

### Summary

Savillex PFA labware products are found in thousands of laboratories throughout the world, and are used in many different laboratory applications. Procedures for the initial cleaning of new PFA labware (including bottles) and cleaning after each use vary widely depending on the application – particularly where labware is used for sample preparation or sample handling for trace metals analysis. The following examples of cleaning procedures are provided as guidelines for cleaning Savillex PFA labware and Purillex™ bottles for some of the most common lab applications. They should not be considered the only effective methods for cleaning PFA labware. These procedures can be used as a basic starting point and modified to suit individual needs and applications. All procedures apply equally to FEP in addition to PFA.



*Savillex PFA Labware*

### Cleaning Procedures

**Note:** Do not clean PFA labware with brushes or abrasives – these will cause scratches the surface which will then trap metals and organic contaminants and prevent effective cleaning.

#### Initial Cleaning of PFA Labware - General Lab Use

1. Rinse labware thoroughly internally and externally with deionized water (DIW) to remove any surface contamination
2. If preferred, a more thorough cleaning can be achieved by immersion in a weak solution of 1% Micro 90 (or similar mild alkaline detergent) and heating to 100°C to remove any organic residues. Allow to cool and rinse well with DIW.

#### Initial Cleaning of PFA and FEP Purillex Bottles for Trace Metals Use

In the trace metals lab, Purillex bottles are typically used as containers for rinse solutions and standards. The Purillex 1000 mL PFA bottle is also supplied with the Savillex DST-1000 Acid Purification System as a collection bottle, and additional Purillex bottles are normally used for storage of high purity acid produced by the DST-1000. Although Purillex bottles are manufactured and bagged inside a cleanroom, for ultratrace (low ppt level) metals use, such as the storage of high purity acids, they should be thoroughly cleaned prior to their first use.

#### Purillex Bottles - Cleaning Procedure for Ultratrace Metal Use

1. Rinse the bottle thoroughly with DIW
2. Fill with a solution of 2% high purity HNO<sub>3</sub> /1% high purity HF and replace the closure
3. Store bottle at 50°C for a minimum of 48 hours (seven days is preferable)
4. Empty the bottle and rinse thoroughly with DIW
5. Repeat steps 2-4
6. Bottle is now ready for ultratrace use

If HF cannot be used, use HNO<sub>3</sub> alone.

### Cleaning After Each Use - PFA Vials for Sample Digestion in Geochemistry

The digestion of geological samples prior to isotopic analysis by TIMS or MC-ICP-MS is one of the most challenging ultra trace applications for PFA labware. Extreme cleaning procedures are necessary for the PFA vials used in the digestion step. Every lab has its own cleaning procedure and all are slightly different. Below are two typical examples of cleaning procedures for PFA vials and closures.

#### Procedure A

1. Mechanically clean vials by **gently** wiping inside with a Kimwipe paper towel and a 2% solution of Citranox (or similar acidic cleaner/detergent) to remove digest residue – take great care not to scratch the surface
2. Immerse vials in 50% aqua regia in a Savillex vial cleaning system. Heat to approximately 90°C for at least 24 hours.
3. Remove from the vial cleaning system and repeat step 2 but using DIW
4. Remove from the vial cleaning system and repeat step 2 but with 50% HNO<sub>3</sub>
5. Repeat step 3
6. Remove from jar and rinse thoroughly with DIW

**Note: Under certain conditions, cleaning PFA with HCl and HNO<sub>3</sub> at high temperature can cause a white deposit to form at the surface of the PFA. This can cause the PFA to take on a cloudy appearance. To avoid the possibility of this occurring, use HNO<sub>3</sub> instead of aqua regia.**

#### Procedure B (Alternative)

1. Mechanically clean vials by gently wiping inside with a Kimwipe paper towel – take great care not to scratch the surface
2. Immerse vials in a weak solution of 1% Micro 90 (or similar mild alkaline detergent) detergent in a vial cleaning system. Heat to 100°C to remove any organic residues. Allow to cool and rinse with DIW.
3. Immerse vials in 6M HNO<sub>3</sub> in a vial cleaning system. Heat to approximately 100°C for six hours.
4. Remove from the vial cleaning system and rinse thoroughly with DIW
5. Place 3-4 mL of high purity 6M HNO<sub>3</sub> in each vial and replace the closure. Place on a hot plate and heat gently until needed (the longer the better – even several days if possible).
6. Empty and rinse thoroughly with DIW

### Initial Cleaning and Sterilization of PFA Labware for Medical/Biopharmaceutical Use

1. Rinse labware thoroughly internally and externally with DIW to remove any surface contamination
2. If preferred, a more thorough cleaning can be achieved by immersion in a weak solution of 1% Micro 90 (or similar mild alkaline detergent) and heating to 100°C to remove any organic residues. Allow to cool and rinse well with DIW.

#### Sterilization

1. Place labware in autoclave with closure removed (this is important to avoid damage to the labware)
2. Autoclave at 121°C for 90 minutes and allow to cool

**Note:** PFA labware can be sterilized by all routine methods except Gamma Radiation and E-Beam.