



CHROMATOGRAPHIC SPECIALTIES INC.

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8-425, 9mm / 9-425, 10-425 screw top caps: How to choose?

Note: For simplicity in this tech tip, screw thread sizes are given for the cap. Remember that your vials will need to have the matching screw thread to your caps.

8-425

When the 12x32mm vial was first developed, manufacturers used the existing cap that best matched the diameter of the vial. This was the 8-425 GPI* standard cap. It sealed well and did not protrude past the body of the vial. However users quickly found two problems. If there was any misalignment of the vial or syringe, the needle would strike the neck of the vial and be bent or dulled. Also, the neck of an 8-425 vial was narrow enough that samples could be trapped out of or in the vial by surface tension.

10-425

Makers tried two options to fix this problem. They moved to the next larger standard cap, the 10-452 GPI. This eliminated the needle damage and surface tension problems. However the larger neck meant the edges of the cap stuck out beyond the walls of the vial. For some autosamplers this was not acceptable.

9mm or 9-425

While looking for a more universal vial and cap system, manufacturers stepped outside the GPI cap standards. By adjusting the glass thickness and thread depth / pitch on the neck of wide mouth vials, they were able to develop a vial and cap that offered the wide mouth of 10-425 vials, the slim profile of the 8-425 caps, and even gave the assembled cap and vial the same profile as a crimp top vial for use in GC "robotic arm" autosamplers.

The near universal fit of the 9mm vials (sometime called 9-425 although they are not part of the GPI definition) has made them the most popular screw top 2mL vial. The only potential issue is that there is no official standard for 9mm vials and caps, so on occasion caps and vials are not fully compatible. To avoid this problem, Chromatographic Specialties is always willing to provide samples to ensure compatibility.

Which Cap is Best?

The first step in choosing the right size of screw cap vial is to determine what vials are acceptable for your autosampler. This information should be included in its manual. As well, most companies selling autosampler vials will provide a table of acceptable vial sizes for common autosamplers. See the following pages for more information.

Once you know what cap sizes work on your autosampler, here are some guidelines for choosing:

- If you have another option for screw caps, avoid 8-425, for the reasons given above.
- If you have the choice between 9mm and 10-425, the selection is a little more difficult. 10-425 caps and vials have the widest opening, so the least chance of needle damage. 9mm caps and vials are compatible with the widest range of instruments. Therefore vial and cap manufacturers tend to release their more specialized products in 9mm.
- 9mm caps and vials tend to be less expensive than their 10-425, as production runs are larger.
- The only caution with 9mm caps and vials is that there are occasional fit problems between manufacturers. Most often, these are a result of a manufacturer tweaking a cap to hold the septum better. If you plan to mix and match with any of our 9mm caps or vials, please call our tech department (tech@chromspec.com or 1-800-267-8103). We'll be glad to check our compatibility notes or send you samples so you can confirm compatibility before you buy.

*Glass Packaging Institute

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