

How Hot Is Your Septum?

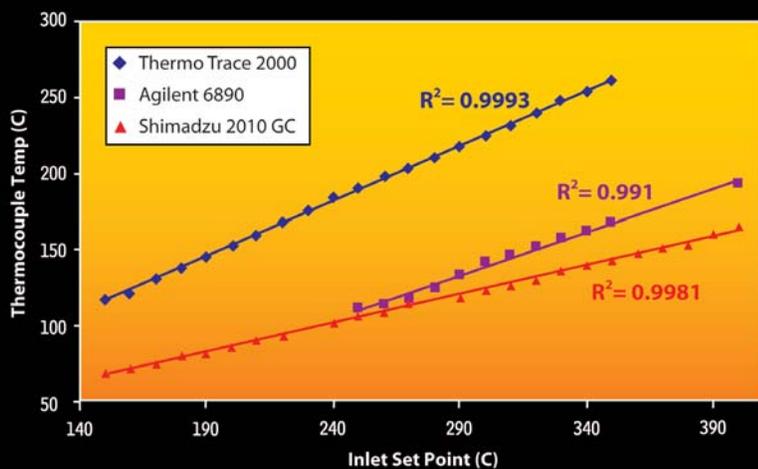
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Different septa brands are given a single, maximum operating temperature based on their performance in a specific instrument inlet, not the actual temperature that the septum can withstand and still function properly. Understanding how different inlets influence the actual temperature at the septum can help prevent problems such as sticking. The temperature at the septum is affected by the heating element and the overall inlet design, which varies significantly among manufacturers. To illustrate this, we placed a thermocouple at the bottom of the septum in several instruments and compared the actual temperature to the inlet set point. The resulting data demonstrate that for any given setting the temperature at the septum is lower than the set point, but the degree of difference, or gradient, varies among instruments (Figure 1).

There are distinct advantages and disadvantages associated with different temperature gradients that should be considered. Inlets with a larger gradient (cooler septum compartment) typically experience fewer problems with septa sticking. In contrast, inlets with a smaller gradient (hotter septum compartment) are more prone to septa sticking, but have the advantage of a more evenly heated inlet and thus more uniform sample vaporization. Uniform vaporization reduces analyte discrimination, the bias against higher boiling point (i.e. higher molecular weight) compounds in favor of lower boiling point compounds that occurs when compounds are not vaporized with equal efficiency.

Operators of instruments that have a smaller temperature gradient should consider using septa that are rated for the highest possible temperature and setting the inlet at the lowest permissible temperature. Low bleed BTO® septa are one of the best choices for temperature resistance, and have the added benefit of a needle guide, which increases septum lifetime (see "Preventing Septum Problems" on page 20 for more information on septum selection and care). Understanding how your inlet temperature setting relates to the actual temperature at the septum allows you to control bias, avoid septum problems, and better understand your results.

Figure 1 Septum temperature differs from inlet temperature set point; the degree of difference varies by manufacturer.



See page 21 for a list of septa we offer or visit us online at www.restek.com