LAB SAFETY

Wood and Paper Science

NC State
Lab Rules:

• Know the safety rules of the lab.
• Do not use equipment without training.
• Clean up!
• Ask permission to borrow anything.
• If you break something, let someone know.

Developed by Drs. Jameel, Lucia, and Saloni (September 2008)
# Emergency Numbers

<table>
<thead>
<tr>
<th></th>
<th>OFFICE</th>
<th>HOME</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Campus Emergencies (Police, Fire, Spills)</strong></td>
<td>911</td>
<td>(Identify as being at NCSU)</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>515-5127</td>
<td></td>
</tr>
<tr>
<td>Hazardous Material Division</td>
<td>515-6863 (6864)</td>
<td></td>
</tr>
<tr>
<td>Health &amp; Safety Services</td>
<td>515-6858</td>
<td></td>
</tr>
<tr>
<td>Rex Hospital Emergency Room</td>
<td>784-3100</td>
<td></td>
</tr>
<tr>
<td>Wake Medical Center Emergency Room</td>
<td>350-8000</td>
<td></td>
</tr>
<tr>
<td>Carolinas Poison Center</td>
<td>1-800-848-6946</td>
<td></td>
</tr>
<tr>
<td>Barbara White, Lab Manager/CNR Safety</td>
<td>513-0298</td>
<td>753-8523</td>
</tr>
<tr>
<td>Wes Johnson, Pilot Plant</td>
<td>515-7761</td>
<td></td>
</tr>
<tr>
<td>Tony LaPasha, Hodges Wood Products</td>
<td>515-2850</td>
<td></td>
</tr>
</tbody>
</table>
Common Hazards

Wood and Paper Science
Chemicals
Equipment
Compressed Gases
Magnet/Quench
Ultraviolet Lamp
High Pressure
High Voltage
Radiation
Nip/Pinch Point
Steam Lines
Noise
Slip Hazard/Wet Floor
Cuts
Sawdust
Protect yourself!

Know what hazards are present in your work area and how to safeguard against them.
Safety Plan

Location
## Material Safety Data Sheet

**Material:** MANGARIS® HARDWOOD DECKING - WOOD DUST

### 1. MSDS Information

#### 1.1. MSDS Information

- **Product:** MANGARIS® HARDWOOD DECKING - WOOD DUST
- **Supplier:** Data Provided: April 2023
- **Review MSDS for chemicals

#### 1.2. MSDS available at www3.ncmsds.com or supplier.

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### 2. Material and Hazard Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust</td>
<td>1234567</td>
<td></td>
</tr>
<tr>
<td>Manganese</td>
<td>2345678</td>
<td></td>
</tr>
</tbody>
</table>

### 3. Physical and Chemical Properties

- **Appearance:** Brown powder
- **Odor:** None

### 4. Fire and Explosion Data

- **Flash Point:** 60°C
- **Explosion Limits:** 1.5-10.0% (v/v)

### 5. Health and Environmental Hazards

- **Inhalation:** May cause respiratory tract irritation.
- **Skin Contact:** May cause skin irritation.

### 6. Precautions for Safe Handling and Use

- **Eye Contact:** Wash with water.
- **Skin Contact:** Wipe with soap and water.

### 7. Transportation Information

- **UN Number:** 3668
- **Risk Group:** IV

### 8. Regulatory Information

- **Regulatory Status:** No special handling required.

### 9. Disposal

- **Disposal Methods:** Incinerate or send to a hazardous waste facility.

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**Special Handling Precautions:**

- Store in a cool, dry place.
- Do not mix with other chemicals.
- Do not incinerate.

**Product Information:**

- **Product Name:** MANGARIS® HARDWOOD DECKING - WOOD DUST
- **Supplier:** Data Provided: April 2023
- **MSDS available at www3.ncmsds.com or supplier.
Personal Protective Equipment (PPE)

Select and wear the proper personal protective equipment to protect against the hazards found in the safety plan and the MSDS.
Safety Glasses
(All labs and shops)
Lab Coats
(All labs—not in shops)
Gloves
According to Hazard
Proper Shoes for Labs
Improper Shoes

• NOT ACCEPTABLE!!!!
Suitable Clothing for Labs
NOT PROPER ATTIRE
Foot Protection-Pilot Plant Area

• Steel-toes only!
Specialty PPE
Long Hair
SAFETY EQUIPMENT
Fire Extinguishers
First Aid Kits
Fire Extinguisher

DO NOT USE A FIRE EXTINGUISHER UNLESS YOU HAVE BEEN CERTIFIED BY FIRE SAFETY PERSONNEL.
Eyewash and Safety Shower
Use of Eyewash

If chemicals have been splashed in the eye, immediately flush the eye for an extended period of at least 15 minutes (15 minutes of cold water is intolerable)

- During washing, hold the eyelids away from the eyeball and move the eye up and down and sideways to wash thoroughly behind the eyelids.
- Check for and remove contact lenses if possible, but do not delay irrigation if lenses are difficult to remove.
Safety Showers

• **Used in the event that significant amounts of caustic, toxic, or otherwise hazardous materials are spilled on yourself or others.**
  1. Get under the shower
  2. Pull the handle down
  3. If necessary, remove contaminated clothing or shoes

• Generally located in the hallways outside of laboratories.
E Stop
E-Stops

• Typically located near the door.
• Shut off power to electrical wall outlets
  - Useful in fire fighting or electrocution
• Do not cut power to the lighting
• Do not cut power to high voltage equipment
DO NOT WORK ALONE!

At least one other authorized person must be present in the general work area.

Friends, wives, children or other unauthorized students must not be in the laboratory.
Security Measures

• No visitors or tours of labs without permission of PI or responsible staff.
• Lab doors should be locked when unoccupied.
• Outside doors should be locked after hours.
• Report suspicious people to Campus Police and department head.
NO FOOD OR DRINK!!

Including empty wrappers and cups!!! This is an OSHA violation!
Labeling of Materials

- Chemicals and stock solutions
- Experiments
- Hazardous wastes
Proper Labeling of Chemicals and Stock Solutions

• Name(s) and concentration(s) of components
• Date of preparation
• Your name
• PI name
• Hazard i.d. (HMIS)
Labeling of Stock Solutions
Hazardous Materials Identification System (HMIS)

**Health (BLUE)**
- 4 Deadly
- 3 Extreme danger
- 2 Hazardous
- 1 Slight Hazard
- 0 Normal

**FIRE (RED)**
- Flash Points
  - 4 Below 73 F
  - 3 Below 100 F
  - 2 Below 200 F
  - 1 Above 200 F
  - 0 Will not burn

**REACTIVITY (YELLOW)**
- 4 May detonate
- 3 Shock and heat
- 2 Violent chemical reactions
- 1 Unstable if heated
- 0 Stable

**SPECIFIC HAZARDS (WHITE)**
- Oxidizer OX
- Acid ACID
- Alkali ALK
- Corrosive COR
- Use NO Water W
- Radiation Hazard
- Bio Hazard

0 – 1 REASONABLY SAFE
2 SOME HAZARD – USE CAUTION
3 – 4 HAZARDOUS, BE VERY CAUTIOUS
Proper Labeling of Experiment

- “Experiment in Progress”
- Your name
- PI name
- General description of matrix/hazard
- Key to sample IDs referenced
Experiment Labeling-Good Start!
Hazardous Waste Labeling

- **HAZARDOUS WASTE**
- Components (with concentrations or volume)
- PI’s Name (or room number of lab)
- Start date of collection
Fire Prevention Guidelines
Fire Safety Tips

• Locate nearest fire alarm box
• Clear exits
• Store flammable/combustible materials in appropriate containers away from heat and spark sources.
• Never leave open flame unattended.
• Regularly check electrical cords-switches.
• No extension cords.
In the Event of a Fire

• If there is time, turn off open flames.
• Pull down fume hood sashes.
• Close the door.
• Activate pull station.
• Exit the building.
• Call 911 from another building or from a cell phone outside. Identify as being at NC State.
Safe Handling of Chemicals

• Proper labeling of all materials.
• Maintain current inventory
• No 20 L cans without permission of lab manager
• Minimize exposure to all chemicals
• No eating, drinking, or applying cosmetics in labs.
• Avoid mouth pipetting and inhalation.
Safe Handling of Chemicals (Cont.)

• Clean up residue from counters, containers, and equipment daily!
• Transport chemicals in bottle carriers.
• Wash your hands when leaving the lab.
Chemical Storage

- Large quantities of acids, alkalis, or solvents should not be in the department.
- Order the least amount of chemicals that are needed to complete the task.
- Store in proper cabinet(s).
- No chemicals stored overhead.
- Secondary containment
Example of Secondary Containment
Major Hazardous Waste Rules

- Hazardous wastes and stock chemicals MUST be stored separately.
- NO hazardous waste may be carried through a door or into a hallway.
- Do not stockpile hazardous waste—submit for pick-up as soon as the bottle is 2/3 full.
- Separate incompatible chemicals.
- Use suitable container and secondary containment.
Chemical Disposal

Following information required:

- Components (with concentrations)
- State (solid, liquid, gas)
- Volume or weight (include units)
- Location

Contact person for submission:
3rd Floor: Barbara White
1st and Second Floors: Linda McMurray
Wood Products: Tony LaPasha
Label for Waste Pick-up

HAZARDOUS WASTE   DATE______________

State: Solid / liquid / gas   Wt. or Vol.:  

Form Number: _________________________________

Generator: _________________________________

Building: _________________________________

Corrosive _____ Flammable _____ Air/H2O Reactive_____  

Constituents_________________________________________  

_________________________________________________  

____________________
Chemical Spills

- When in doubt, evacuate the area and notify lab manager or PI. After hours, call 911.
- Small spills—use Chemsorb to absorb and dispose as hazardous waste.
- Large spills (especially of fuming acids)—evacuate and call 911.
Lab Operations
Training for Equipment

- Pilot Plant—Wes Johnson
- Pulping/Bleaching—Linda McMurray
- Hodges Wood Products Lab—Tony LaPasha
Analytical Facilities

- See Barbara White to locate responsible user.
- Make appointment for training.
- Set up account for instrument reservation.
- Reserve time online:
  [http://www.cgibin.ncsu.edu/wps-bin/calendar_admin.pl](http://www.cgibin.ncsu.edu/wps-bin/calendar_admin.pl)
Equipment Requiring Reservations (No Use Rate)

• Autoclave
• High speed centrifuge
• Incubator (Biotech Lab)
• DCA
• UV-Vis spectrophotometers
• SPRs
• QCMs
• Muffle Furnace
Chromatography Service Center
(Use Rate)

- Dionex Ion Chromatographs
- Dionex HPLC
- GCD
- GPC (Waters)
- Wyatt Light Scattering
- GCs
- GC-MS
Thermal Analysis Center  
(Use Rate)

- TGA
- DSC
- DMA
- Rheometer
- FTIR
NMR Service Center
(Use Rate)
Orders for Chemicals and Supplies

- Rojas and Hubbe students: Youssef Habibi
- Argyropoulos and Lucia students: Magaly Ramirez
- Park students: Jun Park
- Heitmann, Jameel, Byrd, Kocurek, Venditti, Pawlak: Linda McMurray
- Wood Products: Melissa Rabil
Good luck with your research!