

## Workshop Wizard Handbook

### Microfluidics Lab Routine Maintenance

#### Chores:

#### 1. *Check and replenish paper towels in dispensers*

- Paper towels are stocked in brown paper packages on the shelves along the wall by the entrance.
- There are 2 paper towel dispensers in the lab, just turn the key to check how much there are.

#### 2. *Check and replenish gloves*

- Check if any glove boxes are about to run out, should be 2 glove locations.
- If they are, open up the next one on top of the stack and add a new box of gloves to the bottom of the stack.
- Make sure there are both nitrile and latex gloves to use.
- Gloves are stocked on the shelves along the wall by the entrance, as well as above the vacuum furnace.

#### 3. *Tidy up bench spaces*

- Properly dispose of sharps and put away tools/supplies.

#### 4. *Sweep and mop*

- Walkways and under benches.
- Start at the corner of the lab and move in a zig-zag direction around the lab to make sure you don't get trapped.
- Dirty water poured in the sink
- Use the general maintenance cart located in the hallway outside the lab. The cleaner is stored in the cabinet under the sink.
- **Rule of thumb:** Best to do in the mornings or weekends.

#### 5. *Check and replenish hazardous waste labels*

#### 6. *Check sharps containers*

- If full, tape off the top and place in the hazardous waste bin.
- Usually will consider full when you can't put something else in the container without getting cut.

#### 7. *Check glass waste bin*

- If full, seal and tape off the top.

#### 8. *Make sure all cabinets are locked*

#### 9. *Check and replenish Kim wipes at every station*

- Kim wipes are stocked on the shelves along the wall by the entrance.

#### 10. *Refill solvent squirt bottles in fume hood*

- Fume hood should have 3 bottles of IPA, 2 bottles of Ethanol, Acetone.
- Large jugs under the hood in the cabinet.
- New jugs in the cabinet labeled "extra solvents."
- Wear gloves and lab coat; do all refilling in the fume hood.
- Keep empty solvent bottles as waste bottles.
- **NOTE:** Acetone will drip when refilled due to pressure differences. So point away from yourself.

11. *Monitor the hazardous waste jugs*

- Place in the hazardous waste bin if needed.

12. *Top off the Sonicator with DI water*

13. *Replace the paper towels in the spin coaters if needed*

- Paper towels will have oil streaks if the spinner has been used.
- Usually use 3 paper towels at the bottom and top of the spin coater.

14. *Top off cutting fluid in diamond cutter*

- The blue fluid by the CNC drill.

15. *Restart the Objet Printer*

- **IN THIS ORDER:**
- Turn computer and Objet off. Wait 10 seconds
- Turn Objet on (use mirror to find power switch in the back).
- Turn the computer on.
- Open remote desktop.
- Open Objet application on remote desktop.
- Open Object Studio software on the main desktop.

16. *Replace empty resin and waste containers in the printer*

- Check software. If the resin level is red or has an hourglass, it cannot be put back in once taken out. Avoid wasting resin.
- Restock spare materials in the grey bin under the printer.
- Print new labels if necessary.

17. *Clean the pressure washing station*

- Make sure water is off (both levers should be down).
- Check the yellow gloves and replace torn.

18. *Restock Thinky Mix Uline jars*

- Stored below the workbench.

19. *Replace dirty bench liners*

- Remove, wipe the area, and place a new one shiny side down.
- Stored under the workbench near gloves.

20. *Turn off Olympus microscope*

21. *Turn off Keyence light*

- Power button.

22. *Refill CNC drill squirt bottle*

- Use blue coolant.

23. *Clean the laser cutter*

- Take out the (layer with a bunch of hexagons) and vacuum small bits from the bottom.

24. *Clean laser cutter lens*

- Tools in the yellow bin above the bench.
- Place bubble wrap under the laser (in case of the lens drops)
- Unscrew the cap
- Use 1 drop of cleaner and a lint-free cloth to polish both sides of the lens.
- Replace the lens, the convex side should be facing down. Do not overtighten.
- **NOTE:** The convex side of the lens will have a more prominent (relative to the concave side) dot in the center.
- The grey knob on the laser will release the mirror for cleaning if necessary.

### **Innovation Workshop Maintenance Manual**

- 1) Check gloves: extra boxes are in microfluidics lab, write down what is taken on clipboard on the fume hood nearest to the exit.
- 2) Check paper towels/WypAll: there is a dispenser above every sink and the key should already be in the dispenser.
- 3) Clean up sander/grinder: Use paintbrush hanging with the tools and the vacuum to clean up debris.
- 4) Lower fume hood sashes, except one with imaging equipment
- 5) Put away tools
- 6) Return lab coats and safety glasses
- 7) Organize scrap wood: put it on shelf near lab coats
- 8) Sweep and mop lab: Mop is upstairs, cleaning fluid is under sink near the door, broom is in the hallway in between labs
- 9) Replenish hazardous waste labels
- 10) Check sharps bins, also check to make sure there are no sharp metal scraps in the trash bins
- 11) Check glass waste
- 12) Make sure all drawers are closed

- 13) Make sure all power tools and cabinets are locked
  - 14) Clean and lubricate the mill: vacuum away any chips and debris. Oil using oil bottle into all lubrication valves.
  - 15) Clean the bandsaw and drill press. Use the vacuum. On bandsaw, open up the top door and make sure the inside is clean.
  - 16) Charge the camera battery: battery door is on bottom of camera and there is a wall charger in the fume hood.
  - 17) Calibrate the scanner: I) Go into the Einscan software on the desktop, then choose Einscan sp. II) Choose calibrate in the main interface. III) Place the Calibration stand on the turn-wheel and orient the calibration board (using the reference dots) on the stand as shown in the image on the software. IV) Press snap. Once complete, re-orient the board and snap again until the process is finished.
- Note:** The board and the stand can be found in the scanner fume hood.
- 18) Turn off camera box light: the power button is on the side
  - 19) Thermo oven labels should be printed from the templates and signs folder on the shared drive.
  - 20) When cleaning the electronics workbench, clear any wires and tools from the bench and check to make sure that the soldering irons are turned off.
  - 21) If the build platform is not on the formlabs printer, use the additional rotation platform from the resin cleaning fume hood.
  - 22) The laser cutter cleaning has three components: a) The platform should be cleaned weekly to clear remnants of jobs. (Open the drawer for vacuuming if necessary.) b) The lens should be cleaned weekly. c) The mirrors (2) should be cleaned monthly. Cleaning log is found on the exhaust manager to the left of the cutter.
  - 23) When clearing the cricut and ultimaker shelf, make sure to wipe remaining glue on the ultimaker platform. Take out the platform and use IPA.
  - 24) The chips made by the carbide 3D should be regularly vacuumed. Reminder: the shop vac should be emptied, and the batteries should be replaced on a weekly basis.
  - 25) When replacing the liners in the 3D printer cleaning fume hood, use the stock in the cabinet located to the lower left of the hood.
  - 26) Fill out the IPA in the resin cleaner to the halfway point of the indicator lines. Measure the specific gravity of the IPA in the cleaner. If the O-ring on the measuring device sits above the large flaps, replace the IPA. Reminder: Check the IPA level in the squirt bottles regularly.
  - 27) The trash should be enclosed properly (wraps found in the drawer to the left of the hood) and marked as contaminated with liquid resin. Replace the container frequently to leave room for wrapping the trash.
  - 28) Stratasys maintenance: a) Check the filament level, replace it with stock from the shelves in the

corridor if necessary. (more details to be posted) b) To vacuum the print platform, go to settings and bring the gantry up; preferably use gloves.

29) Miicraft maintenance: Remove the resin cover and mix the resin with a disposable pipette (found on the big, white box across the room) until the solution is homogeneous. Return the cover to protect from dust. Note: Be careful when stirring, Teflon is extremely sensitive.

30) SCA 1200HT maintenance: Check for the fluid threshold level weekly. Over longer intervals, remove the container to check for parts in the cleaner (rotate 90 degrees to minimize splashing.) Note: This device is particularly dangerous. Wear gloves, coat, and face shield when opening the door. Ask Daniel or Mr. Bothman for detailed instructions. Note: The alarm may sound if the container is lowered too quickly. Silence the alarm with the button that is indicated with a warning light but do so only if you are certain that this was the cause of the alarm.

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