

Vials and well plates

Optimizing sample integrity

Choosing the right vial for accurate analysis

Maintaining sample integrity is crucial for obtaining reliable results in various analytical applications. Selecting the appropriate vial plays a vital role in this process, as different vial types cater to specific needs and address potential challenges. In this paper, we'll explore the distinct advantages of three commonly used vial options: total recovery vials, fused insert vials for smaller sample volumes, and the versatility of Polyspring™ inserts.

Total recovery vials: Minimizing loss for variable volumes

Total recovery vials are specifically designed for situations where there is a huge sample volume variability (Figure 1). These vials boast a unique design that allows for the recovery of nearly all the sample, regardless of the initial volume, minimizing loss and ensuring accurate analysis. They are particularly suitable for:

- Samples with unpredictable or fluctuating volumes (max. usable volume 1.5 mL, min. recommended usable volume 25 μ L, residual volume 1 μ L)
- Applications requiring minimal sample waste
- Studies involving precious or limited samples

The design of total recovery vials typically features a specially shaped inner reservoir that collects the liquid at the base, allowing for almost complete retrieval even with minimal sample volumes. This is crucial for applications where even slight sample loss can significantly impact the accuracy of analysis.

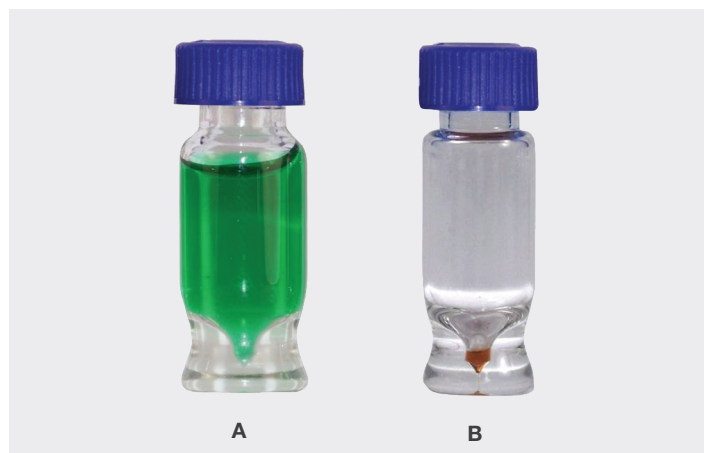


Figure 1. Total recovery vials: minimizing loss for variable volumes. A: Thermo Scientific™ SureSTART™ total recovery glass screw top microvials (cat. no [6PSV9-TR1](#)) with 1.5 mL sample volume, B: total recovery vial with 10 μ L sample volume

Fused insert vials: Optimizing analysis for small volumes

Fused insert vials are the preferred choice for researchers working with sample volumes less than 250 μL (Figure 2). Their design incorporates a smaller surface area compared to standard and total recovery vials, which significantly reduces surface activity and minimizes sample adsorption on the vial walls. This is particularly advantageous for precious or limited samples, ensuring complete recovery and accurate analysis.

Several key features contribute to the effectiveness of fused insert vials for small volumes:

- **Fit for purpose design**—Fused insert vials boast a maximum usable volume of 250 μL , a minimum usable volume of 25 μL , and a minimal residual volume of 2 μL . This optimized design allows for efficient utilization of even the smallest samples, minimizing waste and maximizing analytical accuracy.
- **Conical precision point**—The conical insert within the vial ensures the collection of all liquid, effectively eliminating sample loss during transfer or analysis.
- **Improved sample distribution**—The inner shaping of the vial promotes optimal sample distribution and surface tension, further reducing adsorption and enhancing analytical precision.

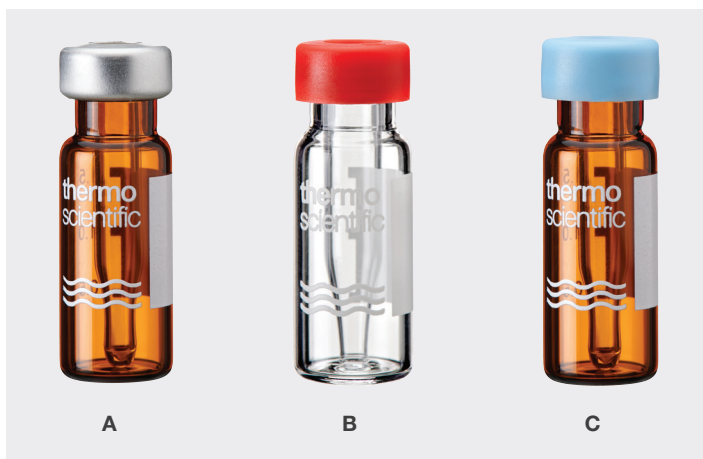


Figure 2. Fused insert vial. A: Thermo Scientific™ SureSTART™ 0.3 mL glass crimp top microvials (cat. no [6PCV1103FIVAP](#)), B: Thermo Scientific™ SureSTART™ 0.3 mL glass snap top microvials (cat. no [6PRV11-03FIVP](#)), C: Thermo Scientific™ SureSTART™ 0.3 mL glass snap top microvials (cat. no [6PRV1103FIVAP](#)).

Polyspring inserts: Enhancing accuracy for larger volumes

Thermo Scientific™ SureSTART™ GOLD-grade Polyspring glass inserts come into play for sample volumes exceeding 250 μL (Figure 3). These can be combined with Thermo Scientific™ SureSTART™ 2 mL vials (screw, snap, or crimp; clear or amber) and they offer several benefits that optimize sample handling and analysis.

- **Enhanced sample centering**—The unique design of the Polyspring effectively centers the sample within the vial. This ensures optimal needle placement during injection or withdrawal, minimizing the risk of sample loss and potential inaccuracies.
- **Improved sample distribution**—The inner shaping of the insert promotes optimal sample distribution and surface tension, further reducing adsorption and enhancing analytical precision. The GOLD grade quality glass surface reduces adsorption effects significantly. This is crucial for maintaining sample integrity and obtaining reliable and repeatable results



Figure 3. Polyspring inserts

Addressing the challenge of bubbles

The presence of bubbles in sample vials, particularly for water-rich samples and low volumes, can pose significant challenges. Bubbles affect the reproducibility of injectable volume and consequently compromise the accuracy of analytical results.

Fortunately, solutions exist to address this issue. SureSTART vials (the fused insert versions, total recovery vials and Polyspring inserts) specifically engineered to create a bubble-free environment, further enhancing sample integrity (Figure 4).



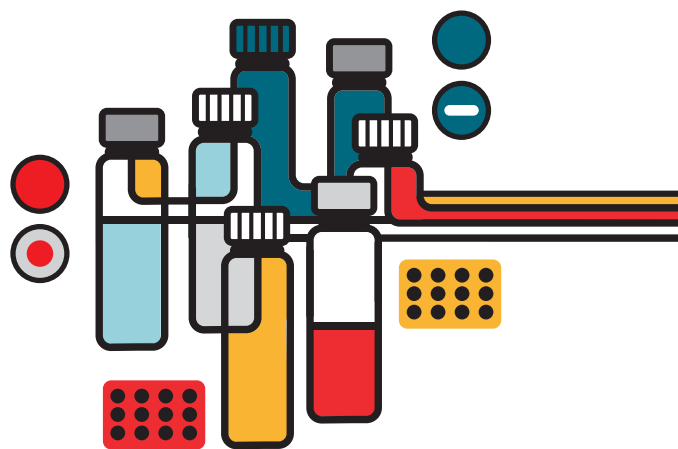
Figure 4. SureSTART vials are specifically engineered to create a bubble-free environment, further enhancing sample integrity.

Optimize sample integrity by selecting the right vial

Understanding the distinct advantages and applications of total recovery vials, fused insert vials, and Polyspring inserts empowers researchers to select the most suitable option for their specific needs. By considering factors like sample volume, variability, potential challenges like bubble formation, and the specific requirements of the analytical application, researchers can optimize their sample handling processes and confidently achieve accurate, reliable, and repeatable results.

Ordering information

Description	Quantity	Cat. no.
SureSTART total recovery vials		
Vial 0.3 mL clear crimp 11 mm ID patch insert	100/pack	6PCV11-03FIVP
Vial 0.3 mL amber crimp 11 mm ID patch insert	100/pack	6PCV11-03FIVAP
SureSTART fused insert vials		
Vial 0.3 mL clear screw 9 mm short thread ID patch insert	100/pack	6PSV9-03FIVP
Vial 0.3 mL amber screw 9 mm short thread ID patch insert	100/pack	6PSV9-03FIVAP
Vial 0.3 mL clear snap 11 mm ID patch insert	100/pack	6PRV11-03FIVP
Vial 0.3 mL amber snap 11 mm ID patch insert	100/pack	6PRV1103FIVAP
SureSTART GOLD-grade Polyspring inserts		
Insert 0.3 mL clear glass gold conical with PE Polyspring	100/pack	6PME03C1SPG



Learn more at thermofisher.com/surestart