

Gas Chromatography



Inlet Septum Maintenance for the GC 2400™ Capillary Split-Splitless Injector

Introduction

Although small and inexpensive, the injection port septum, a.k.a. inlet septum, plays an essential role in GC performance as it maintains the hermetic seal between the GC flow path and the outside environment. A subpar or degraded septum will lead to diminished sensitivity, asymmetrical peak shape, baseline drops, extraneous “bleed” peaks, and overall poor precision and accuracy compared to a well-maintained one. Septa excessively cored by sample syringes can lead to flow issues as well as introduce contaminants into the column. For these reasons, many chromatographers are surprised to learn that major manufacturers recommend daily inspection and/or replacement of the septum. Adhering to such preventative maintenance routines will prevent unscheduled maintenance and is an essential component of a complete laboratory workflow.

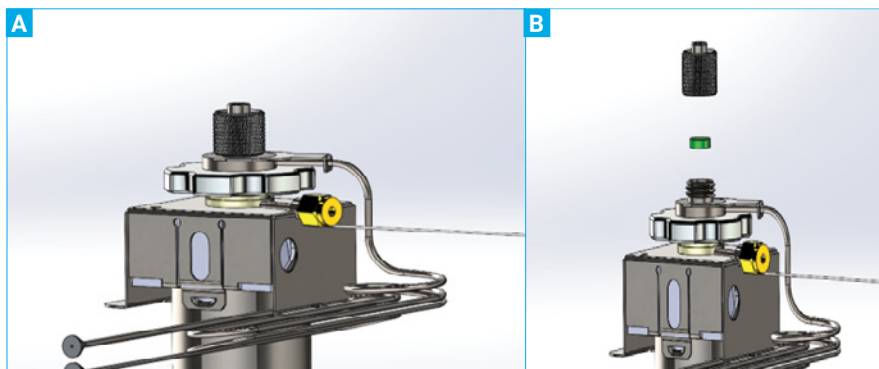


Figure 1: A) CAP injector. B) Exploded CAP diagram highlighting placement of the septum between the septum nut and injection port.

This technical note outlines the inlet septum replacement procedure for the capillary split/splitless (CAP) injector for the PerkinElmer GC 2400. The CAP injector is designed for quick access to the inlet septum for routine maintenance and easy integration into daily workflows. Figure 1 provides an “exploded” diagram of the CAP injector, highlighting placement of the septum and septum nut.

Preparing the Instrument

1. Either use a computer and SimplicityChrom™ CDS to take control of the instrument or utilize the instrument tablet directly.
2. If currently heated, turn off all heated zones: oven, injector(s), and detector(s). Turn off all flow to the detectors, if applicable. Allow the injector to cool before continuing.
3. If carrier is flowing, turn off all flow channels: column, split, and septum purge.

Replacing the Inlet Septa

1. If your CAP injector has an autosampler, gently remove it by lifting vertically until it slides off the anchor rod; place it aside.
2. Using a gloved hand, unscrew the septum nut of the CAP injector, see Figure 2A.

3. The septum will either be sitting atop the injector port or will be adhered to the underside of the nut, see Figure 2B. Gently remove the septum with a pair of tweezers or another appropriate implement.
4. Select the correct septum for your lab operations. See Table 1 for a list of premium PerkinElmer inlet septa.
5. Using a gloved hand or tweezers, place a fresh septum over the port. If your septum has an indented needle guide, ensure the indented side is facing upwards during install.
6. Screw in the septum cap by hand until finger-tight. Do not overtighten the cap. Place the autosampler back over the injector.
7. You may now set up your instrument to run again.

A Note from PerkinElmer: Routine replacement of the inlet septum using this method will help ensure your data quality meets and exceeds the rigorous standards set forth by your laboratory. By setting aside a couple minutes each morning to inspect/replace the septum, your lab will save hours in instrument down-time and recalibrations in the long term. At a near-negligible price point, maintaining a fresh inlet septum isn't only the responsible thing to do—it's good for your laboratory's bottom line.

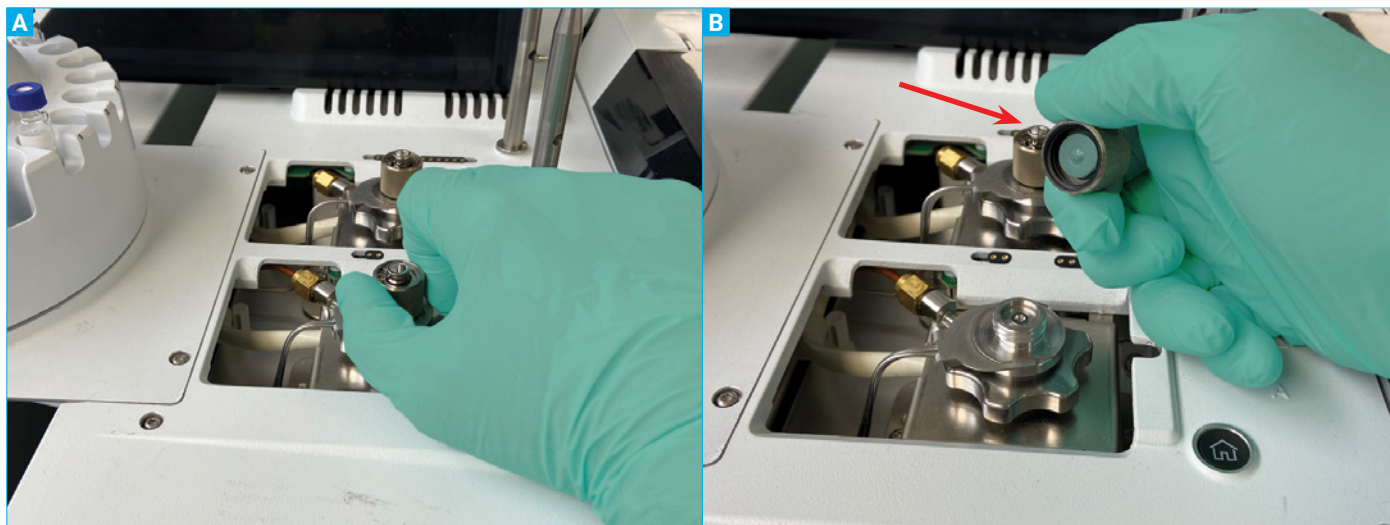


Figure 2: A) The septum nut is a finger-tight fitting which can be unscrewed by rotating counter-clockwise. B) Pry off the spent septum (green disc), shown here adhered to the underside of the septum nut.

Table 1: Ordering information for GC injection port septa at www.perkinelmer.com

Product	Description	Quantity	Part Number
Blue Injection Port Septa	Soft silicone rubber; ideal for routine applications up to 275 °C.	50	N9306874
		10	N9306873
Green Injection port septa	Molded silicone rubber; low bleed and low injection port adhesion with non-stick coating; ideal for routine applications up to 350 °C.	50	N9306219
		10	N9306218
BTO Orange Injection Port Septa	"Bleed Temperature Optimized" molded silicone rubber; ultra low bleed and low injection port adhesion with non-stick coating; ideal for routine applications up to 400 °C.	50	N9302972
		10	N9306872