CNS Form FM040
Cleanroom EH&S Training Checklist

Form to be completed by User during cleanroom safety orientation. Submit completed, signed form to CNS Administrative Office LISE 306 for swipe card authorization.

User Name	User Email	Trainer Signature	Training Date

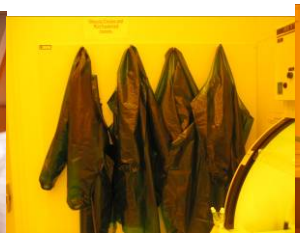
This page left blank

TOPIC	COVERED

A. Emergency Information ☐

1. Call **911** for Fire and Medical Emergencies: Leave building during any fire alarm and report to outside of Pierce Hall.
2. Call Harvard Police (617-49)**5-1212** (lab phones use 5-digits for on-campus dialing) for public safety emergencies.
3. Call (617-49)**5-5560** for all chemical or hazardous release emergencies.
4. If Blue toxic gas alarm sounds leave building and report to area in front of Pierce Hall.
5. If Amber toxic gas alarm sounds, leave immediate area in an orderly manner and report to LISE lobby for updates.
6. Cameras are in the cleanroom and are a resource to use during emergencies.
7. Push Yellow Emergency Gas Off (EGO) button and fire pull station (located at each exit in cleanroom) if you suspect a gas leak or if there is a fire in the cleanroom.
8. Use large double doors at side of cleanroom to exit cleanroom during all fire alarms and blue light toxic gas alarms.
9. First aid kit is located in gowning station.

B. Personnel Protective Equipment (PPE) is available as follows: ☐



1. Minimum Personnel Protective Equipment (PPE) upon entering the cleanroom is safety glasses and a pair of nitrile gloves.
2. Minimum PPE for **handling acids and bases** in the wet benches are as follows: MAPA chemical gloves, safety glasses, face shield and chemical resistant apron.
3. Minimum PPE for **pouring solvents** in quantities **greater than one liter** is a faceshield.
4. PPE must be removed if you cross the yellow and black tape on the floor in the wet process bay.
5. **Contamination Control Techniques:**
   a. Rinse gloves with water before removing if potentially contaminated with acids or bases. If you suspect chemicals have splashed onto glove, change gloves
   b. Wipe outside and inside of face shield **before each use** using a wet wipe to remove potential acid or base residue.

C. Accidents and Injuries

1. Report all injuries to your supervisor, to CNS staff with completed form FM032 "Incident Report", and to Environmental Health and Safety Office by calling 5-1290.
2. First aid kits are available for minor injuries. However, any injury must be reported to CNS staff and Environmental Health and Safety at (617-49)5-1290.
3. Human Resources must also be contacted following injury if a Harvard employee.

D. Hazardous Waste

1. Hazardous waste satellite accumulation areas are located in the following places:
   - Five gallon stainless steel carboys underneath solvent wet bench.
   - One gallon translucent bottles underneath solvent wet bench.
   - Halogenated solvents (i.e. Trichloroethylene, chlorobenzene bromobenzene) are placed in a one gallon bottle that is marked with a hazardous waste (name of halogen on label) label in compartment below wet bench.

2. Hydrofluoric acid waste in beakers is disposed of in accordance with latest revision of SOP019 Wet Bench Safety. Used acid and base beaker solutions located in white wet benches must be disposed of in accordance with latest revision of SOP019 Wet Bench Safety.

3. Notify CNS staff if any of the following deviations exist on the hazardous waste label:
   - Label not filled out properly.
   - Acronyms or formulas are used on the label instead of full name.
   - Hazard Section not marked off.

4. After disposal, make sure waste container is closed and in good condition.

E. Chemical Spills

1. Spills less than one gallon inside a wet bench can be cleaned up using absorbent pads on floor near wet benches.
2. If hydrofluoric acid spill occurs: seek assistance from CNS staff or call 5-5560 Operations Center.
2. If chemical spill occurs outside a fume hood or vented enclosure: isolate spill using A-

frame sign saying “Chemical Spill Keep Away” ; seek assistance from CNS staff or call (617-49)5-5560 Operations Center.

F. Sharps Containers

1. Place all sharps (scalpels, razor blades and syringes etc) in red sharps containers with lid. Dispose of any biohazard red box in the nearest biowaste burn box. The nearest biowaste burn box is in G05.
2. Place broken glass beakers and wafers in the white bucket designated as “broken glass and wafer disposal”.

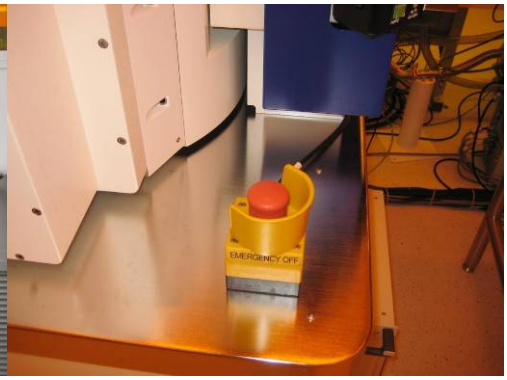
G. Equipment Lock out and Tag out Signs

When you see blue “System in Service” sign, or a red and black “Danger: lockout-tagout sign:, do not attempt to start equipment and do not remove the signs.

H. Safety Warning Signs

1. Read all yellow warning signs and red danger signs on the designated equipment.

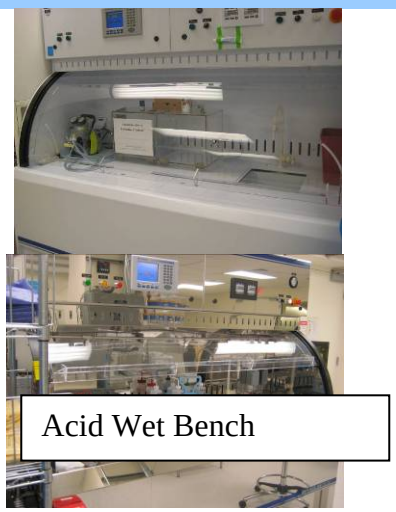
I. Emergency Machine Off (EMO) button



1. Use red “Emergency Machine Off” buttons to de-energize equipment during emergencies.
2. If you discover the equipment is smoking or a gas leak has occurred, press the EMO button if possible and leave cleanroom. If possible press the yellow gas off button at exit doors on your way out.

J. Wet Bench Use ☐

Solvent Wet Bench


Acid Wet Bench

1. Ensure that any one who wants to use the wet benches has been trained and certified in wet bench use by CNS staff.
2. Operate wet bench with sash opened to 18 inches
3. Do not stick head into wet bench at any time.
4. If alarm sounds for low air flow, stop work and contact CNS staff.
5. Do not store things in wet bench that will block the back baffles.
6. Wear appropriate PPE when working in wet bench (chemical gloves and safety glasses and face shield when pouring acids or bases or solvents greater than a liter.
7. Only solvents can be used in the solvent wet bench.
8. The hazardous waste generated in the solvent wet bench can be disposed of by pouring

down the cup sink.

9. See Hazardous Waste Section D if you have questions on hazardous waste disposal.
10. Chemical container labeling: if you place a container in wet bench, make sure it is labeled with date, your name, your phone number, and chemical name.

J. Toxic Gas System Piping & Air Monitoring ☐

1. Toxic gas such as chlorine, hydrogen bromide, boron trichloride, diborane and phosphine are marked with yellow and black label.
2. Flammable gases and pyrophoric gas piping are marked with red and white labels.
3. Toxic gas monitors are monitoring breathing zone air and tool exhaust continuously (24/7).

K. Use of emergency shower and eye wash stations ☐

1. There are six emergency shower and eye wash stations in the cleanroom.
2. Know where the closest one to you is.
3. If you have chemical splashed on your body, find the nearest shower, remove clothing, and pull the triangle handle down to make water come out. Stay in shower for 15 minutes.
4. If you get chemical in your eye, use the eye wash station under the shower. Push the lever back, and with your fingers hold open your eye lids to rinse eyes with water for 15 minutes.
5. Seek medical attention. Have someone call 617-495-5560.

L. Hydrofluoric Acid Use

1. Ensure all users of HF have been through wet bench training.
2. If exposed to HF rinse area for at least 5 minutes.
3. Calgonate is the antidote for hydrofluoric acid exposures.
4. It is located in the first aid kit in gowning station and at the acid wet benches that use hydrofluoric acid
5. Apply Calgonate to area.
6. Seek medical attention immediately.

M. Non-Ionizing Radiation Sources ☐

1. The following equipment could use radiofrequency and microwave power to run the tools: STS PECVD, STS RIE, Uniaxis RIE, NEXX PECVD, and the NEXX RIE.
    - The above equipment is monitored for leaks upon installation and then every two years or immediately if machine is moved.
2. The SEMs and ebeam lithography tools in the cleanroom generate X-rays internal to the microscope. These electron beam tools are monitored for X-ray leaks upon install and then every two years.
3. If you need survey reports for any of the above mentioned tools then you can contact the LISE EH&S officer at 617-495-1290.