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Limited Volume Vial Selection - Tips & Suggestions

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How to Choose the Right Limited-Volume Vial

Fused Insert vs. MRQ™ vs. Max Recovery
By Bill Ciccone – Updated for 2026

Selecting the proper limited-volume 12x32 mm autosampler vial can make a significant difference in sample integrity and analytical accuracy. Customers often ask: **"When should I use MRQ™ autosampler vials versus other options like Fused Insert vials or Max Recovery vials?"**

The short answer: it depends on your application and sample characteristics. Below are practical guidelines and key differences to help you choose the best vial for your needs.

Available Options

1. Fused Insert Vials
2. MRQ™ Vials
3. Max Recovery Vials

Fused Insert Vials

- Design: A precision glass insert fused to the vial's inner ring at the mouth.
- Volume: ~300 µL total capacity.
- Benefit: Consistent bottom well minimizes sample loss and ensures uniform specifications across batches.
- Ideal For: Applications requiring very small sample volumes and maximum consistency.
- The insert is designed to sit slightly above the vial lip, creating a secure seal against the septa —unlike competitor designs where the insert does not seal properly, increasing the risk of leakage into the vial.

MRQ™ Vials

- Design: One-piece glass construction with a 30 µL bottom well for near-complete sample uptake.
- Volume: 1.2 mL total capacity.
- Advantage: Eliminates interior ledges found in competitor products, reducing residual volume loss (up to 40 µL in other designs).
- Ideal For: Autosampler workflows where minimizing residual volume is critical.
- Optimized for use with bottom-port needles to ensure maximum sample recovery.

Max Recovery Vials

- Design: Similar to MRQ™, but with a concave bottom instead of a well.
- Volume: 1.2 mL total capacity.
- Ideal For: General applications where recovery is important but not as critical as in MRQ™ use cases.
- Designed to be center draining for maximum recover when using a bottom port needle.

Key Considerations

- Sample Volatility: Highly volatile samples or those stored for extended periods (>24 hours) are prone to evaporation, which can alter concentration and compromise results.
- Analytical Precision: For sensitive analyses, minimizing evaporation and residual volume is essential.
- Autosampler Compatibility: Only AQ™ and RSA™ brands guarantee bottom-height consistency required for autosamplers. Competitor “look-alike” products may not meet these standards.
- Precise volume injection is a key consideration for any of these products.

Think of it like cooking: If you leave soup uncovered, water evaporates, and the salt concentration rises—changing the flavor. Similarly, evaporation in vials can skew your sample concentration and affect your data.

Bottom Line

- Use Fused Insert Vials for ultra-low volumes and maximum consistency.
- Choose MRQ™ Vials when minimizing residual volume is critical.
- Opt for Max Recovery Vials for general recovery needs.

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