Cleaning Process Not Recommended with RSA Autosampler Vials - Tech Information

Date: 20-NOVEMBER-2012 Last Updated: 27-OCTOBER-2025

Why RSA™ Vials Do Not Require a Cleaning Process

When autosampler vials are manufactured from high-purity glass tubing, they must be annealed at high temperatures—typically between 1,200°F and 1,400°F. This heat treatment relieves internal stress and burns off organic materials, leaving the vials as clean as possible.

However, if the annealing process is not precisely controlled, it can result in the formation of hydroxyl groups (silanols) on the glass surface. These reactive sites can cause significant issues in analytical workflows, especially in:

- GC and GC-MS
- HPLC and LC-MS
- LC-MS/MS

These silanol-rich surfaces can lead to:

- Metal accumulation, which contributes to adduct formation in mass spectrometry
- Permanent adsorption of basic or low-abundance compounds
- pH shifts in deionized water due to sodium and hydroxide ion leaching, forming NaOH

RSA™ Vials: A Different Approach

RSA™ vials are manufactured using a patent-pending process that prevents the formation of this reactive surface layer altogether. This results in a vial that is:

- Inherently low in surface activity
- Free from reactive silanols
- Exceptionally clean and non-reactive

The Problem with “Cleaning” Processes

Some manufacturers attempt to improve vial compatibility with MS by applying post-production cleaning steps. However, these processes can introduce new problems:

- Glass particulates (e.g., delaminated silicates) may remain
- Organic contaminants can be reintroduced during rinsing or drying
- Residual acids or surfactants from cleaning agents are difficult to fully remove
- Airborne particles from drying gases or the environment can contaminate the vials

If particulates are visible in a vial, it's a strong indication that best manufacturing practices were not followed.

Precision Manufacturing of RSA™ Vials

RSA™ vials are produced without the use of petroleum-based lubricants, which are commonly used during the heating phase of standard vial production and can leave behind organic residues. Instead, RSA™ vials are:

- Formed at a slower production rate for greater precision
- Immediately packaged from the Lehr oven in a Class 100,000 cleanroom
- Handled exclusively by robots, ensuring no human contact
- Manufactured under ISO-certified conditions

Key Takeaway

RSA™ vials are engineered to be the cleanest and least reactive autosampler vials available. Their unique manufacturing process eliminates the need for post-production cleaning, ensuring consistent performance and maximum sample integrity—especially critical in high-sensitivity applications like LC-MS/MS.

RSA™
REDUCED SURFACE ACTIVITY GLASS

More RSA Information

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