

**Nanofabrication Facility**  
The Pennsylvania State University  
Materials Research Institute  
230 Innovation Blvd  
University Park, PA 16802  
814-863-0627  
FAX: 814-865-7173

**LABORATORY USAGE &  
SAFETY MANUAL  
FOR THE  
PENN STATE  
NANOFABRICATION  
FACILITY**

**March 2008**  
Second Edition Revised

# **Table Of Contents**

- 1. Introduction**
- 2. General Safety Procedures**
  - A. Introduction**
  - B. Lab Access**
  - C. Portal**
  - D. Material Handling and Use**
    1. Ordering
    2. Storage
    3. Use
    4. Disposal
    5. MSDS (Materials Safety Data Sheets)
- 3. Equipment**
  - A. Training/Usage**
- 4. Incidents and Accidents**
  - A. Introduction**
  - B. Reporting**
  - C. After Hours Emergencies**
  - D. Violations**
- 5. Specific Safety Procedures**
  - A. Introduction**
  - B. Chemicals**
    1. Acids/Bases/Solvents
    2. Usage

3. Disposal

4. Spills

**C.** Etiquette

**D.** Electrical

**E.** Fire

**F.** Gases

**G.** Injuries/Fist-Aid

**H.** Personal Protective Equipment

1. Eye Protection

2. Body Protection

3. Hearing Protection

4. Equipment/Facilities

**Appendix**

- Materials Handling Form
- Nanofab Floor Plan

## Chapter 1: Introduction

The use of this document is for the Penn State Nanofabrication Facility (Nanofab); any other uses are strictly prohibited. All Rights Reserved

This manual is directed to present to the best of ability the policies of the Nanofab. Comments should be sent to the Safety Officer:

Joe Lonjin

155 MRL

University Park, PA 16802

Or [JJL13@psu.edu](mailto:JJL13@psu.edu)

Nanofab faculty and staff enforce all means necessary to keep the laboratory clean and safe for all users. Common sense is a good policy, rules cannot cover all types of situations, consult with a staff member if regulations do not apply to a situation. It is the responsibility of all Nanofab users to act professional, courteous, and safely in the facility. Violations of safety regulations and policies will result in a loss of all privileges.

OSHA and the Pennsylvania Right-to-Know Act require Penn State to properly train and educate laboratory users. This manual, along with the coinciding safety-training course, is designed to act as the Nanofab Chemical Hygiene Plan (CHP). For details contact the Safety Officer.

## Chapter 2: General Safety Procedures

### A. Introduction

These safety procedures seek to create a safe working environment at the Penn State Nanofabrication Facility (Nanofab). In this environment, all laboratory users are aware of proper safety practices and follow them consistently. This will reduce the frequency and severity of incidents. Incidents will occur despite all our best efforts; when they do, following proper procedures can contain the incident, preventing it from escalating to an accident where people are injured or property is damaged. The machines and materials in this laboratory can be very hazardous, in the event of a major accident; the entire building is at risk.

Safety procedures emphasize individual responsibility for each piece of equipment and type of material. They also allow the Safety Officer to document user practices and any changes in laboratory procedure that have an impact on overall safety.

- **THE BUDDY SYSTEM:**
  - a. Rule # 1: All users working in the clean room must have another trained user (their “buddy”) inside or in the vicinity of the clean room at all times.
  - b. Rule # 2: When working in the wet chemical bench area the buddy must be *inside the clean room, aware of your situation, and close enough to be of assistance if you have an accident.*
  - c. This rule does not apply to the use of the Lithography Benches. You may spin resist, develop patterns, and strip resist using the standard solvents and developers in the Litho area without a buddy present inside the clean room. You must still follow rule # 1.
  - d. Never work alone at the Nanofab, always ensure that your buddy knows where you are working inside the laboratory, and check on work partners regularly.
  
- **USE THE MSDS:** Materials Safety Data Sheets are available for all Nanofab materials. These sheets provide all necessary information for proper material handling, usage, and disposal. These sheets are available in the Gowning Room.
  
- **GET TRAINED:** Before using any Nanofab bays or equipment you must be trained for that specific area or tool. NEVER use a tool or area if you have not received the proper Nanofab training session.
  
- **BE PROFESSIONAL:** All users of the Nanofab are expected to adhere to the utmost standards of professional conduct. This includes reporting of unsafe equipment, areas, situations or activities to the Safety Officer.

## B. Lab Access

### 1. Access

Lab access is through the main gowning entrance only. These doors are locked at all times from the outside; you must have a valid user ID to gain entry with the card access system. Users must complete the Safety/Orientation training prior to receiving access. Penn State users can present a current PSU ID to the Admin Staff in room 184 MRI to have their card activated. Non-PSU users will be issued a Nanofab ID card by the Admin Staff.

### 2. Rules

- a. **SWIPE IN / SWIPE OUT:** All users are required to swipe the card reader to the left of the toggging entrance doors to unlock the door. When you go to exit the gowning room, swipe the inside card reader to unlock. If you forget to swipe the reader when you exit you will hear an alarm. STOP, let the door CLOSE, and then swipe the reader to stop the clock.

b. **TAILGATING:** No user is allowed to follow someone into (or out of) the Cleanroom without swiping his or her id card. If a user is caught tailgating, he or she will lose access to the Cleanroom for 1 day. If the user has not completed the requirements necessary to gain access to the Nanofab or if the user bi-passed the Nanofab safety training, the user shall lose access to the Nanofab for ONE MONTH.

c. **USING ANOTHER USERS CARD:** Any user who uses another user's id card to gain access to the Nanofab will lose access to the Cleanroom for 1 day. An example is if you have access but forgot your id at home and "borrow" someone's id in your group. If the user has not completed the requirements necessary to gain access to the Nanofab or if the user bi-passed Nanofab safety training, the user shall lose access to the Nanofab for ONE MONTH.

d. **NOTIFICATION:** If you should ever lose your id please notify one of the Admin staff assistants immediately.

**One final note:** By registering your id with the Nanofab to gain access to the Cleanroom, you are stating you will comply with the above rules.

## C. Portal

The Nanofab portal is used for access and control of the facility. It can be found at <https://portal.mri.psu.edu>. This system will be taught to users at the orientation/safety training session.

## D. Materials Handling and Use

### 1. Ordering

Staff members order all materials purchased for use at Nanofab only. Students or users must have a staff member order any needed materials. The Nanofab regularly stocks materials that are commonly used in the lab. The Safety Officer must approve special requests and materials before orders are placed. Prior to approval **an MSDS and Materials Handling Form must be provided before** the material can be used in the facility. Failure to comply will result in a loss of privileges. (Materials Handling Form available from safety officer, copy located at the end of this manual.)

### 2. Storage

Materials may be stored in or out of the lab at the Nanofab depending on availability and location of the appropriate storage housing. The Safety Officer must approve individual or special materials, and then storage space

will be assigned. Personal storage containers must also be approved prior to use in the lab.

### 3. Usage

Users are responsible for safe use of materials in the lab. When using materials, know what they are; consult a MSDS if you do not. Use proper quantities do not try to hurry. Always use appropriate equipment, fume hoods, protective clothing and proper tools. (See Chapter 6-H for more information on Personal Protective Equipment.)

### 4. Disposal

The Safety Officer has established areas for storage of waste material. Users must label any container and ensure it is compatible and clean before using for waste. Chemicals must be labeled with the full name, no abbreviations or symbols. Labels are provided for chemical waste containers. If you have compatibility questions please contact the Safety Officer for assistance. Also check to ensure there is not already a container started for your material, most materials are commonly used at the Nanofab. Place containers in the designated **Secondary Containment** area and Staff will remove full containers for disposal. Biological or Radioactive materials must be approved prior to use in the lab as waste concerns are different for these materials. All users must take the Chemical Waste Training session given by the Safety Officer or EHS, this is required by EH&S and covers this topic in much more detail. Handling waste material without having the Chemical Waste Training will result in a loss of lab privileges.

### 5. MSDS (Materials Safety Data Sheets)

A MSDS provides all specifications, hazards, precautions and safety concerns for a given material. All materials used in the lab must have MSDS in the binder located in the toggging room. Copies are kept on file as well. For additional information contact the Safety Officer or EH&S (865-6391), MSDS are also available online at [www.ehs.psu.edu/msdsreg.html](http://www.ehs.psu.edu/msdsreg.html). If you have questions on a material consult these sources prior to use. Materials handling requires common sense and knowledge of any specific dangers associated with a given material.

## **Chapter 3: Equipment**

### **A. Training/Usage**

Prior to using any lab equipment, all users must take an equipment training session with a Nanofab Engineer. The training sessions vary in length and materials covered, but are specific sessions designed by the engineer to ensure you can use the equipment safely and productively. After successful completion, you may use the equipment freely, noting that equipment must be reserved for use on the Portal.

Using a tool in the Nanofab, you have a responsibility to know what you are doing, if you have any questions on sample/substrate types, recipes, or special processing conditions, please ask the Primary Engineer for help.

## **Chapter 4: Incidents and Accidents**

### **A. Introduction**

Safety procedures attempt to reduce the number of incidents that occur at the Nanofab. Despite everyone's best efforts, incidents will still occur. Following procedure may keep incidents from becoming accidents. Incidents and accidents must be reported to allow planning and any needed changes to ensure it will not happen again.

### **B. Reporting**

Users will avoid incidents and accidents by following proper procedures. In the event of an incident or accident you must immediately report it to the Safety Officer or a member of Nanofab staff. You are required to report any and all incidents or accidents at the Nanofab. The Safety Officer will investigate all incidents. The purpose is to find a way to prevent the same incident from happening again. Even small incidents must be reported; even if you witness an incident or accident, report it. Failure to report an incident or accident will result in a loss of lab privileges. If you have any question on how to respond to an incident, contact the Safety Officer.

## C. After Hours/Emergency Numbers

Each phone in the Nanofab lists emergency numbers. **911-Emergencies**

EHS	865-6391
After 5	863-1111
Joe Lonjin	342-2397 or 865-9284 – Rings to cell
Guy Lavallee	777-0719

## D. Violations

- 1st Violation - Warning
- 2nd Violation – Additional Safety Training
- 3rd Violation – Suspension from Lab. PI or supervisor will be notified.
  
- The Safety committee will determine what actions will be taken in response to the safety violation. Users should be aware that suspensions from the clean room may be for a day or a period of several weeks, months, or even permanently.
- Readmission to the clean room will be at the sole discretion of the Safety Committee

# Chapter 5: Specific Safety Procedures

## A. Introduction

The safety rules for the Nanofab must be read, understood, and practiced at all times. Use common sense, think about how your actions could affect others, and never work alone. Report any safety problems you encounter to the Safety Officer.

## B. Chemicals

A large variety of chemicals exist in the Nanofab, you are responsible for familiarizing yourself with them. MSDS (Materials Safety Data Sheets) are available in the togging room. Other sources of information are: Chemical labels, manufacturer, Internet, Safety Officer, and Penn State Environmental Health and Safety. PPE or

Personal Protective Equipment must be used at all times. PPE forms a protective barrier between you and the hazard.

## 1. Acids/Bases/Solvents-Specifics

### Acids

- When mixing acids, remember the common alphabetical rule A-W. Always add acid to water, not water to acid.
- Acids are stored separately from Bases and Solvents in the metal cabinet marked **ACIDS**.

**Hydrofluoric Acid (HF)** is particularly hazardous. HF attacks glass, so it must be used and stored in plastic containers. Plastic handling equipment must be used in the place of metal or glass. It also can cause major body damage; HF will break down into free Hydrogen and Fluorine ions in the body. The Hydrogen will cause corrosive tissue burns, and the Fluorine will bond with Calcium in the body to kill nerve endings and displace the Calcium content by forming insoluble salts. If left alone, HF exposure can be fatal. If exposed, flush the area with large quantities of water. Eye wash and shower stations are located throughout the lab. Be sure to clean under fingernails as HF will wick there and is hard to remove. **Calcium gluconate gel** is available in the wet bench area, and should be applied to areas directly exposed to HF continually until you receive medical treatment. Any exposure at the Nanofab requires a trip to the Mount Nittany Medical Center. HF does not produce an instant burning sensation, burning and or throbbing pain will not occur until many hours after the actual exposure. This will depend on concentration. Seek medical attention if any exposure occurs.

**Piranha Etch** is a common name for a mixture of Hydrogen Peroxide and Sulfuric Acid. This mixture reacts with photoresist, metals, and flesh. It is very useful for cleaning wafers, but is highly reactive. The material continues to react and decompose for long periods of time after use. This causes a vapor release that can cause containers to explode. This material is highly unstable and use by lab users is not permitted. The Nanofab supplies a chemically stabilized version of the mixture called **Nanostrip**. This is just as effective as Piranha and is safer to use. Mixing or use of Piranha is a direct lab violation.

- **Bases**

There are many types of bases at the Nanofab. Basic solutions also can harm tissue. If you become exposed, flush the area with large quantities of water. Eye wash and shower stations are located throughout the lab. Acids and Bases can be mixed in controlled amounts for known solutions, **NEVER** mix ACID and BASE waste together.

**Peroxides** are oxidizing materials; energy is released in reactions with common materials. Peroxide mixtures can be unstable and can explode. Extreme

care should be used with peroxides, as they are incompatible with all forms of organic solvents and flammable materials.

When using chemicals you must follow the PPE guidelines.

- **Solvents**

Solvents should be handled with care, as most are highly flammable. Most also can cause skin irritation and eye damage. Some have other threats, read the corresponding MSDS to ensure you know all hazards and risks.

Acetone is used commonly throughout the lab, it is very flammable and has a low flash point; it will combust very easily at low temperatures. Acetone spills can present a huge fire or explosion hazard. Handle carefully in fume hoods and keep away from direct heat sources.

Chlorinated solvents such as Chlorobenzene and Methylene Chloride are also used throughout the lab, mostly for lithography processing. These are known carcinogens, handle with care in hoods only, use separate waste containers and avoid skin contact or breathing of vapors.

Glycol Ethers are also used widely in lithography processes. These chemicals are known to cause birth defects, kidney, eye, lung, and brain damage. Avoid skin contact and breathing of vapors. Wear proper equipment and work in ventilated areas.

When using chemicals you must follow the PPE guidelines.

## 2. General Chemical Usage

All chemicals for use at the Nanofab are provided. If you need a new chemical not provided, you must have approval from the Safety Officer before bringing the chemical to the facility. The Appendix of this manual contains the Materials Handling Form; you must provide a complete **MSDS** and a **Materials Handling Form** prior to bringing, or using the new chemical in the Nanofab. Unknown chemicals will be disposed of.

- Standard chemical etching, cleaning, and processing are to be done only in the Wet Bench area only!
- **The lithography area is only for photosensitive materials processing. Automated process benches are for Staff Use Only!**
- Safety Glasses are required at all times!
- When using any chemicals, they must be used in fume hoods for **proper ventilation**, except for spray bottles containing Acetone and Isopropanol for general cleaning.

When using chemicals make sure you are properly protected. What you should wear is as follows:

- **2 stages of PPE for the chemical use in the lab.**

**Stage 1:** General lab use, spray bottles and/or Lithography.

**Wear - Lab gloves and Safety Glasses (Chem Gloves recommended for lithography solvents)**

**Stage 2:** Use of Chemicals in Wet Bench Area

**Wear – Chemical gloves, Face Shield, Apron**

**PPE should be inspected for damage before and after use. Do not wear, or put back PPE that is damaged, throw it away! Contact the safety officer for new PPE if needed.**

When moving chemicals to the bench top, ensure that containers have secure lids. Glass bottles should be transported in the polypropylene bottle carriers. Be sure to check that there are no bottles of your needed chemical before opening new ones. When pouring out chemicals, never pour a chemical back into the original container, this will contaminate the chemical and make it unusable.

- Glassware and plasticware in the wet bench area are to be **rinsed and dried** after each use prior to returning it to the storage shelf. Gloves and other protective equipment also must be rinsed and dried.
- Broken lab glass is to be cleaned up by the person who broke it. It is to be placed in the **RED** container marked LAB GLASS.
- Any container or chemical in use **must be labeled** with the supplied labels, regardless of whether you are monitoring the material or not! Label with your full name, date, time, and type of material.
- If you must leave a container out of sight or unattended, the container must have a lid. Leaving chemicals unattended without the proper label or lid is a direct lab violation.
- Chemicals that need to be left for more than 24 hours or overnight must have a note stating the date and time the material will be left unattended.
- Special mixtures must be approved prior to mixing or use by the Safety Officer. Special labels are used to ensure that proper approval has been given.
- Hot plates must be monitored at all times during use.

### 3. Disposal/Clean-up

All chemical waste at the Nanofab must be disposed of in containers. **No chemicals will be dumped down the drain.** Rinse-Water is the only liquid allowed in the drain other than normal DI-Water. Supply bottles are reused as waste bottles, but only **PLASTIC BOTTLES!** When a plastic chemical container is empty **you must rinse the container 3 times** and place it in the waste storage area to be used as a waste container. Prior to making a waste bottle, rinse the container yourself, again 3 times to ensure no residual chemicals are in the bottle. Waste labels are provided on the storage shelf, and must be filled out in full with the complete chemical name, ***no brand names or formulas***. Place the waste label over the original bottle label. Check to see that a chemical does not have a waste container before creating a new one. **A NEW Vented lid must be used for all mixtures.** Airtight lids can lead to container explosion if the material releases vapor, as with most oxidizers. Use the provided funnels, they must be rinsed and dried after use. The wet benches must also be wiped with wet wipers and dried after each use. Do not leave any glass, lab ware, chemicals, or waste on the wet bench surface. You are expected to clean up after yourself.

Chemical residue is hard to see, it is **recommended** that you wash your hands after exiting the lab.

### 4. Spills

For any spill in the Nanofab please contact a member of staff, phone numbers are on the provided phone sheets, for assistance. In emergencies, evacuate the area, and then contact the Safety Officer at 814-777-0719, and EHS at 863-1111 or Dial 911. Use the lab paging system to alert the lab of an evacuation. This can be done from either of the two digital phones outside the lab, one by the toggging room, and the other by the break room. To page, press the “*page*” button then “1” and speak into the receiver.

- **If you are exposed or burned, remove exposed material and use the safety showers or eye wash stations. Rinse for at least 15 minutes then seek medical attention, have someone else call EH&S and contain the spill.**

## C. Etiquette

Mutual consideration of your fellow users is essential to the efficient operation of the Nanofab. Remember the following:

General lab rules:

- Sign in each time you enter.
- Use the buddy system.
- Gown from the top down.

- Always use gloves and safety glasses.
- Know where phones and exits are.
- Know where PPE, eyewash, safety shower, and fire extinguishers are.
- Stay out of unauthorized areas.
- Report all problems or incidents.
- Wear appropriate safety gear for chemicals.
- Return tools where they belong.

**Do not:**

- Wear excessive make-up or perfume.
- Wear sandals or open shoes.
- Bring in visitors without permission.
- Work on or modify equipment.
- Bring in unapproved chemicals.
- Make electrical connections.
- Change gas bottles.

**Do not:**

- Work alone.
- Use equipment for which you haven't been trained.
- Bring in paper products. Only use cleanroom paper or clean room notebooks.
- Use pencils.
- Leave materials or belongings in the togging room.
- Wear dirty clothes or shoes.
- Bring in backpacks, purses or other personal storage items.
- Bring in food or drink.
- Listen to music.

**Leave your work area the way you would like to see it when you come in.**

- No chemicals or waste on bench tops.
- No unlabeled solutions.
- No unauthorized solutions or chemicals.
- No waste down the drain.
- No wet lab ware on storage racks.
- No unreported equipment problems.
- No uncleaned empty bottles.

Be considerate of your fellow users.

- Share bench space cleanly and safely.
- Show up for reserved times or cancel the reservation.

Consider the general welfare of the lab.

- Lab staff is here to help.
- Users should fix, clean, etc., when they know how to do so.

- Assist staff and learn from them.
- Know what alarms mean. Don't just turn them off.
- If you have a doubt, ask someone.
- Try to reduce particle and chemical contamination.

## **D. Electrical**

Do not make electrical connections, this will be done by staff or approved persons. Do not overload circuits. Report all problems to the Safety Officer. In case of electrocution, do not touch the person, call 911 and get assistance to shut off the power source. RF, Microwave, and other high-voltage sources are used on various equipment, be careful with liquids, and watch out for high-voltage lines and cables.

## **E. Fire**

Fires can result from ignition of flammable gases, liquids or other materials. A major cause of lab fires is due to ignition of chemical solutions on a hot plate. Use water baths where possible. Be cautious of water use around electrical equipment.

In case of a large fire, evacuate the building, pull a fire alarm, and call 911. Remain calm, if you are in the lab you will hear the fire siren, do not ungnown, find the nearest exit and quickly leave the building. DO NOT RUN. If it is a small fire you feel you can handle, fire extinguishers are located throughout the lab and building. If your clothes are ignited use eye washes or safety showers to drench you.

## **F. Gases**

Gases used at the Nanofab are mostly in high pressure steel compressed cylinders. When in use gas cylinders are kept in special gas cabinets designed with exhaust ventilation and the proper valves, and regulators. When being stored gas cylinders must be securely fastened to a bracket of some kind. Cylinders often weigh up to a few hundred pounds, and can cause personal or property damage if they happen to fall. Gas cylinders must be transported on approved carts and used cautiously as compressed cylinders also can become rockets if the cylinder valves are broken or damaged.

Nitrogen and Compressed air is house supplied by the building. A large liquid nitrogen tank is located outside the loading dock. The boil off is used as nitrogen gas for purging processes and nitrogen blowguns. Blowguns and compressed air are highly pressurized. At high pressures nitrogen or air can cause damage to equipment, clothing, or actually tear skin. Use common sense always. Small tanks and Dewars can be filled with liquid nitrogen for process use. Liquid nitrogen can cause freeze burns to skin or damage to equipment. Training must be given by Nanofab Staff prior to use of Liquid Nitrogen. Always wear appropriate gloves and goggles, and use caution.

Many gases here at the Nanofab are corrosive, toxic, or pyrophoric. *A gas that is pyrophoric will spontaneously ignite in air.* An example of pyrophoric gas used at PSNF is Silane (SiH<sub>4</sub>). Some toxic or corrosive gases used are: Ammonia, Phosphine, and Chlorine.

Because toxic gases are used and odor is not a reliable detector for toxic gases, the Nanofab utilizes a Zellweger MDA-16 toxic gas monitor. This system monitors 16 different points throughout the lab for exposure levels less than that of the **PEL/TLV** values set as standard by OSHA. The **Permissible Exposure Limit** and **Threshold Limit Value** are considered the same. It is the averaged level to which you can be exposed 8 hours a day, 5 days a week, without adverse health affects. So this system can detect toxic gases long before they can actually become a threat to your health. In the event that the monitor detects a toxic gas, a **toxic gas alarm** will occur. The orange strobe lights in the lab turn on and the toxic gas siren begins to sound, in this event you must **immediately** exit the lab and building **without** removing your lab gown, and congregate in the parking lot outside. Be calm and do not run!

**There are no drills of this alarm; every toxic gas alarm must be taken seriously.**

**\*Note-In the event of a strange smell / odor, evacuate the lab, and then call Joe Lonjin at 865-9284 or EHS at 865-6391.**

## **G. Injuries/First Aid**

Injuries such as minor burns and cuts can be treated using the supplied first aid kits. Trained medical personnel at Ritenour Health Center or Centre Community Hospital must treat anything of a more severe nature.

## **H. Personal Protective Equipment**

### **1. Eye Protection**

Safety glasses must be worn in the lab at all times. Approved safety glasses are supplied, see the Safety Officer if you need a pair. Over the glasses pairs are also available.

### **2. Body Protection**

Lab gowns will protect against most solvents and light abrasions. Aprons and chemical resistant gloves are supplied for wet bench use. Heavy-duty aprons and specialized gloves or other body protection is available upon request for special approved projects or for dewar use with liquid nitrogen.

### **3. Hearing Protection**

Earplugs are available for use when working near noisy equipment.

#### 4. **Equipment/Facilities**

Throughout the lab facilities safety equipment is provided. These include but are not limited to:

SCBA-Self Contained Breathing Apparatus

Oxygen tank and mask

Calcium gluconate gel

Neutralizer

Fire extinguishers

Safety showers

Eye wash stations

## Appendix

### Nanofab Material Handling Report

Material Name: \_\_\_\_\_

(Note: Put each material on a separate Material Handling Report.)

Material Classification: \_\_\_\_\_

Equipment that will use material: \_\_\_\_\_

Coordinating Researcher: \_\_\_\_\_

Primary Engineer: \_\_\_\_\_ Approval: Yes No

Date material use will begin: \_\_\_\_/\_\_\_\_/\_\_\_\_

Specific hazards of material:  
\_\_\_\_\_  
\_\_\_\_\_

Detail usage procedure for material:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

How much material will be used on an average basis? \_\_\_\_\_

Who will order the material? -PSNF -You

How much needs to be on stock? \_\_\_\_\_

Safety Officer Approval: Yes No

Lab Manager Approval: Yes No

Before using any material at the Nanofab you must complete this form, provide an MSDS, and receive approval of the above individuals.

## Nanofab Floor Plan

