

## CLEANING BILAYER CUPS AND CHAMBERS

Several requests have been made regarding the proper cleaning of bilayer cups and chambers. In addition, several investigators have reported that the cleaning techniques they currently employ can degrade the quality of the aperture in the polystyrene cup over several months.

In general, Delrin is more chemically stable but not as structurally sound as polystyrene. By comparison, the advantages of the structural rigidity provided by polystyrene are compromised by the fact that it is more readily attacked by acids, bases and organic solvents.

We have developed a cleaning procedure which easily and quickly cleans polystyrene, polycarbonate and Delrin (as well as most other plastics). In field tests, materials cleaned using this technique have been maintained in good working order in excess of five years.

### **Materials**

- Sodium phosphate, tribasic ( $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$ )  
Make a 40-50 mM solution (~3 g per 200 ml – yes, you can estimate!)
- Dilute HCl solution (0.1% by volume)
- DD- $\text{H}_2\text{O}$  and nanopure water
- 3 - 250 ml squirt bottles  
Label and fill squirt bottles with the solutions described above.

### **Procedure**

Use the following procedure to clean both cups and chambers. The advantage of using squirt bottles to apply solutions will become apparent when you clean the aperture.

The basic strategy is to first rinse with DD- $\text{H}_2\text{O}$ , then clean using the trisodium phosphate solution. After rinsing, residual phosphate is removed with dilute HCl and any remaining HCl is removed with nanopure water.

Squirt bottles are used to apply solutions and, more importantly, to clean the aperture. The fundamental technique is to press the bottle nozzle against the aperture in the cup and squirt a stream of solution through the hole. If properly performed, you will see a smooth stream of solution entering the cup from the aperture.

- Rinse cups and chambers with DD- $\text{H}_2\text{O}$ .
- Clean all surfaces using the trisodium phosphate solution. Clean the aperture by squirting a stream of phosphate solution through the hole.
- Rinse phosphate using DD- $\text{H}_2\text{O}$ .
- Complete removal of residual sodium phosphate is easily achieved by rinsing with dilute HCl. Rinse the aperture as described above.
- A final rinse is performed using nanopure water. Proceed as above.
- Cups and chambers can be quickly dried using Kimwipes or air jet.

**NOTE: Do not store plastics in phosphate solution. We recommend plastics be stored dry or for a short time in nanopure  $\text{H}_2\text{O}$ .**