Sample Carry Over Using One Syringe Filter for Many Samples - HPLC Primer

Date: 22-APRIL-2012 Last Updated: 25-FEBRUARY-2026

Overview

One of the most common sources of unexpected chromatographic artifacts or inconsistent results is the reuse of a syringe filter across multiple samples. While it may seem economical, this practice frequently leads to sample carryover, variable adsorption, and inconsistent filtrate composition.

Every time a sample passes through a membrane, analytes can adsorb to the filter, remain trapped within internal structures, or adhere to the housing. These retained compounds can then leach into the next sample—resulting in contamination and unreliable data.

Why Carryover Occurs

Syringe filters have internal cavities, membrane surfaces, and flow paths where residual analytes may remain. When used repeatedly, the following problems are likely:

- Adsorbed analytes release over time, bleeding into subsequent samples
- Membrane saturation changes filtration characteristics, altering recovery
- Trapped particulate matter can dislodge, entering later samples
- Chemical interactions with the membrane can evolve as different samples pass through

Even small amounts of carryover can significantly affect UHPLC/HPLC results, causing:

- Ghost peaks
- Elevated baselines
- Retention time shifts
- Suppressed or enhanced peaks
- Increased RSD values

Best Practice Recommendation

Always use a new syringe filter for each sample.

This ensures:

- No cross-contamination
- Consistent analyte recovery
- Repeatable chromatographic performance
- Compliance with validated or regulated workflows

Even with AQ™ Brand Syringe Filters, which are engineered for extremely low extractables and minimal adsorption, reuse is still discouraged because the physical retention of analytes inside the

membrane cannot be controlled once multiple samples are introduced.

When Reuse Might Be Especially Problematic

Reusing a filter is particularly risky with:

- Complex matrices (protein-rich, particulate-heavy, biological samples)
- Sticky or hydrophobic analytes
- Trace-level analysis
- Stability-sensitive compounds
- Gradient HPLC methods (ghost peaks often appear during strong solvent phases)

Any of these conditions can amplify carryover and lead to major analytical errors.

Ordering Information: *Click HERE for AQ syringe filter ordering information and pictures*

Attachment: MICROSOLV filters equivalency study pdf Download File

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