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Gas Venting Prevention from an Autosampler Vial Recommendation - Tech Information

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When selecting a vial cap to prevent gas venting in an autosampler, the choice of closure type plays a critical role in seal integrity, consistency, and long-term performance.

Crimp Caps – Best Seal Quality (With Proper Technique)

Crimp caps generally provide the highest-quality, longest-lasting seal. However, this is true only when the crimping tool is properly calibrated and the user applies a correct, uniform crimp.
To maintain reliable performance, crimping tools should be re-calibrated every 10–15 crimps, and each seal should be visually checked to ensure it is tight and uniform. While effective, this level of maintenance and validation can be time-consuming and inconvenient in high-throughput environments.

Screw Caps – Strong Seal With Greater Convenience

For many users, screw caps offer an ideal balance between convenience and reliable sealing. When high-quality vials and caps that are designed to match each other are used, screw caps can provide an excellent seal with far less maintenance than crimp systems.
It is essential that the threads of the vial and cap match perfectly, and that the cap is tightened correctly to ensure optimal sealing performance.

A proper tightening technique is important—improper application may compromise seal integrity.

Gas Retention and Septa Considerations

Both crimp and screw caps, when properly applied, prevent most gases from escaping because the rubber/PTFE septa act as the primary barrier.
Among septa materials, silicone rubber is thicker and has superior re-forming ability compared to natural rubber. This helps maintain a tighter seal, especially after needle puncture from an autosampler injection.

Snap Caps – Not Recommended

Snap caps are not designed to prevent gas venting and should not be used in applications where gas retention or tight seals are required. Their closure mechanism does not produce the compression necessary to maintain a secure, gas-tight seal under typical autosampler conditions.

AUTOSAMPLER
VIALS AND CAPS

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