

Septum Selection for Scion Split/Splitless Capillary Injector (Model 1177)

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Liquid samples are introduced into a split/splitless capillary injector with a syringe penetrating through a silicone septum on top of the injector body. Silicone septum has the distinct advantages of self-sealing the hole created from the piercing of the syringe needle after removal, and ability to handle the wide temperature range required for proper experimental conditions.

Varian/Bruker/Scion Gas Chromatographs, since the introduction of the Varian Vista 6000 in 1979, are designed to reduce the temperature at the septum location, even with extremely high injector temperatures. Use of a finned injector nut radiates heat away from the septum area to reduce thermal effects on the septum and lengthen its useful life. Figure 1 is a photo of the finned nut mounted on an injector. The lower temperatures realized for the septum area and injector nut are measured with a thermocouple probe that is inserted through the injector nut and into the septum to emerge at the inside septum surface (Figure 2).



Figure 1. Photo of finned injector nut, with an injector switch to start chromatographic run on injection.



Figure 2. Photo of finned injector nut with probe inserted through septum to measure surface temperature.

Results are summarized in Figure 3. These lower temperatures extend the life of septa without restricting temperature operations of the injector.

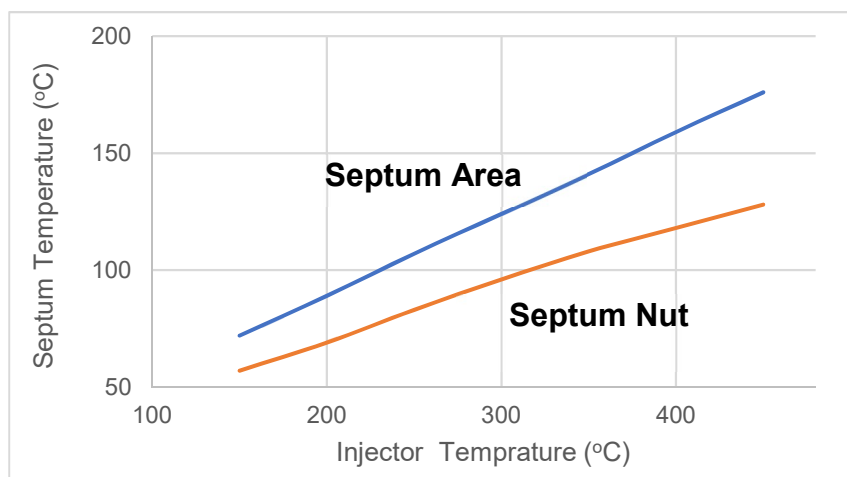


Figure 3. Plots for temperatures of septum area and injector nut for various injector temperatures.

Septa are available from many suppliers. They are made from a variety of polymers and come in a range of colors. A popular vendor is Restek (www.restek.com/catalog/view/9553), offering their red Premium Non-stick BTO (P/N 23862 pkg-50) and green Thermolite Plus septa (27084 pkg-50) for Scion split/splitless injectors. Both septa are treated with a special coating to eliminate sticking to the injector port, and are preconditioned for immediate use.



Premium BTO septa are made with a proprietary polymer and designed to operate at high injector temperatures. Its usable temperature range is 250 °C to 400 °C. Temperatures below 250 °C are not high enough to keep the septum pliable and tend to lead to coring out sections around the needle penetration point.

Thermolite Plus septa are made with ultra-low bleed silicone and have a temperature range up to 350 °C.

Since the Scion capillary injector never reaches temperatures above 200 °C, even with the injector body at 450 °C, Thermolite Plus is the **appropriate** septum for use under all injection operations with Scion Gas Chromatographs. And the cooler operating temperature of the septum permits more needle injections, dramatically extending septum life to as many as 500 injections before replacement.

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