



# Lab Manual

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## ***Sink 4 Operation***

(sink4)

### **1.0 Title**

Sink 4 Operation

### **2.0 Purpose**

This document has specific information about wet sink4 in Y1.

### **3.0 Scope**

Sink4 is a general use photolithography sink.

All water above the deck available to the users of sink4 is ultra pure DI water. The sink consists of an HMDS vapor prime, a rinse/drain tank, a container for small photoresist waste bottle disposal, a chlorobenzene dispenser, acetone wash bottle, methanol wash bottle, IPA wash bottle and a general sink top area for developing substrates. Chlorobenzene waste and photoresist waste bottles are under spinner1.

See [diagram](#) in Section 11.

### **4.0 Applicable Documents**

[Revision History](#)

### **5.0 Definitions & Process Terminology**

**Plenum L/L High** – Early warning alarm indicates sink drain failure.

### **6.0 Safety**

**EPO Red Button:** Cuts power to the sink in case of emergencies. Report promptly on FAULTS.

The hotplates in the Y1 area are for substrate heating only - no chemistry or heating of solvents is allowed at these hotplates.

### **7.0 Statistical/Process Data**

### **8.0 Available Processes, Gases, Process Notes**

HMDS & chlorobenzene treatment.

### **9.0 Equipment Operation**

#### **9.1 Control Panel**

The buttons along the front of the sink are used to control the EPO, power on, power off, alarm silence and alarm reset. The dials on the top panel are used to control the HMDS timer and aspirator time. The following describes their use.

**ASPIRATOR TIMER & PLENUM FLUSH:** The container or beaker which holds etchant or solvent is drained by using the aspirator in combination with the plenum flush. Turn the Aspirator Time on should automatically activate the plenum flush (the PLENUM button will light). If not, push the PLENUM button yourself. Be sure the PLENUM is active during the entire aspiration cycle. If not, post as a problem on FAULTS.

Before aspirating any solution, rinse off the aspirator tip with the deck hose to avoid contamination.

All acids can be aspirated, same for water-soluble solvents such as acetone, methanol and isopropanol. Collect non-water soluble solvents such as photoresist and chlorobenzene in organic waste bottles under spinner1.

**HMDS TIMER:** Used to control the HMDS vapor prime at sink4.

**UTILITY WATER:** The amount of water flow can be adjusted by the handle on the faucet to operate the "gooseneck" DI water faucet in the left of the sink. The deck hose can be used to fill beakers with DI water also.

**POWER ON:** Main power on for top control panels.

**POWER OFF:** Main power off for top control panels.

**ALARM SILENCE:** Silences the low liquid alarm.

**ALARM RESET:** Resets alarm system to this sink.

**ASP ON/OFF:** Not in use.

### 9.1.1 Sink 4

Sink 4 is the general use photolithography sink. The fixed bath and rinse tanks are covered with perforated panels to provide more work surface. Raised above the surface at the right side of the sink is the HMDS vapor prime tank. To use the HMDS vapor prime, first remove the tank covers. Lift out the sample holder and place your samples on the tray. Return the holder to the tank and cover tightly with the lids. Turn the HMDS Timer on for 5 minutes (timer dial is on the top panel); this starts N2 bubbling through the HMDS liquid in the container attached to the right of the sink. The N2 will automatically shut off. (See the instructions posted at the sink for further details).

Only the blue cassette labeled "HMDS" is allowed in the HMDS tank.

There is an automatic dispenser for chlorobenzene at sink4. It will automatically dispense 5 ml, but can be adjusted to dispense from 1-20 ml. The automatic dispenser should minimize chlorobenzene use and waste. You are encouraged to recycle the chlorobenzene for your own use as much as possible to eliminate costly waste disposal.

It is very important that all users of chlorobenzene follow the disposal procedure outlined at sink4. Bottle 1 is for chlorobenzene waste ONLY! No photoresist or water soluble chemical (including water) is to be put in this bottle. Bottle 2 is for photoresist/acetone waste ONLY! No chlorobenzene or water soluble chemical (including water) is to be put in this bottle. It is necessary to keep these separate bottles because chlorobenzene, photoresist, and water will react to form a solid/liquid phase. Environmental Health & Safety (EH&S) charges us more to dispose of multi-phase wastes.

Underneath this sink, is a chemical storage drawer primarily for developers, chlorobenzene and HMDS. Check this drawer first for an opened chemical before bringing another one into the Microlab. Neither this drawer nor the surrounding floor area of this sink is meant for empty bottles. All empty chemical bottles MUST be taken promptly to Room 432C, rinse 3X, scratch labels and dispose properly.

### 9.1.2 Changing Chemicals in Sink4

HMDS Bubbler: When the HMDS bubbler at sink4 is low or empty, simply refill it. A bottle of HMDS is stored in the rolling bin underneath sink4. Loosen the clamp to the HMDS bubbler; remove the glass top and refill it to indicated level; replace the glass top and re-tighten the clamp.

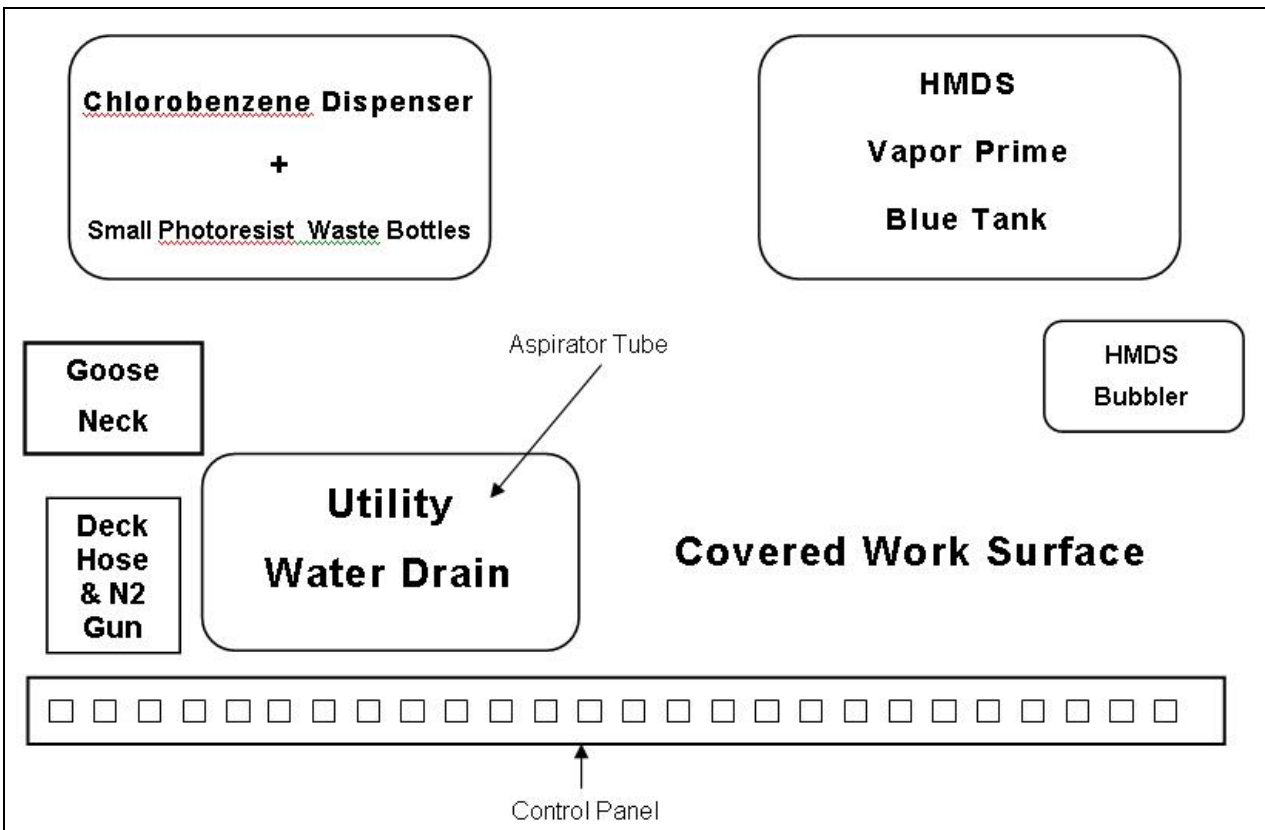
## 10.0 Troubleshooting Guidelines

### 10.1 Sink System Status Indicators (located on top sink panel to the left of the HMDS timer.)

- LOW PURGE** Red indicator light will come on when there is low air purge to cool off electronics for the sink.
- PLENUM L/L** Red indicator light will come on when the plenum liquid level is too high.
- ASPIRATOR** Red indicator light will come on when aspirator is in use.
- DRAIN** Not in use.

**PLENUM L/L HIGH:** If it sounds, push the **ALARM SILENCE** button on the sink, and notify the process staff and post the problem on Faults, as a full plenum lockout is an early warning alarm indicating sink drain failure. The area under the deck of a wet process station (sink) is known as the plenum. This area receives the water and chemicals when they drain from the tanks and the utility sink. When the level of water in the plenum reaches 3 inches, a float activated switch opens a valve and the waste is removed. Should the water rise too high in the plenum because of a failure of the system, all sources of water to the sink are shut off and the alarm will sound. This is to prevent an overflow. If the user silences the alarm, it will again sound when the problem is solved and the water level has returned to normal.

## 11.0 Figures & Schematics



**12.0 Appendix*****DECK HOSE Instructions***

The de-ionized (DI) water deck hose for sink4 is **ALWAYS** available for emergencies; it provides a good safety backup in the event of exposure to chemicals.

If this hose develops a leak, report as a problem on FAULTS.

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