

Advantages and Disadvantages of Acid Washing Autosampler Vials - HPLC Primer

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Acid-Washing Autosampler Vials: When It Helps, When It Hurts—and Why RSA™ Vials Don't Need It

Acid washing is sometimes used to “deactivate” standard borosilicate autosampler vials by stripping reactive surface silanols (Si–OH). While this can reduce surface activity in ordinary glass, it also introduces non-trivial risks—and it is unnecessary for RSA™ (Reduced Surface Activity) vials, which are manufactured to minimize surface activity from the start.

1) What labs intend to fix with acid washing

- **Goal:** reduce adsorption of basic and other surface-sensitive analytes by removing or passivating native silanol sites on standard Type I borosilicate glass. In conventional vials, these sites can bind analytes and erode recovery/linearity—especially at low concentrations.

RSA™ exception: RSA™ vials are produced with a proprietary process that greatly suppresses silanol-driven surface activity, so no acid treatment is required to achieve low-adsorption performance. They are effectively “LC-MS ready” out of the box.

2) Why acid washing standard vials can backfire

Even when carefully performed, acid washing can create new problems:

- Ionic residue risk: chloride, sodium, and other trace ions can remain from reagents or containers and later appear in blanks or samples.
- Variability: manual cleaning introduces vial-to-vial inconsistency—some vials end up more “active” than others, impairing reproducibility. Operational burden: added reagents, rinsing, drying, and contamination control increase cost and time, and re-contamination can occur during handling

Bottom line: for high-sensitivity HPLC/LC-MS work, acid-cleaned conventional vials can still contribute ghost peaks/background or inconsistent adsorption, whereas RSA™ vials avoid the added processing step and its risks.

3) Practical guidance for technical users

Use RSA™ vials when:

- Working with basic/cationic analytes, peptides, amines, or other adsorption-prone compounds.
- Running LC-MS, HILIC, ANP, or trace-level assays where background and reproducibility are critical.
- You need consistent, low-activity surfaces without post-processing.

If you must clean standard vials:

- Validate the cleaning protocol (reagent grades, rinse sequence, dry conditions).
- Verify by blank injections and replicate tests that ionic residues and adsorption have been acceptably reduced.
- Document lot-level differences; expect residual variability.

4) Key takeaways

- Acid washing is not recommended for RSA™ vials—they are engineered to have minimal surface activity and do not require acid treatment.
- Acid washing standard vials can introduce chloride/sodium and other trace contaminants , add variability, and consume resources.
- For high-sensitivity or regulated workflows , choose vial technologies that avoid post-processing and minimize extractables/adsorption from the start.

Click [HERE](#) for RSA Vials ordering information.



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