

Mercury Collection and Analysis in Ambient and Effluent Waters using EPA Method 1631

Sampling Equipment

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Sampling Equipment Requirements

- ◆ Must be **non-metallic** and free from materials that contains metals, as described in **Method 1669**
- ◆ All sampling equipment and sample containers must be **precleaned** in a laboratory or cleaning facility, as described in **Method 1631**
- ◆ Gloves, storage bags, plastic wrap may be used new without cleaning unless **equipment blank** results pinpoint any of these materials as a contamination source
 - If so, then supplies must also be precleaned or obtained from different supplier



Protective Clothing

- ◆ Protective Coveralls, Smocks or Coats (where necessary)
 - Disposable Tyvek, or equivalent
 - Constructed of synthetic material to prevent possible contamination of samples by mercury adsorbed onto cotton or other clothing fibers
 - Cost: \$5 to \$10 each
- ◆ Gloves
 - Clean, disposable, powder-free latex, vinyl or polyethylene
 - Sleeve protectors or shoulder-length gloves may be used by “clean hands” person
 - Cost: \$15 to \$20 per 100



Sample Collection Bottles

- ◆ Fluoropolymer (FEP, PFA) or Borosilicate Glass
 - 125ml to 1L
 - Fluoropolymer or fluoropolymer-lined screw cap
- ◆ New bottles cleaned prior to use
 - Some vendors provide certified, precleaned glass bottles with various levels of cleanliness
 - Recommend analysis of **bottle blanks** on a portion of bottle lot to verify cleanliness *prior* to sampling
- ◆ Used fluoropolymer bottles can be cleaned and reused



Sample Collection Bottles (cont.)

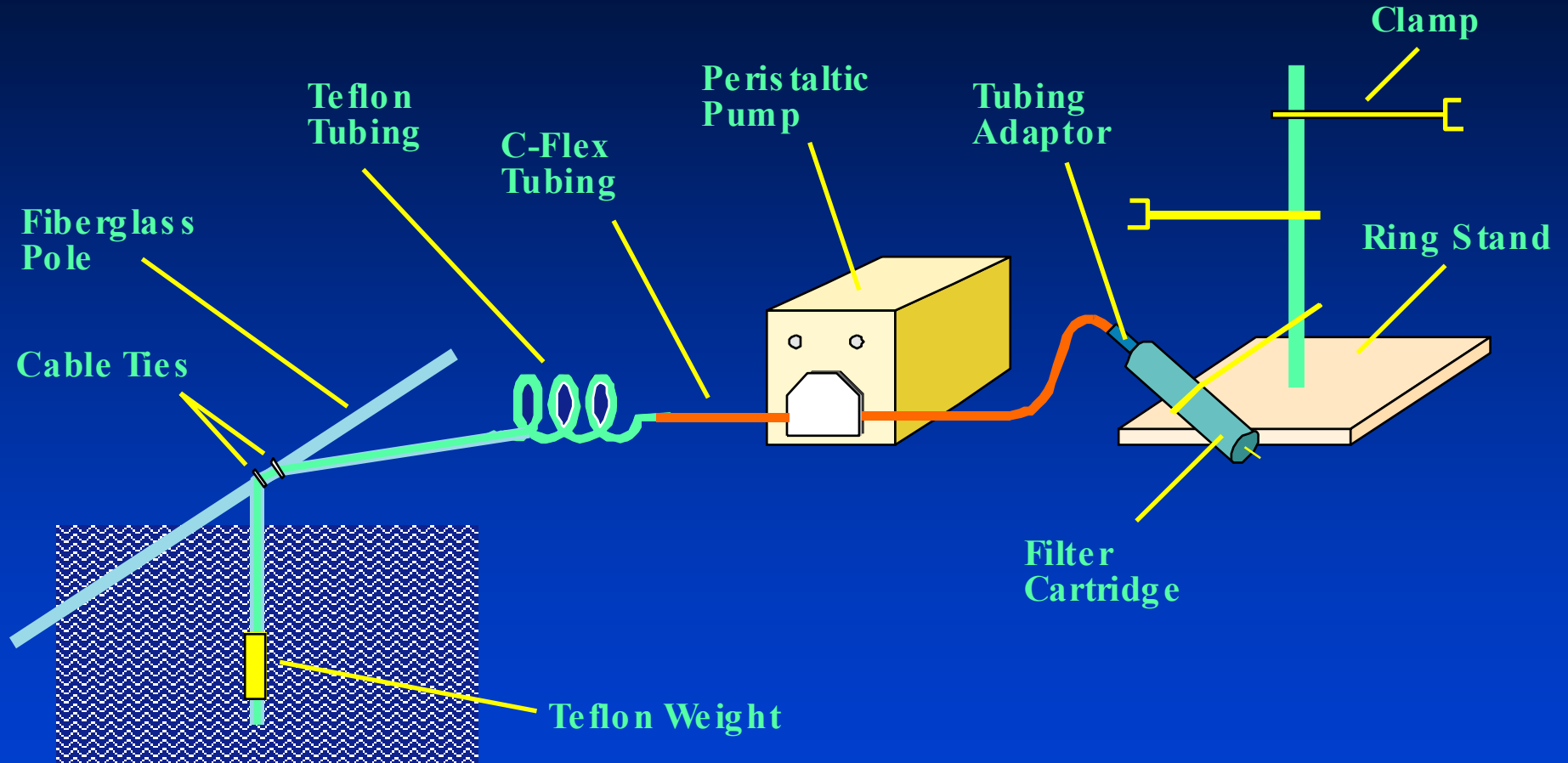
- ◆ Store cleaned sample bottles with 0.1% HCl
 - May empty weak acid solution and refill sample bottle with reagent water immediately prior to transport to the field
- ◆ Cost: 125ml to 1L
 - Fluoropolymer: \$40 to \$120 each
 - Glass: \$2 to \$5 each



Sample Storage and Transport

- ◆ Storage Bags
 - Clean, zip-lock, nonvented, colorless polyethylene
- ◆ Storage Cooler
 - Clean, non-metallic, white interior
- ◆ Ice or refrigerant packs

Continuous-Flow Sampling Apparatus



Continuous-Flow Sampling Apparatus (cont.)

- ◆ Used for **effluent** and **ambient water** sampling
- ◆ Peristaltic pump
 - AC, 12VDC or internal battery, variable speed, single pump head
 - Cole-Parmer, portable, Masterflex L/S with Easy Load pump head, or equivalent
 - Cost: \$800 to \$1500 per pump system

Continuous-Flow Sampling Apparatus (cont.)

◆ Tubing

- Fluoropolymer (FEP)
 - 1/4" OD x 3/16" ID, in lengths as required to reach sampling point
 - Cost: \$1 to \$2 per ft
- C-Flex, made w/ styrene-ethylene-butylene-silicone (SEBS) resin for use in peristaltic pump head
 - Size 25, 5/16" OD x 3/16" ID, 1ft
 - Cost: \$1 to \$2 per ft



Continuous-Flow Sampling Apparatus (cont.)

◆ Support Stand w/ Clamp

- Used to support end of outlet tubing
- Polyethylene, fiberglass or plastic-coated
- Cost: \$80 to \$120

◆ Filter (dissolved metals)

- 0.45 um, 15 mm diameter or larger, tortuous-path capsule filter
- Gelman Supor # 12175, or equivalent
- Cost: \$20 to \$25 each

Boat Sampling

- ◆ Metal-free (e.g. fiberglass) boat, along with wooden or fiberglass oars should be used
 - For most situations, use of existing, available boat is acceptable
 - Flat-bottom, Boston Whaler-type boat is preferred because sampling materials can be stored with reduced chance of tipping
 - Gasoline- or diesel-fueled boat motors should be avoided because exhaust can be source of contamination

Boat Sampling (cont.)

- ◆ Before first use, boat should be cleaned and stored in area that minimizes exposure to dust and atmospheric particles
 - Immediately before use, boat should be washed with water at sampling site away from any sampling points to remove any dust or dirt accumulation
- ◆ Samples should be collected upstream & downwind of boat movement

Vendors

- ◆ Brand names, suppliers and part numbers in Method 1669 are for illustration only and no endorsement is implied. Equivalent performance may be achieved using apparatus and materials other than those specified in Method 1631.
- ◆ Some vendor sources include:
 - Cole-Parmer
 - Fisher Scientific
 - Nalgene Labware
 - VWR Scientific Products
 - I-Chem
 - Gelman Sciences
 - Lab Safety Supply
 - Bel-Art Scienceware Products
 - Associated Bag Co.
 - Eagle Picher

