

How do RSA Autosampler Vials Compare Against Silanized Vials for Pharma Applications - HPLC Primer

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Technical Overview: RSA™ vs. Silanized Vials and RSA-Pro X™

Understanding Surface Chemistry in Autosampler Vials

The surface properties of autosampler vials play a critical role in sample integrity, particularly for sensitive analytes such as basic compounds, peptides, and proteins. RSA™ (Reduced Surface Activity) vials offer a fundamentally different surface profile compared to conventional silanized or siliconized vials, and selecting the appropriate vial depends on the nature of your analyte and analytical method.

RSA™ Vials: Engineered for Low Surface Activity

RSA™ vials are manufactured using a proprietary process that eliminates surface silanols and avoids the formation of borate and silicate residues common in standard borosilicate glass. This results in:

- Reduced adsorption of basic analytes, especially at low concentrations
- No need for post-manufacturing cleaning, which can reintroduce contaminants
- Improved pH stability, with no contribution to pH drift from surface leaching
- Lower surface energy than untreated glass, minimizing hydrophilic interactions

These characteristics make RSA™ vials ideal for LCMS and other sensitive techniques where surface interactions can compromise quantitation, particularly for basic drugs and low-abundance compounds.

RSA-Pro X™ Vials: Hydrophobic Surface for Protein & Peptide Recovery

RSA-Pro X™ vials are surface-treated RSA™ vials designed for applications where hydrophobicity is critical. They are particularly effective for:

- Proteins, peptides, and other biomolecules that tend to adsorb to glass surfaces
- Hydrophilic compounds that interact with untreated or silanized glass
- Applications requiring extreme hydrolytic stability, such as aqueous sample storage or thermal cycling

Compared to conventional silanized vials, RSA-Pro X™ offers:

- More complete and uniform surface coverage
- No delamination or degradation of the surface treatment
- Superior sample recovery and reproducibility (RSD)

- Compatibility with autoclaving and cryogenic storage (down to -80°C)

Key Considerations for Basic Analytes

- RSA™ vials eliminate silanol groups, reducing ionic and polar interactions with basic compounds.
- Unlike silanized vials, RSA™ vials do not rely on surface coatings that can degrade or vary in coverage.
- RSA™ glass has a different surface tension profile than untreated borosilicate, further reducing unwanted interactions.
- In many cases, RSA™ vials outperform pharmaceutical-grade silanized vials in preventing adsorption and pH instability.

Conclusion

When selecting a vial for your autosampler, consider the chemical nature of your analytes and the sensitivity of your method.

- Choose **RSA™** for basic compounds, low-abundance analytes, and LCMS workflows requiring ultra-clean, low-adsorption surfaces.
- Choose **RSA-Pro X™** for proteins, peptides, and hydrophilic compounds where hydrophobicity and surface stability are essential.

Both vial types are engineered for dimensional precision and surface consistency, ensuring compatibility with modern autosamplers and delivering reliable, reproducible results.



[See more information about RSA Glass Autosampler Vials](#)

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