

JEWELRY METALS STUDIO LAB SAFETY PLAN

This form is designed to document that students have been informed concerning safety procedures in the metals studio.

Primary Investigator is Professor Robly A. Glover – 806-470-7485

3D Annex Building Supervisor is Mark Bond – 806-392-0225

Safety Coordinator is Robert Terrell – 806-224-6159

****ADDENDUM IN EFFECT FALL 2013 AND BEYOND****

Texas Tech Environmental Health and Safety have enforced the new Chemical Hygiene Plan. They consider all studios within the School of Art bound by the regulations of this plan. PI's (Principal Investigators, i.e.: faculty and staff) MUST stringently adhere to these rules and regulations. These rules and regulations include:

- **No food or drink of any kind is allowed in the studio.** No exceptions.
- **Everyone must wear safety glasses at ALL TIMES while any individual is working in the studio.** The only exception to this rule is during critiques. However, during this time, no one may work.
- **Faculty MUST abide by and enforce the Chemical Hygiene Plan or risk employee termination.**
- Any questions, concerns, or clarification regarding these new policies may be directed towards Texas Tech Environmental Health and Safety representatives. Their contact information is available at <http://www.depts.ttu.edu/ehs/Web/StaffDirectory.aspx>. The Chemical Hygiene Plan is available in its entirety at http://www.depts.ttu.edu/ehs/Web/Docs/Chem_Hygiene_Plan.pdf

CHEMICAL SPILL PROTOCOL

Small chemical spills can generally be handled in house with a spill containment kit. Spill containment kits are clearly marked and are in rooms 100, 100A, 100B, 102 and 103. Spills should be handled in the following manner if at all possible:

- o Contain
- o Capture
- o Clean and neutralize

In the event of a **large spill**, *first call the PI* (instructor/graduate student). If the PI (instructor/graduate student) is unreachable or it is determined that the spill is beyond in house cleaning capabilities and poses a significant risk, call TTU Environmental Health & Safety at **(806) 742-3876** (during regular business hours) or **(806) 742-3328** (after hours).

A. EMERGENCY

1. In the event of a fire alarm or fire, students will leave the building immediately, no exceptions. Call the fire department from another location.
2. In a severe storm or tornado, students will proceed to the back of the men's and women's bathroom in the 3/D Annex as quickly as possible. This interior room offers the greatest potential protection from storm debris.
3. In the event of an assault, personal injury or medical emergency situation, dialing **806-742-3931** will reach the Campus Police or use the **Blue Emergency** phone located in the hallway between the wood shop and the Design II room.
4. The fire extinguisher is located in Room 100 on the west wall next to soldering lab, Room 100B doorway. The fire blanket is located in Room 100B on the east side of the room.
5. The MSDS (Materials Safety Data Sheets) and the Lab Safety Plans are located in the soldering lab (Room 100B) next to the teaching table.

B. FIRST AID

1. The eyewash stations are located in room 100, 100A and 103. In the event of an eye irritant immediately use the eyewash station, hold your eye(s) in the wash station and flushing for 5-10 minutes unless otherwise instructed.
2. First Aid kits are located in each room of the jewelry metals area and are clearly marked.
3. In the event of a severed finger or limb the body part must be collected (while wearing gloves) and accompany the victim to the hospital in a clean wet medium, as quickly as possible. Call University police for assistance. It is essential that you protect yourself from coming in contact with bodily fluids.
4. In the event of a major acid mishap use the safety shower system by pulling the handle of the shower. Tepid water will fall and an alarm will sound, signaling that there has been a mishap.
5. There are two kinds of cuts and burns that need attention:
 - a. **Minor cuts/burns** – “boo-boo’s” can be attended to in-house. (Example: Cuts that are not deep and stop bleeding or

burns that do not exhibit large blisters.) **Minor cuts** should be cleaned with peroxide and an anti-bacterial used. Cover with sterile Band-Aid. **Minor burns** should be immersed in cool (not cold) running water for 10-15 minutes until pain subsides and then apply a sterile bandage. Do not apply ice or ointments. If the wound does not heal properly, seek medical attention immediately.

b. **Major cuts/burns** – these are deep cuts or burns that will need immediate medical attention. (Example: cuts that are pulsing blood, will not stop bleeding, or are more than ¼” deep or with jagged edges or burns that develop blisters larger than 2”x2” or that remove first layer of skin.) **Deep cuts** should have pressure applied with a clean compress. **Major burns** should NOT be immersed in cool water, but covered with a clean compress and held above heart level if possible. In both cases, seek immediate medical attention.

c. **When in doubt, always seek professional medical attention.**

(First aid guidelines recommended by MayoClinic.com)

C. STUDIO LAB VISTOR POLICY

Children, pets, or non-enrolled persons are NOT to be allowed in the studio lab for their own safety.

D. DOORS AND LOCK BOXES

1. ALL hallway doors to all rooms (100, 102, 103) must remain closed at all times and locked after class hours. This is by the order of the Environmental Health & Safety department, in compliance with the Chemical Hygiene Plan.
2. There is to be no tampering with the designated codes in the lock boxes.
3. The key should remain attached to the punch card at all times.
4. The front door should never be left unlocked after class hours. This door is to remain locked for the students' safety.
5. Even if a student goes to the bathroom, make sure the door is locked behind.

E. POLICY ON CONTAINERS

1. No containers may be brought into the studio unmarked. All containers must be clearly and permanently labeled with the following information: ALL chemicals must be clearly labeled with:
 - a. Student name
 - b. Name of the substance
 - c. Date
 - d. Semester, Course number and section
2. There could be a \$250.00 fine assigned to the School of Art if safety inspectors find any unmarked containers. This includes boric acid, water, or flux containers.
3. There are ink pads, stamps, and self adhesive labels will be provided for labeling for containers including boric acid, denatured alcohol, distilled water, and flux. These supplies are located on the top shelf of the blonde tool cabinet in the southwest corner of room 100. These materials are to be used by ALL students, undergraduate and graduate. We cannot have any unmarked containers in the jewelry metals lab. Sometimes these materials are located next to the flammable cabinet for convenience at the beginning of the semester.

F. ETCHING Health and Safety Protocols for the Spray Etching Machine and Acid Room.

1. **Intro to Jewelry metals students (3333) may NOT use etching room or etching materials.**
2. Protection: Always wear mandatory health and safety equipment, including: goggles/safety glasses, gloves, face shields, and apron.
3. When in doubt concerning proper usage of the spray etching liquid, ferric chloride, consult the Material Safety Data Sheets (MSDS) located in the soldering room 100B next to the ventilation switch.
4. Etching must ONLY be done during class under the supervision of a PI (instructor/graduate student). Students must be checked into and out of room by PI on duty.
5. Always make sure that the machine is unplugged while you are setting up the machine or moving the storyboard in and out of the machine. Never leave the storyboard stored in the machine - it must be totally rinsed with clean water, dried thoroughly and stored outside of the machine.
6. The machine should never be operated when the lid is not properly sealed. Failure to secure the lid will result in etching solution being sprayed all over the room, causing severe injury to anyone in the room.
7. The tank must be carefully wheeled to the sink so the storyboard can be removed and rinsed- as demonstrated in class. If you are not familiar with this procedure do not proceed without proper instruction!
8. Always maintain one clean hand and one dirty hand that can work with the etching solution. Failure to do this will result in etching solution being spread all over the etching room and beyond. Always rinse your hands before removing your etching gloves. Never proceed to the next step wearing gloves that are contaminated with etching solution. This is imperative for health and safety reasons.
9. When small spills occur, the etching solution (ferric chloride) can be neutralized with baking soda and cleaned up with paper towels and cold water. After putting on clean gloves, make sure that you wipe the soiled area multiple times in order to assure that the etching solution has been thoroughly removed. Be courteous to your fellow students by leaving a clean working area.
10. Failure to comply with any of these safety protocols will result in the immediate suspension of access for all students to the etching room and any processes that happen there.
11. When in doubt always consult with an Instructor on the proper use of the equipment. Failure to comply with these

procedures could result in grievous injury and destruction of University property, which will not be tolerated!

12. The etching room contains materials and equipment for electroforming and various types of anodizing. There are many hazardous chemicals stored in this room as well as equipment that can cause harm when improperly used. Do NOT use any equipment that you are not familiar with.

13. Chemical storage: There are numerous types of mild acids and chemicals that are not compatible. All containers and funnels must be thoroughly rinsed and dried prior before and after use. It is your responsibility that the chemicals that you use are returned to the original container, re-sealed, and that the container label identifying contents is readable and up-to-date.

14. Ventilation: During ANY type of chemical process work, the ventilation system in the Acid Room 100A must be turned on using the red switches to the immediate left on the inside of the Acid Room wall and the doors must be kept closed.

15. Horseplay: Due to the confined nature of the Acid Room and the potentially dangerous effects of improperly used chemicals, horseplay of any type is FORBIDDEN. Horseplay in this area could cause harm to yourself, your fellow students, and could also result in damage to University property.

16. Skin and eye irritation can occur when using mild acids located in this room. If acids come in contact with skin wash the area with soap and water. If acids come in contact with eyes rinse eyes in the eyewash station for 5 minutes. If irritation persists, seek medical attention.

G. ANODIZING

1. Anodizing is a potentially dangerous activity.
2. When anodizing goggles, rubber gloves and a rubber apron must be worn.
3. Individuals with pacemakers or other electrical implants should not enter the room while this process is being conducted and a notifying sign must be posted on the door.
4. Anodizing can only be done in class under the supervision of a PI (instructor/graduate student).
5. Lead is a hazardous material and you must not let lead come in contact skin or transfer to the mouth.
6. The lead sheet is cleaned under running water and should never be rubbed when dry.
7. The caustic soda (lye), nitric acid, sulfuric acid, dyes, and sealing salts should not come into contact with skin or eyes.
8. There is the potential for electrical shocks when anodizing.
9. The fumes should not be inhaled and anodizing should always carried out under a ventilation hood.
10. When anodizing processes are underway, ventilation must be turned on and door to room 100A must be kept closed until process is complete.

H. STEAM CLEANER

1. Only advanced level students are permitted to use this equipment.
2. The steam cleaner is a potentially dangerous piece of equipment because of the potential to cause severe burns.
3. Eye protection when using this piece of equipment is mandatory.
4. Always hold the work to be cleaned with rubber coated tongs.
5. Never open shuttlecock valves on the top or bottom of the machine. Opening these valves when under pressure will cause an extreme stream of steam and boiling liquid to flood the area around the machine potentially resulting in mild to serious burns.
6. Use only distilled water and de-scaling solution in machine.
7. The foot pedal should be held down when filling the machine with fluid. The machine cannot be filled when under pressure.

I. FLAMMABLES

1. The following chemicals and gasses are used in the studio lab on a routine basis. These materials when exposed to flame can catch fire. Extreme care should be exercised at all times when dealing with these gasses/chemicals.
2. Denatured alcohol and turpentine may only be used in or in the vicinity of the sinks in rooms 100, 100A, 100B, 102, and 103. Never pour alcohol or turpentine at the work or soldering stations. Never store alcohol lamps with alcohol in them, instead place the denatured alcohol container in the sink and using a funnel pour alcohol from the lamps back into the original container and place in flammables cabinet.
3. Flammable gasses (natural gas, acetylene) are located at the soldering stations. Never trap or contain gases in a hollow container or form. This could result in an explosion. Always utilize these gases through the control of torch handles, etc.
4. These gasses can be turned off using the red Emergency Off Switch, located on the east wall of 100B, soldering hall.
5. Storage locations of chemicals/gasses is as follows:
 - Denatured alcohol – must be stored in yellow flammables cabinet at all times.
 - Turpentine (paint thinner) – must be stored in yellow flammables cabinet at all times.
 - Natural gas – can only be used in conjunction with torch handles and tips during soldering procedures.
 - Acetylene – can only be used in conjunction with torch handles and tips during soldering procedures.
6. In the event of a fire mishap, use the fire extinguisher on object or people to put out flames. The emergency shower in rooms 100, 100A and 103 may also be used to extinguish flames on clothing, hair, etc.
7. The fire alarm pull boxes are located in Rooms 100, 102, and 103 and are shown during the safety orientation.

J. MECHANICAL OR PHYSICAL

1. When operating mechanical equipment or soldering safety glasses must be worn.

2. Long hair **MUST** be kept in a secure manner, away from moving parts of equipment so as not to get caught or snagged, causing injury.
3. All loose flowing clothing must be kept away from flames and mechanical equipment.
4. When working with airborne materials such as sprays, mists, or dust the studio lab ventilation systems and/or the proper respirator must be used. Students and faculty must participate in a respiratory safety class before respirators can be worn.

K. BUFFER

1. Buffer can only be used in class under the supervision of a PI (instructor/graduate student). The buffer is a potentially dangerous piece of equipment if not properly operated. Long hair will not be loose while using the buffer, hair must be held securely back from the work.
2. No long sleeves will be worn when operating the buffer.
3. Eye protection is mandatory.
4. No gloves can be worn while using the buffer.
5. Chains cannot be buffed.
6. The buffer vacuum system must be turned on when buffer is being used.
7. Buffer and surrounding area will be vacuumed with the ShopVac and thoroughly cleaned after use.
8. Greystar is the only buffing compound approved for use on buffer.

L. DRAW BENCH

1. The draw bench is a potentially dangerous piece of equipment if used improperly.
2. Eye protection is mandatory when using this piece of equipment because when the wire exits the draw plate, it could puncture the eye or skin.
3. The thin metal shavings produced during the drawing process are extremely sharp and can lacerate the skin or eyes.
4. Steel plates and tongs are heavy and could cause injury if dropped on a foot. Steel plates and tongs must be returned to their appropriate drawer after use in order to prevent injury for the next user.

M. ROLLING MILLS

1. The rolling mills are potentially dangerous pieces of equipment because it has the potential to crush or pinch fingers when used improperly.
2. Students should never force fingers into the rolling mill platens.
3. No steel or ferrous metals should be rolled through the rolling mills.
4. No wet materials of any kind are allowed in the rolling mills. Organic materials, etc. should be thoroughly dried prior to rolling. If in doubt concerning a rolling material, please consult the instructor.
5. Upon completion, rolling mill and surrounding area must be thoroughly vacuumed and clean of debris.

N. SANDBLASTER

1. The sandblaster is a potentially dangerous piece of equipment if used improperly.
2. Never operate the sandblaster with the lid open.
3. Always latch the lid firmly closed.
4. Do not manipulate the pressure of the sandblaster without the assistance of the PI (instructor/graduate student).
5. Upon completion, sandblaster and surrounding area must be thoroughly vacuumed and free of debris.

O. INTERPAC HYDRAULIC PRESS

1. The hydraulic press is a potentially dangerous piece of equipment if used improperly.
2. Eye protection when using this piece of equipment is mandatory. There is a potential for blowouts caused by the extreme pressure.
3. No foreign materials should be placed in the platens of the hydraulic press.
4. All materials should be dry when placed under the press to prevent slippage and rust.
5. The hydraulic press should never be red zoned. The hydraulic fluid could explode into the room.
6. Never exceed pressure of 10,000 psi.
7. Excessive repetitive motion can damage tendons and strain muscles. Sensible working practices are advised. It is also advisable to take breaks during use of the hydraulic press.

P. BAND SAW

1. The band saw can be a potentially dangerous piece of machinery if not handled correctly.
2. Safety glasses are mandatory.
3. Fingers must be kept away from the blade, outside the circle plate.
4. The blade guard **MUST** be engaged at a level appropriate for the material/s being cut. The guard should only be high enough to allow material to pass through.
5. Upon completion, saw and surrounding area must be thoroughly vacuumed and cleaned of debris.

Q. SANDER

1. The sander is a potentially dangerous piece of equipment if used improperly.
2. Long hair must be securely fastened away from the machinery.

3. Safety glasses are mandatory.
4. No long sleeves, or flowing clothes that could get caught in the moving parts of the machinery.
5. Do not operate the sander with your face on the same level as the belt, in case the work would fly off the belt.
6. Upon completion, sander and surrounding area must be thoroughly vacuumed and cleaned of debris.

R. DRILL PRESS

1. Drill presses can be potentially dangerous machinery if not handled correctly.
2. Safety glasses are mandatory.
3. Large drill press may only be used under the supervision of a PI (instructor/graduate student).
4. When using the large drill press, the work must be pinned with vises and c-clamps to the bed of the drill.
5. When using the large drill press, surrounding students must be warned prior to engaging drill. Be wary of kickback. Never try to stop a piece of material that has been snagged by the drill. Simply turn the machine off and stand back until rotation ceases.
6. Upon completion, drill press and surrounding area must be thoroughly vacuumed and free of debris.

S. METAL SHEARS

1. Keep hands and foreign materials away from the table.
2. Only cut sheet brass, copper, or sliver. No tubing, wire, or steel.
3. Never force sheet metal shears; it could potentially ruin a very expensive piece of equipment.
4. Be mindful of the location of your fingers when using the shears.
5. On large shear, never cut anything smaller than 3", instead use the smaller tabletop shear. On the tabletop shear, never cut anything smaller than 2".
6. Do not jump on or force either shear.
7. Upon completion, shear and surrounding area must be thoroughly cleaned and free of debris and metal slivers. Scraps will be placed in appropriate drawers/boxes.

T. FLEX-SHAFTS

1. The flex-shafts are potentially dangerous pieces of equipment if used improperly.
1. Long hair, loose clothing and jewelry must be pulled back and secured.
2. Eye glasses are mandatory when using this equipment.
3. When working with the flex-shaft as a drill, you must have your piece on top of a piece of scrap wood, so that you do not drill into the table. NEVER drill directly into the table.
4. Always use a lubricant (BurLife) when using flex shafts as a drill in order to help prevent drill bit breakage/snapping.
5. If grinding woods or other materials, respiratory masks are mandatory in order to protect yourself from upper respiratory infections. However, if using a respirator, you must attend a respirator safety class and wear a TTU approved respirator. Exotic woods such as purple heart, paduch, ebony, etc. harbor microorganisms that can cause severe upper respiratory infections. These woods are not allowed in the jewelry metals studio for obvious reasons. These woods may be worked with the proper safety gear and under supervision in the wood shop and assembled in the jewelry metals studio lab.
6. Clean up the area after using the flex shafts. Tables, floors, and flex shaft machinery must be vacuumed free of all debris. Big Sister is watching.

U. OUTSIDE FACILITIES

1. Students are responsible for cleaning up after themselves when using the outside facilities.
2. No tobacco products are allowed in the outside facilities – this is still a classroom of the Texas Tech campus.
3. There are two trashcans on the outside pad and students are expected to use them. Students must also return any chairs on the pad to their appropriate positions. Wooden chairs are to be stored at an angle, to prevent water from being collected and warping their surfaces.
4. If students make a mess on the picnic tables outside, they are expected to wash the tables and clean them up.

V. TOBACCO POLICY

There are no tobacco products allowed within the walls of the 3-D art annex, and smoking can only be done 20 feet from the front door. Everyone must dispose of his or her cigarette butts in a butt receptacle, or in a trashcan. Grounds maintenance is using video devices to catch people violating this policy. Fines will be assessed and put towards the grounds maintenance budget.

W. GENERAL CHEMICALS

1. All chemical substances are potentially hazardous. **Read and keep all safety instructions on any chemical you use or bring into the studio to use.** Always use them in compliance with the manufacturer's instructions.
2. **Small spills** can generally be handled in house with a spill containment kit. Spill containment kits are clearly marked and are in rooms 100, 100A, 100B, 102 and 103. Spills should be handled in the following manner if at all possible:
 - a. Contain
 - b. Capture
 - c. Clean and neutralize

In the event of a **large spill**, if possible, *first call the PI* (instructor/graduate student). If the PI (instructor/graduate student)

is unavailable or it is determined that the spill is beyond in house cleaning capabilities and poses a significant risk, call TTU Environmental Health & Safety at **(806) 742-3876** (during regular business hours) or **(806) 742-3328** (after hours).

3. ALL chemicals must be clearly labeled with:

- a. Student name
- b. Name of the substance
- c. Date
- d. Semester, Course number and section

Failure to properly label chemicals could result in the School of Art being assessed a \$250.00 fee.

4. Resin has the potential to destroy the working surfaces of the studio, which is HIGHLY inconsiderate. This takes hours to clean up (floors, sinks, tables, etc.) and is also highly flammable. Anyone caught not cleaning up after their resin will be expected to scrap up the mess and will be banned from further use of resin in the jewelry labs.

5. Spray paint is NOT ALLOWED in the Jewelry Design and Metalsmithing area except within the outdoor spray booth. This includes the outside and surrounding areas of the building, sidewalks, tables, etc. Anyone caught using spray paint outside the spray booth can be expelled from his or her jewelry class.

6. When using the spray booth, it is mandatory to cover the interior of the booth with brown paper so as to prevent buildup of over-spray.

7. Fluxes: there are only 4 fluxes allowed in the studio:

Boric Acid (mixed 50/50 with denatured alcohol) this material may only be mixed in the soldering room, 100B. The mixing of this material MUST happen on the northwest sink, away from flames. Never mix boric acid in the presence of flame as this can trigger a fire event.

Superior Flux (mixed 50/50 with distilled water) this material may only be mixed in the soldering room, 100B.

Handy Flux (mixed with distilled water until the consistency of whole milk) this material may only be mixed in the soldering room, 100B.

Battern's Self-Pickling Flux (for gold only, not to be mixed with any other material)

All 4 fluxes can cause irritation if in contact with skin/eyes. If contact occurs, wash the skin with soap and water. If eye contact occurs, rinse eyes for 5 minutes in eyewash station. Never breathe fumes from flux materials. If irritation persists, seek medical help.

X. PATINAS

1. All commercial patinas must be used in compliance with manufacturer's Health and Safety directions. Generally, rubber gloves are required while applying patina. Patinas must be applied in well-ventilated area, such as backdraft vent on the south wall of either the acid etching room (100A) or the advanced room (room 103).

2. The following patinas are the only patinas approved for studio use. Any other patina must specifically be approved by PI (instructor/graduate student) for use in the studio.

Liver of sulfur

Black Max

Red/Brown patina (Rio Grande)

Black/Brown patina (Rio Grande)

Turquoise patina (Rio Grande)

Rock salt

Ammonia (household cleaner strength)

Copper carbonate (non-scientific grade)

3. Disposal of these chemicals must comply with manufacturer's MSDS (Material Safety Data Sheets). In the event of large spills, use the emergency spill kit.

Y. WAX WORK

1. Prior to beginning work, cover work area with brown craft paper. When working with wax for casting, all wax shavings must be cleaned up – including from the floor. If students leave wax on the floor, especially brown soft microcrystalline wax, it sticks and forms lumps. Students will be expected to take scrapers or razor blades to properly clean the mess.

2. If using a glass alcohol lamp during waxwork, fill lamp with denatured alcohol in the sink in Room 100 to contain spills.

3. Prior to replacing alcohol lamp back in cabinet after use, pour denatured alcohol out of the lamp and back into the denatured alcohol canister (stored in the flammable cabinet next to the hallway door in Room 100) using a funnel. Alcohol lamps CANNOT be stored in the cabinets or lockers while still full of denatured alcohol as this poses a fire risk.

4. Do not light alcohol lamps with the soldering torches.

5. Use caution when using sharp wax tools. Always carve away from your body.

6. When preparing wax for placement in investment flask, be sure to leave room from the highest point of the wax original for a mandatory ¼" (or greater) layer of investment to avoid blowouts during the casting process. **Blowouts pose the most risk to students and instructor associated with the casting process.**

Z. INVESTMENT

1. Investment, used in casting, should be handled with care.

2. Investment will only be mixed during class, in the presence of the PI (Instructor/graduate student), in room 103, in front of the backdraft vent located on the southeast corner next to the sink.

3. Cover ALL countertop space with at least 2 layers of brown craft paper prior to beginning work.

4. Students must wear eye protection and rubber gloves while mixing investment to prevent irritation. In the event that investment comes in contact with skin, wash it with soap and water. If investment comes in contact your eyes, rinse them for five minutes at the eyewash station. If irritation continues, seek medical help.
5. When mixing investment, material should never become airborne. Working slowly and deliberately is essential when handling this material.
6. Ventilation system must always be on when mixing investment.
7. Ransom & Randolph Ultravest BANDUST is the only investment material that can be used in the studio.
8. Meticulously clean up the area after you mix the investment utilizing a wet sponge with at least 3 rinses. Wiping area once will NOT be sufficient to clean all investment residue from surfaces. Failure to clean investment properly could result in contamination issues.
9. Dispose of leftover investment in brown craft paper, taking care not to spill any on the floor. Wrap all investment and paper up and throw into the trash.
10. Messes will NOT be tolerated – remember, “Big Sister” is watching. Any students failing to follow this protocol will lose their casting privileges and/or have their access to the jewelry lab suspended for no less than two weeks (or longer).

AA. CASTING AREA

1. The centrifugal casting unit is a potentially dangerous piece of equipment if used improperly.
2. Students can **only** cast during class time when a PI or Instructor is present. No exceptions.
3. Tinted glasses must be worn when casting.
4. Long hair or loose fitting clothing have the potential to catch fire or become caught in the casting unit and must be properly restrained in order to prevent injury. Gauze, lace, or other fine fabric garments should not be worn during casting process, long sleeve cotton shirts and aprons are encouraged.
5. Only gold (multiple karats), silver (fine, sterling, or Argentium), and ancient bronze can be cast. NO other materials are allowed due to contamination issues. When blowing organic materials out of flasks wear safety goggles and protect those around you.
6. In the event of emergencies, shut off the gas using the Emergency Gas Shut Off switch on the east wall of Room 100B.
7. Casting flame must be appropriate to material. Overheating metal, crucibles, or other casting unit components will not be tolerated. Overheating poses an extreme danger to the student casting and other students in the area.
8. Mandatory ¼” (or greater) layer of investment must above the highest point of the wax original.

BB. COMPRESSED GASES

1. Torches at the soldering station must be turned off at the end of each period of use in order to avoid an explosive fire hazard.
2. The **red Emergency Off switch** is located on the east wall of the soldering hall, room 100B. When this button is depressed it turns off the flow of gas to all stations. Remember, it takes a short time for the gas remaining in the lines to burn off. Leave button depressed and do not lift until hazard subsides. If there is ever a problem with gas or fire in the soldering hall push this button in to minimize the damage.
3. The **Emergency Off** switch must be pushed in to turn off the flow of gas at the end of every day. If you are the last person in the studio, push this button. No exceptions – “Big Sister” is watching.
4. PI’s and graduate students must understand that when not properly used the compressed tanks are potentially deadly. They can act as projectiles and can explode if they are mishandled. They should never be removed from the cage and should be treated with the utmost respect. If a graduate student is not 100% confident, they should NEVER attempt to change the tanks. This activity is reserved for the most experienced and approved graduate students.
5. Undergraduates and graduates should not adjust the regulation system at any point in the torch system. This also applies to the ventilation system. These systems are very carefully checked and monitored and should never be manipulated.
6. **At no time should an undergraduate student touch the outside tank system.** If there is any issue with the gas, report it to an PI, instructor, a lab technician, or Mark Bond. Anyone caught tampering with the valves or gates on tanks immediately, and without exception, is expelled from class. This is highly dangerous and there is no excuse for anyone to risk tampering with this equipment.

CC. SOLDERING

1. Soldering is a potentially dangerous activity if done improperly.
1. Wear safety glasses when soldering.
2. Avoid breathing fumes and solder with the ventilation system on.
3. Operate the torch in a responsible manner so as not to burn yourself or others and keep flammable materials away from the soldering area.
4. After you have finished soldering turn off all gas and bleed the gas remaining in the hoses. This also ensures that no gas will leak or bypass the shutoff valve. If gas escape continues, seek the help of a PI (instructor/graduate student) immediately.
5. Clean up the area after soldering utilizing a wet sponge with at least 3 rinses. Wiping area once will NOT be sufficient to clean all residue from surfaces. Failure to clean properly could result in contamination issues.
6. Return all torch tips, pumice pans, strikers, bricks, etc. to the appropriate drawer. Turn off all torches and dimmer lights. Failure to comply with all cleaning protocols will result in suspension or expulsion from the studio lab.

DD. KILNS

1. Working with a burn out kiln is a potentially dangerous activity if used improperly.
2. When in use, kilns are extremely hot and can cause severe burns.
3. When blowing organic materials out of flasks, be sure to wear safety goggles and protect those around you.
4. Whenever the kilns are in use, the casting ventilation system must be on.
5. There must be a safeguard buddy system in place. Kilns can never be left unmonitored for more than 24 hours. If you cannot cast at your appointed time, there must be a buddy who will take your place. That individual must have access to your metal and understands what needs to be done. Remember, casting can only be done in class under the supervision of a PI (instructor/graduate student).
6. Enamel kilns can NEVER be left unattended. A pyrometer could fail and the kiln could overheat and trigger a major fire event. Never operate a kiln without knowing what temperature at which it is operating. Overheating a kiln can significantly shorten the life of a kiln and its components.
7. Experimental kilns in outdoor work area can also never be left unattended.

EE. PITCH

1. Pitch is a potentially dangerous material capable of inflicting serious burns if not handled properly. If pitch is contained in an enclosed space and heated it has the potential to explode, possibly causing severe burns to yourself and myself.

Mandatory safety precautions when using pitch:

- a. The area must be free of other students, several layers of brown craft paper must be layered in work area, and extreme caution taken when using the pitch. Upon completion, craft paper must be discarded and work area must be thoroughly cleaned.
- b. The heat gun is the ONLY method acceptable for heating pitch to temperature. Heating pitch with torches is expressly forbidden.
- c. Eye Protection must be worn
- d. Face Shield must be worn
- e. Cotton Gloves must be worn
- f. Long Sleeve Shirt and Apron must be worn

FF. GRADUATE STUDIO

1. There is to be no entrance into the graduate studios without specific permission or invitation.
2. No food, drink, or medicines are to be stored or kept in the graduate lab's public spaces, by the order of the Environmental Health and Safety department.
3. Graduate students are required to maintain MSDS on any chemical or material they bring into the studio. Graduate students will be provided with an MSDS folder to store these sheets. MSDS must be kept in a generally accessible area adjacent to the student's bench in the studio lab.
4. Only Metals graduates are allowed to use the equipment and computers stored in the graduate studios.
5. The office of the department head is also restricted – no undergraduates are to use the computer or equipment within this office.
6. Furnishings may not be moved or manipulated due to Fire Marshal regulations.

GG. SPAREX

1. The pickling acid "Sparex" is a potentially dangerous acid if not properly used. **Beginners are NEVER allowed to mix Sparex.**
2. If there are any health and safety concerns about Sparex acid, you may consult the MSDS (materials safety data sheets) located in the soldering room under the ventilation switch.
3. Begin the process with wearing the proper health and safety equipment. Safety glasses and gloves are mandatory safety equipment.
4. Make sure there is an adequate supply of baking soda available to neutralize the acid if there are spills, drips or mishaps.
5. Acid drips on clothes can be neutralized with a liberal amount of baking soda allowed to dry and then brushed free from clothing. This procedure will prevent small holes from appearing in your freshly laundered clothing.
6. Begin the disposal process by placing a red rubber bucket in the chemically resistant sink. Turn cold water on and carefully pour the Sparex acid from the crockpot into the bucket. Make sure you don't over spill or get the liquid anywhere other than inside the sink and bucket. This is paramount in the proper transfer of the acid to the bucket. The acid may be hot so it is important to be extremely careful! Place a large quantity of paper towels on the cabinet counter top and then set the bucket on the paper towels and wipe all the excess liquid away from the bottom edge of the bucket.
7. You're now ready to proceed to the blue safety container on your left marked "danger acid". The blue safety container is rimmed by a yellow safety enclosure. Do not step on this enclosure. Remove the screw cap from the safety container. Place the large blue funnel into the safety container and carefully pour the bucket contents into the blue safety container. Use the pouring spout on the side of the bucket to allow proper pouring. Please remember that the blue safety container has a rim, but this rim does not contain the liquid. There are two holes on either side of the barrel that allows the acid to drip down the side. Do not assume that this rim will hold back the acid.
8. It is essential to take your time and allow the liquid to slowly pour out of the bucket into the container slowly, avoiding any spills or drips. Do not overwhelm the funnel by pouring liquid too quickly. If drips or spills occur, immediately neutralize the spill with baking soda powder. There will be a visual and audible chemical reaction when the baking soda comes in contact with the acid. This is nothing to worry about as it confirms that the acid is being neutralized. Wipe up the

neutralized acid with a cellulose sponge and rinse it in the sink.

9. Replace the screw top on the container and clean up any drips or spills that are on or around the blue safety container. Proceed to the sink and rinse the bucket thoroughly with a small amount of baking soda and cold water. Turn the bucket upside down and allow it to dry.

10. Failure to comply with these health and safety requirements will result in a grade reduction and possible expulsion from the studio.

11. Mixing fresh Sparex: maintaining your health and safety equipment, mix one package of Sparex with approximately 2 gallons of warm water and follow the instructions on the package of the Sparex acid. If the Sparex reaches a boil, a thick brown liquid that resembles jelly will form on the top of the crockpot. This can be removed by skimming off the top with a paper towel and discarding it in a Ziploc bag and throwing it in the trash. During this procedure, make sure to be extremely cautious because the pickle is generally hot and can result in burns. Removal of this brown scum will not affect how the acid works.

12. If you have any concerns or questions immediately seek help from a graduate student or one of the professors. Graduate students are the primary individuals who take care of the pickle disposal and mixing. Graduate students are the individuals that first need to be contacted about the pickle that has been contaminated or is no longer working.

HH. TUMBLER PROTOCOL

1. When using the tumblers, the student is responsible for cleaning them after use.
2. The student should always run a tumbler inside of a plastic safety tray.
3. If a tumbler pops open and spills shot and liquid, the student who is using it is responsible for cleaning it up.
4. There is, under no circumstances, to be any transfer of tumbler shot. The shot in the tumblers has been weighed for safety and longevity of the equipment.
5. If the tumbler soap supply runs short immediately notify the instructor or lab technician. Do not run a tumbler without soap.
6. When the motor is not running, the tumbler barrel must be stored outside of the roller tracks – leaving the barrel resting on the tracks can damage the equipment.
7. If you encounter any problems with a tumbler, stop use immediately and report the problem to your instructor.

II. MILLING MACHINE/METAL LATHE

1. Only advanced level students are permitted to use this equipment during class and while under the supervision of a PI (instructor/graduate student).
2. The milling machine and the metal lathe are potentially dangerous pieces of equipment if used improperly.
3. Eye protection when using this equipment is mandatory.
4. There is the potential for severe cuts when using this equipment.
5. Students are required to familiarize themselves with the instructional manuals before using either of these tools.
6. It is essential that the student keep track of all small components using in operating the lathe. Keep all materials together in accompanying toolboxes.

JJ. VULCANIZER

1. Only advanced level students are permitted to use this equipment during class and while under the supervision of a PI (instructor/graduate student).
2. The vulcanizer is a potentially dangerous piece of equipment if used improperly.
3. This unit produces high heat and could cause serious burns if used improperly.
4. Students are encouraged to wear cotton gloves while using this equipment.
5. Rubber molds are cut using a surgical scalpel, this tool is twice as sharp as an X-acto blade and extreme caution must be used while cutting molds. The vulcanizing equipment can never be left unattended and must be shut off at the end of its use.
6. After use, the area surrounding the vulcanizer must be thoroughly vacuumed and cleaned and all equipment put away. The student is responsible for waiting until the unit is cool in order to put it away.

KK. WAX INJECTOR

1. Only advanced level students are permitted to use this equipment during class and while under the supervision of a PI (instructor/graduate student).
2. The wax injector is a potentially dangerous piece of equipment.
3. Eye protection is mandatory when using this piece of equipment because the contents are hot and under pressure, which could result in serious eye injury.
4. This unit produces high heat and could cause serious burns if used improperly.
5. The wax is hot and under pressure and the student can cause serious injury if they exceed 4 lbs. PSI when using this equipment.

LL. WHEEL POLICY

No bicycles, rollerblades, skates, or any other wheeled leisure equipment is allowed within the 3-D art annex. Bikes, scooters, etc. also cannot be stored or housed in any manner within the walls of the building.

MM. DAMAGED EQUIPMENT

1. If a student damages or breaks a tool or piece of equipment, they must immediately report it to the instructor. This is imperative for the safety and stability of the lab.
2. Mistakes are obviously understood, but persistent negligence will be met with severe consequences.
3. Failure to report damaged equipment greatly increases the likelihood of injuries due to damaged equipment. Individuals who do not report damages bear the responsibility for injury.
4. In the event of damaged equipment, it is mandatory that the student or PI (instructor/graduate student) put a sign on the broken equipment indicating the malfunction.

NN. LOCKER POLICY

Any locker abandoned for more than two semesters will have its lock cut and the contents will be discarded. You may not use a locker if you are not concurrently enrolled in a metals class. We are not a storehouse for your materials. Over one hundred students per year use this room and we cannot afford to tie up lockers. Lockers will be cleaned out once a year by the Graduate Lab technicians.

OO. VIDEO SURVEILLANCE (“BIG SISTER”)

1. The Jewelry/Metals labs are under video surveillance in order to protect yourself and your fellow students. If you are caught misusing equipment or not cleaning up after yourself your actions will be documented on videotape and you will be held responsible. Practice the following procedures:

- a. At all times while in studio lab, especially while soldering, protect your eyes from heat and flying debris by wearing safety glasses.
- b. Utilize the proper ventilation systems and/or respirators as necessary. (TTU approved respirators may only be used after student undergoes respirator training course.)
- c. Do not let any chemical touch your skin, eyes, or clothing – wear the appropriate safety gear.
- d. Materials not allowed in the studio: lead, spray paint, wood dust, Napa, and any new substance not found in the studio that has not been cleared by the PI (instructor/graduate student).