Savillex
Your Fluoropolymer Solutions Partner

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# Savillex Technical Note

## 50 mL PFA Dropper Bottle Design Features

*Savillex 50 mL PFA Dropper Bottle*

## Overview

The Savillex 50 mL PFA dropper bottle is designed to precisely deliver liquids, producing small droplets with a narrow size range distribution. Constructed entirely from PFA, the dropper bottle is suitable for the most challenging trace metals applications. Fine droplet control is achieved through the use of microbore PFA tubing that forms the liquid delivery tip. A PFA dust cover prevents airborne contamination and minimizes evaporation. The Savillex 50 mL PFA dropper bottle is perfect for delivering isotopic spike solutions in geochemistry and for many other uses.

## Design

The Savillex dropper bottle was designed in conjunction with Dr. Mark Schmitz, Boise State University, USA, specifically for isotopic spike solution delivery. All components of the dropper bottle (bottle, cap, microbore delivery tube and cover) are manufactured from PFA using the highest purity grade PFA resin. The bottle itself is manufactured using a unique stretch blow molding technique, which produces a very smooth surface, and minimizes the likelihood of trace metal deposition on the bottle walls. Bottle wall thickness is very uniform and thin enough to allow good control over droplet delivery as the bottle is squeezed. The PFA knurled cap features a PFA microbore tip, which produces extremely uniform droplets.

The microbore tubing is a single piece of tubing with constant internal diameter (ID), which extends from the inside surface of the cap to the delivery tip. The absence of any void or dead space within the tip area also contributes to the uniform droplet delivery: since liquid cannot build up around the tip area, droplet formation is very reproducible. The ID of the microbore tubing was also optimized to prevent droplets being produced under gravity. Droplets are formed only when the bottle is gently squeezed. This control is critical for the delivery of isotopic spike solutions for use in geochemistry. A snap-on dust cover protects the tip from contamination and also minimizes evaporation. The dust cover does not contact the tip, which also greatly reduces the possibility of contamination.

## Droplet Size and Range

The Savillex dropper bottle was compared to an alternative (FEP) dropper bottle. Droplet size (volume) range and mean were compared. Using water as a delivery liquid at 20° C, for each bottle, three sets of eight droplets were delivered and weighed. The weight of each droplet set was converted to volume (uL) using the density of water at 20° C. The volume of each of the three sets was combined and then divided by 24 to give the average volume of each droplet. The droplet size range was obtained using the average droplet size of each of the three sets of droplets. The results are shown below:

| | Average Droplet Size (uL) (n=24) | Droplet Size Range (uL) (n=3) |
|---|---|---|
| Savillex PFA dropper bottle | 15 | 13-18 |
| Alternative manufacturer dropper bottle (FEP with ETFE cap) | 27 | 16-36 |

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Note that the mean droplet size of the Savillex is smaller, but more importantly, the size range of the droplets produced is significantly narrower. This allows spike solutions and any standard or reagent to be accurately and reproducibly delivered.

## 50 mL PFA Dropper Bottle

Savillex part number: 700-550

| Dimensions (with dust cover) | |
|---|---|
| Height | 3.95" (10.0 cm) |
| Diameter | 1.44" (3.7 cm) |
| Weight | 0.09 lbs (42 g) |

- All PFA construction – the only PFA dropper bottle available
- Microbore PFA tip for fine droplet control
- Average droplet size: 15 uL
- Narrow droplet range: 13-18 uL
- PFA cover prevents contamination and minimizes evaporation
- Perfect for delivering isotope spike solutions and many other uses


**Visit www.savillex.com to find out more information as well as fast and convenient ordering.**

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