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INTRODUCTION

Safety Committee of the Industrial and Engineering Technology Department

The head of the Department of Industrial & Engineering Technology shall appoint a safety committee consisting of five members. Appointments to the committee will be made in May of each year. At a minimum, one tenured or tenure-track faculty member from Industrial Technology, one tenured or tenure-track faculty member from Engineering Technology, one tenured or tenure-track faculty member from OSHE, and one instructor will serve on the committee. The remaining at-large members can be tenured or tenure-track faculty members or instructors in any discipline. Ideally one member will have a specialty in Occupational, Safety, Health, and Environment.

The chair of the committee shall be a tenured or tenure-track faculty member elected by the members of the committee in a timely manner to serve a two-year term commencing on July 1 of odd numbered years. There shall be no limit on the number of terms served consecutively by the chair.

It is the responsibility of the safety committee to develop and maintain the Safety Handbook for the department of Industrial & Engineering Technology. The safety committee is responsible for the investigation of accidents that occur in the department. The department head will forward to the chair of the safety committee all accident report forms. The chair of the committee will then forward the accident report forms to the individual members so that a decision can be made relative to a course of action (if any).

The safety committee is responsible for development of safety policies for the department and involved with decisions concerning safety matters.

In performing investigations, the safety committee has the authority to collect data, inspect facilities and equipment. The safety committee shall make recommendations to the department head for remediation of safety issues.

Safety Handbook of the Department of Industrial & Engineering Technology

The purpose of this manual is to document proper safety procedures for the Department of Industrial & Engineering Technology.

Both the faculty and administration are responsible for promoting and administering the safety program in all lecture and laboratory classes taught under their supervision. Every researcher is responsible for the safety of their laboratories and the safety of all persons working under their direction. Each individual is responsible for performing his/her job safely. Each individual should always be diligent in their efforts to have safety hazards corrected as soon as possible. It is the instructor’s responsibility to know the proper action to take if an accident occurs in their lecture or laboratory class, to be familiar with the operation and use of all safety equipment in the department, to know
the proper evacuation route from each of the classrooms used by them, and to be aware of the proper emergency procedures established for the Department, the College, and the University.

Every laboratory instructor/supervisor should set a good example by observing all rules and recommendations and by being an active safety advocate.

The instructor should:

1. Discuss safety procedures and policies with the students during first laboratory period.
2. Be alert for unsafe conditions.
3. Inspect often and intelligently.
4. Take effective corrective action promptly.
5. Maintain discipline and enforce safety rules.
6. Assume responsibility for visitors and require that they follow the same rules as students.
7. Carefully review all laboratory experiments for possible safety problems before the experiments are assigned to students.
8. At the beginning of class point out to the students any possible hazards that may be encountered and, in the event that an accident occurs, indicate the proper course of action that must be taken. The immediate and proper use of the eye wash or safety shower should be emphasized.
9. The instructor should in general be present at all times in teaching labs except as follows:
   i. The instructor must leave in order to tend to an emergency (and in that case a responsible stand in should be appointed if at all possible)
   ii. The class utilizes several different lab locations (for example Material Testing Laboratory)

This manual is not intended to supersede the Southeastern Louisiana University Safety Manual but is intended to be a supplement to be used in conjunction with that manual. Other available sources of safety related information include: (1) Safety Data Sheets which are located in each lab, (2) “Dangerous Properties of Industrial Materials” by Sax. All of these sources are located in the Laboratory Coordinators office.
# EMERGENCY RESPONSE NUMBERS

**IF IN QUESTION...CALL UNIVERSITY POLICE AT 985-549 2222**

<table>
<thead>
<tr>
<th>IN CASE OF...............</th>
<th>CALL..........</th>
<th>AT..........</th>
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<tbody>
<tr>
<td>Fire</td>
<td>University Police</td>
<td>2222</td>
</tr>
<tr>
<td>Medical Emergency</td>
<td>University Police</td>
<td>2222</td>
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<tr>
<td>Injury</td>
<td>University Police</td>
<td>2222</td>
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<tr>
<td>Question concerning minor injury</td>
<td>University Health Center</td>
<td>2241</td>
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<tr>
<td>Minor Chemical Spill</td>
<td>Laboratory Coordinator</td>
<td>3310</td>
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<tr>
<td>Major Chemical Spill</td>
<td>University Police &amp; Environmental Health and Safety &amp; Laboratory Coordinator</td>
<td>2222 &amp; 2157 &amp; 3310</td>
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<td>Missing Lab Materials</td>
<td>Laboratory Coordinator</td>
<td>3310</td>
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<tr>
<td>Safety Question</td>
<td>Environmental Health and Safety</td>
<td>2157</td>
</tr>
<tr>
<td>Emergency Chemical Information</td>
<td>CHEMTREC</td>
<td>9-1-800-424-9300</td>
</tr>
<tr>
<td>Emergency Hazardous Substance</td>
<td>LA State Police</td>
<td>9-1-504-925-6595</td>
</tr>
<tr>
<td>Equipment Malfunction</td>
<td>Laboratory Coordinator</td>
<td>3310</td>
</tr>
<tr>
<td>Major Maintenance</td>
<td>Physical Plant</td>
<td>3333</td>
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<tr>
<td>Other Issues</td>
<td>Industrial and Engineering Technology Dept. Secretary</td>
<td>2189</td>
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<tr>
<td>SELU Information</td>
<td>2000</td>
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A copy of this list should be posted by each laboratory phone.
RESPONSE TO ACCIDENTS

IN CASE OF AN ACCIDENT WITH INJURY - CALL UNIVERSITY POLICE –985-549-2222

If you need emergency assistance call University Police at 985 549-2222

Phones are located in each office. Be sure to tell police your exact location and the nature of the incident.

An Accident Report MUST be filled out for each accident involving injury to student or faculty member. The Accident Report form may be found in Appendix I of this document and in the form drawer of the Departmental office.

If a student refuses additional medical care (from Student Health Center, University Police, or local walk-in clinic) be sure student signs this fact on Accident Report.

First Aid Procedures
Some minor first aid may be given while awaiting arrival of help. First Aid materials administered should be limited to soap, water, paper towels and standard band-aids. A summary of appropriate temporary aid follows.

Moving Victim- Never move or lift accident victims unless they are in danger of further injury. If they must be moved from a hazardous area, grasp their feet and drag them away while protecting the head from injury. Calm and comfort the victim and do not alarm them.

Acid and Alkali Burns - Flush the affected area with water and remove or cut away clothing. This may be done in the sinks or showers. There are emergency showers and eyewash stations in every laboratory. If substantial amount of acid has gotten on clothes, have individual enter shower and remove all contaminated clothing.

Acid and Alkali Splashes to the Eye - First aid for splashes to the eye should begin as quickly as possible by thoroughly washing the face, eyelids, and eye. Eyewash stations are available in all of the laboratories. The eye should be thoroughly flushed for an additional 15 minutes. The eye lids must be held open during this time. DO NOT RUB THE EYE. Only plain water should be used.

Swallowed Poisons - Dilute strong acids and alkalis by quickly administering large amounts of water. But, NEVER give liquids to an unconscious person. If strong acids, strong alkalis, or petroleum products are known to have been swallowed, do not induce vomiting.

Cuts- If there is a possibility of contamination, wash affected area with copious amounts of soap and water. If bleeding, follow instructions below.

Bleeding - Have the student apply pressure directly to the wound. This may be done with a clean paper towel or directly with a hand. Do NOT apply a tourniquet. Try to insure that the blood does not contact anyone else.
Fractures - Do NOT move the victim unless absolutely necessary.

Thermal Burns - Immerse burn in gently running cool water. If burn is severe do NOT attempt to remove clothing. If burn is very severe, be careful about applying ice or water over burn, as this may intensify shock reaction.

Electrical Shocks - Remove the source of shock as soon as possible either by (a) shutting off the source of power or (b) using a non-conductive object (wood or dry cloth) to separate the victim from the source.

Note: The instructor should escort the injured student to the eye wash or safety shower to ensure that proper flushing is initiated.

SAFETY TRAINING

All faculty, staff, research students, and solutions workers will participate in an ongoing program of principle-based safety training. The department head will document all training.

SAFETY INSPECTIONS

Quarterly building inspections will be conducted by the building coordinator or his designee. For CSTB, the building coordinator is the Department Head. The stockroom coordinator is designated to conduct safety inspections in accordance with the guidelines set forth by the Environmental Health and Safety Office Department at Southeastern Louisiana University.

Whenever a faculty member leaves the department on a permanent basis, the building coordinator or designee shall conduct an inspection of the laboratory spaces previously occupied by that person to ensure that there are no hazardous conditions (wastes, chemicals etc.) that need to be addressed before that person vacates the premises. A completed report will be delivered to the department head for appropriate action.

CORRECTION OF UNSAFE CONDITIONS

The purpose of conducting safety inspections is to identify potential unsafe practices or conditions. The designated person needs to be notified of all unsafe conditions. It is the designated person’s responsibility to ensure that proper corrective action is taken in a timely manner to remediate all documented hazardous conditions. This may mean submitting a service request, contacting the laboratory coordinator, asking another faculty member to do so, or taking care of the matter personally. If correcting the safety infraction is outside of the designated person’s ability, then inform the Department Head of the situation and suggested corrected action immediately.

DO NOT WAIT FOR A SAFETY REPORT! If you see an unsafe condition, immediately correct it or report it to the Lab Coordinator or the Departmental Safety Chairman.
SAFETY POLICY FOR LABORATORY WORK

Different laboratories have slightly different safety policies dependent upon the commonly encountered hazards associated with each particular laboratory. There are separate laboratory safety policies and guidelines for each individual laboratory. These laboratory Policy Sheets may be found in this handbook. It is necessary to review in detail each laboratory policy sheet the first day of each new lab class.

SAFETY DOCUMENTATION PRIOR TO LABORATORY WORK

Before each student may begin a new laboratory class they must successfully complete a safety test documenting their knowledge and understanding of the Laboratory Policy for that class. Different classes have slightly different safety tests which focus on the particular safety aspects of that lab. After the test has been taken the instructor will review the correct answers with students before the test is collected.

BUILDING EVACUATION

At the beginning of each semester the instructor shall inform the students in each of their classes the proper evacuation route from that classroom. In case of an emergency evacuation, the instructor shall make certain that all of their students leave the by the most direct safe route and meet in the grassy area within Railroad Street Park. There is an evacuation route posted adjacent to all common room exit doors. If the usual evacuation route is blocked, then the students shall exit the building by the most direct and safe alternate route. The evacuation routes for Computer Science and Technology Building (CSTB) are listed in Appendix I.

After an emergency occurs which requires the evacuation of the building, the Faculty and Staff of the Industrial and Engineering Department and Computer Science Department are to meet the Building Coordinator in the grassy area within Railroad Street Park. This Requirement is to be met so that emergency personal do not have to enter the building looking for you or your students. It is the instructor’s responsibility to ensure that all of their students have evacuated the building. If you suspect someone may be trapped inside the building, notify firefighters on the scene. Do not leave Railroad Street Park until a responsible party has been made aware of your successful evacuation of the building.

Do not reenter building until directed by police or fire department personnel.

FIRE ALARM PROCEDURE

The safety of the students, staff, and faculty in a fire situation is of the utmost importance. The hallways in for Computer Science and Technology Building CSTB are equipped with internal fire and smoke sensors so that when fire or smoke is detected the alarm will sound. The laboratories ARE NOT equipped with automatic fire or smoke sensors. If a fire occurs in a lab, and help is needed, it must be summoned (by pulling a fire alarm pull station). When a fire alarm is activated, lights will flash and a loud high-pitched alarm will sound. The alarm is monitored and University Police will be automatically contacted. If a fire alarm results, it is also beneficial to call the University Police (2222) to update them on specific hazards and current status. When a fire
alarm sounds, the building must be evacuated. The building may not be reentered until an “All Clear” is given by fire and police personnel. All faculty, staff, and students should meet in the grassy area of Railroad Street Park and be prepared to verify that all of their students are accounted for.

**EMERGENCY RESPONSE TO LABORATORY FIRE**

As soon as a fire is noticed do the following.

1. Alert other people in the laboratory or immediate area by calling “Fire”.

2. If the fire is large, spreading, in close proximity to high volume of flammable or explosive items, or is threatening to block your exit,
   a. Immediately evacuate the room. Do not pause to collect personal items. Pull the (fire) doors closed behind you.
   b. Pull the fire alarm.
   c. Leave the building by appropriate route. Use stairs not elevators.
   d. Proceed to Railroad Street Park. (Students must check in with instructors at Railroad Street Park).
   e. Notify firefighters on the scene if you suspect someone may be trapped inside the building.
   f. Do not reenter building until directed by police or fire department personnel.

3. If the fire is small, contained, not blocking your exit, and you feel comfortable doing so, you may choose to fight the fire. Otherwise evacuate following the above steps.

To fight a fire, do the following....

   a. If the fire is small and self-contained, you may be able to extinguish it by covering it with a nonflammable item such as a beaker or watch glass.
   b. Very small contained fires (such as small amount of material in a test tube or beaker) which are not in close proximity to other flammables may be allowed to burn themselves out. This is particularly useful when isolated within a hood.
   c. If the fire is electric in nature, and you can safely do so, unplug the equipment.
   d. Use a nearby fire extinguisher to control and extinguish the fire.

When using a fire extinguisher, remember the word PASS:

- Pull the pin
Aim the nozzle at the base of the fire
Squeeze the handle to release the extinguishing agent
Sweep the base of the fire from side to side

e. If the fire is not extinguished after one extinguisher, then evacuate the building using above steps.

FIRE OUTSIDE OF THE BUILDING

Call University Police (2222) for an automobile or trash fire.

BOMB THREAT

In the event that a bomb threat is received, notify the University Police (2222) immediately. The decision to evacuate a building due to a bomb threat shall be made by the person deemed responsible for the building and the Director of University Police.

If a decision is made to evacuate the building, occupants in each office, classroom, and laboratory in the building will be notified by the University Police or other personnel to evacuate the building and report to the grassy area of Railroad Street Park for further instructions. Instructors should be directed to bring the class in a group and recheck the roll at the final destination.

All persons not connected with a search of the building will remain outside of the building until it has been declared safe for occupancy by University Police.

GENERAL EMERGENCY RESPONSE PROCEDURES

Since the hoods are interlocked with the air handling units, the hoods in the lab will fail when the air handling unit stops. If the hoods stop many experiments may no longer be done safely and a hazardous (potentially lethal) environment may develop.

In the event of hood stoppage, a chemical spill, gas leak, fire in a laboratory, classroom or other building area, the Instructor, Department Head, or Laboratory Safety Coordinator shall decide as to whether or not the emergency can be abated locally, or whether evacuation of the building is required, and if outside assistance is needed.

If the building must be evacuated, follow the below procedures.

1. Alert other people in the immediate area.
2. Immediately evacuate the room. Do not pause to collect personal items. Pull all doors closed behind you.
3. Pull the fire alarm.
4. Leave the building by appropriate route. Use stairs not elevators.
5. Proceed to Railroad Street Park. (Students must check in with instructors at Railroad Street Park).

6. Call University Police (2222) and advise them of the problem.
   a. Your name
   b. Exact location of the Emergency
   c. Cause of the emergency
   d. List materials that have been spilled or may be released.
   e. Actions taken to ameliorate the emergency.

7. Notify firefighters on the scene if you suspect someone may be trapped inside the building.
8. Do not reenter building until directed by police or fire department personnel.

ELEVATORS

There are two elevators in CSTB. The freight elevator is located at the North end of the main Hall. The passenger elevator is located at the South East corner of for Computer Science and Technology Building CSTB. Never use the passenger elevator for the movement of hazardous objects such as gas cylinders or hazardous chemicals. Never ride in the freight elevator. Never use the elevator if there is a fire in the building.

SAFETY DATA SHEETS

Under the OSHA Hazard Communications Standard (29CFR 1910.1200), all personnel working with hazardous materials must have access to Safety Data Sheets or SDS (formerly called MSDS or Material Safety Data Sheets), and be trained in the safe handling of the material. The SDS provides necessary, helpful, and useful information on the properties of the hazardous material. Each person working with hazardous materials should familiarize themselves with those properties before you work with the material. It is a vital safety requirement to be able to refer to the SDS immediately in the event of an emergency and provide a copy to emergency responders. OSHA has ruled that electronic access to SDS is an acceptable alternative to maintaining paper files. Each lab, department, or work group has the option to maintain a hard copy SDS binder or file. As a minimum, each work group should maintain an inventory of hazardous material names and suppliers and methods to quickly and easily access the SDS if there is no hard copy available. Students and student workers are to be instructed that they have ready access to SDS for all hazardous substances with which they may have contact while working in laboratories. They are also to be instructed in the use of SDS.

The laboratory coordinator will be responsible for providing up to date SDS folders in all teaching labs for which hazardous materials are utilized by students. For labs that are do not use hazardous materials for teaching but utilize them for maintenance, the instructor will be responsible for the SDS.
HAZARDOUS MATERIAL LABELS

Hazardous Material containers must be labeled with either the original label or a new label to include the following information: Chemical Name, Hazard(s), Date and Manufacturer or owner. The labels are to be affixed and filled out by the laboratory coordinator or instructor. Hazard designations should be indicated USING the NFPA 704 standard with the colored diamond and appropriate numeric hazard codes. Mixtures can often be rated conservatively by rating each of the individual components and using the highest number for health, flammability and instability (independently). Use judgment in rating since some of the chemicals can act synergistically different than the individual components, and because the components may be present in different percentages.

FLAMMABLE LIQUID/HAZARDOUS MATERIAL LOCKERS

A method by which the Flammable Liquids/Chemical Lockers can be maintained in a neat, safe, and reliable repository for chemicals is outlined in this section.

Students are never allowed access to the Flammable Liquids/Chemical Lockers unless they are under the immediate supervision of the Laboratory Coordinator, Department Head, or Faculty member.

The storage room should contain only chemicals that will be used within their accepted shelf life. Chemicals should be removed and disposed of, following the guidelines for disposal of chemicals, when they fall in one of the following categories.

1. Any hazardous material whose label has fallen off or the label is not readable.
2. Any hazardous material whose cap has broken or cracked.
3. Any hazardous material that has obviously reacted with the air or water.
4. Any hazardous material that is unusually dangerous, such as explosives (picric acid)

The chemical storage area should be inspected at least once a semester and hazardous material that fall in any of the following categories should be removed and disposed of using the proper disposal procedure.

Hazardous Materials Acquisition

All incoming containers of hazardous material should be given an indelible, corrosion-resistant date of arrival on the container. Each arriving hazardous material should be entered into the hazardous materials inventory system.

Hazardous Materials Inventory Procedures

It is important to keep an updated inventory of the hazardous material on hand for safety and financial reasons.
The hazardous materials inventory system requires that all hazardous material be logged out and logged whenever removed from or returned to the Flammable Liquids/Chemical Lockers.

HAZARDOUS MATERIALS STORAGE BY GROUP (Flammable, Acids, etc.)

Southeastern Louisiana University Laboratories voluntarily aims to meet OSHA Laboratory Safety Requirements. These requirements are written in the Code of Federal Regulations 1910.1450 (available in the Federal Documents Sections 3rd floor Sims Library) and “Prudent Practices” by the National Research Council available in its entirety from the National Academy Press 2101 Constitution Ave, NW Washington DC20418 (or in excerpt in “Laboratory Safety: Principles and Practices”, Fleming, et al. (Sims QR 64.7 L33 1995)).

Of particular interest is the Code of Federal Regulations (CFR, 1910.1450, D.2. b, c and d.) A summary of general guidelines for safe storage of chemicals follows. This guideline is not complete. Specific compounds should be stored according to the procedure documented in its SDS. Whenever in doubt consult the SDS of the original chemical manufacturer.

Flammable Solvents

These are materials that have a flash point below 100 F.

1. Store in approved safety cans or cabinets.
2. Segregate from oxidizing acids and oxidizers.
3. Keep away any source of ignition: flames, localized heat or sparks.
4. Safety cans or drums containing flammable liquids should be grounded and bonded when being used.
5. Keep fire-fighting equipment readily available.
6. Have spill cleanup materials handy.
7. Store highly volatile flammable liquids in a specially equipped refrigerator.
   Examples: Hydrocarbons, ketones, alcohols, ethers, esters etc.

Bronsted Acids

These are materials that are proton donors

1. Store large bottles of acids on low shelf or in acid cabinets.
2. Segregate oxidizing agents from organic acids, flammable and combustible
3. Segregate acids from bases and active metals such as sodium, potassium, magnesium, etc.

4. Segregate acids from chemicals which could generate toxic gases upon contact such as sodium cyanide, iron sulfide, etc.

5. Use bottle carriers for transporting acid bottles.

6. Have spill control pillows or acid neutralizers available in case of acid spills.
   Examples: Glacial Acetic Acid, Hydrocyanic Acid, Hydrochloric Acid, Hydrobromic Acid, Nitric Acid, Phosphoric Acid, Sulfuric Acid.

Bases

These materials are active proton acceptors.

1. Segregate bases from acids.

2. Segregate bases from substances that may release corrosive, toxic, or flammable fumes on reaction such as Chloroform.


4. Have spill control pillows or caustic neutralizers available for caustic spills.
   Examples: Ammonium Hydroxide and Sodium Hydroxide.

Water Reactive Chemicals

These materials are highly reactive with water.

1. Store is specially designated reactive cabinet

2. Store in cool dry place far away from water sources.

3. Label storage area as “Danger, Water Reactive”
   Examples: Hydrides (Lithium Aluminum Hydride, Sodium Hydride), Alkali metals (Sodium, Potassium), Inorganic Chlorides (Aluminum chloride, Boron trichlorides).

Air Sensitive Chemicals

These materials need special storage and handling procedures.

1. Store in specially sealed container possibly blanketed with Nitrogen.

2. Store in cool dry place.
3. Label storage area as “Caution. Air Sensitive Chemicals”

Oxidizers

These materials accelerate the combustion of organic matter.

1. Store in cool dry place.

2. Keep away from flammable and combustible materials (such as paper, hydrocarbons, etc.)

3. Keep away from reducing agents such as zinc, alkaline metals etc.

4. Label storage area as “Caution Oxidizers”
   Examples: Hydrogen peroxide, Chlorates, Chlorites, Perchlorates,

Toxic Compounds

These materials may produce bodily injury when encountered.

1. Store according to hazardous nature of chemical.

2. Label container as toxic.

3. Personal Protective Equipment (goggles, gloves, fume hood) need to be utilized when using material.
   Examples: Halogens, Carbon Monoxide, Arsenic, Lead, Mercury, Halogenated hydrocarbons, etc.

Light-Sensitive Materials

These materials will react or decompose when exposed to light.

1. Avoid exposure to light. Store in amber bottles or wrapped in Aluminum foil.
   Examples: Ethyl ether, Mercuric salts, Silver salts, Bromine

Carcinogenic Materials

These materials have a high probability of causing cancer

1. Label all containers as Cancer Suspect Agents.
2. Store according to hazardous nature of chemical, using appropriate security when necessary
   Examples: Benzene, Chromium Oxide, Cadmium compounds, Arsenic compounds.

Peroxide Forming Chemicals
These materials may form explosive peroxides if given the proper conditions.

1. Store in airtight containers in dark, cool, dry place.
2. Label containers with receiving, opening and disposal dates.
3. Keep chemicals on active inventory; ensure chemicals are disposed of before expected date of first peroxide formation.
   Examples: Acetaldehyde, Ethyl ether, Tetrahydrofuran.

Highly Reactive Chemicals (Explosives)

This type of chemical is not to be stored in this building.
   Examples: polynitrotoluene, picric acid

HAZARDOUS MATERIAL WASTE/USED

Hazardous Materials that have no anticipated safe future use should be disposed of in a timely and safe manner.

Segregate halogenated and non-halogenated materials. Do not combine materials in a waste container which may react with each other. Combine materials of similar composition and toxicity which will not react with each other. For instance, a series of non-halogenated organic solvents can often be combined in a common waste container.

Do not combine any materials without detailed knowledge of how they will (will not) react with each other.

Label each waste container with the following information.

1. Complete name of each and every chemical contained.
2. Name of Responsible Individual.
3. Room from which it originated.

Waste containers must be made of appropriate material that does not react with the waste chemicals. DO NOT use glass waste bottles for materials which could develop pressure. USE plastic waste containers whenever possible. DO NOT use plastic waste containers with materials which could compromise the integrity of the plastic. Waste containers must have secure fitting lids. Waste containers should not be identifiable (by shape, lid or label) as empty food containers.

Once waste containers are properly labeled, filled and sealed, they should be transferred to the green waste disposal shelf in the chemical stockroom. Waste should be brought to the disposal shelf promptly after filling or after they are no longer being actively used.

The material on the waste disposal shelf in the chemical stockroom will be turned over to the Director of the Environmental Health and Safety Office on a monthly basis.
COMPUTER SCIENCE AND TECHNOLOGY BUILDING HVAC SYSTEM

The heating ventilation and air conditioning system will only function properly and safely if doors are kept closed. The Life Safety Code (NFPA 101) under which this building was reviewed, requires that each space be separated from the corridor by rated doors. In the event of an emergency, this separation should provide adequate time to evacuate the building before smoke or fire would block the means of egress. The HVAC system was balanced with corridor doors closed. Each laboratory was balanced such that it was negative in pressure with respect to the corridor. In the event of smoke generation within a laboratory, the air handler serving that area will stop. If the doors are closed, smoke should be contained within that area for sufficient time required for the evacuation of the building.

GENERAL LABORATORY PROTOCOL

Good Laboratory Practices should be in operation in all teaching and research labs. These good practices include the following.

1. Good housekeeping and tidiness.

2. Keep all aisles and exits clear of obstacles.

3. Reduce all tripping, slipping, and fall hazards.

4. Clean all workspaces within a reasonable amount of time after work is finished.

5. Label all containers with chemical content and responsible person name.

6. Provide information to the laboratory coordinator relative to the composition of “unknowns”. A list of allowed compounds for unknowns will be established by the tenure/tenure-track organic chemists for organic laboratory.

7. Keep eyewashes, showers, and all other safety equipment in well maintained and easily accessible manner.

8. Have spill kits readily available.

9. Have evacuation routes clearly posted.

10. Have emergency contact numbers clearly posted.

11. Have reactive chemicals properly stored and well labeled.

12. Have appropriate personal protection equipment (PPE) available and in good condition. (goggles, gloves, lab coats etc.)
13. Have appropriate safety instructions readily available.


15. Have SDS and other safety information readily on hand.


CHEMICAL FUME HOODS

Fume hoods capture, contain, and expel emissions generated by chemicals. In general, it is a good idea to conduct all laboratory chemical experiments in a fume hood.

Before using the hood, make sure that the main switch is on. If you have any question concerning the operation contact the Lab Coordinator x3310 in room 3009.

Never place any body part other than your hands inside a fume hood.

Do not use the laboratory fume hoods as a chemical storage cabinet. If a hood contains a large quantity of bottled chemicals, it is time to do some housekeeping and return the chemicals to the chemical storeroom or the hazardous waste storage (whichever is appropriate).

The fume hoods in each location will only develop proper air flow if the doors to the room in which the hoods are installed are kept closed. When doors are propped open, the air balance to the space is altered.

Hoods in for Computer Science and Technology Building are not certified for use with Hazardous Chemicals (NFPA 45)

CHEMICAL SPILLS

Chemical spills are to be cleaned up immediately using the proper procedure. Safety goggles, gloves, and a lab coat should be worn during a spill clean-up. All available spill kits are located in the north east corner of the chemical stockroom. This includes Caustic Spill Clean-up Kit, and additional Solusorb solvent absorbent.

Spilled Liquids; acids, bases, and organic solvents

The specialty spill kits normally are used to adsorb 0.5-1.0 liter. These are located on the shelf adjacent to the stockroom computer. There are large boxes of adsorbent located in the bottom of the reactive chemical cabinet to be used on larger spills.

One should make a dike around the spill to contain it and then use more of the adsorbent inside the adsorbent dike to complete the adsorption process. It is essential that the hoods in the laboratory affected by the spill be turned on to reduce the amount of vapors remaining in the air in this room. Turning on the hoods also will close the return air damper to that room which will prevent contamination of other parts of the building. If the chemical is toxic or vapors are filling the room (even if only a small amount of the chemical
has been spilled out in the lab proper) the laboratory shall be evacuated. This does not necessarily mean that the entire building must evacuate. The Laboratory Coordinator (3310) shall be notified. If this takes place in a teaching laboratory, the Director of Safety & Hazardous Materials Management (2157) shall be notified. After the spill has been cleaned up and the air quality of the lab has returned to normal, the students may be allowed back into the laboratory. After the spill has been adsorbed or neutralized, it should be placed in a plastic bag and labeled properly and placed in a hood until it can be picked up by the Laboratory Coordinator for proper disposal.

Spilled Solids

These spills can normally be swept into a dust pan and then placed into a suitable container for disposal. Be careful of chemicals that produce fine particles that can be inhaled. A dust mask would be appropriate to use in this case. Reactive solids may need to be neutralized before disposal.

SHARP OBJECT DISPOSAL

All broken glass, razor, and scalpel blades shall be placed into a cardboard box that is labeled “CAUTION SHARP OBJECTS” or “CAUTION BROKEN GLASS”. When the container is full it shall be securely closed (with tape) and taken to the outside dumpster.

COMPRESSED GAS CYLINDERS

Cylinders must have the valve covered with its metal cover, if so designed, before moving or transporting. Cylinders should be transported using a hand truck that has a chain or belt to secure the cylinder. When the cylinder is in place it should be clamped securely to the wall or counter top before the metal valve cover is removed. Every effort should be made not to drop cylinders or allow them to strike other cylinders or walls violently. If you are not sure of the proper procedure of connecting a cylinder to a regulator, please contact Anthony Blankeney or Lab Coordinator (3310). When a cylinder becomes empty, write “EMPTY” with chalk on the cylinder or attach an “EMPTY” tag and return it to the storage area and order another tank to replace it.

Always consider a cylinder as being full, and handle them with care. Do not test a cylinder to see if it has gas in it by opening the valve without a regulator on it.

The fusible safety plugs on acetylene cylinders melt at about the boiling point of water. If an outlet becomes clogged with ice or frozen, it should be thawed with warm (not boiling) water applied only to the valve. Never use a flame on any cylinder or valve.

Using Cylinders

1. Cylinders that contain liquefied gases and acetylene should be used in an upright position and be secured against accidentally being knocked over. For that matter, all compressed gas cylinders must be secured to the wall or counter top
by chains or cylinder belt clamps.

2. Make sure that the correct pressure reducing regulator designed for the particular gas is used for each cylinder and be sure to leak test cylinder and regulator before use.

3. Before a regulator is removed from a cylinder valve, close the cylinder valve and release the gas from the regulator.

4. Unless the cylinder valve has first been closed tightly, do not attempt to stop a leak between the cylinder and the regulator by tightening the union nut.

5. Never use oil or grease as a lubricant on valves or attachments of oxygen cylinders. Never use oxygen as a substitute for compressed air.

6. Be aware that some cylinders have left handed threads (denoted by a notched nut). These cylinders typically require special procedures (as with oxygen). Be careful not to damage the threads by attempting to turn in wrong direction.

7. If a leak is suspected in a fuel gas cylinder, do not use a flame for detection; rather a soapy water solution or other suitable “snoop” solution should be used. If the leak cannot be remedied by closing a valve or tightening a packing nut, emergency action should be affected. A cylinder in which leaks occur should be taken out of use immediately and handled as follows:

   a. Close the valve and take the cylinder outdoors well away from any source of ignition. Properly tag the cylinder and notify the supplier and University Police. A regulator attached to the valve may be used temporarily to stop a leak through the valve seat.

   b. If the leak occurs at a fuse plug or other safety device, take the cylinder outdoors well away from any source of ignition. Notify University Police so they can maintain a safety area around the cylinder so that no one brings a cigarette or any other spark source into the area and notify the supplier of the cylinder. It is suggested that the fire department be notified by University Police.

Storage of Cylinders

1. Cylinders should be stored in a safe, dry, and well-ventilated place prepared and reserved for this purpose. Cylinders are not designed for temperatures in excess of 130°F (54°C). Thus, do not store near heaters, radiators, furnaces, or any other heat source (continuous sunlight).

2. Cylinders of oxygen should not be stored within 20 feet of cylinders containing flammable gases or highly combustible materials.

For more information on cylinders: refer to Southeastern Louisiana Safety Manual Section II pages 16-20.
ROTATING AND PINCHING HAZARDS

Hand injuries are commonly caused by simple pinching and binding. The best prevention is to keep fingers, loose clothing, and hair far removed from all rotating equipment. All rotating equipment should have adequate guards or warnings in place. Bind hair and keep loose clothing to a minimum when operating such equipment. If necessary to have hands in close proximity to rotating equipment, ensure that proper guards are in place. Kevlar or metal mail gloves may be warranted.

THERMAL HAZARDS

There are many heating devices located throughout for Computer Science and Technology Building; for example, Cole-Parmer Box Furnaces. Most items appear cool even when very hot. Do not assume something will be cool when it could be hot.

If you are unsure of the temperature first check the setting on the piece of equipment. If it is off, it may have just been switched off and it may still be hot. To verify the temperature either touch surface with a T/C and get a direct reading or place your hand NEAR object and attempt to detect warmth. Zetex gloves may be warranted if routinely working around hot equipment.

If you are leaving a heated piece of equipment unattended, be sure a sign warning of the thermal hazard is prominently displayed.

ELECTRICAL HAZARDS

Before working on any 120V, 208V, 240V, 277V or 480V, equipment, be sure the equipment is not energized and cannot be easily reenergized. Unplug the equipment and ensure the plug is within your control at all times while working on the equipment. LOCK OUT /TAG OUT procedures should be used where the energizing mechanism is not within your control at all times while manipulating.

Equipment over 120V should only be worked on by an authorized person.

ENCLOSED SPACES

Working in unventilated enclosed spaces such as walk-in coolers poses a suffocation hazard. The following safety policy shall apply:

1. No work shall be performed in an enclosed space which is not equipped with an interior door handle or other door latch opening mechanism.

2. No work is to be performed in a space in which an exterior door lock cannot be overridden from the inside.

3. No work exceeding three minutes per 150 cubic feet shall be performed without additional ventilation.
4. If work time is expected to exceed the value above, a means of supplying adequate ventilation must be provided. There shall be a second party, not in the enclosed space, that shall supervise that ventilation at all times. Specialty training must be obtained before undertaking this type of process.

5. Notify a responsible party that you will be entering the enclosed space, even for routine occupation.
INDUSTRIAL AND ENGINEERING TECHNOLOGY DEPARTMENT
ACCIDENT/INCIDENT REPORT FORM

Date of accident: ____________________________ Time of accident: ____________________________ am pm

Name of injured person: _________________________

Did accident occur during regularly scheduled period? □ Yes □ No

Course number and section of class: ____________________________

Action being conducted during accident: ____________________________

Exact Location where accident occurred: ____________________________

Instructor in charge: ____________________________

Instructor’s description of accident (attach additional sheet if necessary) ____________________________

Other Witnesses: ____________________________________________

Was instructor in area when accident occurred? □ Yes □ No

If not, explain why not present ____________________________

Was University Police notified? □ Yes □ No Time: ____________________________ am pm

Name of police officer or Ambulance service transporting victim: ____________________________

Name of attending physician or hospital: ____________________________

Was Health Center notified? □ Yes □ No Time: ____________________________ am pm

Name of Health Center Staff member receiving call: ____________________________

Was student escorted to Health Center □ Yes □ No; By whom: ____________________________

Was any minor first aid given to victim prior to police arrival or transport to Student Health Center? □ Yes □ No If so, what? ____________________________

Did victim refuse further assistance (first aid by police, call to police, transport by ambulance, escort to Health Center □ Yes □ No If so, why ____________________________

I verify that I have refused further medical assistance

______________________________
(signature)

I certify that to the best of my knowledge that the above information is correct.

______________________________ Date of Report

(signature of instructor)
SAFETY PROCEDURES FOR GENERAL LABORATORIES

General Safety Policy for Students in Industrial and Engineering Technology.

EMERGENCIES—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone. When using a cell phone, it is necessary to dial (985)-549-2222.

CONDITIONS OF YOUR WORK AREA
You should maintain a work area that is free of unnecessary equipment, books, coats, purses, excess chemicals, and trash. Keep aisles and exits unobstructed. Before you leave the lab, be prepared to have your station inspected by your instructor.

CHEMICAL SPILLS
All chemical spills should be cleaned up immediately by the proper procedure (if you do not know the correct procedure, notify your instructor for instructions).

EYE PROTECTION
Safety goggles must be worn at all times when you are in the laboratory. Contact lenses are not recommended, however ACS indicates that these lenses are acceptable with proper safety goggles. It is required that you wear safety goggles over your regular prescription glasses.

DISPOSAL OF WASTE MATERIALS
Waste chemicals are to be discarded in the properly labeled waste container. BE SURE TO READ THE LABEL ON THE WASTE CONTAINER. Waste paper, towels, and other trash should be discarded in the waste baskets.

EATING OR DRINKING
Since there is a possibility of food substance becoming contaminated with toxic chemicals, no eating or drinking will be allowed in any of the laboratories. No chewing gum or hard candy. Never taste any chemicals from the laboratory.

SMOKING
Smoking is not allowed in any building on campus.

FIRE IN THE LABORATORY
Call out “FIRE” and get away from the fire. Notify the instructor. Your safety is the number one priority. Some small fires may be extinguished as discussed, the first day of lab. Medium to Large fires will require evacuation of the building. Pull the fire alarm, and then evacuate the building.

EVACUATION
In case of evacuation, leave behind all personal objects, leave the room by nearest exit and proceed directly to Railroad Street Park. Evacuation Routes are posted adjacent to all classroom exit doors. Check in with instructor at Railroad Street Park to ensure your safety and verify that no rescue is necessary. Do not leave until told to do so.

FIRE ON A PERSON
If your clothing or hair catches fire, DO NOT RUN. Running only fans the flames and makes them burn faster and hotter. Go immediately to and use the safety shower and call out for help. Stay under the shower until the fire is out and the skin temperature has cooled down. If you are in a lab where a person is on fire, it is your responsibility to help that person get under the safety shower and assist them in any way that you can. NEVER USE A FIRE EXTINGUISHER ON A PERSON.

CHEMICAL SPILLS ON
Remember that speed in washing to remove the chemical is most important in reducing the extent of injury. Wash off the contaminated area immediately. Notify the Laboratory Coordinator.

YOUR EYES
Immediately go to the eye wash station and while holding your eye open, irrigate the eye completely for at least 15-30 minutes. Report to the Student Health Center.

YOUR HANDS OR ARMS
Immediately go to the sink and wash your hands until they are no longer contaminated. If a chemical burn has occurred, notify the Lab Coordinator and report to the Health Center. Always wash your hands before you leave the laboratory.

YOUR BODY
Immediately go to the safety showers, pull the shower lever, and with the water running remove any contaminated clothing. Stay under the shower until all of the contamination has been washed away. Notify the Instructor and report to the Health Center.

OTHER INJURIES
In the event that you or your lab partner cuts themselves or burns themselves, you should notify your instructor immediately.

CHEMICALS
Never use a chemical from an unlabeled container. Never substitute a chemical in an experiment without the instructor’s permission. Always treat unfamiliar chemicals as dangerous.

FUME HOOD
When dispensing or working with volatile chemicals, it is recommended to do so in the fume hood. Never place any body part other than your hands inside the fume hood. When working in fume hood, keep the sash line between you and the material being manipulated.

PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY
Due to the possibility of contact with chemicals, please self-notify your instructor if you are currently pregnant, have a known allergy or have a known chemical sensitivity or if you develop of any of these conditions during the semester. Additional safety equipment (such as gloves and lab coats) may be put in place. You may be forbidden from participating in select labs.

HEALTH CONDITIONS
If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc.) notify your instructor. Special safety practices may be put in place.
SAFETY PROCEDURES FOR AUTOMATION, CNC, & ROBOTICS ROOM 1005

General Safety Policy for Students in Automation, CNC, & Robotics Lab Room 1005

The Automation, CNC, and Robotics Lab has enjoyed an excellent safety record. This is directly attributed to the combined efforts of the students, faculty, and staff alike. We must all follow correct safety procedures while working in all of the Manufacturing Laboratories. This will enable us to accomplish our goals of maintaining a healthy and accident free environment, to promote a positive safety attitude, and to learn the practical aspects of safety in the workplace appropriate for future supervisors and teachers.

The following safety rules are divided into the four major areas of General Safety Instructions, Safety Instructions for Personal Protection, Safety Instruction for the Use of Tools, Equipment, and Machines, and Personal Attitudes and Conduct.

General Safety Instructions
1. ABC – Always Be Careful. Never take chances.
2. Observe all safety rules.
3. Report immediately to your instructor upon incurring any injury, even though you feel it is negligible.
4. No horseplay or playing practical jokes in the laboratory.
5. Caution any person you see violating a safety rule.
6. Do not run in the lab.
7. Be considerate of the safety of others.
8. Never throw any object in the laboratory.
9. Learn the location and use of the fire extinguishers.
10. In the event of fire, notify the instructor immediately.
11. Insure that there is adequate ventilation for the task being performed. Occasionally, a window may need to be opened or a fan may be needed to help circulate the air.
12. Follow prescribed safety instructions in lifting or handling awkward, large, heavy, and or long pieces of material. In general, never carry material over six feet in length or over 50 pounds in weight without assistance. Lift with your legs, not your back.
13. Never use compressed air for purposes other than specified in your experiments. Likewise, be careful around pressurized hydraulic systems.
14. Make certain your hands and tools are kept free of oil and grease.
15. If you feel ill, do not work in the lab. Report to your instructor.
16. Never treat, or remove particles from the eye. See your instructor or school health personnel for immediate attention.

Safety Instruction for Personal Protection
1. Wear proper eye protection while participating in activities that may pose danger to your eyes. All forms of eye protection must conform to OSHA specs Z87.1, and must have clear lenses and be equipped with side shields.
2. Wear ear protective devices if sharp sounds or excessive noise is anticipated.
3. Be sure your clothes are safe and suitable for laboratory work. Remove or fasten any loose clothing. Roll loose sleeves above your elbows. Tuck shirttails into your pants. Remove ties when working with machinery.
4. Keep your hair away from machinery. Students with long hair must confine their hair in nets or caps when around tools, equipment, and machinery.
5. Rings, bracelets, watches, and other jewelry must be removed when working in the laboratory.
6. Wear rubber gloves when handling caustic materials, acids, and/or petroleum distillates.
7. Wear protective clothing and equipment for the use intended for its wear.
8. Wash your hands with soap and water as a method of preventing skin disease.

**Safety Instructions for the Use of Tools, Equipment, and Machines**
1. Do not use tools, equipment, and machines until instruction relative to their safe operation has been given.
2. Observe safety rules for all machines and equipment. Follow prescribed procedures when working with mechanical, electrical, fluid, or combined power systems.
3. Know and follow the specific requirements of the kind and type of machine you are operating.
4. Secure approval of your instructor before you begin working. This applies to all experiments and projects in which you use the lab tools, equipment, machines, and supplies.
5. Have your instructor check special machine setups.
6. Students may use the tools, machines, and equipment only when the instructor is present in the lab.
7. Do not use defective tools, machines, and equipment. Inform the instructor immediately.
8. Be sure the guards are in place and functioning properly before turning on machinery. Do not remove guards and other safety devices.
9. Machines must be operated by only one person at a time.
10. Do not talk with or otherwise distract other students while you or they are operating machines.
11. Persons not operating power tools or machinery should keep clear of the operator and the work area.
12. Never leave a machine while it is running.
13. When in use, give the machine your undivided attention; never look away for any reason.
14. Allow revolving machinery to stop on its own. Resist the desire to grab chucks, spindles, or other rotating parts with the hand.
15. Do not stop or start a machine for another person except in an emergency.
16. Do not tamper with adjustments or play with machinery at any time. Serious accidents may result.
17. Do not lean on machines and equipment. You may press a switch or throw a control which could endanger the safety of the operator or damage the machine.
18. Check machines and make all adjustments before turning on the power.
19. Turn power off and allow the machine to come to a complete stop before adjusting, cleaning,
removing work, or making new set-ups.

20. Make sure other persons are clear before starting machinery.

21. Allow a safe distance between your hands and blades, cutters, or moving parts. Keep your fingers in such a position that there is no danger of their slipping into the cutter or moving parts.

22. Keep machines clear of tools, stock, and other items.

23. Develop a respect for machine tools and understand their purpose.

24. Recognize the distinctive sound of a properly adjusted and smooth-running machine tool. If something doesn’t sound right, there is probably something wrong.

25. Use the proper size and type of hand tool for the specific task.

26. Use the right tool for the job.

27. Keep tools and materials from projecting over the edge of your workstation so that others will not walk into them and become injured.

28. Clean workstations and place tools in the proper areas at the end of each class period.

29. When finished with a tool, clean and return it to its proper location.

30. Ensure that vise hands hang free when not in use.

31. Be aware of pinch points around vises, presses, hydraulic and pneumatic components, and other such hazardous areas when working with machines and equipment.

32. Keep the floor around the tools clear of liquids, scraps, tools, and other materials.

33. If oil is spilled on the lab floor, immediately stop what you are doing and clean up the spill.

34. Make sure that all cutting tools are sharp and in good condition before using them.

35. Handle edged or pointed tools by the handles, with sharp points or edges pointed away from yourself and others.

36. When using sharp-edged tools, be sure to direct their action away from yourself and your classmates.

37. Pass tools to other persons with handles forward.

38. Carefully read your lab manual instruction sheets before operating machines and equipment.

39. Avoid using wrenches that do not properly fit the nuts, bolts, or other objects which they are being used to turn.

**Personal Attitudes and Conduct**

Violation of the following indicates a deficient attitude toward safety. Violation of these concepts will not be tolerated. Almost all accidents that occur in the industrial technology laboratories are attributable to one of the causes listed.

1. Taking unnecessary chances
2. Getting in too big a hurry
3. Showing off
4. Lack of information
5. Preoccupation of the mind
6. Distraction of attention
7. Fear
8. Experimenting
9. Failure to follow instructions
10. Poor discipline
11. Guard removal
12. Excitement
13. Selfishness
14. Improper Clothing
15. Poor Health

EMERGENCIES—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone.

CONDITIONS OF YOUR WORK AREA
You should maintain a work area that is free of unnecessary equipment, books, coats, purses, excess chemicals, and trash. Keep aisles and exits unobstructed. At conclusion of lab, clean all used glassware and bench top, and replace all equipment in proper location.

CHEMICAL SPILLS
All chemical spills should be cleaned up immediately by the proper procedure (if you do not know the correct procedure, notify your instructor for instructions).

EYE PROTECTION
Safety goggles must be worn at all times when you are in the laboratory. Contact lenses are not recommended to be worn; however, ACS indicates that these lenses are acceptable with proper safety goggles. It is recommended that you wear a regular pair of prescription glasses under your safety goggles.

EATING OR DRINKING
Since there is a possibility of food and drink becoming contaminated with toxic chemicals or bacteria, no eating or drinking is allowed in the laboratory (this includes chewing gum and hard candy). Never taste any chemicals from the laboratory.

SMOKING
Smoking is not allowed in any building on campus.

EVACUATION
In case of Computer Science and Technology Building evacuation, leave behind all personal objects, leave room by the nearest exit and proceed directly to Railroad Street Park. Evacuation routes are posted adjacent to all classroom exits. Check in with the instructor at Railroad Street Park to ensure your safety and to verify that no rescue is necessary. Do not leave until told to do so.

FIRE ON A PERSON
If your clothing or hair catches fire, DO NOT RUN. Running only fans the flames and makes them burn faster and hotter. Go immediately to, and use, the safety shower and call out for help. Stay under the shower until the fire is out and the skin temperature has cooled down. If you are in a lab where a person is on fire, it is your responsibility to help that person get under the safety shower and assist them in any way that you can. NEVER USE A FIRE EXTINGUISHER ON A PERSON.

CHEMICAL SPILLS ON
Remember that speed in washing to remove the chemical is most important in reducing the extent of injury. Wash off the contaminated area immediately. Notify the Laboratory Coordinator.
YOUR EYES
Immediately go to the eye wash station and while holding your eye open, irrigate the eye completely for at least 15-30 minutes. Report to the Student Health Center.

YOUR HANDS OR ARMS
Immediately go to the sink and wash your hands until they are no longer contaminated. If a chemical burn has occurred, notify the Lab Coordinator and report to the Health Center. Always wash your hands before you leave the laboratory.

YOUR BODY
Immediately go to the safety showers, pull the shower lever, and with the water running remove any contaminated clothing. Stay under the shower until all of the contamination has been washed away. Notify the Lab Coordinator and report to the Health Center.

CHEMICALS
Never use a chemical from an unlabeled container. Always treat unfamiliar or unlabeled chemicals as if they are dangerous.

PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY
Due to the possibility of contact with chemicals, please self-notify your instructor if you are currently pregnant, have a known allergy or have a known chemical sensitivity or if you develop any of these conditions during the semester. Additional safety equipment (such as gloves and lab coats) may be put in place. You may be forbidden from participating in select labs.

HEALTH CONDITIONS
If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc.) notify you instructor. Special safety practices may be put in select labs.

FUME HOOD
Never place any body part other than your hands inside the fume hood. When working in fume hoods, keep the sash line between you and the material being manipulated.

HAZARD COMMUNICATION
While academic laboratories do not fall under the purview of OSHA, students graduating in the sciences are likely to be hired into positions were a basic knowledge of chemical safety and its hazard communication are expected and required by law. OSHA Hazard Communications Standard 29 CFR 1910.1200 requires written communication of the hazards associated with chemicals, proper labeling of hazardous chemicals and access to safety data sheets, and safety training.

LAB ATTIRE
Safety practices mandate proper attire for handling unknown or hazardous chemicals. The department is not required to provide make-up labs due to safety noncompliance.

1. Always wear eye protection.
2. DO NOT wear sandals or open-toe shoes.
3. If you have long hair, pull it back in a bun or a ponytail
4. If you have on long, baggy sleeves, roll them up.
5. Shorts are acceptable provided they are knee length. You should also consider wearing a lab coat or plastic apron.
SAFETY PROCEDURES FOR MACHINE & MANUFACTURING RAPID PROTOTYPING
ROOM 1006

General Safety Policy for Machine & Manufacturing Rapid Prototyping Room 1006

The Machine and Manufacturing Rapid Prototyping Lab has enjoyed an excellent safety record. This is directly attributed to the combined efforts of the students, faculty, and staff alike. We must all follow correct safety procedures while working in all of the Manufacturing Laboratories. This will enable us to accomplish our goals of maintaining a healthy and accident free environment, to promote a positive safety attitude, and to learn the practical aspects of safety in the workplace appropriate for future supervisors and teachers.

The following safety rules are divided into the four major areas of General Safety Instructions, Safety Instructions for Personal Protection, Safety Instruction for the Use of Tools, Equipment, and Machines, and Personal Attitudes and Conduct.

General Safety Instructions
1. ABC – Always Be Careful. Never take chances.
2. Observe all safety rules.
3. Report immediately to your instructor upon incurring any injury, even though you feel it is negligible.
4. No horseplay or playing practical jokes in the laboratory.
5. Caution any person you see violating a safety rule.
6. Do not run in the lab.
7. Be considerate of the safety of others.
8. Never throw any object in the laboratory.
9. Learn the location and use of the fire extinguishers.
10. In the event of fire, notify the instructor immediately.
11. Insure that there is adequate ventilation for the task being performed. Occasionally, a window may need to be opened or a fan may be needed to help circulate the air.
12. Follow prescribed safety instructions in lifting or handling awkward, large, heavy, and or long pieces of material. In general, never carry material over six feet in length or over 50 pounds in weight without assistance. Lift with your legs, not your back.
13. Never use compressed air for purposes other than specified in your experiments. Likewise, be careful around pressurized hydraulic systems.
14. Make certain your hands and tools are kept free of oil and grease.
15. If you feel ill, do not work in the lab. Report to your instructor.
16. Never treat, or remove particles from the eye. See your instructor or school health personnel for immediate attention.

Safety Instruction for Personal Protection
9. Wear proper eye protection while participating in activities that may pose danger to your eyes. All forms of eye protection must conform to OSHA specs Z87.1, and must have clear lenses and be equipped with side shields.
10. Wear ear protective devices if sharp sounds or excessive noise is anticipated.
11. Be sure your clothes are safe and suitable for laboratory work. Remove or fasten any loose clothing. Roll loose sleeves above your elbows. Tuck shirttails into your pants. Remove ties when working with machinery.
12. Keep your hair away from machinery. Students with long hair must confine their hair in nets or caps when around tools, equipment, and machinery.
13. Rings, bracelets, watches, and other jewelry must be removed when working in the laboratory.
14. Wear rubber gloves when handling caustic materials, acids, and/or petroleum distillates.
15. Wear protective clothing and equipment for the use intended for its wear.
16. Wash your hands with soap and water as a method of preventing skin disease.

Safety Instructions for the Use of Tools, Equipment, and Machines
1. Do not use tools, equipment, and machines until instruction relative to their safe operation has been given.
2. Observe safety rules for all machines and equipment. Follow prescribed procedures when working with mechanical, electrical, fluid, or combined power systems.
3. Know and follow the specific requirements of the kind and type of machine you are operating.
4. Secure approval of your instructor before you begin working. This applies to all experiments and projects in which you use the lab tools, equipment, machines, and supplies.
5. Have your instructor check special machine setups.
6. Students may use the tools, machines, and equipment only when the instructor is present in the lab.
7. Do not use defective tools, machines, and equipment. Inform the instructor immediately.
8. Be sure the guards are in place and functioning properly before turning on machinery. Do not remove guards and other safety devices.
9. Machines must be operated by only one person at a time.
10. Do not talk with or otherwise distract other students while you or they are operating machines.
11. Persons not operating power tools or machinery should keep clear of the operator and the work area.
12. Never leave a machine while it is running.
13. When in use, give the machine your undivided attention; never look away for any reason.
14. Allow revolving machinery to stop on its own. Resist the desire to grab chucks, spindles, or other rotating parts with the hand.
15. Do not stop or start a machine for another person except in an emergency.
16. Do not tamper with adjustments or play with machinery at any time. Serious accidents may result.
17. Do not lean on machines and equipment. You may press a switch or throw a control which could endanger the safety of the operator or damage the machine.
18. Check machines and make all adjustments before turning on the power.
19. Turn power off and allow the machine to come to a complete stop before adjusting, cleaning, removing work, or making new set-ups.
20. Make sure other persons are clear before starting machinery.
21. Allow a safe distance between your hands and blades, cutters, or moving parts. Keep your fingers in such a position that there is no danger of their slipping into the cutter or moving parts.
22. Keep machines clear of tools, stock, and other items.
23. Develop a respect for machine tools and understand their purpose.
24. Recognize the distinctive sound of a properly adjusted and smooth-running machine tool. If something doesn’t sound right, there is probably something wrong.
25. Use the proper size and type of hand tool for the specific task.
26. Use the right tool for the job.
27. Keep tools and materials from projecting over the edge of your workstation so that others will not walk into them and become injured.
28. Clean workstations and place tools in the proper areas at the end of each class period.
29. When finished with a tool, clean and return it to its proper location.
30. Ensure that vise hands hang free when not in use.
31. Be aware of pinch points around vises, presses, hydraulic and pneumatic components, and other such hazardous areas when working with machines and equipment.
32. Keep the floor around the tools clear of liquids, scraps, tools, and other materials.
33. If oil is spilled on the lab floor, immediately stop what you are doing and clean up the spill.
34. Make sure that all cutting tools are sharp and in good condition before using them.
35. Handle edged or pointed tools by the handles, with sharp points or edges pointed away from yourself and others.
36. When using sharp-edged tools, be sure to direct their action away from yourself and your classmates.
37. Pass tools to other persons with handles forward.
38. Carefully read your lab manual instruction sheets before operating machines and equipment.
39. Avoid using wrenches that do not properly fit the nuts, bolts, or other objects which they are being used to turn.

**Personal Attitudes and Conduct**

Violation of the following indicates a deficient attitude toward safety. Violation of these concepts will not be tolerated. Almost all accidents that occur in the industrial technology laboratories are attributable to one of the causes listed.

1. Taking unnecessary chances
2. Getting in too big a hurry
3. Showing off
4. Lack of information
5. Preoccupation of the mind
6. Distraction of attention
7. Fear
8. Experimenting
9. Failure to follow instructions
10. Poor discipline
11. Guard removal
12. Excitement
13. Selfishness
14. Improper Clothing
15. Poor Health

EMERGENCIES—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone.

CONDITIONS OF YOUR WORK AREA
You should maintain a work area that is free of unnecessary equipment, books, coats, purses, excess chemicals, and trash. Keep aisles and exits unobstructed. At conclusion of lab, clean all used glassware and bench top, and replace all equipment in proper location.

CHEMICAL SPILLS
All chemical spills should be cleaned up immediately by the proper procedure (if you do not know the correct procedure, notify your instructor for instructions).

EYE PROTECTION
Safety goggles must be worn at all times when you are in the laboratory. Contact lenses are not recommended to be worn; however, ACS indicates that these lenses are acceptable with proper safety goggles. It is recommended that you wear a regular pair of prescription glasses under your safety goggles.

EATING OR DRINKING
Since there is a possibility of food and drink becoming contaminated with toxic chemicals or bacteria, no eating or drinking is allowed in the laboratory (this includes chewing gum and hard candy). Never touch any chemicals from the laboratory.

SMOKING
Smoking is not allowed in any building on campus.

EVACUATION
In case of Computer Science and Technology Building evacuation, leave behind all personal objects, leave room by the nearest exit and proceed directly to Railroad Street Park. Evacuation routes are posted adjacent to all classroom exits. Check in with the instructor at Railroad Street Park to ensure your safety and to verify that no rescue is necessary. Do not leave until told to do so.

FIRE ON A PERSON
If your clothing or hair catches fire, DO NOT RUN. Running only fans the flames and makes them burn faster and hotter. Go immediately to, and use, the safety shower and call out for help. Stay under the shower until the fire is out and the skin temperature has cooled down. If you are in a lab where a person is on fire, it is your responsibility to help that person get under the safety shower and assist them in any way that you can. NEVER USE A FIRE EXTINGUISHER ON A PERSON.

CHEMICAL SPILLS ON

Remember that speed in washing to remove the chemical is most important in reducing the extent of injury. Wash off the contaminated area immediately. Notify the Laboratory Coordinator.

YOUR EYES
Immediately go to the eye wash station and while holding your eye open, irrigate the eye
completely for at least 15-30 minutes. Report to the Student Health Center.

YOUR HANDS OR ARMS
Immediately go to the sink and wash your hands until they are no longer contaminated. If a chemical burn has occurred, notify the Lab Coordinator and report to the Health Center. Always wash your hands before you leave the laboratory.

YOUR BODY
Immediately go to the safety showers, pull the shower lever, and with the water running remove any contaminated clothing. Stay under the shower until all of the contamination has been washed away. Notify the Lab Coordinator and report to the Health Center.

CHEMICALS
Never use a chemical from an unlabeled container. Always treat unfamiliar or unlabeled chemicals as if they are dangerous.

PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY
Due to the possibility of contact with chemicals, please self-notify your instructor if you are currently pregnant, have a known allergy or have a known chemical sensitivity or if you develop any of these conditions during the semester. Additional safety equipment (such as gloves and lab coats) may be put in place. You may be forbidden from participating in select labs.

HEALTH CONDITIONS
If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc.) notify you instructor. Special safety practices may be put in select labs.

FUME HOOD
Never place any body part other than your hands inside the fume hood. When working in fume hoods, keep the sash line between you and the material being manipulated.

HAZARD COMMUNICATION
While academic laboratories do not fall under the purview of OSHA, students graduating in the sciences are likely to be hired into positions were a basic knowledge of chemical safety and its hazard communication are expected and required by law. OSHA Hazard Communications Standard 29 CFR 1910.1200 requires written communication of the hazards associated with chemicals, proper labeling of hazardous chemicals and access to safety data sheets, and safety training.

LAB ATTIRE
Safety practices mandate proper attire for handling unknown or hazardous chemicals. The department is not required to provide make-up labs due to safety noncompliance.

1. Always wear eye protection.
2. DO NOT wear sandals or open-toe shoes.
3. If you have long hair, pull it back in a bun or a ponytail
4. If you have on long, baggy sleeves, roll them up.
5. Shorts are acceptable provided they are knee length. You should also consider wearing a lab coat or plastic apron.
SAFETY PROCEDURES FOR MATERIAL TESTING LAB ROOM 1018

General Safety Policy for Material Testing Lab Room 1018

EMERGENCIES—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 985-549-2222.

EYE PROTECTION
Safety goggles must be worn when performing shock and loading tests on metal and plastic samples.

ELECTRICITY
Do not insert anything into the electrical outlets on or under the lab tables except the electrical plugs designed for this purpose.

DISPOSAL OF WASTE MATERIALS
Waste paper, towels, and other trash should be discarded in the waste baskets.

THERMAL HAZARDS
There are 4 heating devices located Material Testing Lab, Cole-Parmer Box Furnaces. These box furnaces operate from room temperature 30°C/72°F to 11000°C/19832°F. Box furnaces may appear cool even when very hot. Do not assume something will be cool when it could be hot.

If you are unsure of the temperature first check the setting on the piece of equipment. If it is off, it may have just been switched off and it may still be hot. To verify the temperature either touch surface with a T/C and get a direct reading or place your hand NEAR object and attempt to detect warmth. Zetex gloves may be warranted if routinely working around hot equipment.

If you are leaving a heated piece of equipment unattended, be sure a sign warning of the thermal hazard is prominently displayed.

SMOKING
Smoking is not allowed in any building on campus.

FIRE IN THE LABORATORY
Call out “FIRE” and get away from the fire. Notify the instructor. Pull the fire alarm, and then evacuate the building.

EVACUATION
In case of Computer Science and Technology Building evacuation, leave behind all personal objects, leave the room by the East door and evacuate the building by the East door. Check in with the instructor at Railroad Street Park to ensure your safety and that no rescue is necessary. Do not return to the building until told to do so.

General Safety Instructions
1. ABC – Always Be Careful. Never take chances.
2. Observe all safety rules.
3. Report immediately to your instructor upon incurring any injury, even though you feel it is negligible.
4. No horseplay or playing practical jokes in the laboratory.
5. Caution any person you see violating a safety rule.
6. Do not run in the lab.
7. Be considerate of the safety of others.
8. Never throw any object in the laboratory.
9. Learn the location and use of the fire extinguishers.
10. In the event of fire, notify the instructor immediately.
11. Insure that there is adequate ventilation for the task being performed. Occasionally, a window may need to be opened or a fan may be needed to help circulate the air.
12. Follow prescribed safety instructions in lifting or handling awkward, large, heavy, and or long pieces of material. In general, never carry material over six feet in length or over 50 pounds in weight without assistance. Lift with your legs, not your back.
13. Never use compressed air for purposes other than specified in your experiments. Likewise, be careful around pressurized hydraulic systems.
14. Make certain your hands and tools are kept free of oil and grease.
15. If you feel ill, do not work in the lab. Report to your instructor.
16. Never treat, or remove particles from the eye. See your instructor or school health personnel for immediate attention.

Safety Instruction for Personal Protection
1. Wear proper eye protection while participating in activities that may pose danger to your eyes. All forms of eye protection must conform to OSHA specs Z87.1, and must have clear lenses and be equipped with side shields.
2. Wear ear protective devices if sharp sounds or excessive noise is anticipated.
3. Be sure your clothes are safe and suitable for laboratory work. Remove or fasten any loose clothing. Roll loose sleeves above your elbows. Tuck shirttails into your pants. Remove ties when working with machinery.
4. Keep your hair away from machinery. Students with long hair must confine their hair in nets or caps when around tools, equipment, and machinery.
5. Rings, bracelets, watches, and other jewelry must be removed when working in the laboratory.
6. Wear rubber gloves when handling caustic materials, acids, and/or petroleum distillates.
7. Wear protective clothing and equipment for the use intended for its wear.
8. Wash your hands with soap and water as a method of preventing skin disease.

Safety Instructions for the Use of Tools, Equipment, and Machines
1. Do not use tools, equipment, and machines until instruction relative to their safe operation has been given.
2. Observe safety rules for all machines and equipment. Follow prescribed procedures when working with mechanical, electrical, fluid, or combined power systems.
3. Know and follow the specific requirements of the kind and type of machine you are operating.
4. Secure approval of your instructor before you begin working. This applies to all experiments and projects in which you use the lab tools, equipment, machines, and supplies.
5. Have your instructor check special machine setups.
6. Students may use the tools, machines, and equipment only when the instructor is present in the lab.
7. Do not use defective tools, machines, and equipment. Inform the instructor immediately.
8. Be sure the guards are in place and functioning properly before turning on machinery. Do not remove guards and other safety devices.
9. Machines must be operated by only one person at a time.
10. Do not talk with or otherwise distract other students while you or they are operating machines.
11. Persons not operating power tools or machinery should keep clear of the operator and the work area.
12. Never leave a machine while it is running.
13. When in use, give the machine your undivided attention; never look away for any reason.
14. Allow revolving machinery to stop on its own. Resist the desire to grab chucks, spindles, or other rotating parts with the hand.
15. Do not stop or start a machine for another person except in an emergency.
16. Do not tamper with adjustments or play with machinery at any time. Serious accidents may result.
17. Do not lean on machines and equipment. You may press a switch or throw a control which could endanger the safety of the operator or damage the machine.
18. Check machines and make all adjustments before turning on the power.
19. Turn power off and allow the machine to come to a complete stop before adjusting, cleaning, removing work, or making new set-ups.
20. Make sure other persons are clear before starting machinery.
21. Allow a safe distance between your hands and blades, cutters, or moving parts. Keep your fingers in such a position that there is no danger of their slipping into the cutter or moving parts.
22. Keep machines clear of tools, stock, and other items.
23. Develop a respect for machine tools and understand their purpose.
24. Recognize the distinctive sound of a properly adjusted and smooth-running machine tool. If something doesn’t sound right, there is probably something wrong.
25. Use the proper size and type of hand tool for the specific task.
26. Use the right tool for the job.
27. Keep tools and materials from projecting over the edge of your workstation so that others will not walk into them and become injured.
28. Clean workstations and place tools in the proper areas at the end of each class period.
29. When finished with a tool, clean and return it to its proper location.
30. Ensure that vise hands hang free when not in use.
31. Be aware of pinch points around vises, presses, hydraulic and pneumatic components, and other such hazardous areas when working with machines and equipment.
32. Keep the floor around the tools clear of liquids, scraps, tools, and other materials.
33. If oil is spilled on the lab floor, immediately stop what you are doing and clean up the spill.
34. Make sure that all cutting tools are sharp and in good condition before using them.
35. Handle edged or pointed tools by the handles, with sharp points or edges pointed away from yourself and others.
36. When using sharp-edged tools, be sure to direct their action away from yourself and your classmates.
37. Pass tools to other persons with handles forward.
38. Carefully read your lab manual instruction sheets before operating machines and equipment.
39. Avoid using wrenches that do not properly fit the nuts, bolts, or other objects which they are being used to turn.

Personal Attitudes and Conduct

Violation of the following indicates a deficient attitude toward safety. Violation of these concepts will not be tolerated. Almost all accidents that occur in the industrial technology laboratories are attributable to one of the causes listed.

1. Taking unnecessary chances
2. Getting in too big a hurry
3. Showing off
4. Lack of information
5. Preoccupation of the mind
6. Distraction of attention
7. Fear
8. Experimenting
9. Failure to follow instructions
10. Poor discipline
11. Guard removal
12. Excitement
13. Selfishness
14. Improper Clothing
15. Poor Health
SAFETY PROCEDURES FOR CONSTRUCTION TECHNOLOGY LAB ROOM 1019

General Safety Policy for Construction Technology Lab Room 1019

EMERGENCIES—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone.

CONDITIONS OF YOUR WORK AREA
You should maintain a work area that is free of unnecessary clutter. Store personal items out of the way while working in lab. Clean up all bench tops and surrounding area before departing lab. Replace all equipment in proper location. If you find a messy lab when you enter, notify the Laboratory Coordinator as to the time, place, and nature of the incident.

EYE PROTECTION
Safety goggles must be worn at all times when you are in the laboratory.

General Safety Instructions
1. ABC – Always Be Careful. Never take chances.
2. Observe all safety rules.
3. Report immediately to your instructor upon incurring any injury, even though you feel it is negligible.
4. No horseplay or playing practical jokes in the laboratory.
5. Caution any person you see violating a safety rule.
6. Do not run in the lab.
7. Be considerate of the safety of others.
8. Never throw any object in the laboratory.
9. Learn the location and use of the fire extinguishers.
10. In the event of fire, notify the instructor immediately.
11. Insure that there is adequate ventilation for the task being performed. Occasionally, a window may need to be opened or a fan may be needed to help circulate the air.
12. Follow prescribed safety instructions in lifting or handling awkward, large, heavy, and or long pieces of material. In general, never carry material over six feet in length or over 50 pounds in weight without assistance. Lift with your legs, not your back.
13. Never use compressed air for purposes other than specified in your experiments.
14. If you feel ill, do not work in the lab. Report to your instructor.
15. Never treat, or remove particles from the eye. See your instructor or school health personnel for immediate attention.

Safety Instruction for Personal Protection
1. Wear proper eye protection while participating in activities that may pose danger to your eyes. All forms of eye protection must conform to OSHA specs Z87.1, and must have clear lenses and be equipped with side shields.
2. Wear ear protective devices if sharp sounds or excessive noise is anticipated.
3. Be sure your clothes are safe and suitable for laboratory work. Remove or fasten any loose clothing. Roll loose sleeves above your elbows. Tuck shirttails into your pants. Remove ties when working with machinery.
4. Keep your hair away from machinery. Students with long hair must confine their hair in nets or caps when around tools, equipment, and machinery.
5. Rings, bracelets, watches, and other jewelry must be removed when working in the laboratory.
6. Wear rubber gloves when handling caustic materials, acids, and/or petroleum distillates.
7. Wear protective clothing and equipment for the use intended for its wear.
8. Wash your hands with soap and water as a method of preventing skin disease.

Safety Instructions for the Use of Tools, Equipment, and Machines
1. Do not use tools, equipment, and machines until instruction relative to their safe operation has been given.
2. Observe safety rules for all machines and equipment. Follow prescribed procedures when working with mechanical, electrical, fluid, or combined power systems.
3. Know and follow the specific requirements of the kind and type of machine you are operating.
4. Secure approval of your instructor before you begin working. This applies to all experiments and projects in which you use the lab tools, equipment, machines, and supplies.
5. Do not use defective tools, machines, and equipment. Inform the instructor immediately.
6. Be sure the guards are in place and functioning properly before turning on machinery. Do not remove guards and other safety devices.
7. Machines must be operated by only one person at a time.
8. Do not talk with or otherwise distract other students while you or they are operating machines.
9. Persons not operating power tools or machinery should keep clear of the operator and the work area.
10. Never leave a machine while it is running.
11. When in use, give the machine your undivided attention; never look away for any reason.
12. Allow revolving machinery to stop on its own. Resist the desire to grab chucks, spindles, or other rotating parts with the hand.
13. Do not stop or start a machine for another person except in an emergency.
14. Do not tamper with adjustments or play with machinery at any time. Serious accidents may result.
15. Do not lean on machines and equipment. You may press a switch or throw a control which could endanger the safety of the operator or damage the machine.
16. Check machines and make all adjustments before turning on the power.
17. Turn power off and allow the machine to come to a complete stop before adjusting, cleaning, removing work, or making new set-ups.
18. Make sure other persons are clear before starting machinery.
19. Allow a safe distance between your hands and blades, cutters, or moving parts. Keep your fingers in such a position that there is no danger of their slipping into the cutter or moving parts.
20. Keep machines clear of tools, stock, and other items.
21. Recognize the distinctive sound of a properly adjusted and smooth-running machine tool. If something doesn’t sound right, there is probably something wrong.
22. Use the proper size and type of hand tool for the specific task.
23. Use the right tool for the job.
24. Keep tools and materials from projecting over the edge of your workstation so that others will not walk into them and become injured.
25. Clean workstations and place tools in the proper areas at the end of each class period.
26. When finished with a tool, clean and return it to its proper location.
27. Be aware of pinch points around vises, presses, hydraulic and pneumatic components, and other such hazardous areas when working with machines and equipment.
28. Keep the floor around the tools clear of liquids, scraps, tools, and other materials.
29. Make sure that all cutting tools are sharp and in good condition before using them.
30. Handle edged or pointed tools by the handles, with sharp points or edges pointed away from yourself and others.
31. When using sharp-edged tools, be sure to direct their action away from yourself and your classmates.
32. Pass tools to other persons with handles forward.
33. Carefully read your lab manual instruction sheets before operating machines and equipment.
34. Avoid using wrenches that do not properly fit the nuts, bolts, or other objects which they are being used to turn.

**Personal Attitudes and Conduct**

Violation of the following indicates a deficient attitude toward safety. Violation of these concepts will not be tolerated. Almost all accidents that occur in the industrial technology laboratories are attributable to one of the causes listed.

1. Taking unnecessary chances
2. Getting in too big a hurry
3. Showing off
4. Lack of information
5. Preoccupation of the mind
6. Distraction of attention
7. Fear
8. Experimenting
9. Failure to follow instructions
10. Poor discipline
11. Guard removal
12. Excitement
13. Selfishness
14. Improper Clothing
15. Poor Health
SAFETY PROCEDURES FOR INDUSTRIAL HYGIENE & FIRE PROTECTION LAB ROOM 2005

General Safety Policy for Industrial Hygiene & Fire Protection Lab Room 2005

EMERGENCIES—In case of an emergency when the supervisor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone.

SAFETY DATA SHEETS
Under the OSHA Hazard Communications Standard (29CFR 1910.1200), all personnel working with hazardous materials must have access to Safety Data Sheets or SDS (formerly classed MSDS or Material Safety Data Sheets), and be trained in the safe handling of the material. The SDS provide necessary, helpful, and useful information on the properties of the hazardous material. You should familiarize yourself with those properties before you work with the material. It is vital to your safety to be able to refer to the SDS immediately in the event of an emergency and provide a copy to emergency responders. Your instructors or research directors or supervisor will endeavor to alert you to the hazards of materials used in the laboratories; however, you may read the SDS should you desire to review the information provided their in. Updated Safety Data Sheets (SDS) shall be kept readily available.

LAB ATTIRE
Safe laboratory practices mandate proper attire for handling unknown or hazardous chemicals. Departmental policy forbids students from entering the lab if they are non-compliant with safety policy (including attire items 1-5 below).

1. ALWAYS wear eye protection.
2. DO NOT wear sandals or open-toe shoes.
3. If you have long hair, pull it back in a bun or a pony-tail
4. If you have long, baggy sleeves roll them up or bind them close.
5. Wear proper gloves when appropriate.

CONDITIONS OF YOUR WORK AREA
You should maintain a work area that is free of unnecessary clutter. Store personal items out of the way while working in lab. Clean up all bench tops, fume hoods, and surrounding area before departing lab. Replace all equipment in proper location. If you find a messy lab when you enter, notify the Laboratory Coordinator as to the time, place, and nature of the incident.

EYE PROTECTION
Safety goggles must be worn at all times when you are in the laboratory.

DISPOSAL OF NON-CHEMICAL WASTE MATERIALS
Broken glass tubes for gas detection pump should be placed in the broken glass container. Waste paper towels, filter paper, boiling stones and other trash should be discarded in the waste baskets.

EATING OR DRINKING
Since there is a possibility of food substance becoming contaminated with toxic chemicals, no eating or drinking will be allowed in the laboratory. No chewing gum and no hard candy. Never taste any chemicals from the laboratory.

FIRE IN THE LABORATORY
Call out “FIRE” and get away from the fire. Immediately notify any faculty member. Small, self-contained fires with limited fuel source may be extinguished by covering with a watch glass or simply allowing it to burn itself out. Small to Medium fires may be extinguished by the instructor using a fire extinguisher located in the lab. Medium to Large fires demand evacuation of the building. Pull the fire alarm, and then evacuate the building.

EVACUATION
In case of Computer Science and Technology Building evacuation, leaving behind all personal objects, leave room by nearest exit and using evacuation route proceed directly to Railroad Street Park. Check in with instructor at Railroad Street Park to ensure your safety and that no rescue is necessary. Do not leave until told to do so.

FIRE ON A PERSON
If your clothing or hair catches fire, DO NOT RUN. Running only fans the flames. Go immediately to and use the safety shower and call out for help. Stay under the shower until the fire is out and the skin temperature has cooled down. If you are in a lab where a person is on fire, it is your responsibility to help that person get under the safety shower and assist them in any way that you can. NEVER USE A FIRE EXTINGUISHER ON A PERSON.

CHEMICAL SPILLS ON
Remember that speed in washing to remove the chemical is most important in reducing the extent of injury. Wash off the contaminated area immediately. Notify the Instructor immediately.

**YOUR EYES**
Immediately go to the eye wash station and while holding your eye open, irrigate the eye completely for at least 15-30 minutes. Report to the Student Health Center.

**YOUR HANDS OR ARMS**
Immediately go to the sink and wash your hands until they are no longer contaminated. If a chemical burn has occurred, notify the Instructor and report to the Health Center. Always wash your hands before you leave the laboratory.

**YOUR BODY**
Immediately go to the safety showers, pull the shower lever, and with the water running remove any contaminated clothing. Stay under the shower until all of the contamination has been washed away. Notify the Instructor and report to the Health Center.

ALLERGY/CHEMICAL SENSITIVITY
Due to the possibility of contact with chemicals, please self-notify the Lab Coordinator if you have a known allergy or have a known chemical sensitivity or if you develop any of these conditions during the semester.

HEALTH CONDITIONS
If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc.) notify the Lab Coordinator. Special safety practices may be put in place.

FUME HOOD
Never place any body part other than your hands inside the fume hood. When working in fume hood, keep the sash line between you and the material being manipulated. When working with particularly hazardous materials, it is recommended that the sash be pulled down so that there is a solid barrier between you and the chemicals. Never dispense chemicals on the air foil sill of the hood. This creates a potential spill hazard and interrupts proper air flow.

This Safety Policy is by no means a complete and absolute statement of laboratory safety instructions. The Lab Coordinator will periodically point out other safety precautions.
General Safety Policy for Fluid Power & Thermal Fluid Lab Room 2006

The Fluid Power and Thermal Fluid Lab has enjoyed an excellent safety record. This is directly attributed to the combined efforts of the students, faculty, and staff alike. We must all follow correct safety procedures while working in all of the Manufacturing Laboratories. This will enable us to accomplish our goals of maintaining a healthy and accident free environment, to promote a positive safety attitude, and to learn the practical aspects of safety in the workplace appropriate for future supervisors and teachers.

The following safety rules are divided into the four major areas of General Safety Instructions, Safety Instructions for Personal Protection, Safety Instruction for the Use of Tools, Equipment, and Machines, and Personal Attitudes and Conduct.

General Safety Instructions
1. ABC – Always Be Careful. Never take chances.
2. Observe all safety rules.
3. Report immediately to your instructor upon incurring any injury, even though you feel it is negligible.
4. No horseplay or playing practical jokes in the laboratory.
5. Caution any person you see violating a safety rule.
6. Do not run in the lab.
7. Be considerate of the safety of others.
8. Never throw any object in the laboratory.
9. Learn the location and use of the fire extinguishers.
10. In the event of fire, notify the instructor immediately.
11. Insure that there is adequate ventilation for the task being performed. Occasionally, a window may need to be opened or a fan may be needed to help circulate the air.
12. Follow prescribed safety instructions in lifting or handling awkward, large, heavy, and or long pieces of material. In general, never carry material over six feet in length or over 50 pounds in weight without assistance. Lift with your legs, not your back.
13. Never use compressed air for purposes other than specified in your experiments. Likewise, be careful around pressurized hydraulic systems.
14. Make certain your hands and tools are kept free of oil and grease.
15. If you feel ill, do not work in the lab. Report to your instructor.
16. Never treat, or remove particles from the eye. See your instructor or school health personnel for immediate attention.

Safety Instruction for Personal Protection
1. Wear proper eye protection while participating in activities that may pose danger to your eyes. All forms of eye protection must conform to OSHA specs Z87.1, and must have clear lenses and be equipped with side shields.
2. Wear ear protective devices if sharp sounds or excessive noise is anticipated.
3. Be sure your clothes are safe and suitable for laboratory work. Remove or fasten any loose clothing. Roll loose sleeves above your elbows. Tuck shirttails into your pants. Remove ties when working with machinery.
4. Keep your hair away from machinery. Students with long hair must confine their hair in nets or caps when around tools, equipment, and machinery.
5. Rings, bracelets, watches, and other jewelry must be removed when working in the laboratory.
6. Wear rubber gloves when handling caustic materials, acids, and/or petroleum distillates.
7. Wear protective clothing and equipment for the use intended for its wear.
8. Wash your hands with soap and water as a method of preventing skin disease.

Safety Instructions for the Use of Tools, Equipment, and Machines
1. Do not use tools, equipment, and machines until instruction relative to their safe operation has been given.
2. Observe safety rules for all machines and equipment. Follow prescribed procedures when working with mechanical, electrical, fluid, or combined power systems.
3. Know and follow the specific requirements of the kind and type of machine you are operating.
4. Secure approval of your instructor before you begin working. This applies to all experiments and projects in which you use the lab tools, equipment, machines, and supplies.
5. Have your instructor check special machine setups.
6. Students may use the tools, machines, and equipment only when the instructor is present in the lab.
7. Do not use defective tools, machines, and equipment. Inform the instructor immediately.
8. Be sure the guards are in place and functioning properly before turning on machinery. Do not remove guards and other safety devices.
9. Machines must be operated by only one person at a time.
10. Do not talk with or otherwise distract other students while you or they are operating machines.
11. Persons not operating power tools or machinery should keep clear of the operator and the work area.
12. Never leave a machine while it is running.
13. When in use, give the machine your undivided attention; never look away for any reason.
14. Allow revolving machinery to stop on its own. Resist the desire to grab chucks, spindles, or other rotating parts with the hand.
15. Do not stop or start a machine for another person except in an emergency.
16. Do not tamper with adjustments or play with machinery at any time. Serious accidents may result.
17. Do not lean on machines and equipment. You may press a switch or throw a control which could endanger the safety of the operator or damage the machine.
18. Check machines and make all adjustments before turning on the power.
19. Turn power off and allow the machine to come to a complete stop before adjusting, cleaning, removing work, or making new set-ups.
20. Make sure other persons are clear before starting machinery.
21. Allow a safe distance between your hands and blades, cutters, or moving parts. Keep your fingers in such a position that there is no danger of their slipping into the cutter or moving parts.
22. Keep machines clear of tools, stock, and other items.
23. Develop a respect for machine tools and understand their purpose.
24. Recognize the distinctive sound of a properly adjusted and smooth-running machine tool. If something doesn’t sound right, there is probably something wrong.
25. Use the proper size and type of hand tool for the specific task.
26. Use the right tool for the job.
27. Keep tools and materials from projecting over the edge of your workstation so that others will not walk into them and become injured.
28. Clean workstations and place tools in the proper areas at the end of each class period.
29. When finished with a tool, clean and return it to its proper location.
30. Ensure that vise hands hang free when not in use.
31. Be aware of pinch points around vises, presses, hydraulic and pneumatic components, and other such hazardous areas when working with machines and equipment.
32. Keep the floor around the tools clear of liquids, scraps, tools, and other materials.
33. If oil is spilled on the lab floor, immediately stop what you are doing and clean up the spill.
34. Make sure that all cutting tools are sharp and in good condition before using them.
35. Handle edged or pointed tools by the handles, with sharp points or edges pointed away from yourself and others.
36. When using sharp-edged tools, be sure to direct their action away from yourself and your classmates.
37. Pass tools to other persons with handles forward.
38. Carefully read your lab manual instruction sheets before operating machines and equipment.
39. Avoid using wrenches that do not properly fit the nuts, bolts, or other objects which they are being used to turn.

Personal Attitudes and Conduct

Violation of the following indicates a deficient attitude toward safety. Violation of these concepts will not be tolerated. Almost all accidents that occur in the industrial technology laboratories are attributable to one of the causes listed.

1. Taking unnecessary chances
2. Getting in too big a hurry
3. Showing off
4. Lack of information
5. Preoccupation of the mind
6. Distraction of attention
7. Fear
8. Experimenting
9. Failure to follow instructions
10. Poor discipline
11. Guard removal
12. Excitement
13. Selfishness
14. Improper Clothing
15. Poor Health

EMERGENCIES—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone.

CONDITIONS OF YOUR WORK AREA
You should maintain a work area that is free of unnecessary equipment, books, coats, purses, excess chemicals, and trash. Keep aisles and exits unobstructed. At conclusion of lab, clean all used items and bench top, and replace all equipment in proper location.

CHEMICAL SPILLS
All chemical spills should be cleaned up immediately by the proper procedure (if you do not know the correct procedure, notify your instructor for instructions).

EYE PROTECTION
Safety goggles must be worn at all times when you are in the laboratory. Contact lenses are not recommended to be worn; however, ACS indicates that these lenses are acceptable with proper safety goggles. It is recommended that you wear a regular pair of prescription glasses under your safety goggles.

EATING OR DRINKING
Since there is a possibility of food and drink becoming contaminated with toxic chemicals or bacteria, no eating or drinking is allowed in the laboratory (this includes chewing gum and hard candy). Never taste any chemicals from the laboratory.

SMOKING
Smoking is not allowed in any building on campus.

EVACUATION
In case of Computer Science and Technology Building evacuation, leave behind all personal objects, leave room by the nearest exit and proceed directly to Railroad Street Park. Evacuation routes are posted adjacent to all classroom exits. Check in with the instructor at Railroad Street Park to ensure your safety and to verify that no rescue is necessary. Do not leave until told to do so.

FIRE ON A PERSON
If your clothing or hair catches fire, DO NOT RUN. Running only fans the flames and makes them burn faster and hotter. Go immediately to, and use, the safety shower and call out for help. Stay under the shower until the fire is out and the skin temperature has cooled down. If you are in a lab where a person is on fire, it is your responsibility to help that person get under the safety shower and assist them in any way that you can. NEVER USE A FIRE EXTINGUISHER ON A PERSON.

CHEMICAL SPILLS ON
Remember that speed in washing to remove the chemical is most important in reducing the extent of injury. Wash off the contaminated area immediately. Notify the Laboratory Coordinator.

YOUR EYES
Immediately go to the eye wash station and while holding your eye open, irrigate the eye completely for at least 15-30 minutes. Report to the Student Health Center.

YOUR HANDS OR ARMS
Immediately go to the sink and wash your hands until they are no longer contaminated. If a chemical burn has occurred, notify the Lab Coordinator and report to the Health Center. Always wash your hands before you leave the laboratory.

YOUR BODY
Immediately go to the safety showers, pull the shower lever, and with the water running remove any contaminated clothing. Stay under the shower until all of the contamination has been washed away. Notify the Lab Coordinator and report to the Health Center.

CHEMICALS
Never use a chemical from an unlabeled container. Always treat unfamiliar or unlabeled chemicals as if they are dangerous.

PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY
Due to the possibility of contact with chemicals, please self-notify your instructor if you are currently pregnant, have a known allergy or have a known chemical sensitivity or if you develop any of these conditions during the semester. Additional safety equipment (such as gloves and lab coats) may be put in place. You may be forbidden from participating in select labs.

HEALTH CONDITIONS
If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells,
seizures, tremors, etc.) notify you instructor. Special safety practices may be put in select labs.

FUME HOOD
Never place any body part other than your hands inside the fume hood. When working in fume hoods, keep the sash line between you and the material being manipulated.

HAZARD COMMUNICATION
While academic laboratories do not fall under the purview of OSHA, students graduating in the sciences are likely to be hired into positions where a basic knowledge of chemical safety and its hazard communication are expected and required by law. OSHA Hazard Communications Standard 29 CFR 1910.1200 requires written communication of the hazards associated with chemicals, proper labeling of hazardous chemicals and access to safety data sheets, and safety training.

LAB ATTIRE
Safety practices mandate proper attire for handling unknown or hazardous chemicals. The department is not required to provide make-up labs due to safety noncompliance.

1. Always wear eye protection.
2. DO NOT wear sandals or open-toe shoes.
3. If you have long hair, pull it back in a bun or a ponytail
4. If you have on long, baggy sleeves, roll them up.
5. Shorts are acceptable provided they are knee length. You should also consider wearing a lab coat or plastic apron.
SAFETY PROCEDURES FOR MECHATRONICS LAB ROOM 2013

General Safety Policy for Mechatronics Lab Room 2013

Following proper safety practices are a must when working with electronic equipment. Not only is there the danger of electrical shock, but the components can explode if not connected properly. Many of today’s electronic components are easily damaged by improper handling. The test equipment used in the electronic service industry is expensive and easily damaged if proper operating procedures are not followed.

1. ALWAYS wear your SAFETY GLASSES.
2. KEEP soldering irons in their protective STAND when not in use.
3. Always CUT wire LEADS so the clipped wire falls on the table top and not toward others.
4. DO NOT TOUCH the tip end of a soldering iron to check for heat.
5. AVOID an EARTH GROUND when working with AC powered units.
6. ONLY work with powered units WHEN NECESSARY for troubleshooting.
7. AVOID SKIN CONTACT with chemicals.
8. REPLACE ALL screws, not just some.
9. Use the CORRECT CLEANING SOLVENTS for the job.
10. Avoid PINCHING wires when putting equipment back together.
11. Use a HEAT SINK when soldering temperature-sensitive components.
12. NEVER SOLDER a circuit that has the power applied.
13. DOUBLE CHECK circuits for proper connections and polarity prior to applying the power.
14. Observe POLARITY when connecting polarized components or test equipment into a circuit.
15. When soldering a multi-pin component, avoid excessive heating to one area of the component; DO NOT go from pin to pin in a straight line.
16. Make sure TEST instruments are set for proper FUNCTION AND RANGE prior to taking a measurement.
17. When measuring UNCERTAIN qualities, start with the range switch on the HIGHEST setting.
18. ALWAYS REPLACE shields that were removed during service to avoid signal RADIATION.
19. When cutting with an X-Acto knife, AVOID CUTTING TOWARDS yourself.
20. Apply HEAT from a soldering pencil for no more than a couple of seconds to AVOID HEAT DAMAGE.
21. Keep the INTENSITY on oscilloscopes as LOW as possible when in use and all the way down when not in use to avoid burning out the screen.
22. Always OBSERVE POLARITY when connecting components into a circuit, especially with electrolytic capacitors.
23. Always READ the SDS (Safety and Data Sheet) for all chemicals prior to their use

ROTATING AND PINCHING HAZARDS
Hand injuries are commonly caused by simple pinching and binding. The best prevention is to keep fingers, loose clothing, and hair far removed from all rotating equipment. All rotating equipment should have adequate guards or warnings in place. Bind hair and keep loose clothing to a minimum when operating such equipment. If necessary to have hands in close proximity to rotating equipment, ensure that proper guards are in place.
SAFETY PROCEDURES FOR ELECTRONICS LAB ROOMS 2014 & 2016


Following proper safety practices are a must when working with electronic equipment. Not only is there the danger of electrical shock, but the components can explode if not connected properly. Many of today’s electronic components are easily damaged by improper handling. The test equipment used in the electronic service industry is expensive and easily damaged if proper operating procedures are not followed.

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3. Always CUT wire LEADS so the clipped wire falls on the table top and not toward others.
4. DO NOT TOUCH the tip end of a soldering iron to check for heat.
5. AVOID an EARTH GROUND when working with AC powered units.
6. ONLY work with powered units WHEN NECESSARY for troubleshooting.
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8. REPLACE ALL screws, not just some.
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22. Always OBSERVE POLARITY when connecting components into a circuit, especially with electrolytic capacitors.
23. Always READ the SDS (Safety and Data Sheet) for all chemicals prior to their use.
SAFETY PROCEDURES FOR DRAFTING DESIGN LAB ROOMS 2029 & 2030

General Safety Policy for Drafting Design Lab Rooms 2029 & 2030

EMERGENCIES—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone. When using a cell phone, it is necessary to dial (985)-549-2222.

EATING OR DRINKING
Since there is a possibility of food substance becoming contaminated with toxic chemicals, no eating or drinking will be allowed in any of the laboratories. No chewing gum or hard candy. Never taste any chemicals from the laboratory.

SMOKING
Smoking is not allowed in any building on campus.

FIRE IN THE LABORATORY
Call out “FIRE” and get away from the fire. Notify the instructor. Your safety is the number one priority. Some small fires may be extinguished as discussed, the first day of lab. Medium to Large fires will require evacuation of the building. Pull the fire alarm, and then evacuate the building.

EVACUATION
In case of evacuation, leave behind all personal objects, leave the room by nearest exit and proceed directly to Railroad Street Park. Evacuation Routes are posted adjacent to all classroom exit doors. Check in with instructor at Railroad Street Park to ensure your safety and verify that no rescue is necessary. Do not leave until told to do so.

FIRE ON A PERSON
If your clothing or hair catches fire, DO NOT RUN. Running only fans the flames and makes them burn faster and hotter. Go immediately to and use the safety shower and call out for help. Stay under the shower until the fire is out and the skin temperature has cooled down. If you are in a lab where a person is on fire, it is your responsibility to help that person get under the safety shower and assist them in any way that you can. NEVER USE A FIRE EXTINGUISHER ON A PERSON.

OTHER INJURIES
In the event that you or your lab partner cuts themselves or burns themselves, you should notify your instructor immediately.

PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY
Due to the possibility of contact with chemicals, please self-notify your instructor if you are currently pregnant, have a known allergy or have a known chemical sensitivity or if you develop any of these conditions during the semester. Additional safety equipment (such as gloves and lab coats) may be put in place. You may be forbidden from participating in select labs.

HEALTH CONDITIONS
If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc.) notify your instructor. Special safety practices may be put in place.
SAFETY PROCEDURES FOR FACULTY RESEARCH LABS ROOM 3007, 3008, 3009, & 3010

General Safety Policy for Faculty Research Labs Rooms 3007, 3008, 3009, & 3010

EMERGENCIES—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone. When using a cell phone, it is necessary to dial (985)-549-2222.

EATING OR DRINKING
Since there is a possibility of food substance becoming contaminated with toxic chemicals, no eating or drinking will be allowed in any of the laboratories. No chewing gum or hard candy. Never taste any chemicals from the laboratory.

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HEALTH CONDITIONS
If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc.) notify your instructor. Special safety practices may be put in place.

Following proper safety practices are a must when working with electronic equipment. Not only is there the danger of electrical shock, but the components can explode if not connected properly. Many of today’s electronic components are easily damaged by improper handling. The test equipment used in the electronic service industry is expensive and easily damaged if proper operating procedures are not followed.

1. ALWAYS wear your SAFETY GLASSES.
2. KEEP soldering irons in their protective STAND when not in use.
3. Always CUT wire LEADS so the clipped wire falls on the table top and not toward others.
4. DO NOT TOUCH the tip end of a soldering iron to check for heat.
5. AVOID an EARTH GROUND when working with AC powered units.
6. ONLY work with powered units WHEN NECESSARY for troubleshooting.
7. AVOID SKIN CONTACT with chemicals.
8. REPLACE ALL screws, not just some.
9. Use the CORRECT CLEANING SOLVENTS for the job.
10. Avoid PINCHING wires when putting equipment back together.
11. Use a HEAT SINK when soldering temperature-sensitive components.
12. NEVER SOLDER a circuit that has the power applied.
13. DOUBLE CHECK circuits for proper connections and polarity prior to applying the power.
14. Observe POLARITY when connecting polarized components or test equipment into a circuit.
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16. Make sure TEST instruments are set for proper FUNCTION AND RANGE prior to taking a measurement.
17. When measuring UNCERTAIN qualities, start with the range switch on the HIGHEST setting.
18. ALWAYS REPLACE shields that were removed during service to avoid signal RADIATION.
19. When cutting with an X-Acto knife, AVOID CUTTING TOWARDS yourself.
20. Apply HEAT from a soldering pencil for no more than a couple of seconds to AVOID HEAT DAMAGE.
21. Keep the INTENSITY on oscilloscopes as LOW as possible when in use and all the way down when not in use to avoid burning out the screen.
22. Always OBSERVE POLARITY when connecting components into a circuit, especially with electrolytic capacitors.
23. Always READ the SDS (Safety and Data Sheet) for all chemicals prior to their use.

ROTATING AND PINCHING HAZARDS
Hand injuries are commonly caused by simple pinching and binding. The best prevention is to keep fingers, loose clothing, and hair far removed from all rotating equipment. All rotating equipment should have adequate guards or warnings in place. Bind hair and keep loose clothing to a minimum when operating such equipment. If necessary to have hands in close proximity to rotating equipment, ensure that proper guards are in place.
SAFETY PROCEDURES FOR SENIOR RESEARCH LAB ROOM 3057

General Safety Policy for Senior Research Lab Room 3057

EMERGENCIES—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone. When using a cell phone, it is necessary to dial (985)-549-2222.

EATING OR DRINKING
Since there is a possibility of food substance becoming contaminated with toxic chemicals, no eating or drinking will be allowed in any of the laboratories. No chewing gum or hard candy. Never taste any chemicals from the laboratory.

SMOKING
Smoking is not allowed in any building on campus.

FIRE IN THE LABORATORY
Call out “FIRE” and get away from the fire. Notify the instructor. Your safety is the number one priority. Some small fires may be extinguished as discussed, the first day of lab. Medium to Large fires will require evacuation of the building. Pull the fire alarm, and then evacuate the building.

EVACUATION
In case of evacuation, leave behind all personal objects, leave the room by nearest exit and proceed directly to Railroad Street Park. Evacuation Routes are posted adjacent to all classroom exit doors. Check in with instructor at Railroad Street Park to ensure your safety and verify that no rescue is necessary. Do not leave until told to do so.

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OTHER INJURIES
In the event that you or your lab partner cuts themselves or burns themselves, you should notify your instructor immediately.

PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY
Due to the possibility of contact with chemicals, please self-notify your instructor if you are currently pregnant, have a known allergy or have a known chemical sensitivity or if you develop any of these conditions during the semester. Additional safety equipment (such as gloves and lab coats) may be put in place. You may be forbidden from participating in select labs.

HEALTH CONDITIONS
If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc.) notify your instructor. Special safety practices may be put in place.

Following proper safety practices are a must when working with electronic equipment. Not only is there the danger of electrical shock, but the components can explode if not connected properly. Many of today’s electronic components are easily damaged by improper handling. The test equipment used in the electronic service industry is expensive and easily damaged if proper operating procedures are not followed.

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Hand injuries are commonly caused by simple pinching and binding. The best prevention is to keep fingers, loose clothing, and hair far removed from all rotating equipment. All rotating equipment should have adequate guards or warnings in place. Bind hair and keep loose clothing to a minimum when operating such equipment. If necessary to have hands in close proximity to rotating equipment, ensure that proper guards are in place.

THERMAL HAZARDS
There is a heating device located in 3057, Desktop Model Studio System Furnace. Most items appear cool even when very hot. Do not assume something will be cool when it could be hot.

If you are unsure of the temperature first check the setting on the piece of equipment. If it is off, it may have just been switched off and it may still be hot. To verify the temperature either touch surface with a T/C and get a direct reading or place your hand NEAR object and attempt to detect warmth. Zetex gloves may be warranted if routinely working around hot equipment.

If you are leaving a heated piece of equipment unattended, be sure a sign warning of the thermal hazard is prominently displayed.

1. Do not open the chamber door until prompted to do so.
2. Chamber interior and metal parts may be hot, up to 200°C/392°F. Use appropriate PPE (Personal Protective Equipment) when handling parts.
3. Never attempt to open the furnace chamber lid during the sintering process.
4. Never attempt to open the furnace lid beyond its limits.
5. Use caution when removing parts from furnace as they may be hot.
6. Use caution when removing or replacing gas canisters.
7. Do not touch or break insulation.
8. Do not handle insulation dust until all safety precautions have been read and understood.
9. Do not lean on or push the furnace other than with the provided handle.
10. Do not apply paint, lubricants, or other coatings to the furnace, cables, or fasteners.
11. Do not operate the furnace if the housing, power cables, or components are damaged.
12. Do not allow foreign objects or liquids to enter the unit. Never place containers with liquid on or near the unit.
13. Unit is heavy. Do not attempt to manually lift.
14. Never attempt to sinter any material other than a brown part debound with the Studio Study debinder. Any other use could impact system performance, lead to hazards or impact part quality.
Appendix II - Example Safety Data Sheet

MATERIAL SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Group: REFRACTORY CERAMIC FIBER PRODUCT
Chemical Name: VITREOUS ALUMINOSILICATE FIBER
Synonym(s): RCF, ceramic fiber, synthetic vitreous fiber (SVF), man-made vitreous fiber (MMVF), man-made mineral fiber (MMMF)

Trade Names: MOLDATHERM

Manufacturer/Supplier:

RMG
Rex Materials Group
P.O. Box 980
Fowlerville, MI 48836

For additional information or MSDSs, call Rex Materials Customer Service at (517) 223-3787.

2. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>COMPONENTS</th>
<th>CAS NUMBER</th>
<th>% BY WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refractories, Fibers, Aluminosilicate</td>
<td>142844-00-6</td>
<td>40-95</td>
</tr>
<tr>
<td>Amorphous Silica</td>
<td>7631-86-9</td>
<td>0-60</td>
</tr>
<tr>
<td>Alumina</td>
<td>1344-28-1</td>
<td>0-40</td>
</tr>
</tbody>
</table>

(See Section 8 "Exposure Controls / Personal Protection" for exposure guidelines)
# 3. HAZARDS IDENTIFICATION

## EMERGENCY OVERVIEW

**Warning!** Possible Cancer Hazard by Inhalation. (See Section 11 for more information.)

## CHRONIC EFFECT

There has been no increased incidence of respiratory disease in studies examining occupationally exposed workers. Long-term, high-dose exposure to specially prepared fibers which are respirable by rodents has resulted in fibrosis, lung cancer, and mesothelioma in rodents (rats or hamsters).

## OTHER POTENTIAL EFFECTS

### TARGET ORGANS:
Respiratory Tract (nose & throat), Eyes, Skin

### RESPIRATORY TRACT (nose & throat) IRRITATION:
If inhaled in sufficient quantity, may cause temporary, mild mechanical irritation to respiratory tract. Symptoms may include scratchiness of the nose or throat, cough, or chest discomfort.

### EYE IRRITATION:
May cause temporary, mild mechanical irritation. Fibers may be abrasive; prolonged contact may cause damage to the outer surface of the eye.

### SKIN IRRITATION:
May cause temporary, mild mechanical irritation. Exposure may also result in inflammation, rash or itching.

### GASTROINTESTINAL IRRITATION:
Unlikely route of exposure.

### MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
Pre-existing medical conditions, including dermatitis, asthma, or chronic lung disease, may be aggravated by exposure; individuals who have a history of allergies may experience greater amounts of skin and respiratory irritation.

## HAZARD CLASSIFICATION

Although studies, involving occupationally exposed workers, have not identified any increased incidence of respiratory disease, results from animal testing have been used as the basis for hazard classification. In each of the following cases, the conclusions are qualitative only and do not rest upon any quantitative analysis suggesting that the hazard actually may occur at current occupational exposure levels.

In October 2001, the International Agency for Research on Cancer (IARC) confirmed that Group 2b (possible human carcinogen) remains the appropriate IARC classification for RCF.

The Seventh Annual Report on Carcinogens (1994), prepared by the National Toxicology Program (NTP), classified respirable RCF and glasswool as substances reasonably anticipated to be carcinogens.

The American Conference of Governmental Industrial Hygienists (ACGIH) has classified RCF as “A2-Suspected Human Carcinogen.”

The Commission of The European Communities (DG XI) has classified RCF as a substance that should be regarded as if it is carcinogenic to man.

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The State of California, pursuant to Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986, has listed "ceramic fibers (airborne fibers of respirable size)" as a chemical known to the State of California to cause cancer.

The Canadian Environmental Protection Agency (CEPA) has classified RCF as "probably carcinogenic" (Group 2).

The Canadian Workplace Hazardous Materials Information System (WHMIS) – RCF is classified as Class D, 2, A – Materials Causing Other Toxic Effects

The Hazardous Materials Identification System (HMIS) –
Health: 1* Flammability: 0 Reactivity: 0 Personal Protection Index: X (Employer Determined)
(*) denotes potential for chronic effects

4. FIRST AID MEASURES

FIRST AID PROCEDURES

RESPIRATORY TRACT (nose & throat) IRRITATION:
If respiratory tract irritation develops, move the person to a dust free location. Get medical attention if the irritation continues. See Section 8 for additional measures to reduce or eliminate exposure.

EYE IRRITATION:
If eyes become irritated, flush immediately with large amounts of lukewarm water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Do not rub eyes. Get medical attention if irritation persists.

SKIN IRRITATION:
If skin becomes irritated, remove soiled clothing. Do not rub or scratch exposed skin. Wash area of contact thoroughly with soap and water. Using a skin cream or lotion after washing may be helpful.

GASTROINTESTINAL IRRITATION:
If gastrointestinal tract irritation develops, move the person to a dust free environment.

NOTES TO PHYSICIANS:
Skin and respiratory effects are the result of temporary, mild mechanical irritation; fiber exposure does not result in allergic manifestations.

5. FIRE FIGHTING MEASURES

NFPA Codes: Flammability: 0 Health: 1 Reactivity: 0 Special: 0

NFPA Unusual Hazards:
Flammable Properties:
Flash Point:
Unusual Fire and Explosion Hazard:
Extinguishing Media:
None
None
None
None
Use extinguishing media suitable for type of surrounding fire.
6. ACCIDENTAL RELEASE MEASURES

SPILL PROCEDURES

Avoid creating airborne dust. Dust suppressing cleaning methods such as wet sweeping or vacuuming should be used to clean the work area. If vacuuming, the vacuum must be equipped with a HEPA filter. Compressed air or dry sweeping should not be used for cleaning.

7. HANDLING AND STORAGE

STORAGE

Store in original container in a dry area. Keep container closed when not in use. Avoid unnecessary disturbance of the product.

HANDLING

Handle ceramic fiber carefully. Limit use of power tools unless in conjunction with local exhaust. Frequently clean the work area with HEPA filtered vacuum or wet sweeping to minimize the accumulation of debris. Do not use compressed air for clean-up.

EMPTY CONTAINERS

Product packaging may contain residue. Do not reuse.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE GUIDELINES

<table>
<thead>
<tr>
<th>COMPONENTS</th>
<th>OSHA PEL</th>
<th>SUPPLIER REG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refractories, Fibers, Aluminosilicate</td>
<td>None Established*</td>
<td>0.5 f/cc, 8-hr. TWA**</td>
</tr>
<tr>
<td>Amorphous Silica</td>
<td>80 mg/m³ / % SiO₂</td>
<td>N/A</td>
</tr>
<tr>
<td>Alumina</td>
<td>5 mg/m³ (resp.), 15 mg/m³ (total)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* There is no specific regulatory standard for RCF in the U.S. OSHA's "Particulate Not Otherwise Regulated (PNOR)" standard [29 CFR 1910.1000, Subpart Z, Air Contaminants] applies generally; Total Dust 15 mg/m³; Respirable Fraction 5 mg/m³.
The Refractory Ceramic Fibers Coalition (RCFC) has sponsored comprehensive toxicology and epidemiology studies to identify potential RCF-related health effects [see Section 11 for more details], consulted experts familiar with fiber and particle science, conducted a thorough review of the RCF-related scientific literature, and further evaluated the data in a state-of-the-art quantitative risk assessment. Based on these efforts and in the absence of an OSHA PEL, RCFC has adopted a recommended exposure guideline, as measured under NIOSH Method 7400 B. The manufacturers’ REG is intended to promote occupational health and safety through prudent exposure control and reduction, and it reflects relative technical and economic feasibility as determined by extensive industrial hygiene monitoring efforts undertaken pursuant to an agreement with the U.S. Environmental Protection Agency.

OTHER OCCUPATIONAL EXPOSURE LEVELS (OEL)

RCF-related occupational exposure limits vary internationally. Regulatory OEL examples include: Australia – 0.5 f/cc; Austria – 0.5 f/cc; Canada – 0.5 to 1.0 f/cc; Denmark – 1.0 f/cc; France – 0.6 f/cc; Germany – 0.5 f/cc; Netherlands – 1.0 f/cc; New Zealand – 1.0 f/cc; Norway – 2.0 f/cc; Poland – 2.0 f/cc; Sweden – 1.0 f/cc; United Kingdom – 2.0 f/cc. Non-regulatory OEL examples include: ACGIH TLV 0.2 f/cc; RCFC REG 0.5 f/cc. The objectives and criteria underlying each of these OEL decisions also vary. The evaluation of occupational exposure limits and determining their relative applicability to the workplace is best performed, on a case-by-case basis, by a qualified Industrial Hygienist.

Amorphous Silica 10 mg/m³ (ACGIH TLV)
Alumina 10 mg/m³ (ACGIH TLV)

ENGINEERING CONTROLS

Use engineering controls such as local exhaust ventilation, point of generation dust collection, down draft work stations, emission controlling tool designs, and materials handling equipment designed to minimize airborne fiber emissions.

PERSONAL PROTECTION EQUIPMENT

Respiratory Protection – RCF: When engineering and/or administrative controls are insufficient, the use of appropriate respiratory protection, pursuant to the requirements of OSHA Standards 29 CFR 1910.134 and 29 CFR 1926.103, is recommended. The following information is provided as an example of appropriate respiratory protection for aluminosilicate fibers. The evaluation of workplace hazards and the identification of appropriate respiratory protection is best performed, on a case by case basis, by a qualified Industrial Hygienist.

<table>
<thead>
<tr>
<th>Supplier’s Respiratory Protection Recommendations When Handling RCF Products</th>
<th>Respirable Airborne Fiber Concentration</th>
<th>Respirator Recommendation*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 0.5 f/cc</td>
<td>No specific recommendation. User preference based upon conditions present</td>
<td></td>
</tr>
<tr>
<td>0.5 f/cc – 5.0 f/cc</td>
<td>Half-face, air purifying respirator equipped with a NIOSH approved P100 particulate filter cartridge</td>
<td></td>
</tr>
<tr>
<td>5.0 f/cc – 25 f/cc</td>
<td>Full-facepiece, air purifying respirator equipped with a NIOSH approved P100 particulate filter cartridge</td>
<td></td>
</tr>
</tbody>
</table>

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* The P100 recommendation is a conservative default choice; in some case, solid arguments can be made that other respirator types (e.g., N95, R99, etc.) may be suitable for some tasks or work environments. The P100 recommendation is not designed to limit informed choices, provided that respiratory protection decisions comply with 29 CFR 1910.134.

**Other Information:**

Concentrations based upon an eight-hour time weighted average (TWA) as determined by air samples collected and analyzed pursuant to NIOSH method 7400 (B) for airborne fibers.

The manufacturer recommends, at a minimum, the use of a full-facepiece air purifying respirator equipped with an appropriate particulate filter cartridge during furnace tear-out events and the removal of used RCF to control exposures to airborne fiber and the potential presence of crystalline silica.

Potential exposure to other airborne contaminants should be evaluated by a qualified Industrial Hygienist; the selection of appropriate respiratory protection and air monitoring depend upon the conditions present in the work environment.

**Skin Protection:**

Wear gloves, head coverings, and full body clothing as necessary to prevent skin irritation. Washable or disposable clothing may be used. If possible, do not take unwashed clothing home. If soiled work clothing must be taken home, employers should ensure employees are thoroughly trained on the best practices to minimize or avoid non-work dust exposure (e.g., vacuum clothes before leaving the work area, wash work clothing separately, rinse washer before washing other household clothes, etc.).

**Eye Protection:**

Wear safety glasses with side shields or other forms of eye protection in compliance with appropriate OSHA standards to prevent eye irritation. The use of contact lenses is not recommended, unless used in conjunction with appropriate eye protection. Do not touch eyes with soiled body parts or materials. If possible, have eye-washing facilities readily available where eye irritation can occur.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>ODOR AND APPEARANCE:</th>
<th>White board or shape/No odor</th>
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</thead>
<tbody>
<tr>
<td>CHEMICAL FAMILY:</td>
<td>Vitreous Aluminosilicate Fibers</td>
</tr>
<tr>
<td>BOILING POINT:</td>
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<tr>
<td>WATER SOLUBILITY (%):</td>
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<tr>
<td>MELTING POINT:</td>
<td>1760° C (3200° F)</td>
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<td>SPECIFIC GRAVITY:</td>
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<tr>
<td>VAPOR PRESSURE:</td>
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<tr>
<td>pH:</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>VAPOR DENSITY (Air = 1):</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>% VOLATILE:</td>
<td>Al₂O₃·3SiO₂</td>
</tr>
<tr>
<td>MOLECULAR FORMULA:</td>
<td></td>
</tr>
</tbody>
</table>

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10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable under conditions of normal use.
INCOMPATIBILITY: Soluble in hydrofluoric acid, phosphoric acid, and concentrated alkali.
CONDITIONS TO AVOID: None.
HAZARDOUS DECOMPOSITION PRODUCTS: None
HAZARDOUS POLYMERIZATION: Not Applicable.

11. TOICOCLOGICAL INFORMATION

HEALTH DATA SUMMARY

There has been no increased incidence of respiratory disease or other significant health effects in occupationally exposed workers. In animal studies, long-term, high-dose inhalation exposure resulted in the development of respiratory disease in rats and hamsters.

EPIDEMIOLOGY

The University of Cincinnati is conducting an ongoing epidemiologic investigation. The evidence obtained from employees in U. S. RCF manufacturing facilities is as follows:

1) There is no evidence of any fibrotic lung disease (interstitial fibrosis) from evaluations of chest X-rays.

2) There is no evidence of an elevated incidence of lung disease among RCF manufacturing employees.

3) An early statistical "trend" was observed, in the exposed population, between RCF exposure duration and some measures of lung function. The observations were clinically insignificant. If these observations were made on an individual employee, the results would be interpreted as being within the normal (predicted) respiratory range. A more recent longitudinal study of employees with 5 or more pulmonary function tests found that there was no effect on lung function associated with RCF production experience.

4) Pleural plaques (thickening along the chest wall) have been observed in a small number of RCF employees. The best evidence to date indicates that pleural plaques are a marker of exposure only. Under most circumstances, pleural plaques are not associated with pulmonary impairment. The pathogenesis of pleural plaques remains incompletely understood; however, the mechanism appears to be an inflammatory response caused by inhaled fibers.

5) Initial data (circa 1987) seemed to indicate an interactive effect between smoking and RCF exposure; more recent data, however, found no interactive effect. Nevertheless, to promote good health, RCF employees are still actively encouraged not to smoke.
TOXICOLOGY

A number of toxicological studies designed to identify any potential health effects from RCF exposure have been completed. In one study, conducted by the Research and Consulting Company, (Geneva, Switzerland), rats and hamsters were exposed to 30 mg/m³ (about 200 fibers/cc) of specially-prepared RCF for 6 hours/day, 5 days/week, for up to 24 months. In rats, a statistically significant increase in lung tumors was observed; two mesotheliomas (cancer of the pleural lining between the chest wall and lung) were also identified. Hamsters did not develop lung tumors; however, interstitial fibrosis and mesothelioma was found. Some, in the scientific community, have concluded that the "maximum tolerated dose" was exceeded and that significant particle contamination was a confounding issue; therefore, this study may not represent an accurate assessment of the potential for RCF to produce adverse health effects.

In a related multi-dose study with a similar protocol, other rats were exposed to doses of 16 mg/m³, 9 mg/m³, 3 mg/m³ which corresponds to about 115, 75, and 25 fibers per cubic centimeter respectively. This study found no statistically significant increase in lung cancer. Some cases of pleural and parenchymal fibrosis were seen in the 16 mg/m³ dose group. Some cases of mild fibrosis and one mesothelioma were observed in the 9 mg/m³ group. No acute respiratory effects were seen in the rats in the 3 mg/m³ exposure group, which suggests that there may be a dose/response threshold, below which irreversible respiratory impacts do not occur.

Other toxicological studies have been conducted which utilized non-physiological exposure methods such as intrapleural, intraperitoneal and intratracheal implantation or injection. Some of these studies have found that RCF is a potential carcinogen. Some experts, however, suggest that these tests have limited relevance because they bypass many of the biological mechanisms that prevent fiber deposition or facilitate fiber clearance.

To obtain more epidemiology or toxicology information, please call the toll free telephone number for the Unifrax Corporation Product Stewardship Program found in Section 16 - Other Information.

12. ECOLOGICAL INFORMATION

No ecological concerns have been identified.

13. DISPOSAL CONSIDERATIONS

WASTE MANAGEMENT

To prevent waste materials from becoming airborne during waste storage, transportation and disposal, a covered container or plastic bagging is recommended.

DISPOSAL

RCF, as manufactured, is not classified as a hazardous waste according to Federal regulations (40 CFR 261). Any processing, use, alteration or chemical additions to the product, as purchased, may alter the disposal requirements. Under Federal regulations, it is the waste generator’s responsibility to properly characterize a waste material, to determine if it is a "hazardous" waste. Check local, regional, state or provincial regulations to identify all applicable disposal requirements.
EUROPEAN UNION

Waste from this product is not classified as "hazardous" or "special" under European Union regulations. Disposal is permitted at landfills licensed for industrial waste.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

<table>
<thead>
<tr>
<th>Hazard Class:</th>
<th>Not Regulated</th>
<th>United Nations (UN) Number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labels:</td>
<td>Not Applicable</td>
<td>North America (NA) Number:</td>
</tr>
<tr>
<td>Placards:</td>
<td>Not Applicable</td>
<td>Bill of Lading:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

INTERNATIONAL

Canadian TDG Hazard Class & PIN: Not regulated
Not classified as dangerous goods under ADR (road), RID (train) or IMDG (ship).

15. REGULATORY INFORMATION

UNITED STATES REGULATIONS

EPA:
Superfund Amendments and Reauthorization Act (SARA) Title III - This product does not contain any substances reportable under Sections 302, 304, 313, (40 CFR 372). Sections 311 and 312 (40 CFR 370) apply (delayed hazard).
Toxic Substances Control Act (TSCA) - All substances in this product are listed, as required, on the TSCA inventory. RCF has been assigned a CAS number; however, it is a simple mixture and therefore not required to be listed on the TSCA inventory. The components of RCF are listed on the inventory.
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Clean Air Act (CAA) - RCF contains fibers with an average diameter greater than one micron and thus is not considered a hazardous air pollutant.

OSHA:

California:
"Ceramic fibers (airborne particles of respirable size)" is listed in Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986 as a chemical known to the State of California to cause cancer.

Other States:
RCF products are not known to be regulated by states other than California; however, state and local OSHA and EPA regulations may apply to these products. If in doubt, contact your local regulatory agency.
INTERNATIONAL REGULATIONS

Canada:
Canadian Workplace Hazardous Materials Information System (WHMIS) – RCF is classified as Class D, 2, A – Materials Causing Other Toxic Effects
Canadian Environmental Protection Act (CEPA) - All substances in this product are listed, as required, on the Domestic Substance List (DSL)

European Union:
European Directive 97/69/EC classified RCF as a Category 2 carcinogen; that is it “should be regarded as if it is carcinogenic to man.”

16. OTHER INFORMATION

RCF DEVTIRIFICATION

As produced, all RCF fibers are vitreous (glassy) materials which do not contain crystalline silica. Continued exposure to elevated temperatures may cause these fibers to devitrify (become crystalline). The first crystalline formation (mullite) begins to occur at approximately 985°C (1805°F). Crystalline silica (cristobalite) formation may begin at temperatures of approximately 1200°C (2192°F). The occurrence and extent of crystalline phase formation is dependent on the duration and temperature of exposure, fiber chemistry and/or the presence of fluxing agents. The presence of crystalline phases can be confirmed only through laboratory analysis of the “hot face” fiber.

IARC’s evaluation of crystalline silica states “Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1)” and additionally notes “cancerogenicity in humans was not detected in all industrial circumstances studied” (IARC Monograph Vol. 68, 1997). NTP lists all polymorphs of crystalline silica amongst substances which may “reasonably be anticipated to be carcinogens”.

IARC and NTP did not evaluate after-service RCF, which may contain various crystalline phases. However, an analysis of after-service RCF samples obtained pursuant to an exposure monitoring agreement with the USEPA, found that in the furnace conditions sampled, most did not contain detectable levels of crystalline silica. Other relevant RCF studies found that (1) simulated after-service RCF showed little, or no, activity where exposure was by inhalation or by intraperitoneal injection; and (2) after-service RCF was not cytotoxic to macrophage-like cells at concentrations up to 320 µg/cm² - by comparison, pure quartz or cristobalite were significantly active at much lower levels (circa 20 µg/cm²).

RCF AFTER-SERVICE REMOVAL

Respiratory protection should be provided in compliance with OSHA standards. During furnace tear-out operations where overhead work is required, a FULL FACE RESPIRATOR (at a minimum) is recommended to reduce inhalation exposure along with eye and respiratory tract irritation. A specific evaluation of workplace hazards and the identification of appropriate respiratory protection is best performed, on a case by case basis, by a qualified industrial hygiene professional.
PRODUCT STEWARDSHIP PROGRAM

The Unifrax Corporation, a manufacturer of Refractory Ceramic Fiber, has established a program to provide customers with up-to-date information regarding the proper use and handling of refractory ceramic fiber. In addition, Unifrax Corporation has also established a program to monitor airborne fiber concentrations at customer facilities. If you would like more information about this program, please call the Unifrax Corporation Product Stewardship Information Hotline at 1-800-322-2293.

As of the date of preparation of this document, the foregoing information is believed to be accurate and is provided in good faith to comply with applicable Federal and State laws. However, no warranty or representation, expressed or implied, is made as to the accuracy or completeness of the foregoing data. In addition, no responsibility can be assumed by the vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.