

Limited Volume Vial Selection Suggestions - Tips and Suggestions

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Selecting the right limited-volume autosampler vial is crucial for protecting sample integrity, maximizing recovery, and ensuring reproducible injections—especially when working with small volumes or sensitive LC/MS methods.

Many users ask whether they should choose Fused Insert, MRQ™, or Max Recovery vials, and the best choice depends on the analytical requirements, sample characteristics, and autosampler configuration. The guidance below highlights the differences and practical considerations for each vial type.

Fused Insert Vials

Fused insert vials incorporate a **precision-formed glass insert permanently fused** to the vial's internal ring at the mouth. This results in:

- ~300 µL total capacity, ideal for very small sample volumes.
- A consistent and uniform bottom geometry, minimizing sample loss and supporting highly reproducible extractions.
- An insert that sits slightly above the vial lip, forming a secure seal with the septa—an advantage over competitor products where loose or improperly seated inserts allow sample leakage or bypass.

Best for: Small-volume, high-precision applications in which bottom geometry consistency and tight sealing are critical.

MRQ™ Vials

MRQ™ vials feature a **one-piece glass design** with a **30 µL bottom well** engineered for near-complete sample uptake.

Key benefits include:

- 1.2 mL total volume, suitable for standard autosampler racks.
- Elimination of interior ledges that can trap sample in competitor vials—reducing residual volume losses of up to 40 µL.
- Optimized design for bottom-port autosampler needles, ensuring the highest achievable recovery.

Best for: Workflows where minimal residual volume and maximum sample recovery are top priorities, particularly in LC/MS systems with bottom-port needles.

Max Recovery Vials

Max Recovery vials resemble MRQ™ vials but use a **concave, center-draining bottom** rather than a defined well.

Features include:

- 1.2 mL total volume, same as MRQ™.
- Excellent general-purpose recovery performance.
- More forgiving design for applications where recovery matters but does not require the precision of MRQ™.
- Optimized for use with bottom-port needle autosamplers.

Best for: General laboratory use where sample recovery is important, but ultra-low residual volume is not mandatory.

Key Considerations for Choosing the Right Vial

Sample Volatility

Highly volatile or long-stored samples (>24 hours) are particularly susceptible to evaporation, which can change concentration and compromise analytical results—similar to leaving soup uncovered and watching its saltiness increase as water evaporates.

Analytical Precision Requirements

For sensitive, quantitative workflows—especially LC/MS—minimizing dead volume, evaporation, and carryover becomes essential. MRQ™ or fused insert vials usually provide the best control.

Autosampler Compatibility

Only **AQ™** and **RSA™** brands guarantee the strict bottom-height consistency required by many autosamplers. “Look-alike” competitor products may not provide stable injection heights, leading to inconsistent sampling or partial injections.

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.

AUTOSAMPLER
VIALS AND CAPS

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MicroSolv Technology Corporation

9158 Industrial Blvd. NE, Leland, NC 28451

Tel: (732) 380-8900

Fax: (910) 769-9435

Email: customers@mtc-usa.com

Website: www.mtc-usa.com