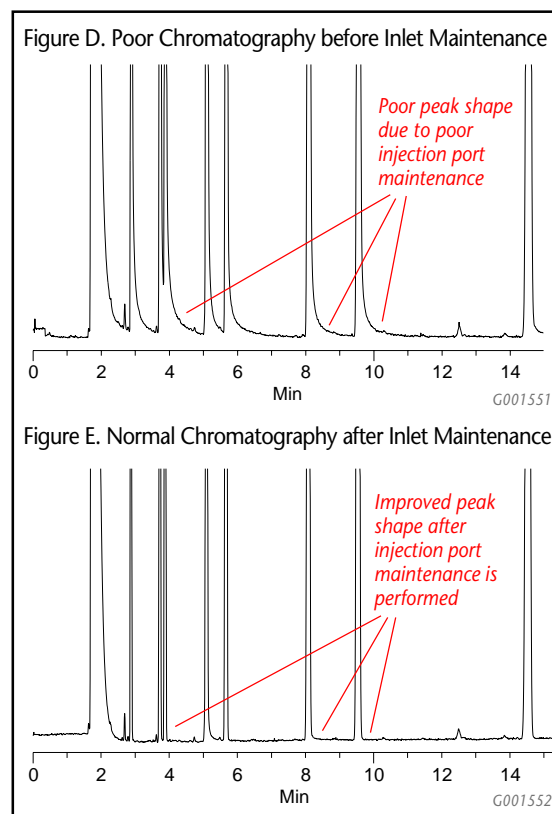
The Technical Service chemist wanted to determine if the problem could be something other than the column. He began to ask questions concerning the type of routine maintenance performed in the customer's lab. He discovered the analyst was relatively new to her position and had not performed any maintenance on the GC inlet system.

The Technical Service chemist explained that peak tailing and disappearing peaks could be a symptom of a dirty inlet liner. When septa fragments and residues accumulate in the liner, they create adsorption sites that interact with the sample as it passes through the inlet. He instructed the analyst to inspect the liner. If it appeared dirty, she should replace it with a brand new, deactivated liner and run her routine assay samples to see if this improved peak shape.

Upon following these instructions, the analyst reported that she found the inlet liner had a brown coating on the inside. She replaced the liner, reinstalled the column, and

ran some samples. The chromatograms looked great (Figure E), solving her problem and saving the price of a replacement column.

For more information request T400008.



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