

Polymer Materials Engineering Lab Policies

Revision Date – 8/6/2024

A. Introduction

- i. The following lab policies are intended for all users of the Polymer Materials Engineering laboratory spaces, including rooms ET 106, 107, 108, 110, 111, 112, 113, 114, 122, 126, 128, 164
- ii. Failure to follow the following policies can result in consequences ranging from a temporary loss of lab privileges, grade penalty for lab assignment, additional lab cleanup due at the end of the quarter, and/or ejection from all PME labs for the quarter (and the consequent effect on grades in PME courses)

B. Authorization of Lab Use

- i. To gain authorized access to the PME labs, users must:
 - Acquire a *First Floor Engineering & Design Badge* by completing the “1st Floor Spaces & Expectations” and “1st Floor General Lab Safety” modules in the ENGD Badge Program Canvas course.
 - Additionally, students must meet one of the following criteria to be authorized to use the lab:
 - a. PME majors who have taken at least one PME course
 - b. Students currently enrolled in a PME class
 - c. Students with written permission from Professors Gao, Larson, Misasi, Peyron, or Rider, or Lab Technician Russell Choi-Pearce
 - A visitor badge, obtained from the main Engineering and Design office, is required for non-Engineering and Design persons wishing to use PME labs
- ii. Extended or after-hours lab use is offered only when a PME faculty or staff member

C. Lab Access Times

- i. Standard Access
 - Monday-Friday, 8:00am – 5:00pm
- ii. Extended Access
 - Additional access may be scheduled and supervised by PME faculty or staff
 - Students should watch for postings on PME lab doors and/or email and/or Canvas
- iii. Lab Closures
 - Occasionally the lab will be closed during Standard Access times
 - Students should watch for postings on PME lab doors and/or email and/or Canvas
 - No one shall work in the PME labs when closed. The lab is considered closed when:
 - a. All outside lab doors are locked (door to ET 113 and ET 122)
 - Note that even if lights are on and other doors to lab are unlocked (such as ET 107), the lab is still considered closed

D. General Lab Safety

- i. Introduction

- Maintaining an optimum level of safety is the responsibility of each person using the lab
- Safety is, to a large extent, a matter of attitude and depends on each person's knowledge of safe practices and concern for safe working conditions for all lab users
- Power machinery operation and chemical management are a major concern

ii. Lab Attire

- The following attire is required for all PME lab users:
 - a. Long pants covering ankles
 - b. Shirts covering mid-drift
 - c. Hair ties for long hair
 - d. Close-heel/toe shoes
- The following cannot be worn in PME lab spaces:
 - a. Neckwear (necklaces outside of shirt, scarves, etc.)
 - b. Extremely loose-fitting clothing

iii. Personal Protective Equipment (PPE)

- The following PPE is required to be brought to PME lab by PME lab users:
 - a. Safety glasses
 - b. Lab badges
- The following PPE is supplied by the PME program for specific uses:
 - a. Insulated, heat-resistant gloves and arm covers
 - b. Nitrile and other chemically resistant gloves
 - c. Ear protection
 - d. Face shields
 - e. Dust masks
- The following PPE may be required for certain activities, but is to be supplied by the student:
 - a. Half and full-face respirators
 - Respirators must be fit-checked with EHS before use in PME lab spaces

iv. Safety Data Sheets (SDSs)

- Consult SDSs to determine the necessary safety measures needed when using chemical reagents, resin additives, compressed gases, commercial products, etc.
- SDSs are available online in the [database available](#) on the desktop of any Engineering & Design computer

v. Ventilation

- Ventilation exists in three main forms in the PME labs:
 - a. Air exchanges in main lab rooms
 - b. Air handlers such as exhaust fans, snorkels, low flow hoods, fume hoods that draw airborne fumes away from workers
 - c. Dust extraction connected to downdraft table and cutting and sanding tools in ET 122
- Exhaust snorkels must be placed next to processing equipment and opened while running at the equipment
- Dust extraction in ET 122 must be turned on during the use of the following:
 - a. Downdraft table

- b. Sanders
 - c. Bandsaws
 - d. Table saw
- vi. Dust masks must also be worn while using any process that requires the dust extraction ventilation
- vii. Food and Drink
 - No food or drink is allowed in the PME lab spaces
 - Both food and drink should be taken outside of the PME lab doors
 - Sealed water bottles can be stored inside the temporary personal belongings storage areas at the front of the lab, near the lab doors
- viii. Storage Areas
 - PME labs have dedicated student storage areas for class and research projects
 - Storage used by students must be clearly labeled with the names of users, expected end of use date, and associated project title.
 - The storage areas can be found in the following places:
 - a. The green and gray lockers in Soft Tooling (ET 122)
 - b. The shelves above the chest freezers in the prepreg lab (ET 126)
 - c. The cubbies under the whiteboard in Plastics Processing lab (ET 113)
 - At the end of each academic year, students are to remove contents, clean, and empty all storage areas previously used
 - Storage areas will be purged of all contents by faculty and staff at the end of each academic year
- ix. Music
 - No headphones of any kind are allowed in the PME labs
 - Music played from phones and speakers is at the discretion of the lab technician and faculty, but should not be a distraction to other lab members
 - Music should not be played from phones and speakers in PME labs to minimize distractions and be courteous to fellow students
- x. Unsafe Conditions
 - Although every effort is made to maintain the lab in a safe operational condition, there will be occasional breakdowns and problems that need immediate attention
 - If you should observe such a condition, particularly with a power machine, electrical components, ventilation system, chemicals, or any other suspected hazard, please report this to the instructor or technician immediately for corrective action
- xi. Injury
 - Any injury (requiring a band aid or more treatment) must be reported to faculty or staff
 - An Accident Report must be filed EHS

E. Machine Operation Safety

- i. Training
 - Knowledge of safe operating practices and maintaining safe working conditions, is paramount in the operation of all power machinery

- Each person may only use equipment for which they have received specific training from the faculty/technician on safe operating procedures and potential hazards
- Failure to observe equipment protocols and safety precautions when using any piece of equipment may result in ejection from the lab
 - a. This includes failure to use appropriate PPE
- Individual help from the faculty/technician is continually encouraged

ii. Equipment and Students

- The users of any power equipment must be sure they understand the operational procedures and safety requirements for any machine they use
 - a. Ask questions if in doubt!
- Adjustments to machines should only be done with power off.
- Guards on machines are provided for your protection and should not be removed
- Lab users must know the location of emergency stop switches in each lab
- When a student/staff/faculty uses equipment, the Machine's Use Report must be completed prior to leaving the work center.
 - a. Failure to fill out the Machine Use Report may result in damage to the equipment, unsafe working environments, and not receiving a grade for the assignment that utilized the machine
- Students are required to follow the color coded tool use guidelines posted in the labs and shown below:

| Green | Yellow | Red |
|----------------------|------------------------------|----------------------|
| Tools on tool panels | Thermoformer | Injection Molders |
| 3D Printers | Compression Molders | T.S. Extruders |
| Ovens | Single Screw Extruder | Rotational Molder |
| Vacuum Pumps | Hot Table | Laser Linc |
| Handheld Sanders | MTS Machines | Band Saw |
| Hopper Dryers | Snowboard Press | Tile Saw |
| Cordless Tools | Paint Booth | Thermal Conductivity |
| Downdraft Table | N.C. Ultrasound | Drill Press |
| Dremel | Fume Hood | |
| | Feeders | |
| | Granulator | Black |
| | Composite kit prep and layup | Autoclave |
| | Belt Sanders | Table Saw |
| | Sheet Press | |

- No running equipment is to be left unattended with the exception of ovens and the autoclave; unattended equipment will require a label with:
 - a. Users last names
 - b. Cell phone numbers
 - c. Oven content
 - d. Date and time of return
- Only use brass tools when working with molds in the PME labs
- Never use a propane torch on a mold
 - a. Heat the brass tool with the torch if needed

F. Materials Use and Safety

- i. Materials used in the PME lab include but are not limited to:
 - Hazardous chemicals
 - Paints
 - Resins
 - Adhesives
 - Automotive products
 - Composites fabrics/bagging
 - Plastic pellets
 - Other

- ii. All materials must be properly labeled
 - This means the original label or a suitable material label (available in lab to be filled out by the user) for transfer containers; reaction containers
 - a. Steel cans used for composites resin mixing, need tape labels that describe the following:
 - Names
 - Material(s)
 - Course/Project
 - Date
 - b. Failure to properly label material containers can lead to points lost on assignments and/or temporary or permanent removal from PME lab spaces

- iii. All flammable materials must be labelled and stored in a flammables cabinet in ET 110, 113, 122, or other PME lab spaces

- iv. All chemicals must be properly disposed of
 - No chemicals are to be dumped in any sink or waste basket
 - If you don't know how to dispose of something, ask faculty members or the technician

- v. All materials brought into the Engineering & Design Building must be checked in by a technician prior to bringing them into the lab
 - SDS should accompany the material

- vi. Flammable, toxic, corrosive materials and oxidizers require careful handling
 - Consult SDS for PPE appropriate to the lab activity
 - Use proper ventilation when using such chemicals

G. Lab Cleanliness

- i. All work spaces must be cleaned and tools cleaned and put away in the proper location before leaving the lab
- ii. Leaving a dysfunctional workspace may result in a grade penalty for the assignment or additional lab cleanup
- iii. Any equipment or projects left unattended at any time must have the following attached in a conspicuous location:

- Owners' name
 - Project or class descriptor
 - Date and time returning
- iv. Projects without the former information may be discarded
- v. Sinks are intended for water only.
- Do not allow the following to enter the drain:
 - a. Resins
 - b. Plastic wastes
 - c. Plasters
 - Lab sinks contain secondary containment pans that should always be used to prevent foreign objects from entering the drain
 - a. If removed for any reason, secondary containment pans should be placed back in sink before next use
- vi. Containers are available for proper disposal of materials, please ask