TRAJAN

CRS GC septa

Science that benefits people

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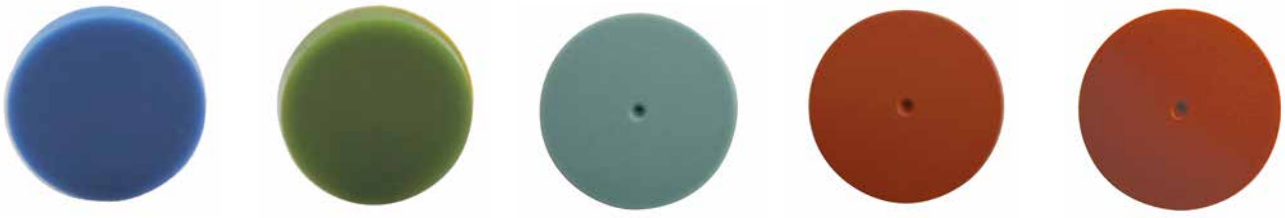
Give your GC the seal of approval.

Injection port septa are one of the most critical consumables that have a direct impact on the workflow stage of sample introduction. Trajan's CRS GC septa are designed with stringent specifications to deliver quality GC analysis.

The efforts of our team of scientists and engineers have led to the development of Trajan's industry-leading line of GC septa to support the gas chromatography analyses around the world. Designed for various applications, Trajan's CRS GC septa are available in a wide range of types to address specific user application needs such as temperature, cleanliness, minimal volatile offgassing and surface material specifications.



CRS GC septa range: (left to right) General purpose blue, Puresep T™, AG3, Marathon, and BTO®.

Contents

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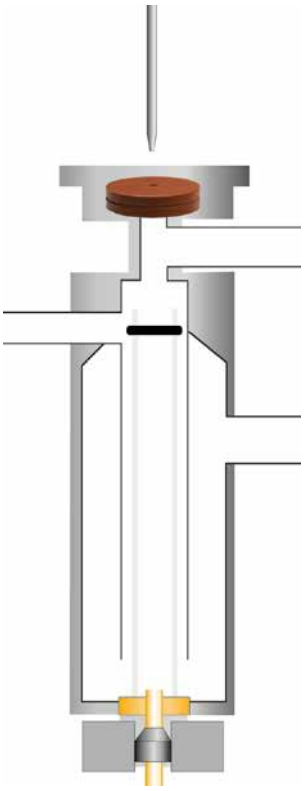
The importance of GC septa selection



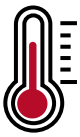
What is the function of a GC septum?

The GC inlet functions as the interface of the sample flow pathway between the syringe and the GC capillary column, where the sample is introduced, vaporized, mixed with carrier gas and transferred to the analytical column.

The role of a septum in a GC system is to isolate the sample flow path from the outside world. The septum provides a barrier readily penetrated by the injection needle while maintaining internal pressure without causing system contamination. An ideal septum exhibits low bleed, long lifetime, minimal coring, ability to handle the temperature ranges governed by the application methodology and provides little to no offgassing of volatile compounds that can interfere with analyses. All this is accomplished at a price point that keeps your laboratory operations quality-driven and competitive.

Choosing the correct GC septa for your applications

When deciding which GC septum is the best solution for your workflow there are a few things to keep in mind.

	**Material** - Septa are available in a wide variety of materials designed to provide various levels of features such as longer life, ability to handle a multitude of temperature ranges, and provide low bleed.
	**Pre-pierced** - Septa that are pre-pierced offer the ability to avoid damage to the syringe needle and reduce coring particulate within the inlet liner.
	**Temperature** - GC applications require certain temperature ranges to complete an analysis effectively. The materials used to manufacture The CRS range of GC septa are designed to work best at specific temperatures.
	**Cost** - When selecting septa consider the long-term cost of using different types of septa. This includes application temperature, replacement frequency and potential downtime because of coring or bleed. The CRS range of GC septa offers options to optimize performance and work within your lab budget.

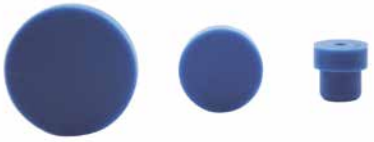
As illustrated above, septa are not trivial, choosing the correct septum is an important process to ensure your instrument is set up for success. Each GC septa has its own unique advantages and limitations. Now, by continuing through the brochure, you will continue to learn more about how Trajan's CRS GC septa can improve the quality and efficiency of your analytical laboratory workflow needs.

General purpose GC septa

When to choose general-purpose GC septa?

Trajan's CRS GC septa for general purpose use are designed to be suitable for a wide range of routine analytical applications, offering a balance between performance and cost. Able to withstand moderate temperatures and injection pressures, we highly recommend you check out Trajan's CRS GC septa for general-purpose application workflows. Since general-purpose septa are simple in design, they typically are more affordable for labs working with a smaller budget.

General purpose blue GC septa



Recommended for non-demanding, routine applications.

- Made from silicone and easy to penetrate.
- Temperatures up to 275°C.
- Available sizes (mm): 5, 6.4, 8, 9, 9.5, 10, 11, 11.5, 12.7, 17, and Shimadzu plug style.

Puresep T™ GC septa

Enhanced durability and low bleed for non-demanding, routine applications.

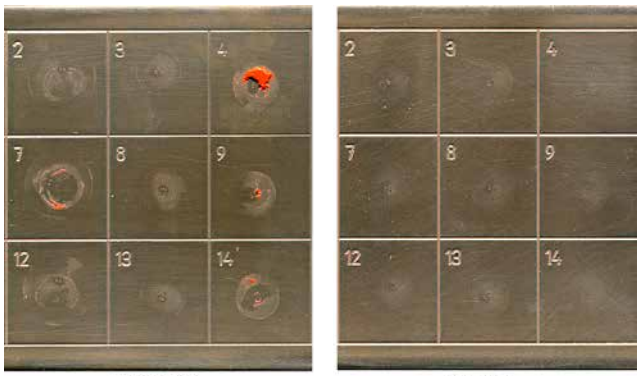
- Silicone-based septum that is faced on one side with a double layer of polyimide and PTFE materials.
- The polyimide adheres to both the PTFE and silicone, providing a better bond and enhanced durability. The outer coating of PTFE assures maximum inertness and helps minimize bleed.
- Temperature applications of 225°C.
- Available sizes (mm): 6.4, 9.5, 11, 11.5, and 12.7.

Benefits of choosing CRS premium GC septa

High temperature performance

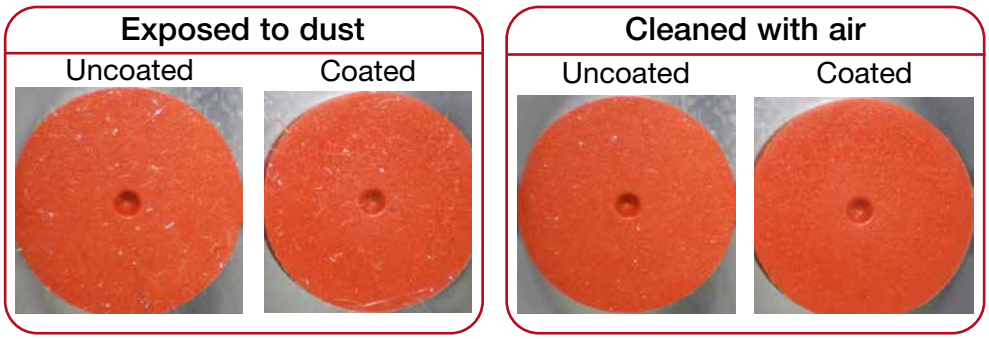
Have you ever had trouble with your septum sticking to your inlet when replacing the septum? This could be attributed to selecting a septum that has not been designed to withstand the higher temperatures required by your application.

Our premium GC septa are made from specifically designed material that holds up to high temperatures. Accelerated high-temperature tests show adhesion of silicone rubber formulations to a stainless steel plate, with and without Trajan's non-stick coating. The difference in adhesion is readily apparent. In actual use this performance means easier septum removal and less injection port cleanup.



Plasma coating

Utilizing clean and non-sticking septa is essential for obtaining accurate test results and making routine maintenance a breeze. Our proprietary plasma coating process ensures a non-stick surface treatment, making premium GC septa easy to change, even after high-temperature use. Lastly, the coating keeps the septa clean and does not attract dust. Placing high-quality materials into your workflow ensures the output of high-quality analyses.



Center guide and pre-pierced advantage

Have you noticed or experienced septum particles collecting in the inlet liner after multiple injections? This is a result of “coring” which occurs when particles of septum material are stripped and deposited into the inlet liner with the syringe passing through the septum into the liner to deliver the injection sample.

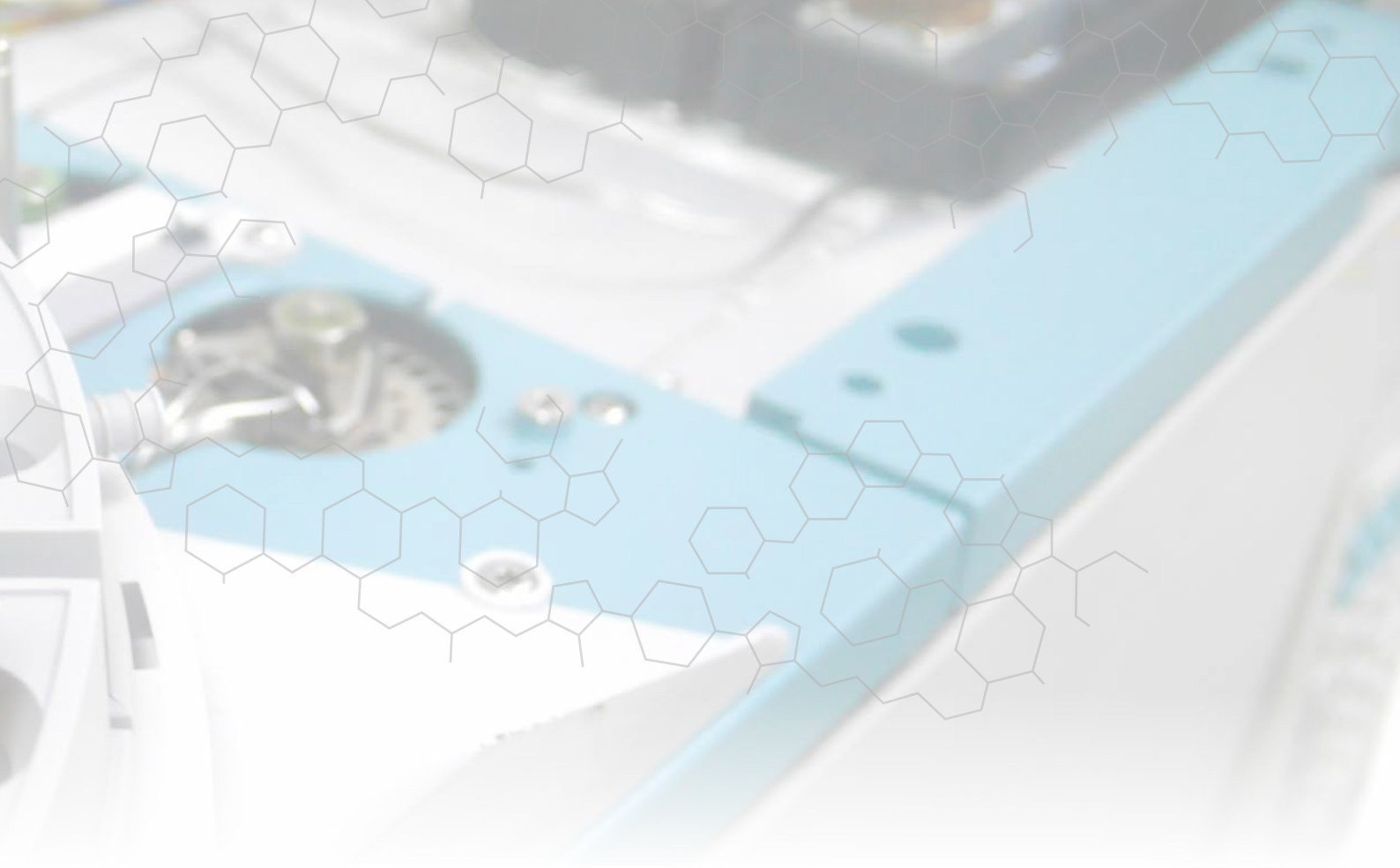
Our premium GC septa are precision molded with a recess on the injection side, to guide the syringe needle to the same point with every injection. Without compromising performance, the center guide design requires less force to achieve initial penetration for a smoother feel and reduces needle bending. Pre-pierced septa achieve long injection life for automated workflows, they reduce coring events, and provide industry-leading performance.

Center guide and pre-pierced

Non-center guide and non-pierced

GC septa packaging

Trajan’s CRS branded premium GC septa are plasma-coated to provide low bleed and to reduce sticking to the GC inlet. To ensure a high level of purity our septa are packed in contaminant free blister packs and sterilized glass jars. To maintain product integrity, and minimize the risk of introducing unwanted contaminants, we also recommend handling the septa with tweezers for best results.



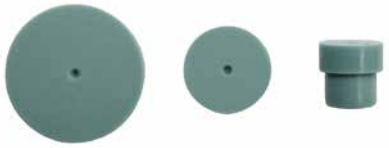
Premium GC septa

When to choose premium GC septa?

If you work at high temperatures, require reduced instrument downtime, or separate sensitive analytes, then Trajan's CRS premium GC septa are the optimal choice for your laboratory. They are designed for low bleed performance, plasma-coated to minimise sticking, engineered to increase longevity, and capable to withstand high-temperature applications. CRS premium septa are ideal for demanding and critical analyses. Being pre-conditioned also offers the added benefit of being able to quickly resume your analysis, avoiding unnecessary equilibration or additional conditioning time associated with septa that have not been pre-treated.

Trajan's CRS premium GC septa have been designed to provide a reliable seal against the carrier gas pressure. Premium septa can be pierced and resealed time after time with the reduced risk of pieces of septum being deposited within the GC system. Additionally, the CRS premium septa will not introduce contamination or elevated levels of bleed into your chromatographic system.

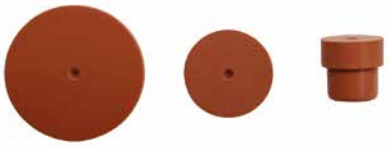
AG3 low-bleed GC septa



Durable septum you can use for all your critical analyses.

- Combines significantly longer injection life, low bleed and low injection port adhesion.
- Temperatures up to 350°C and 300°C for 17 mm size.
- Available sizes (mm): 5, 6, 6.4, 7, 8, 9, 9.5, 10, 11, 11.5, 12.7, 17, and Shimadzu plug style.

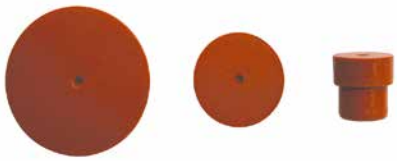
Marathon long-life GC septa



Advanced GC septa for autosampler use, which provides a significantly longer life. Also ideal for standard manual injection GC and GC-MS.

- Typically achieves 400 injections without failure using a rounded-tip needle and autosampler or needle guide. Now you can make extended autosampler rounds without fear of sample loss caused by blow-back of leaking carrier gas.
- Temperatures up to 350°C and 300°C for 17 mm size.
- Available sizes (mm): 5, 9, 11, 11.5, 12.7, 17, and Shimadzu plug style.

BTO® premium high-temp GC septa



Recommended for the most demanding GC and GC-MS applications; it is the optimum GC septum.

- Formulated to provide low bleed and outstanding mechanical properties of premium GC septa to the highest temperature applications.
- Temperatures up to 400°C and 330°C for 17 mm size.
- Available sizes (mm): 5, 6, 6.4, 9, 9.5, 10, 11, 11.5, 12.7, 17, and Shimadzu plug style.

Endura-Seals GC septa

Are you running an automated analysis with long sequence time? Do you find that traditional silicone based GC septa don't provide the lifetime you need and compromises your sequence time?

CRS Endura-Seals GC septa are resilient to needle wear and tear, eliminate coring and are recommended for automated analysis that requires long run times. Endura-Seals are a patented alternative to typical silicone-rubber injection port septa for gas chromatography. They work in a 2-part sealing system that includes the septum and the sealing nut. Endura-Seals offer excellent durability and good resealing, for use at a maximum injector temperature of 400°C.

The duckbill valve and wiper seal combination in the Endura-Seals is much more resistant to needle "wear and tear" than traditional pierced septa. While premium septa are already designed to reduce coring (particles in the liner), the Endura-Seals allow the needle to glide through the valve to completely eliminate such particles. These features make the Endura-Seals GC septa an ideal choice for automated analyses in the long sequences used with today's high capacity autosamplers.

Applications that could benefit from using Endura-Seals:

- Environmental analysis: Analyzing volatile organic compounds (VOCs) in air or water samples using GC-MS.
- Food analysis: Detecting contaminants or flavor compounds in food products.
- Pharmaceutical analysis: Quality control testing of drug formulations.
- Chemical analysis: Identifying and quantifying unknown compounds in complex mixtures.

Endura-Seals are available in 11 mm and Shimadzu style kits. Each kit includes one sealing nut and two septa. 11 mm Endura-Seals will fit most industry standard instrument injection ports without needing an adapter kit.

Material	Durability	Resealing	Required needle	Max Pressure	Maximum injector temperature
Silicone	Excellent	Good	23 gauge	100 PSI	400°C

CRS GC septa range

	General purpose blue GC septa	Puresep T™ GC septa	AG3 (Advanced Green 3) GC septa	Marathon GC septa	BTO® (Bleed and temperature optimized) GC septa	Endura-Seals GC septa
						
Overall benefits	Low temperature applications	Enhanced durability and low bleed for low temperature applications	Combines significantly longer injection life, low bleed and low injection port adhesion	Premium septum for autosamplers. Up to 400 injections per septum.	Bleed and temperature optimized, combined with outstanding mechanical properties for the highest temperature applications. Retains softness and pierceability at high temperatures and low injection port adhesion.	Resilient to needle wear and tear, eliminate coring and are recommended for automated analysis that requires long run times.
Material	Silicone	Silicone/PTFE	High temperature silicone	High temperature silicone	BTO silicone	Silicone
Durability	Good	Good	Excellent	Excellent	Excellent	Excellent
Resealing	Good	Good	Excellent	Excellent	Excellent	Excellent
Solvent resistance	Excellent	Good	Excellent	Excellent	Excellent	Excellent
Tear resistance	Good	Good	Excellent	Excellent	Excellent	Excellent
Maximum temperature	275°C	225°C	350°C, 300°C for 17 mm size	350°C, 300°C for 17 mm size	400°C, 330°C for 17 mm size	400°C

For more information about Trajan's GC septa, please contact our friendly experts at techsupport@trajanscimed.com.

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CRS GC septa | Part numbers

General purpose blue

Part number	Part description and detail
234106	5 mm OD General purpose blue GC septa PK50
234626	6.4 mm (1/4") OD General purpose blue GC septa PK50
234113	8 mm OD General purpose blue GC septa 8 mm PK50
234108	9 mm OD General purpose blue GC septa PK50
234906	9.5 mm (3/8") OD General purpose blue GC septa PK50
234111	10 mm OD General purpose blue GC septa PK50
234116	11 mm OD General purpose blue GC septa PK50
234216	11.5 mm OD General purpose blue GC septa PK50
234126	12.7 mm (1/2") OD General purpose blue GC septa PK50
234118	17 mm OD General purpose blue GC septa PK50
234121	Shimadzu plug General purpose blue GC septa PK50

Puresep T™

Part number	Part description and detail
230665	6.4 mm (1/4") OD Puresep T coated GC septa PK50
230675	9.5 mm (3/8") OD Puresep T coated GC septa PK50
230685	11 mm OD Puresep T coated GC septa PK50
230697	11.5 mm OD Puresep T coated GC septa PK50
230695	12.7 mm (1/2") OD Puresep T coated GC septa PK50

AG3 low-bleed

Part number	Part description and detail
Non-center guide	
246526	6 mm OD AG3 low-bleed GC septa PK50
041916	6.4 mm (1/4") OD AG3 low-bleed GC septa PK25
246527	7 mm OD AG3 low-bleed GC septa PK50
246528	8 mm OD AG3 low-bleed GC septa PK50
041901	9.5 mm OD AG3 low-bleed GC septa PK25
246124	9.5 mm OD AG3 low-bleed GC septa PK50
246510	10 mm OD AG3 low-bleed GC septa PK50
Center guide	
041917	5 mm OD AG3 low-bleed center guide GC septa PK25
246525	5 mm OD AG3 low-bleed center guide GC septa PK50
041900	9 mm OD AG3 low-bleed center guide GC septa PK25
246713	9 mm OD AG3 low-bleed center guide GC septa PK50
041902	11 mm OD AG3 low-bleed center guide GC septa PK25
246225	11 mm OD AG3 low-bleed center guide GC septa PK50
246228	11 mm OD AG3 low-bleed center guide GC septa PK100
041904	11.5 mm OD AG3 low-bleed center guide GC septa PK25
246725	11.5 mm OD AG3 low-bleed center guide GC septa PK50
041906	12.7 mm (1/2") OD AG3 low-bleed center guide GC septa PK24
246325	12.7 mm (1/2") OD AG3 low-bleed center guide GC septa PK50
041903	17 mm OD AG3 low-bleed center guide GC septa PK24
246624	17 mm OD AG3 low-bleed center guide GC septa PK50
246424	Shimadzu Plug AG3 low-bleed center guide GC septa PK50

Marathon long-life

Part number	Part description and detail
041911	5 mm OD Marathon long-life center guide GC septa PK25
239597	5 mm OD Marathon long-life center guide GC septa PK50
041908	9 mm OD Marathon long-life center guide GC septa PK25
239779	9 mm OD Marathon long-life center guide GC septa PK50
041915	11 mm OD Marathon long-life center guide GC septa PK25
239297	11 mm OD Marathon long-life center guide GC septa PK50
239888	11 mm OD Marathon long-life center guide GC septa PK100
041907	11.5 mm OD Marathon long-life center guide GC septa PK25
239798	11.5 mm OD Marathon long-life center guide GC septa PK50
041914	12.7 mm (1/2") OD Marathon long-life center guide GC septa PK24
239397	12.7 mm (1/2") OD Marathon long-life center guide GC septa PK50
041910	17 mm OD Marathon long-life center guide GC septa PK24
239698	17 mm OD Marathon long-life center guide GC septa PK50
041913	Shimadzu plug Marathon long-life center guide GC septa PK25
239498	Shimadzu plug Marathon long-life center guide GC septa PK50

BTO® high-temp

Part number	Part description and detail
Non-center guide	
0418999	6 mm (4 mm thick) OD BTO® premium high-temp pre-drilled GC septa PK50
041919	6.4 mm (1/4") OD BTO premium high-temp GC septa PK25
298755	6.4 mm (1/4") OD BTO premium high-temp GC septa PK50
041897	9.5 mm OD BTO premium high-temp GC septa PK25
298705	9.5 mm (3/8") OD BTO premium high-temp GC septa PK50
041918	10 mm OD BTO premium high-temp GC septa PK25
298745	10 mm OD BTO premium high-temp GC septa PK50
Center guide	
298787	5 mm OD BTO premium high-temp center guide GC septa PK50
041896	9 mm OD BTO premium high-temp center guide GC septa PK25
298713	9 mm OD BTO premium high-temp center guide GC septa PK50
041898	11 mm OD BTO premium high-temp center guide GC septa PK25
298717	11 mm OD BTO premium high-temp center guide GC septa PK50
298718	11 mm OD BTO premium high-temp center guide GC septa PK100
041899	11.5 mm OD BTO premium high-temp center guide GC septa PK25
298777	11.5 mm OD BTO premium high-temp center guide GC septa PK50
0418992	12.7 mm OD BTO premium high-temp center guide GC septa PK24
298727	12.7 mm OD BTO premium high-temp center guide GC septa PK50
0418990	17 mm OD BTO premium high-temp center guide GC septa PK24
298817	17 mm OD BTO premium high-temp center guide GC septa PK50
298735	Shimadzu Plug BTO premium high-temp center guide GC septa PK50

Endura-seals

Part number	Part description and detail
250111	11 mm OD Endura-Seals GC septa kit
250112	11 mm OD Endura-Seals replacement GC septa
250100	Shimadzu Endura-Seals GC septa kit
250101	Shimadzu Endura-Seals replacement GC septa

GC inlet maintenance

Why GC inlet maintenance should be a priority?

Paying attention to the quality of your GC consumables and how often they are replaced can mean the difference between a robust analysis and one that you must repeat, costing you time, money, and frustration.

Fully understanding the condition of your other GC inlet consumables can assist in avoiding the following:

- Difficulty maintaining required column head pressure (particularly with constant flow).
- Loss of sample during injections.
- Loss of resolution.
- Poor peak shapes.
- High activity levels.
- Elevated bleed values.
- Loss of accuracy and precision.

How to properly handle GC septa?

Septa may seem like a minor detail, but how you handle them can make a major difference in your GC system's performance. Regardless of how durable or heat-resistant a septum is, it won't hold up if installed improperly. One of the most common issues is overtightening the septum nut – doing so compresses the material too much, which can lead to splitting and small fragments breaking off (a problem known as coring). These particles can interfere with your injection port and even compromise your data. Another thing to keep in mind is septum bleed. All septa release trace volatiles like phthalates when first heated. While this is normal, these compounds can show up in your baseline if not cleared. Fortunately, most GC systems have a built-in septum purge that takes care of this within about 30 minutes of installation.

A few easy habits; tightening just enough to seal, handling with clean tools, and giving your system a brief moment to settle, can help extend septum life and ensure cleaner, more consistent results.

Why GC septa should be replaced regularly?

GC septa should be replaced regularly to avoid decomposition in the GC inlet, to prolong column lifetime, and to avoid system leaks eliminating sample loss and poor chromotography. Trajan recommends the following guidelines for properly maintaining your GC consumables.

- Keep a logbook for each GC. Example logbook on the page 17.

- In GC-MS analysis, keep an eye out for mass spectrum analysis that shows extra peaks of ions m/z 73, 147, and 281 which can indicate septa fragments in your inlet liner.
- Keep track of how many injections have been made.
- When something goes wrong, document what was done to fix it.
- Use the above information to develop a preventative maintenance schedule that helps you determine how frequently you need to change your GC consumables, allowing you to proactively avoid problems.

What causes septum coring?

- Damaged syringe: A damaged or bent syringe needle can core a septum.
- Overtightened septum nut: Overtightening the septum nut can reduce the life of the septum, this compresses the septum causing it to be harder and increase the density. It can also increase coring and splitting.
- Using the wrong needle type: A sharp-point needle is more likely to core a septum than a rounded-tip or cone-tip needle.
- Using a rigid septum: Softer septa are less likely to core than firmer septa.

What are the consequences of septum coring?

Poor chromatography: Coring can cause poor chromatography. A cored septum may introduce a leak and/or result in extra peaks in the chromatogram.

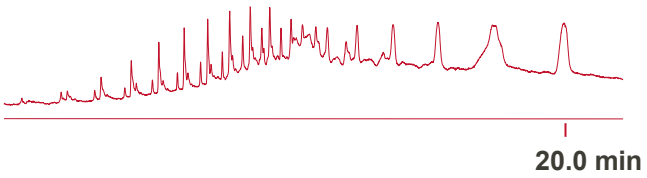
Sample loss: Coring can cause sample loss from the injection port.

Ghost peaks: Coring can cause unwanted peaks in the chromatogram.

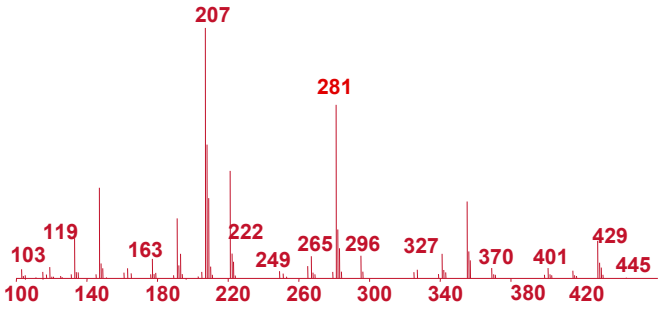
Increased liner changes: Coring can cause more frequent liner changes.

Let's see how coring in the inlet liner can affect your chromatography in the following examples.

Chromatogram of septum bleed



Typical mass spectrum of septum bleed



The presence of peaks with m/z 73, 147, 207, 281 and 355 in mass spectrum will indicate siloxane contamination from damaged septa.

How can you prevent septum coring?

- Use a rounded-tip or cone-tip needle.
- Use a softer septum.
- Replace the septum regularly.
- Inspect the syringe needle for damage.
- Don't over-tighten the septum nut.
- Performing a manual tune, m/z 73, 147, 207, 281 and 355 can indicate siloxane contamination from damaged septa.

Needle tip selection plays a role in GC septa longevity

Choosing the right syringe needle tip can impact the maintenance frequency of your septum. Coring is when a 'hole' is created in the septum which can then lead to septum particles accumulating in your inlet liner. Coring occurs when the syringe needle punctures the septum too many times, if the needle is damaged, or even when using a less than optimal needle type.

Let's look at the recommended needle tip style that will maximize your lab's workflow efficiency and reduce damage to the septa.

Needle tip style	Application	Features/applications	Trajan's tip code	Recommended SGE syringe	Support documents
Bevel 	Manual GC	• A 20° tip which is typically used for manual injections. • Designed for optimum septa penetration during manual injections.	BV	002000 002200	PD-1240-G PDPN-1240-G
Cone 	GC autosampler	• Designed to withstand multi-injection requirements and improve septa lifetime when using a GC autosampler. • The needle passes through the septa during use and does not cause a slit.	C	002810 0039871	PD-1006-G PDPN-1006-G
Dome 	With pre-drilled septa	• The rounded and polished tip make this needle ideal for use with pre-drilled septa.	D	038815	PD-1240-G PDPN-1240-G
Side hole 	Large volume injection (LVI)	• Samples are filled and dispensed through the side hole eliminating septa plugging of the needle. • Ideal for large volume gas injections and headspace.	H	008636 002983	PDPN-1111-G

For more information about Trajan's SGE® GC syringes please reference our syringe brochure.

Instrument Maintenance Tracker - planned and unplanned events

Instrument name:_____

Serial number:_____

Instrument location:_____

Prepared by:_____

Manufacturer:_____

Calibration date:_____

Inservice date:_____

Approved by:_____

Instrument	Product Part Number / Description	Date Checked	Action Required	Action Completed	Initials responsible	Signature	Date Completed	Notes

For friendly guidance and assistance, please contact one of Trajan's technical support specialists at technicalsupport@trajanscimed.com.
Please visit Trajan's website for the full selection of GC consumable products here.

Additional GC consumables that are critical to proper inlet performance.

As you complete your GC inlet maintenance, you also need to check and replace your o-rings, inlet liners, inlet base seals and ferrules as needed.

Trajan's CRS inlet liner seals are critical in forming a seal between the inlet liner and GC injection port. CRS ONE o-rings are premium liner seals made from industry standard fluoroelastomer (FKM) material, which have been processed to avoid inlet contamination typically attributed to standard o-rings. CRS ONE o-rings are pre-cleaned and conditioned to minimize potential active sites and system contamination. For more information click here.

Trajan's SGE® inlet liner range, including the OptChem™ technology, aims to make it simple for all gas chromatographers to select the optimal liner for their application including geometries and different deactivation types.

- Easy to choose - Color coded by geometry to simplify your selection.
- Easy to use - Contain o-rings so you're ready to go.
- Confidence in your analysis - Certified deactivation gives you confidence in your analysis.

More information can be found on Trajan's website.

Trajan's SilTite® base seals enable leak-free seal between the inlet body and the capillary column ferrules. For more information click here.

Trajan manufactures a wide variety of standard and specialized ferrules used in gas chromatographs and other instruments. Our wide range of ferrules are made from Vespel®, Vespel®/graphite, graphite and PTFE. The standard ferrule product line is used to seal tubing and capillaries to standard compression fittings in a variety of sizes. For more information about Trajan's CRS GC ferrule product line please refer to our brochure BR-0613-G.

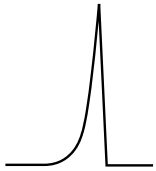
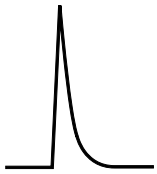
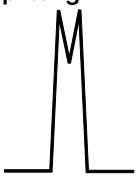
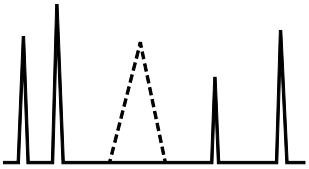
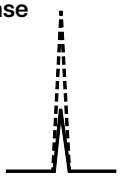
Septum size reference

Septum Size	Instument Manufacturer	Instrument Model
5 mm (3/16”) 	Agilent	On-Column Injection
9 mm (11/32”) 	Bruker/Varian	Packed Column
9.5 mm (3/8”) 	Agilent	5700, 5880
	Bruker/Varian	Packed Column
10 mm (13/32”) 	Agilent	5700, 5880
	Bruker/Varian	Packed Column
	GL Sciences	GC-380
	Hitachi	G-3000, G-5000
11 mm (7/16”) 	Agilent	5880A, 5890, 6850, 6890, 7890, 8890, PTV
	Bruker/Varian	1075/1077, 1078/1079
	FULI	GC9720PLUS, GC9790PLUS, GC9790II
	GL Sciences	GC-4000, GC-3200, GC-390, GC-353, GC-323
	Optic	Optic 2, Optic 3, Optic 4
	PerkinElmer	Sigma Series, 900, 990, 8000 Series, Auto SYS, Auto SYS XL, Clarus 680, Clarus 480, Clarus 590, Clarus 580, Clarus 690
	Thermo Scientific	TRACE 1300/1310, 1600/1610 Series
12.7 mm (1/2”) 	Thermo Scientific	GCQ w/ TRACE, PTV
17 mm (21/32”) 	Thermo Scientific	TRACE Ultra GC, FOCUS GC, 8000 Series
Plug	Optic	Optic 4
	Shimadzu	All Models

Basic guide to GC troubleshooting

Problem	Resolution
No column flow	Check carrier gas flow and adjust. Replace septum/injector seal. Visually check column integrity i.e. is it broken? Remove section if it is small enough or replace the column.
High column bleed	Check the published maximum temperature. Check carrier gas flow rates/velocity, correct for column/length - adjust if necessary. Check the column has not moved in the detector. Check for leaks produced during initial heating especially Vespel® ferrules. Check that the oxygen filter is not spent - replace it if necessary. Make sure detector temperature is higher than final column temperature if possible. Check the cleanliness of the detector - clean if necessary. Recondition column - re-run conditioning program. Cut 50 cm from the front end of the column.
Retention time shifts	Check the temperature program. Check injector temperature. Ensure the manual injection technique is consistent. Check carrier gas flow rate/velocity. Check for injector leaks. Ensure the same solvent being used. The column is contaminated - rinse or replace. Remove 50 cm from the front of column. Phase breakdown - replace the column.
Poor resolution or loss of resolution	Use the correct column or phase. Use different temperature program. Check injector temperature - is it correct for solvent and analytes? Check injection technique. Check carrier flow/velocity. Sample overload - dilute or change the split ratio. Contaminated column - rinse or replace. Phase breakdown - replace column.
Phase breakdown	Check for leaks and repair. Check oxygen traps and replace if necessary. Exceeded upper temperature limit of column for extended periods - replace column. Column contamination - replace column (perform extra cleanup of samples). Damage due to sample - do not inject strong acid or base samples.
Poor or no detector response for all peaks	Correct injection technique for concentration of analyte. Check that the proper liner is used for the injection technique. Check the syringe needle is not blocked or the plunger is leaking. Check the split ratio if using the split technique. Check the injector temperature is correct. Check detector temperature is correct. Check flow rates of detector gas(es). Error in sample concentration - verify concentrations.
Detector problems	PID - Dirty window - clean according to manufacturer's specifications. ELCD - Faulty reactor tube. - Contaminated alcohol. - Incorrect alcohol flow rate. ECD - Impurities in nitrogen. - Dirty detector; clean (bake) according to manufacturer's specifications. NPD - Bad bead. FID - Partially blocked jet. FPD - Incorrect gas flow rates. - Incorrect filter installed. - Clean filter. TCD - Balance flow rates.

Poor peak shape troubleshooting

Problem	Reason	Resolution
Peak fronting 	Column overload.	Reduce sample concentration or injection volume.
	Incorrect polarity of column for compound.	Use correct the column.
Peak tailing 	Column is active.	Remove the first meter of column; recheck; replace the column if necessary.
	Active inlet liner.	Replace the liner with a clean, deactivated liner.
	Incorrect column for analysis.	Use the correct column.
	Incorrect column installation.	Check inlet and outlet connections, for any cold spots.
Peak splitting 	Poor injection technique.	Refine injection technique.
	Mixed solvents.	Use only a single solvent system.
	Poor resolution.	Use different column or change the temperature profile.
Ghost peaks 	Run GC without injection; if ghost peaks disappear then the problem is probably the syringe or solvent; if ghost peaks are still evident, then the problem is either the septum or the breakdown of the phase.	
	Contaminated syringe or solvents.	Clean the syringe thoroughly and replace the solvents.
	Septum bleed.	Replace the septum.
	Breakdown of column phase.	Choose a different phase which restricts breakdown.
	Too large an injection volume.	Decrease injection volume.
Specific peaks low response 	Column is active.	Remove the first meter or column; recheck; replace the column if necessary.
	Active inlet liner.	Replace the liner with a clean, deactivated liner.
	Incorrect calculation of sample.	Verify calculations.
	FID altered gas flows.	Readjust gas flows.

TRAJAN

CRS GC septa

Give your GC the seal of approval. Injection port septa are one of the most critical consumables that have a direct impact during the workflow stage of sample injections.

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