

KUMMER STUDENT DESIGN CENTER

**Student Design & Experiential
Learning Center**

General Safety Training



General Safety Training:

Training Opportunity levels

Shop rules

After hours shop procedures

PPE

Safe Practices

Emergency Situations

ICE Medical, Tornado, Fire, Hostage, Active shooter,

Bomb threat

Emergency contacts

Walk through of shop

Training Opportunities

Basic Machine Shop:

Band saws

Bench grinder

Drill press

Cold saw

Hand held power tools

Abrasive Saw

Reciprocating Saws

Drills

Circular Saws

Pneumatics

Sanders

Tubing Bender

Tubing Notcher

Training Opportunities

Electronics Lab:

Oscilloscopes

Soldering Irons

Hot Tweezers

De-Soldering Stations

Volt Meters

Power Supplies

Training Opportunities

Welding Training:

Plasma Cutter

Oxy-Acetylene

GMAW (MIG)

GTAW (TIG)

Composites Room Training

Training Opportunities

Machine Specific:

Mill

Lathe

Table Saw

CNC Mill and Lathe

Water Jet

CNC Hotwire Cutter

Bitrode Battery Charger/Tester

Training Opportunities

Vehicle Training:

Driver Safety

Truck and Trailer

Passenger Van

Rented Vehicles

Training Opportunities

OSHA Certifications:

10-hour General Industry

10-hour General Construction

30-hour General Industry

30-hour General Construction

(\$20 for 10hr / \$30 for 30hr)

Training Opportunities

First Aid, CPR, and AED

2 year Certification
through American Heart Association
\$20 for CPR/ \$30 First Aid and CPR

Shop Rules

- Students are not allowed to use the equipment in the Shop without going through safety training!
- Completion of the Risk Release form required
- Students with access to areas and equipment will NOT allow other student access using their ID nor allow other students to use equipment under their supervision.
- The ONLY person who can train or authorize students to use equipment is the Safety and Shop Operations Manager.

Shop Rules

- Persons with access may give brief tours of the shop areas they have access to.
- The visitors must abide by the eye protection rule and stay clear of all equipment in use.
- If a visiting person approaches a machine in use, the operator should pause the operation or ask the visitors to stay clear until the operation can be paused.
- The visitor leaves when the guide leaves.

Shop Rules

- No one is allowed to use the facility alone---
Two person rule! ALWAYS!!!
- If Shop Manager is present they can act as the second person.
- This rule is particularly important all the time!
- SDELC shop is NOT for personal or any class projects

Shop Rules

- Tools or equipment may not be taken from the shop area without being signed out from the shop manager.
- Equipment is to be returned promptly after use or completion of travel.

Shop CLEANING

- The user of a machine is responsible for **cleaning the machine after use**.
- Cleaning consists of taking all chips off the machine, wiping the machine down with shop cloth, sweeping the floor area, and disposing of all chips and mess created by the user
- Return all tools to their appropriate locations
- Violation of this rule will get the user suspended from the shop.

Shop Rules

- Teams are responsible for their own tooling. Although the Shop contains certain standard tooling (drills, end mills, etc.)
- Teams should be prepared to purchase tooling, as required. See Shop Manager if you have questions.
- If tooling belonging to the Shop are broken, the student is required to notify the Machine Shop Manager.

Shop Rules

- Teams are responsible for providing their own materials.
- Material in the Shop area belongs to specific projects.
- Some stock is obtained for all team and may only be used with approval of the Shop Manager.

Shop Rules

IF IN DOUBT..... ASK !!!

After Hours Procedures

- Remember the two person rule!
- After hours, the stock room and many of the tools are secured. Arrangements for access to the required tools and materials should be made with the shop manager during normal hours.
- Students should not remove tools from the lab unless prior arrangements have been made with the shop manager.
- Ensure all doors are closed and lights out if last one in shop

SAFETY GLASSES and SHIELDS

Safety glasses must be worn at all times while in the shop areas!



PPE

SAFETY GLASSES and SHIELDS

Safety glasses must be worn at all times while in the shop areas.



AT ALL TIMES!!



PPE

Eye protection

- Eye protection that meets the ANSI Z-87.1-1989 standard *MUST BE WORN AT ALL TIME* while in the SDELC, except for offices, restrooms, and break areas.
- Safety glasses with side shields are required
- For people who wear corrective glasses, eye protection must be of the type that can be worn over glasses.
- Visitors must also wear eye protection

PPE

Eye protection FAIL!!



PPE

Eye Protection

All users and visitors who are welding or viewing welding activities must wear eye protection from the radiation produced by welding.

Appropriate eye protection will be provided at the welding areas.

Arc welding or arc cutting operations require the use of welding helmets with an appropriate filter lens.

Full-face shields and safety glasses are required for portable hand grinding or bench grinding operations.

EYE INJURIES ARE THE MOST PREVENTABLE OF ALL INJURIES

PPE

WATCH WHAT YOU WEAR

Long sleeved shirts or loose clothing should not be worn while running machinery. Moving parts of machinery can catch them.



PPE

GLOVES

Gloves must NOT be worn when operating any rotating machinery. Gloves are recommended for handling sheet metal and sharp tools. Gloves are required when working with welding processes.



PPE

GLOVES

Chemical resistant gloves must be worn whenever paints, epoxies, solvents, or other chemicals are used. Disposable nitrile gloves are provided. Other glove types will be provided if nitrile gloves are insufficient for a specific chemical needed in the shop areas.



PPE

LONG HAIR

If you have long hair, you must tie your hair back or put it in a cap to keep it out of the way of moving machinery.



PPE

JEWELRY

Remove rings, watches, bracelets and other jewelry while working in shop.



E.T. says OUCH!!



PPE

Respiratory Protection

Wear a dust mask when working with composites, all sanding and grinding operations, working with concrete, or any operation that produces airborne particulates.

Whenever welding is occurring inside the shop areas ensure you have adequate ventilation.



PPE

FOOT Protection

Closed-toe shoes must be worn when working with any machine tools or equipment, hand tools, sheet metal or metal scraps, and welding equipment.

NO SANDLES or TOE SHOES IN SHOP



PPE

Hard Hats

Protect your Mellon!!

The hats are for your personal protection!

Hard hats must be worn in designated areas.

Hard hats must be worn on construction projects.



"What the heck is THAT?"



PPE

Welding Clothes

All welding safety equipment is available in near the welders.

You must have special training to do any type of welding.

Wear appropriate clothing when near someone welding.

NO POLYESTER CLOTHES!!

Do NOT watch the light of a welder or plasma cutter.



PPE

Welding Shield FAIL!!!



PPE

Hearing Protection

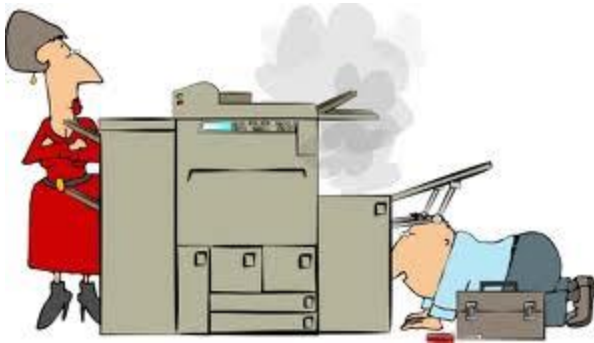
Protect your hearing, it doesn't heal or recover from loss.

Use protection don't take the chance!!

When it is gone..... it is GONE. Do you hear me?

Safe Practices

Do **NOT** do repairs to the machines. If the machine does not run properly, turn it off and contact the shop manager.



Safe Practices

Chemical Safety

All oil and other chemical waste are to be disposed in the hazardous waste MUST be properly disposed of. The SDELC Manager must be consulted before a new waste material is added to a container other than what is already listed on the container waste label.

MSDS information is located in the Student Machine Shop area. Always consult the MSDS when using a chemical for the first time, or when a review of the safety precautions is needed.

Safe Practices

Chemical Safety MSDS Sheet

<S:\Dual purpose vacuum pump oil.pdf>

Safe Practices

Chemical Safety

The SDELC Manager must be informed whenever a new chemical is brought into the SDELC. Any new chemical, cleaner, or solvent that is brought into the SDELC must have a copy of the MSDS on file.

Flammable chemicals must be stored in a designated flammable cabinet. Acids, bases, and strong oxidizing chemicals must be stored in segregated cabinets.

Do **NOT** dump any thing down the drain of a sink!!!!

Safe Practices

Compressed Gas Cylinder

- Compressed gases are unique in that they represent both a physical and a potential chemical hazard (depending on the particular gas).
- Finally, the large amount of potential energy resulting from compression of the gas makes a compressed gas cylinder a potential rocket or fragmentation bomb if the tank or valve is physically broken.
- **Special Handling Procedures**
- Transport gas cylinders in carts one at a time only while they are secured and capped.
- All gas cylinders should be capped and secured when stored. Use suitable racks, straps, chains or stands to support cylinders. All cylinders, full or empty, must be restrained and kept away from heat sources.
- **Always use the correct pressure regulator.** Do not use a regulator adaptor.

Safe Practices

Compressed Gas Cylinder

- Place gas cylinders in such a way that the cylinder valve is accessible at all times.
- Use soapy water to detect leaks.
- Oil or grease on the high pressure side of an oxygen cylinder can cause an explosion. ***Do not lubricate an oxygen regulator or use a fuel/gas regulator on an oxygen cylinder.***
- Never bleed a cylinder completely empty. Leave a slight pressure to keep contaminants out (172 kPa or 25 psi).
- All gas cylinders should be clearly marked with appropriate tags indicating whether they are in use, full, or empty.

Safe Practices

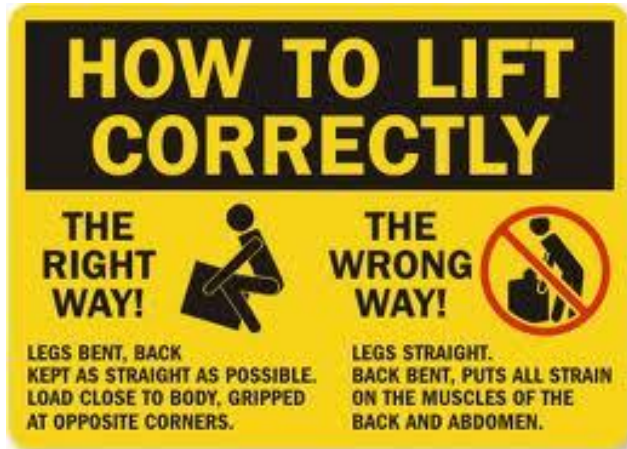
Lifting Correctly

Limit it to 50 pounds; if the load is over 50 pounds, get help.

Lift with your legs, not your back.

Long pieces over 6 feet should be carried horizontally by two people.

Save your back!



Safe Practices

- Do not work if you are ill. Your condition may cause an accident and injury to yourself or others.
- Sleeping in the shop is prohibited.

Safe Practices

- Report defective machinery, equipment, and hazardous conditions to the Shop Manager as soon as possible.
- Do **NOT** remove guards from machinery and equipment.
 - Use appropriate PPE, **ALWAYS!**

Alcohol

- The possession or use of alcoholic beverages on University premises is prohibited; no person shall use the shop while under the influence of intoxicants.
- The use of narcotics, tranquilizers, or barbiturates by University personnel while using the shop is prohibited without the cognizance of the Office of Health Services and Shop Manager.

Safe Practices

- Strongly advised to **NOT** use contact lenses if using chemicals or dusty situations in the shop.
- The use of volatile or flammable chemicals, such as gasoline, lacquer thinner, spray oils (WD-40), or paint thinner, as a skin cleansing agent is prohibited.

Safe Practices

- Lock out tags for defective equipment—The lock out center is in the shop supply cabinet.
- It contains padlocks, lockout tags, and lockout devices.
- Do NOT remove a red padlock without permission from the shop manager.

Green locks represent equipment locked out that need training prior to use.

Safe Practices

- Personal entertainment devices (e.g. IPODS) with ear pieces cannot be used while using machine tools and welding equipment.
- Machine operators should not be startled while in contact with the machine. Avoid sudden loud noises when others are using machine tools in the same room.

Safe Practices

- Electrical panels must be kept clear of obstructions so that emergency personnel can access if needed.
- Do **NOT** remove fire extinguishers from the shop

Emergency Situation

- First survey the area to see if it is safe to enter.
- Immediately send someone to call emergency responders
- Stabilize anyone who is unconscious, has a broken limb or injured back but do not move them unless they are in immediate danger.
- Administer first aid as trained. Practice Universal Precautions to avoid exposure to blood.
- Do check for breathing/open airway, and administer rescue breathing if needed.
- Do administer CPR if needed (and you are trained).
- Do try to stop severe bleeding.
- Treat for shock and make patient comfortable.
- Do get all information concerning the patient and accident or illness if person is conscious (signs, and symptoms, allergies, medication taken, pertinent past illnesses, last oral intake, events leading to pertinent past illnesses, events leading to the illness/injury).

Emergency Situation

- Injuries, no matter how small, **must be reported** to the SDELC Shop Manager immediately.

I.C.E.

In Case of Emergency

Tornado

- Move to the bathrooms
- Conference room
- In shop move to the composites or welding room if possible

I.C.E.

Fire Emergency

- Fire in a University building is the most likely campus emergency that could result in loss of property and threat to lives.
- It is critical that individuals react quickly and responsibly to any indication of fire in their surroundings.

Procedures:

If you **SMELL** smoke or gas:

From the nearest safe phone call the Department of Public Safety, 911 from an outside line.

If you **observe** fire or smoke:

Do not shout "Fire!" Remain calm.

Pull the nearest fire alarm.

Notify those in immediate area to exit.

Exit the building.

Call 911

I.C.E.

Fire Emergency

- From the nearest safe phone call the Department of Public Safety at 911 of the exact location of the fire.
- If possible and safe to do so, after initiating the fire alarm, attempt to extinguish the fire with a fire extinguisher.
- Never use a fire extinguisher on a fire that is larger than a small trash can or when you do not have a way of escape.
- No matter how small the fire, never use an extinguisher without sounding the fire alarm first.
- If you cannot extinguish the fire by yourself with one extinguisher, leave the area and let the professionals handle it.

I.C.E.

Fire Emergency

- Do not prop any fire doors open.
- Evacuate, using appropriate exits and escape routes (do NOT use elevators).
- Provide assistance for those who need it.

- All alarms should be treated as a valid fire alarm until Public Safety personnel verify that it is a false alarm.
- Stop what you are doing immediately, remain calm and follow instructions.
- Do not look for other people or attempt to take along belongings
- Your life is more important than stuff!
- Do not lock doors behind you

I.C.E.

Fire Emergency

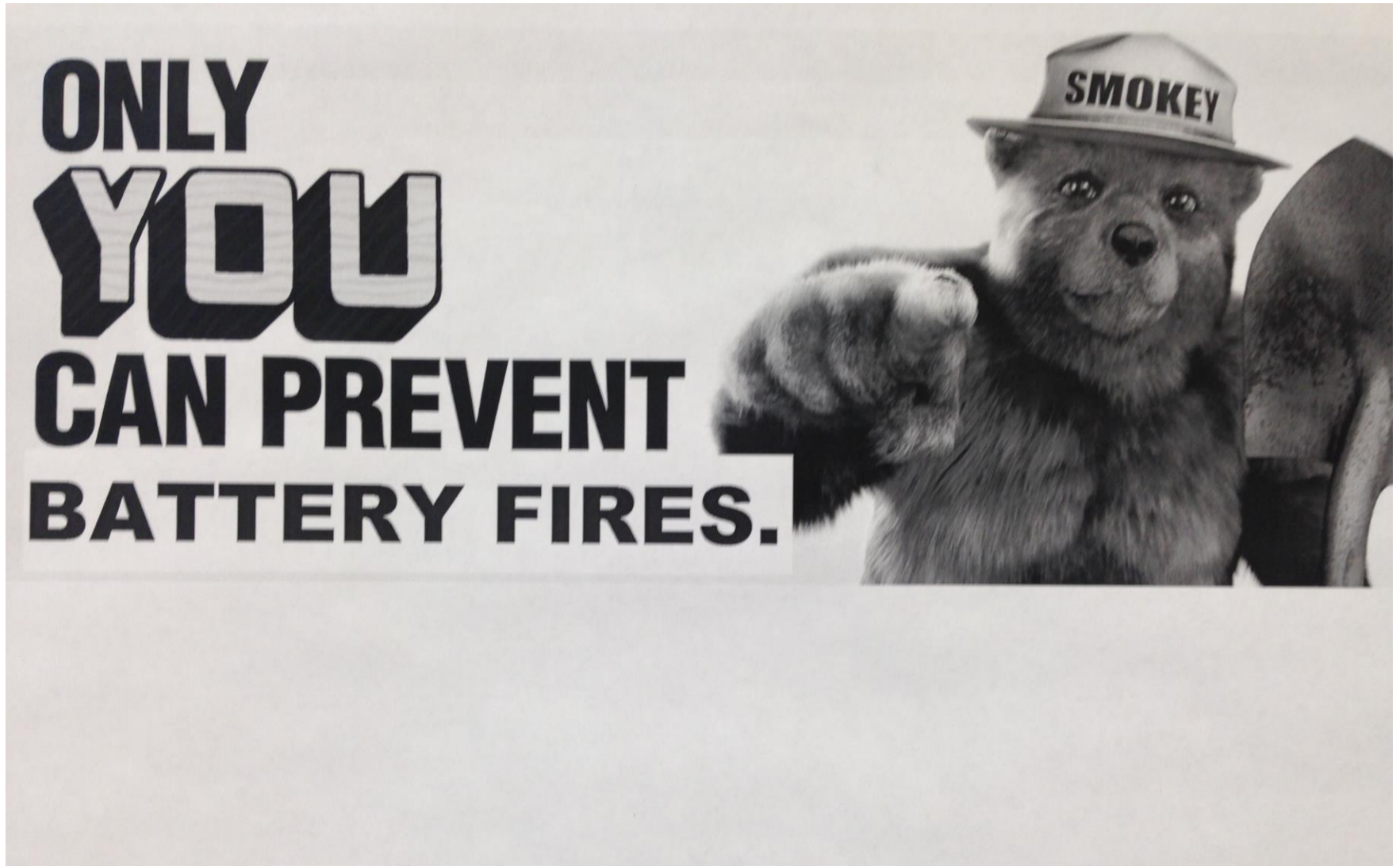
- Using the nearest appropriate exit or escape route (do NOT use the elevators), leave the building quickly and calmly.
- Persons with disabilities should be assisted out of the building or removed to a safe haven to await evacuation by emergency responders.
- Proceed to safe ground at least 50 feet away from the building and out of the fire lane(s). The instructor/supervisor should notify emergency response personnel of missing or disabled persons.
- Do not obstruct fire hydrants or any fire/rescue workers.
- Do not re-enter the building until informed by a uniformed officer.
- Reporting: After contacting Public Safety, and after meeting with the University Police, contact your supervisor.
- Any time that the fire alarm is activated, the building is to be immediately evacuated.

Fire Extinguisher

Use the correct Extinguisher

	<p>A Trash Wood Paper</p>  <ul style="list-style-type: none"> • wood • cloth • paper • rubber • many plastics 		<p>C Electrical Equipment</p>  <ul style="list-style-type: none"> • energized electrical equipment
	<p>B Liquids Grease</p>  <ul style="list-style-type: none"> • gasoline • oil • grease • tar • oil-based paint • lacquer • flammable gases 	<p>COMBUSTIBLE</p>  <p>D</p> <p>METALS</p> <ul style="list-style-type: none"> • magnesium • sodium • potassium • titanium • zirconium • other flammable metals 	

Batteries



I.C.E.

Hostage situation

- Remain calm and avoid any action that might incite the suspect to act violently. The suspect may be nervous. Further excitement by the employee can cause the suspect to panic and harm the employee or bystanders.
- Obey the suspect's instructions, even if it appears that employees cannot be harmed. Money and property are not worth the price of a life.
- Call the department of Public Safety at 911

I.C.E.

Active shooter situation

- If possible get out of the building and go in opposite direction of location of person
- If approached by authorities-- keep hands visible and in air
- If shooter is in immediate area-- barricade your self in room
- Use furniture or other items such as belt to secure door
- Close shades on door and turn out lights
- Stay out of visible sight and keep quiet
- If person is head coming in room-- everyone throw as much as possible at person while others subdue the person
- Cover weapon do not pick it up for any reason

I.C.E.

Bomb Threat

- Any person on campus who receives a bomb threat via telephone call, voice mail, e-mail message, letter, or other communication should proceed as follows.
- All S&T personnel receiving a bomb threat by telephone call should:
 - remain calm and listen carefully
 - keep the caller on the line as long as possible. For example, ask the caller to repeat the message: "I'm sorry, what did you say?"
 - identify and record the number from the display on the phone, if available
 - record every word spoken by the person
 - gather as much information as possible
 - call Public Safety, ext. 4300

I.C.E.

Bomb Threat

- If the bomb threat is received via written communication, do not handle the communication any more than is absolutely necessary and turn the document over to the police when they arrive. The police will want to know the following information: Who found it? Who else was present? Where was it found or how was it delivered? When was it found or delivered? Who has touched it? Have any previous threats been received?
- A Public Safety officer will obtain the information about the bomb threat. The officer will immediately notify the local authorities.
- Public Safety may request people working in the area to assist in sweeping the building. This may be done because people working in the area will be most familiar with what does and does not belong.
- If a suspicious package or object is located, do not touch it. Immediately notify Public Safety at 4300

Emergency Contacts

Medical or other immediate emergency

DIAL 911

All other non emergency call 341-4300

Then call:

Richard Dalton 573-578-2074

richard.dalton@mst.edu

Sign up for text or phone emergency alerts