

The Arts & Humanities Printmaking Studio

Ernest G. Welch School of Art & Design
College of the Arts
Georgia State University

Safety Handbook

All students, faculty and visitors are required to have read, be aware of, and abide by the rules and regulations contained herein.

CONTENTS

PURPOSE FOR THIS GUIDE

EMERGENCY PROCEDURES

RESPONSIBILITY FOR SAFETY

Faculty

Artist

SECURITY

Campus Police/Escort Service

ACCESS TO THE PRINTMAKING DEPARTMENT

Card Access

Hours

Studio Use

Safety in Numbers

Front Door

Combination

Access for those not enrolled in classes

STUDIO ETIQUETTE

Smoking

Food & Beverages

Shows & Grants

Space Allocation

Supplies, Materials & Maintenance

Materials for Student Projects

PERSONAL PROTECTIVE EQUIPMENT

Glove Selection & Use

Respiratory Protection

Eye Protection

Protective Clothing

EXPLANATION OF MATERIAL

SAFETY DATA SHEET

CHEMICAL EXPOSURE

Chemicals on Skin

Chemicals on Eyes

Chemical Inhalation

Accidental Injection of Chemical

SPILL WORK PRACTICES

WASTE DISPOSAL

HANDELING HAZARDOUS WASTE

PARTICULARLY HAZARDOUS SUBSTANCES

Where to find Toxicity Information

ACID SAFETY GUIDELINES

List of Acids and their Uses and Dangers

Acid Hazards and Precautions

USING OIL BASED INKS AND SOLVENTS

VENTILATION: PROCEDURES TO REDUCE TOXIC VAPORS

INTAGLIO AND RELIEF

LITHOGRAPHY

SCREENPRINTING

LETTERPRESS

DARKROOM

RELIEF, MONOTYPE AND OTHER PRINTING PROCESSES

PRINTMAKING STUDIO ROOM 454

- LIST OF SAFETY RULES

CLEAN-UP

Mandatory Clean Up Day

BANNED SUBSTANCES

Illegal Drugs

Alcohol

Certain Chemicals and Materials

STUDIO/UNIVERSITY POLICY

PURPOSE FOR THIS GUIDE

This manual contains printmaking procedures and appropriate safety precautions for all areas of the Printmaking Department (School of Art and Design, Art and Humanities Building, rooms 454 & 453). Though you may be taking classes in a studio/shop in one area of the building, be mindful of appropriate behavior and precautions for the entire Printmaking Department, as you may be exposed to any materials being used by others as well.

EMERGENCY PROCEDURES

EMERGENCY PROCEDURES:

FOR ANY LIFE THREATENING EMERGENCY () – SEEK TREATMENT IMMEDIATELY**

()LIFE THREATENING*EMERGENCY*** Could possibly include, but not limited to: portable damage to major blood vessels or nerves, profuse bleeding that cannot be stopped, amputated body part, broken bone, cut to bone, eye injury, head trauma and/or automobile accident.

IN CASE OF SERIOUS ACCIDENT or SECURITY EMERGENCY:

- Call GSU Public Safety at **404-413-3333** then call **911** for Atlanta City Police or paramedic.
- Immediately notify instructor (room 454, shop tech, or art office (room 117)).

NON-EMERGENCY PROCEDURES

Situations that do not require emergency or immediate attention should be reported to the Area Coordinator.

Students who are injured at Georgia State University:

Students should go directly to the Student Health Center located in the University Commons at 141 Piedmont Avenue, Suite D. **WHAT ABOUT AFTER HOURS – TALK WITH THE HEALTH CENTER AND SEE WHAT THEY RECOMMEND FOR STUDENTS AFTER HOURS**

Faculty & Staff who are injured while working for Georgia State University:

Injured employees, and their supervisors, must follow the current Workers' Compensation Protocols if they wish the Workers' Compensation Insurance to cover their medical expenses for their injury.

RESPONSIBILITY FOR SAFETY

FACULTY

Faculty are responsible for ensuring that students attend training and work safely and:

1. Ensure artists understand the potential health and physical hazards of the chemicals and equipment used;
2. Explain proper and safe procedures for handling, under all circumstances, the hazardous substances used;
3. Provide appropriate equipment to allow laboratory workers to work safely

ARTISTS

Each student, faculty and staff member is expected to attend training and:

1. Follow procedures and practices outlined in this training guide
2. Report all accidents, near misses, and potential chemical exposures to the area coordinator

SECURITY – GSU CAMPUS POLICE: 404-413-2100

CAMPUS POLICE

- Call the police if there is any strange activity or disturbance. Call 404-413-2100 or 3-2100
- Escort service is also available from the Arts & Humanities Building to any Atlanta GSU Building, parked cars, and public transportation. **After hours campus security safety escorts are available by calling 404-413-2100**
- Studio doors should be kept locked at all times.
- After shutting, check to see if the doors are truly locked.

*****When working in the studio after hours, students are encouraged to notify the campus police and to utilize the escort service.**

ACCESS TO THE PRINTMAKING DEPARTMENT

CARD ACCESS

All students who are registered for printmaking classes are given clearance for 24 hr. Panther Card access to the front door of the Art and Humanities Building. If your card does not work two weeks after turning in your After Hours Pass to your course instructor, go to the **Campus Safety Office, 15 Edgewood Avenue**, to activate the card. Have your After Hours Pass with signatures from your course instructor and School Director with you. Sometimes it is necessary to go back several times.

HOURS

The Art and Humanities Building is normally open M-F from 7:30 AM to 7:30 PM during the regular school year. (Summer hours are limited and are for students enrolled in

summer printmaking classes only.)

STUDIO USE

Students are permitted and often required to work outside of class in the printmaking Studios. Note the posted schedule of printmaking classes. You may not work independently in a shop while another class is being held unless you ask the permission of the instructor conducting the class beforehand. **After hours campus security safety escorts are available by calling 404-413-2100**

SAFETY IN NUMBERS

The Art and Humanities Building does not have a guard. It is recommended that you always work with a partner when working outside of scheduled class hours for both personal safety and in case of an accident.

FRONT DOOR

Do not compromise the security of yourself and others in the Art and Humanities Building or the Printmaking Studios (Room 454, 453): Do not leave the front door propped open at any time, either for friends, for a quick trip to the store, or because your card does not work!

COMBINATIONS

Push button combinations to the doors to the printmaking studio are given out to students of the relevant classes by instructors. Do not give out these combinations to anyone except printmaking classmates.

ACCESS FOR THOSE NOT ENROLLED IN CLASSES

Students currently not enrolled in classes who wish to use the printmaking facilities may do so only with the permission of the Printmaking Area Manager. Prior experience with a printmaking class is normally a prerequisite.

STUDIO ETIQUETTE

SMOKING

NO SMOKING AT ANY TIME. Smoking is NOT ALLOWED ANYWHERE IN THE STUDIO, OR WITHIN 25 FEET OF ANY GSU BUILDING.

FOOD AND BEVERAGES

No Food or beverages are allowed in the Printmaking studio

SHOWS & GRANTS

Students are encouraged to post and note shows, as well as, grant opportunities on the bulletin boards between the Arts & Humanities Elevators.

SPACE ALLOCATION

GRADUATE STUDENTS will be assigned space in the graduate room. These **spaces are determined by the faculty and are non-negotiable**. Graduate students will be offered space for **three** contiguous years only. After that time if the student is still in the program, he/she will be required to vacate that space and must provide their own workspace off campus.

The graduate space is reserved for graduate students only. No other students are permitted entry into this space.

SUPPLIES, MATERIALS & MAINTENANCE

Every Printmaking course has an associated fee that provides for purchase of common supplies and studio maintenance. Course fees are paid along with tuition and fee amounts are available in the course catalog. While these fees are sufficient to support most student work in the studio, certain projects may require the student to purchase additional supplies at their own expense. "Excessive use" of common studio supplies and resources is determined by the faculty.

MATERIALS FOR STUDENT PROJECTS

Aside from certain projects in beginning courses, students must supply their own materials for projects. In many cases the department has access to or can help find materials.

Do not use any materials found in the studio or classrooms without permission of the owner or an instructor.

If you did not pay for a particular material or bring it in yourself, then it belongs to Someone Else! **DO NOT USE IT.**

PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) is special gear used to protect the wearer from specific hazards of a hazardous substance. It is a last resort protection system, to be used when substitution or engineering controls are not feasible. It should be understood that PPE does not reduce or eliminate the hazard. It only protects the wearer and does nothing for anybody else in the area or for any equipment exposed to the chemical.

PPE includes gloves, respiratory protection, eye protection, and protective clothing. The need for PPE is dependent upon the type of operations and the nature and quantity of the materials in use, and must be assessed on a case by case basis. Workers who rely on PPE must understand the function, proper use, and limitations of the PPE used.

GLOVE SELECTION AND USE

Gloves should be worn whenever the possibility of skin contact with hazardous

chemicals exists. Every glove is permeable to a chemical. The permeability varies with the chemical being used, the length of time of the exposure and the thickness of the glove. General use gloves, such as the latex surgical gloves, are appropriate when using small amounts of most chemicals for short periods of time. These gloves should be changed whenever they become contaminated with the chemical. Otherwise, the glove that offers the best resistance to the chemical should be used. The following guidelines should be used to determine the appropriate glove.

1. Review the Material Safety Data Sheet (MSDS) for the chemical of interest.
2. Determine the potential consequences of skin contact by the chemical.
3. Determine the exposure period and characteristic of the potential contact. That is, are you choosing gloves to protect you from an occasional splash or spill or are you planning to wear the gloves while you immerse your entire hand and arm in a container of material.
4. Determine which gloves or glove materials offer the best resistance to the chemical. This information may be found in the Personal Protective Equipment section of the MSDS, glove vendor information or the Chemical Protective Clothing database available through Georgia State.
5. Establish the dexterity and sizing requirements.
6. Determine physical resistance properties required of the glove. That is, resistance to heat, cutting, punctures, etc.
7. Other considerations - color, cuffs, length of glove, use of liners.
8. Establish a decontamination procedure. Be sure to check for pinholes before use, wash or decontaminate gloves before removing, and wash hands after removing.

In addition to protecting hands and skin from chemical exposures, there are many gloves which offer protection from physical hazards, such as high or low temperatures, electrical shock, skin abrasions, vibration or sharp objects. Always match the glove to the hazard.

RESPIRATORY PROTECTION

A respirator may only be used when engineering controls, such as general ventilation or a fume hood, are not feasible or do not reduce the exposure of a chemical to acceptable levels. The use of a respirator is subject to prior review by Georgia State Research and Health Safety Officer at 404- 413- 3510, according to university policy, since their use is regulated by the OSHA respiratory protection standard.

Any worker who believes that respiratory protection is needed must notify Georgia State for evaluation of the hazard and enrollment in the Respiratory Protection Program. This program involves procedures for respirator selection, medical assessment of employee health, employee training, proper fitting, respirator inspection, maintenance, and record keeping.

EYE PROTECTION

Safety glasses should be worn for protection from impact of particles. Standard eyeglasses fitted with side shields are generally not sufficient. Workers who are interested in prescription safety glasses should contact Georgia State Environmental Programs Advisory Committee at (404) 413-3500. Goggles should be worn when a potential splash from a hazardous material exists. They may be worn over prescription glasses. Face shields are in order when working with large volumes of hazardous materials, either for protection from splash to the eye or flying particles. Face shields may be used in conjunction with goggles for maximum protection from corrosives and hot chemicals. Contact lenses do not offer any protection from chemical contact.

PROTECTIVE CLOTHING

When the possibility of chemical contamination exists, protective clothing, which resists physical and chemical hazards, should be worn over street clothes. Smocks are appropriate for minor chemical splashes and spills, while plastic or rubber aprons are best for protection from corrosive or irritating liquids.

Loose clothing (such as overlarge smocks or ties), skimpy clothing (such as shorts), torn clothing and unrestrained hair may pose a hazard. Perforated shoes, sandals, or cloth sneakers should not be worn in chemical use areas or where mechanical work is being performed.

EXPLANATION OF MATERIAL SAFETY DATA SHEET

Per the OSHA Hazard Communication Standard, School of Art and Design is required to ensure that material safety data sheets are readily available for all chemicals used in the department. Material Safety Data Sheets (MSDSs) are available upon request. Individuals who bring in materials from outside must keep MSDSs on hand. New materials must be approved for use and storage by the Department Manager or Technical Manager and MSDSs must be included in the MSDS binder.

Following is an explanation which is provided to help you interpret the information found on manufacturers' MSDSs. While the format of these data sheets varies from manufacturer to manufacturer, certain components appear on each sheet.

SPILL WORK PRACTICES

In the event of a chemical spill, the individual(s) who caused the spill is responsible for prompt and proper clean-up. It is also their responsibility to have spill control equipment appropriate for the chemicals being handled readily available. There should be a sufficient quantity of absorbents or other types of materials to control any spill that can be reasonably anticipated. Vermiculite, lined 5-gallon pails and limited spill control materials are available throughout the building.

CHEMICAL EXPOSURE

The following procedures should be followed in the event of chemical exposure. In all cases, the incident should be reported to the area coordinator, regardless of severity.

CHEMICALS ON SKIN

1. Immediately flush with water for no less than fifteen minutes. Remove any jewelry or clothing that have become contaminated to facilitate removal of any residual material. For pullover shirts and sweaters, it may be beneficial to cut garments off to prevent contamination of eyes.
2. If immediate medical attention is needed, call Public Safety at 404-413-3333 for an ambulance or transportation to Hospital.
3. Explain carefully what chemicals were involved.
4. Review the MSDS to determine if any delayed effects should be expected.

CHEMICALS IN EYES

1. Flush eye(s) with water for at least fifteen minutes. The eyes must be forcibly held open to wash, and the eyeballs must be rotated so all surface area is rinsed. The use of an eye wash fountain is desirable so hands are free to hold the eyes open.
2. Remove contact lenses while rinsing. Do not attempt to rinse and reinsert contact lenses.
3. Seek medical attention regardless of the severity or apparent lack of severity. Contact GSU Police at 404-413-3333. Explain carefully what chemicals were involved.
4. Review the MSDS to determine if any delayed effects are expected.

CHEMICAL INHALATION

1. Close containers, open windows or otherwise increase ventilation, and move to fresh air.

2. If symptoms, such as headaches, nose or throat irritation, dizziness, or drowsiness persist, seek medical attention by calling GSU Police at 404-413-3333. Explain carefully what chemicals were involved.
3. Review the MSDS to determine what health effects are expected, including delayed effects.

ACCIDENTAL INJECTION OF CHEMICAL

1. Immediately contact the Poison Control Center at 800-962-1253 for instructions.
2. Do not induce vomiting unless directed to do so by a health care provider. Explain carefully what chemicals were involved.
3. Review the MSDS to determine what health effects are expected, including delayed effects.

WASTE DISPOSAL

HAZARDOUS CHEMICAL WASTE PICK-UP PROCEDURES

The following procedure refers to hazardous chemical waste only (not biological/medical waste).

Keep your hazardous waste containers clean, in good condition, and make sure they are securely closed at all times.

1. Store your hazardous waste containers in secondary containment such as trays to minimize opportunities for a spill.
2. Make sure your hazardous waste containers are labeled with a yellow hazardous waste sticker that details the contents using full chemical names (no abbreviations) and percentages, or using a GSU waste stream name.
3. When your hazardous waste containers are full, create a Pickup Worksheet at <https://chematix.gsu.edu/Chematix/> and submit your request through Chematix. You may also e-mail eprograms@gsu.edu
4. If you require replacement supplies indicate this on your online Environmental Work Request.
5. If you require supplies at any time, without a waste pick-up e-mail eprograms@gsu.edu
6. A list of supplies is available for review online at http://www.gsu.edu/research/lab_safety_supplies.html
7. Allow 72 hours for the waste pick-up or supply delivery.

For questions or concerns contact the Environmental Program Manager: 3-3551, or a Chemical Safety Specialist: 3-3535 or 3-3568

HANDLING HAZARDOUS WASTE

Materials that are to be disposed of as hazardous waste must be placed in sealable containers. Containers should be filled, leaving a headspace for expansion of the contents. Often the original container is perfectly acceptable. If you routinely generate significant quantities of compatible solvents, bulking of waste in five-gallon carboys provided by GSU EPA may be practical.

Similar wastes may be mixed if they are compatible (e.g. solvents, linseed oil and oil-based paint). Containers must be kept closed except during actual transfers. Do not leave a hazardous waste container with a funnel in it hazardous waste label.

Waste containers must be labeled as hazardous waste as soon as the material is first put into the container. Waste container labels are available on each flammable liquid storage cabinet and through the sculpture shop. Be sure to include the name and phone number of a person that can be reached on the day of the waste pickup.

Procedure:

1. Place the waste materials in an appropriate waste container.
2. Seal the container. Do not leave a funnel in an open container.
3. Ensure the container has a completed hazardous waste sticker on it. If there is no room for a sticker, or if a sticker is not immediately available, write the words "Hazardous Waste" on the container and ensure that the contents are clear.
4. Once the container is full, inform the ceramics area to ensure that it is included with the next scheduled waste pickup.

Chemical waste pickups are generally scheduled as needed. Please notify the Graduate Lab Assistant or your faculty member if you notice to fill a container.

PARTICULARLY HAZARDOUS SUBSTANCES

WHERE TO FIND TOXICITY INFORMATION

Toxicity information may be found in Material Safety Data Sheets, under the "Health Hazard Data" section, on product labels, in the Registry of Toxic Effects of Chemical Substances (RTECS), or in many other sources listed in the Health and Safety Reference Guide on the next page.

ACID SAFETY GUIDELINES

Several different acids at varying concentrations are used in the print shop. All are corrosive and must be used with caution and at locations with local ventilation. Before using acids, review all precautions and emergency procedures.

The GSU Health Clinic phone number is 404-413-1930

The Georgia Poison Center 24 hr. hotline number is 1-800-222-1222 or 404-

616-9000**ACID SPLASH IN EYES:**

Flush at eye wash station for 15 minutes, then see a doctor.

ACID CONTACT WITH SKIN:

Remove any contaminated clothing. Rinse thoroughly with running water. Apply sodium bicarbonate (baking soda) directly to affected area. For severe spills, use emergency shower in intaglio room and get medical advice.

ACID SPILLS:

Authorized personnel only: Neutralize with sodium bicarbonate (baking soda). Wear gloves and mop up with spill kit materials or newspapers and paper towels, then thoroughly rinse with water.

1. Dispose of materials properly in plastic bag.
2. **Wear approved gloves*, apron, goggles, and/or a face shield** when handling any pure acids. **AVOID SKIN CONTACT, EVEN WHEN HANDLING DILUTED ACIDS.**
3. Locate the eye wash and emergency shower before working with any corrosives. (* Gloves make handling drop bottles in litho difficult, so do not wear gloves in that case.)
4. **“Do as you otter, add acid to water.”** Always pour acid into water or gum arabic, never the reverse. Pouring water into acid may cause a violent heat-producing reaction.
5. **Avoid breathing acid vapors.** Acute burns to your respiratory system can occur.
6. Though the acid room is equipped with good local ventilation, for prolonged use of the acid room, you may want to wear a respirator with appropriate acid-absorbing cartridges. When using small solutions of concentrated acids such as for “spit biting,” set up at a local ventilation source, such as in spray booth or at litho processing counter, wear safety glasses and use a respirator with appropriate cartridges.
7. **Close lids on acid baths when not in use** to preserve strength and reduce vapors and/or mists.
8. **Do not lean directly over acid baths! Avoid breathing vapors!**
9. **Be extra careful with splashes or spills when putting plates into the acid baths.** If splashes occur on clothing or skin, immediately wash with running water.
10. **Use white plastic spatulas** to assist in removing plates from acid baths. Allow acid to drain from plate over acid bath. Thoroughly rinse plate with cold running water in sink. Do not use metal spatulas in acid baths!
11. **Only the Printmaking area coordinator or trained shop tech is to change or modify acid baths.** Acid solutions are changed once every two weeks. However, their strengths can weaken depending on use. Ask the shop tech to change acid baths if baths seem weak. Do not attempt to mix or spite

the plate etching mordant; only staff or faculty may do this.

12. **Do not use white ground in these acid baths!** Consult with the shop tech in order to set up special bath.

LIST OF ACIDS AND THEIR USES AND DANGERS:

NITRIC ACID

Mixed 8/1 and 11/1 with water for two strengths of baths to etch zinc. Also mixed by drops with gum Arabic to etch litho stones. Produces highly flammable hydrogen gas when etching zinc, though hydrogen gas itself is not a health hazard. Strong solutions can heat up and produce nitrogen oxides, a dangerous chemical.

PHOSPHORIC ACID

Anti-tint solution and for counter-etching stones. Very toxic by all routes of entry. Always use diluted.

ACETIC ACID

Mixed 1 cup (8 oz.) per gallon water for degreasing intaglio plates. Not harmful as diluted but can cause severe burns at full strength. (Vinegar is a form of dilute acetic acid.)

ACID HAZARDS AND PRECAUTIONS:

Acids are used in intaglio (acid etching) and in lithography. Strong acids commonly used include nitric acid, hydrochloric acid, and phosphoric acid, and less commonly carbolic acid (phenol), chromic acid, hydrofluoric and sulfuric acids.

Hazards

1. Concentrated acids are corrosive to the skin, eyes, respiratory system and gastrointestinal system. Dilute acids can cause skin irritation on repeated or prolonged contact.
2. Phenol is highly toxic by skin absorption and ingestion. It may cause severe kidney damage, central nervous system effects and even death if absorbed in large amounts.
3. Concentrated nitric acid is a strong oxidizing agent and can react explosively with other concentrated acids, solvents, etc. Nitric acid gives off various nitrogen oxide gases, including nitrogen dioxide which is a strong lung irritant and can cause emphysema.

Precautions

1. Know what is used. Obtain the MSDS for all acids.
2. Whenever possible avoid concentrated acids.
3. Doing acid etching requires working in a enclosed hood, or in front of a slot exhaust hood or window exhaust fan at work level.
4. Store concentrated nitric and chromic acids away from organic materials. Concentrated nitric acid should always be stored separately even from other acids.
5. An important safety rule when diluting concentrated acids is to add the acid to the water, never the reverse.

6. Wear appropriate gloves, goggles and protective apron or lab coat when handling acids.
7. If adequate ventilation is not available, wear a NIOSH-approved respirator with acid gas cartridges.
8. If acid is spilled on your skin, wash with lots of water. In case of eye contact, rinse the eyes with water for at least 15-20 minutes and seek medical attention.

PRECAUTIONS AND PROCEDURES FOR USING OIL-BASED INKS AND SOLVENTS

Regular and prolonged use of oil based inks and solvents without appropriate protection can lead to allergic reactions and dermatitis through skin contact. Some inks contain pigments and ingredients that are more toxic than others.

BEFORE USING OIL-BASED INKS

Use a barrier cream and/or put on gloves to protect your hands before you begin to work.

This is particularly recommended while inking plates

WEAR GLOVES FOR ALL OIL-BASED INK AND GROUNDS CLEANUP!

Please note that latex gloves are provided by the department, but these are good only for keeping hands clean of ink, etc., not for keeping solvents from getting into the skin.

Nitrile gloves must be worn to protect from solvents; these gloves may be reused for up to a year.

SOLVENTS FOR CLEANING:

1. USE VEGETABLE OIL for initial cleaning of oil-based inks from plates, blocks, palettes, rollers, and brayers.
2. USE ODORLESS MINERAL SPIRITS (GAMSOL) for final cleaning.
3. USE DENATURED ALCOHOL for removal of rosin or stop-out, degreasing plates, thinning shellac, final degreasing of palettes, plates, and press beds.
4. LACQUER THINNER OR ACETONE are sometimes required for special cleaning or transfer techniques. Use only with instructor supervision/permission.
5. SAFETY SOLVENT IN THE PARTS WASHER (a type of mineral spirits with high flash point) may be used for cleaning plates, tools, and brayers.
6. LITHOTINE is used only in stone and plate lithography.
7. USE RAGS WISELY!
 - a. **Re-use rags** that have been partially soiled. Check in the red step cans first.
 - b. **Fold rags** into pads, so only part of the surface is soiled at once.
 - c. **Dispose used rags** in red step flammable storage cans.
8. HAND CLEANING:
 - a. **Never use solvents to clean your hands!**
 - b. **Use waterless hand cleaner or baby oil** to clean inks from hands

before washing with soap and water. Avoid hand cleaners that contain petroleum distillates.

- c. **Use a moisturizer** regularly to replenish natural oils of skin. (Use of hand cleaners and repeated washing of hands can dry out skin.)

INK AND PIGMENT HAZARDS AND PRECAUTIONS:

Intaglio, lithography and relief inks consist of pigments suspended in either linseed oil or water as a vehicle. There can be additional hazardous binders or preservatives, etc.

Hazards

1. Oil-based inks contain treated linseed oils. While linseed oil is not considered a hazard by skin contact or inhalation, ingestion of large amounts of some treated linseed oils might be hazardous due to presence of small amounts of toxic heavy metals.
2. Oil vehicles are flammable when heated, and rags soaked in these may ignite by spontaneous combustion.

Precautions

1. Know what materials are used.
2. Obtain the material safety data sheets (MSDSs) on all products used.
3. Use the least toxic inks possible.
4. Do not use an open flame to heat linseed oil, linseed oil, varnishes, or burnt plate oil.
5. Take normal fire prevention measures (e.g. no smoking or open flames in work area).
6. Place oil-soaked rags in self-closing disposal cans and remove from the studio each day.
7. An alternative is to place the oil-soaked rags in a pail of water.

Pigments

Pigments are the colorants used in lithography, intaglio, and relief printing inks. There are two types of pigments: inorganic pigments, and organic pigments.

Hazards

1. Pigment poisoning can occur if pigments are inhaled or ingested. For normal printing with prepared inks, the main hazard is accidental ingestion of pigments due to eating, drinking or smoking while working, or inadvertent hand to mouth contact.
2. The classic example of a toxic inorganic pigment in printmaking is lead chromate (chrome yellow). Lead pigments can cause anemia, gastrointestinal problems, peripheral nerve damage (and brain damage in children), kidney damage and reproductive system damage. Other inorganic pigments may be hazardous also, including pigments based on cobalt, cadmium, and manganese.
3. Some of the inorganic pigments, in particular cadmium pigments, chrome yellow and zinc yellow (zinc chromate) may cause lung cancer if inhaled. In addition, lamp black and carbon black may contain impurities that can cause skin cancer.

4. Chromate pigments (chrome yellow and zinc yellow) may cause skin ulceration and allergic skin reactions.
5. The long-term hazards of the modern synthetic organic pigments have not been well studied.

Precautions

1. Obtain MSDSs on all pigments.
2. This is especially important because the name that appears on label of the color may or may not truly represent the pigments present.
3. Use the safest pigments possible.
4. Avoid lead pigments.
5. Avoid mixing dry pigments whenever possible.
6. If dry pigments are mixed, wear a NIOSH-approved toxic dust respirator.

SOLVENT HAZARDS AND PRECAUTIONS:

In general, organic solvents are one of the most underrated hazards in art materials. Organic solvents are used in printmaking to dissolve and mix with oils, resins, varnishes, and inks; and to clean plates, rollers, tools, and even hands.

Hazards

1. Repeated or prolonged skin contact with solvents can cause defatting of the skin and resultant dermatitis. Many solvents can also be harmful through skin absorption.
2. Inhalation of solvent vapors is the major way in which solvents are harmful. High concentrations of most solvents can cause dizziness, nausea, fatigue, loss of coordination, or coma. This can also increase the chances for mistakes and accidents.
3. Many solvents are toxic if ingested. Swallowing an ounce of turpentine can be fatal.
4. Most solvents, except chlorinated hydrocarbons, are also either flammable or combustible.

Precautions

1. Obtain the MSDS on all solvent products used.
2. Use the least toxic solvent possible. For example, replace the more toxic methyl alcohol with denatured alcohol or isopropyl alcohol.
3. Use adequate ventilation.
4. Keep minimum amounts of solvents on hand and purchase in smallest practical container size.
5. Large amounts of solvents or solvent-containing materials should be stored in a flammable storage cabinet.
6. Never store solvents or solvent-containing materials in food or drink containers. Always label containers.
7. Do not allow smoking, open flames or other sources of ignition near solvents.
8. Have a class B fire extinguisher in the area. (If ordinary combustible materials are present, you may need a Class ABC fire extinguisher).
9. Wear gloves when handling solvents to avoid skin contact. In particular do not

use solvents to clean ink off hands. Baby oil is a good substitute.

PROCEDURES TO REDUCE VAPORS AND MISTS AND USE OF PROPER VENTILATION

Be aware of proper procedures and the ventilation systems.

DILUTION VENTILATION:

The printmaking studio, Room 454 is equipped with a ventilation system for general dilution ventilation to keep air moving and changing. They run continually and automatically

SPRAY BOOTH: Use spray booth for all aerosol enamel and lacquer spray, for lacquer thinner to remove spray paint, and for spray adhesives. The spray booth is available in the back of the Fifth floor drawing and painting studios.

ACID BOOTH: Acid baths are ventilated 24 hours a day. **Keep acid trays covered when not in use.**

Keep all ink, acid, or solvent containers CLOSED when not in use.

Place all soiled rags in red step flammable storage containers. (Re-use lightly soiled rags!)

INTAGLIO AND RELIEF PROCESSES

Intaglio is a printmaking process in which ink is pressed into depressed areas of the plate and then transferred to paper. These depressed areas can be produced by a variety of techniques, including acid etching, drypoint, engraving and mezzotint.

HANDLE PRESSES WITH CARE Presses generate a tremendous amount of pressure!

Do not force oversized material through the press! (Nothing higher than 1/8" on top of plate matrix.) Keep hands, long hair, and loose clothing contained and away from rollers and crank handles when operating press.

KEEP BLANKETS CLEAN

Clean your hands or use paper picks for handling paper or blankets.

Always protect blankets from bleeds with layer of newsprint or plastic between printing paper and sizing catcher.

Use gray chip board instead of blankets for printing relief blocks.

HOT PLATE FOR GROUNDS

The hot plate is a source of combustion! Do not place flammable materials on or near the hotplate. The hot plate for heating grounds and melting rosin should be used as follows:

- **Turn on fan** when using hot plate. (The fan is on a timer.)
- **Turn on and off hot plate using circuit breaker.**

- **Do not use solvents near the hot plate.**
- **Avoid burns by using metal spatulas** to remove hot zinc and copper plates.
- **Leave thermostat at 250 degrees**

For heating grounds: 250 degrees

For melting rosin: 250 degrees

Do not exceed 250 degrees.

HANDLE SHARP TOOLS APPROPRIATELY!

Keep all bleeding material behind the cutting edge.

When carving wood or linoleum blocks, keep hands behind tool path and do not brace with your hands. Use bench hook.

Use etching and wood cutting tools with care. Protect points of needles and sharp tools with a piece of cork.

Maintain and sharpen tools regularly.

Tape scraper to protect fingers from sharp edges.

Edges from filed etching plates can be very sharp. Handle with care.

Clamp plate to table when filing and wear cloth gloves.

When engraving, remove burrs promptly, sweep up and discard.

PLATE CUTTER

Mark plate and position against stop bar to left of plate cutter.

Site mark by looking straight down and matching with cutting edge.

Protect metal surface from clamp with strip of chipboard.

Clamp plates before cutting.

Keep hands away from cutting edge before using foot pedal!

USE OF SOLVENTS

Cleaning of all etching grounds, aquatints, and residual ink in the printing plates must occur on ventilated ink counters, Rm. 454.

Wear gloves when using solvents to limit contact with skin.

Use volatile solvents like denatured alcohol and lacquer thinner sparingly.

First clean up ink on slabs with razor scraper before using solvent.

Scrape excess ink into ink residual container, (usable ink can be put back in can).

Dispose of rags in red safety container.

Tarlartan and in-process rags are store in specific containers.

No open solvent containers

ACID ETCHING

Wear eye protection when observing plates in acid during the etching process.

Where gloves when removing plate from acid bath.

Report any spillage immediately to faculty.

If acid comes in contacts with an eye, there is an eye wash station in the acid etching room. Run the water for 30 seconds to flush the unit, hold eye open, and wash eye for fifteen minutes. Any eye injury should be examined by a physician.

USE OF ACID

Handle the acid drip bottle with care. Do not remove it from the designated area. Wear a face shield for protection, and wash hands after handling bottle. If acid comes in contact with an eye, there is an eye wash station in the acid etching room. Run the water for 30 seconds to flush the unit, hold eye open, and wash eye for fifteen minutes. Any eye injury should be examined by a physician.

AQUATINT

Use ventilating fans while applying and fusing aquatint.

Use the rack to move the plate.

INTAGLIO HAZARDS AND PRECAUTIONS:

Etching at GSU within the Printmaking area involves use of dilute nitric acid, or ferric chloride to etch the zinc or copper (respectively) metal plate. Unetched parts the plate are protected with resists such as stopout varnishes containing ethyl alcohol, grounds containing asphaltum or gilsonite and mineral spirits, rubber cement, and rosin or spray paints for aquatinting. Sometimes, soft grounds contain more toxic solvents.

Hazards

1. See Solvents section for the hazards of solvents. 1,1,1- trichloroethane found in some soft grounds is moderately toxic by inhalation under normal conditions but may cause fatalities at very high concentrations.
2. See Acids section for the hazards of acids. In particular nitric acid etching releases the respiratory irritant nitrogen dioxide which has poor odor warning properties. During the etching process, flammable hydrogen gas is also produced.
3. Concentrated nitric acid is a strong oxidizing agent and can react with many other chemicals, especially solvents or other organic compounds, to cause a fire.
4. Rosin dust (and asphaltum dust which is also sometimes used) is combustible. Sparks or static electricity have caused explosions in enclosed rosin and aquatint boxes. Rosin dust may also cause asthma and dermatitis in some individuals.
5. Inhalation of solvents and pigments can result from use of aerosol spray paints.

Precautions

1. Obtain the MSDS for all materials used.
2. See Solvents and Acids sections for specific precautions.
3. Application of grounds or stopouts should be done with local exhaust ventilation, (e.g. slot or enclosed hood).
4. Acid etching should be done with local exhaust ventilation. See section on precautions for Acids for more information. Rosin (or asphaltum) boxes should be explosion-proof. Use sparkproof metal cranks, explosion-proof motors, or compressed air. Don't use hair dryers to stir up rosin dust.
5. Avoid stirring up rosin dust and wear a clean high quality **dust mask or full vapor mask** when using powdered asphaltum, and/or powdered rosin.

Other Intaglio Techniques Hazards and Precautions:

Drypoint, mezzotint and engraving use sharp tools to incise lines in metal plates.

Hazards

1. One major hazard associated with these types of processes involves accidents with sharp tools.
2. Long-term use of these tools can cause carpal tunnel syndrome, which can cause numbness and pain in the first three fingers. Severe cases can be incapacitating.

Precautions

1. Keep tools sharp, store them safely and always cut away from yourself.
2. When possible, clamp down plates to avoid slippage.
3. Minimize the chance of carpal tunnel syndrome by choosing tools with wide handles, avoiding tight grips, and doing hand flexing exercises during regular rest periods. Set work table height so wrist flexing motions are minimal.

Printing and Cleanup

Intaglio inks contain pigments, treated linseed oil and modifiers. Printing involves placing the ink on the inking slab, inking the plate by hand, and then printing. Cleanup of inking slab, press bed, and cleaning the plate is done with a variety of solvents including mineral spirits, alcohol, lithotine, turpentine, etc.

Hazards

1. Preparing your own inks from dry pigments can involve inhalation of toxic pigments. See Pigments section for the hazards of pigments.
2. See [Solvents](#) section for the hazards of solvents. Plate cleaning is more hazardous than cleaning inking slabs or press beds because larger amounts of solvents are used.
3. Lithotine, turpentine, or oil-soaked rags can be a spontaneous combustion hazard if improperly stored.

Precautions

1. See Pigments and Solvents sections for the specific precautions for pigments and solvents.
2. NIOSH-approved respirators with organic vapor cartridges can be used if ventilation is not adequate.

Relief Printing

Relief printing techniques include woodcuts, linoleum cuts and acrylic plates for plaster relief. These techniques involve the cutting away of plate areas that are not to be printed. Relief inks can be oil-based or water-based.

Hazards

1. Some woods used for woodcuts can cause skin irritation and/or allergies. This is particularly true of tropical hardwoods.
2. Accidents involving sharp tools can result in cuts.
3. Wood carving and cutting tools can cause carpal tunnel syndrome. This was discussed earlier in the section that included drypoint and mezzotint.

4. Caustic soda (sodium hydroxide) is sometimes used for etching linoleum. It can cause skin burns and severe eye damage if splashed in the eyes.
5. Eating, drinking or smoking while printing can result in accidental ingestion of pigments.
6. Hazardous solvents are used in stopouts and resists in linoleum etching, and for cleaning up after printing with oil-based inks. See Solvents section for more information on the hazards of solvents.

Precautions

1. Obtain the MSDS for all materials used.
2. See Acids and Solvents sections for precautions with acids and solvents.
3. Water-based inks are preferable to oil-based inks since solvents are not needed.
4. Wear appropriate gloves, goggles and protective apron when handling caustic soda.
5. If the chemical is spilled on your skin, wash with lots of water. In case of eye contact, rinse the eyes with water for at least 15-20 minutes and contact a physician.
6. Always cut in a direction away from you, with your free hand on the side or behind the hand with the tool.
7. Carpel tunnel syndrome can be minimized or avoided by using tools with wide handles, avoiding tight grips, and rest periods with hand flexing exercises. Linoleum cutting is softer to work, and thus can reduce musculoskeletal injury.

Sharps Disposal:

Red sharps disposal containers are located throughout the department. **Dispose of all cutting blades properly using these containers.** Throwing blades in trash barrels is a hazard to our Building Services/Housekeeping personnel.

LITHOGRAPHY

Lithography uses either zinc and aluminum metal plates or stones for printing. It involves use of a variety of chemicals to make the image ink-receptive and non-image areas receptive to water and ink-repellent.

Plate and Stone Preparation:

A variety of drawing materials with high wax and fatty acid content are used to make the image, including tusche and lithographic crayons. Airbrushing liquid drawing materials or using spray enamel or lacquer is also common. Other materials used in stone or plate processing include etch solution containing acids and gum arabic, counteretch solutions containing acids and sometimes dichromate salts, and fountain solutions containing dichromate salts. Phenol (carbolic acid) has been used for removing grease from stones, and a variety of solvents including lithotine, gasoline, kerosene, and mineral spirits, which are used for diluting drawing materials, washing out images and correction of images. Talc and rosin mixtures are also used. Metal plates are prepared with solvent-based vinyl lacquers.

HANDLING LITHO STONES AND ALUMINUM PLATES:

Litho stones, whenever moved, are a danger. **Use proper techniques to avoid back injury.** Be particularly careful when removing from storage.

All large stones must be moved with Big Joe.

Take care in handling cut aluminum litho plates. Edges are razor sharp and corners should be trimmed in half moon shapes to eliminate danger of skin cuts. To avoid injury, use the proper technique demonstrated by the teacher when moving and carrying lithography stones.

DUST AND PARTICULATE CONTAMINATES:

Rosin and talc dusting of stones should be done only wearing a dust mask and only at the areas designated for processing stones.

Drawing material for lithography, Korn's crayons, rubbing crayons, tusche, etc. are a skin irritant and nitrile or latex gloves are recommended when using these materials.

Xerox toner used as a drawing material is potentially carcinogenic when particles are inhaled into lungs. Protective particle mask and latex or nitrile gloves must be worn when working with toner and should be done in processing area with ventilation.

ACIDS

Drops of concentrated acid are used to process stones. In this case, gloves may hamper your control of small dropper bottles, so use bare hands for better feel. However, use extreme caution when handling. Note all precautions in *Part 2: Acid Safety Guidelines* for information about acid and dealing with acid spills.

Nitric acid TAPEM (Tannic Acid Plate Etch Mix) Phosphoric acid Counter-etch solution

SOLVENTS AND LACQUERS:

See Parts 3 and 4 on solvent handling and ventilation. **Use nitrile gloves for handling most solvents.** Use gloves and pour solvents on red rags or special application materials provided. Dispose of red rags for recycling in red safety cans with lids. Paper or other solvent-saturated materials must be disposed of in specially marked can with yellow lid. Whenever possible, use all solvents at processing counter with local ventilation turned on.

USE OF SOLVENTS FOR LITHOGRAPHY

Washing out of the image must occur under the ventilation hood.

Wear gloves when using solvents to limit contact with skin.

Use volatile solvents like denatured alcohol and lacquer thinner sparingly.

First clean up ink on slabs with razor scraper before using solvent.

Scrape excess ink into residual container (usable ink can be put back in can).

Dispose of rags in red safety container. For all types of lithographic inks, solvents are used to make image corrections on the press, to remove images, and to clean the press bed and rollers.

LITHOTINE (VARTINE): Greasy solvent used to wash out litho stones and plates.

VEGETABLE OIL: Used to clean palettes and rollers (non-leather).

GAMSOL: Final cleaner for palettes and rollers.

LACQUER THINNER: Wash for cleaning plates before application of Lacquer C. Used for transfers.

ACETONE: Final wash for cleaning plates before Lacquer C.

RED LACQUER C: Not used on a regular basis at **GSU** & used only under instructor supervision. Toxic by both inhalation and skin absorption. Base for litho plates applied with Webril Wipes. Use local ventilation at processing counter, respirator, and gloves.

LITHOGRAPHY HAZARDS AND PRECAUTIONS:

Hazards

1. Acids used include phosphoric, nitric, acetic, hydrochloric, hydrofluoric and tannic acids. The concentrated acids are corrosive and even dilute acid solutions can cause skin irritation from prolonged or repeated contact. Hydrofluoric acid and phenol are the most dangerous to use.
2. Lithotine, kerosene, and mineral spirits are skin and eye irritants and inhalation can cause intoxication and respiratory irritation.
3. The solvents contained in vinyl lacquers can include highly toxic isophorone and cyclohexanone. Methyl ethyl ketone (MEK), which is moderately toxic, is often used as a thinner.
4. Dichromate salts may cause skin and nasal ulceration and allergic reactions, and are suspect cancer-causing agents.
5. Rosin dust may cause asthma and allergic dermatitis. There is the hazard of explosion from the buildup of rosin dust, in enclosed rosin boxes, around an ignition source.
6. Talcs may be contaminated with asbestos and silica.
7. Airbrushing drawing materials or using spray enamel paints is more hazardous than drawing with a brush because the inhalation hazard is higher.

Precautions

1. Obtain the MSDS for all materials used.
2. See Acids and Solvents sections for the precautions with acids and solvents.
3. Use the least toxic solvents. Gasoline should never be used. Lithotine and mineral spirits are less toxic than the more irritating kerosene.
4. Use asbestos-free talcs such as baby powders.
5. Avoid dichromate-containing counteretches and fountain solutions if possible. Do not use hydrofluoric acid or phenol.
6. Appropriate gloves, goggles and a protective apron should be worn when mixing or using concentrated acids.

SCREENPRINTING

Many of the materials in Screen Printing are non-toxic because they are water based, and certified by the American Arts and Crafts Institute. This includes the inks,

extender base, and screen filler. However, the students are advised of these potentially hazardous situations, and are directed to take the following precautions: Protective gloves are to be worn when handling photo-sensitive emulsion, emulsion sensitizer, and emulsion remover.

If the use of a solvent such as denatured alcohol, lacquer thinner, or paint thinner is required in screen cleaning or some other process, the material is to be used next to a ventilated counter, and protective gloves used.

Emulsion is given out only to students enrolled in screenprinting classes or to those who have paid the lab fee. If you are not in a class and wish to have access, you must see the shop tech to pay the fee and obtain the combination for the emulsion.

DIRECT EMULSION (COATING A SCREEN)

Use gloves when applying direct emulsion to screen. A thin layer of photo-emulsion must be applied to the screen using a scoop coater. Return excess emulsion to the bucket. **Clean the scoop coater when you are done, and replace the emulsion in the locker.**

DIRECT EMULSION EXPOSING MACHINE (BURNING A SCREEN)

CAUTION: This machine uses a strong source of ultraviolet rays. Avoid prolonged exposure and do not look directly at UV light.

- Screen must be dry before exposing.
- Make sure vacuum is tight before turning on the timer switch.
- After exposing, release the vacuum and let the suction dissipate before unlatching.

IMAGE WASHOUT (WASHING AFTER EXPOSING)

Wear gloves, apron, goggles and/or a face shield.

POWER Water Sprayer (RECLAIMING A SCREEN)

CAUTION: Emulsion cleaning solutions are painfully corrosive.

Wear gloves, apron, goggles and/or a face shield.

Point gun/wand downward to avoid splashing.

A respirator may have to be worn for prolonged exposure to spray mists.

The following chemicals are used in this area:

Clorox Toilet Bowl Cleaner with Bleach

Wisk Laundry Detergent

Always wear gloves & goggles


IN CASE OF ACCIDENT:

Use eyewash station to flush eyes for 10 minutes, then see a doctor.

Flush accidental splashes on skin with water. Wash with soap and water.

PHOTOMECHANICAL PRINTMAKING

EQUIPMENT

Light exposure unit emits strong UV light that is harmful to your eyes.  Do not look directly at this light. Wear goggles and gloves when mixing chemicals.

PROCEDURES

Always add chemicals to water, not the other way around.
Bamboo tongs are to be used when developing film in trays.

LETTERPRESS

Note: The GSU Printmaking Program has only one small hand operated letterpress that is only used a few times a year by advanced students for independent projects.

TYPE

- **While most of the small amount of type we have in the GSU printshop is wooden, care should be taken with metal type, which contains a mixture of lead, tin, and antimony.** Do not eat or drink in the letterpress shop. Always wash your hands after handling type.

SOLVENTS

The following solvents should be used only for the following purposes, and nitrile gloves should be worn when handling. See Part 3 for more information.

USE VEGETABLE OIL for initial cleaning of rollers and palette.

USE ODORLESS MINERAL SPIRITS (GAMSOL) for final cleaning of palette and type.

USE DENATURED ALCOHOL for degreasing palette and Boxcar base and removing Sharpie guidelines from press or base. **Do not ever use alcohol on rollers or on type** – it will dry them out.

USE CALIFORNIA WASH for final cleaning of the rollers. It contains preconditioners for the rubber rollers.

PAPER CUTTER

The paper cutter is not to be used for bookboard or matboard. • Always use the foot pedal – it holds paper or board in place and also keeps fingers away from blade

- **The edge of the cutting surface is sharp** in addition to the blade. **Keep your hands to the left of the safety guide on the guillotine and shield on the paper cutter.** Take care when retrieving scraps from the paper cutter.

- Blades should always be kept **down**, not up.

MONOTYPE AND OTHER PRINTING PROCESSES HAZARDS AND PRECAUTIONS

Other printing processes include collagraphs and monotypes

Collagraphs

Collagraphs are prints produced by using a collage of different materials glued onto a rigid support. A wide variety of materials and adhesives can be used in making collagraphs.

Hazards (Note: At GSU within our printmaking program only non-solvent glues are authorized for use in collagraph projects.)

1. Rubber cement, a common adhesive used with collagraphs, is extremely flammable and most rubber cements and their thinners contain the solvent n-hexane which can cause damage to the peripheral nervous system (hands, arms, legs, feet) from chronic inhalation.
2. Spraying fixatives on the back of collagraph plates to seal them can involve risk of inhalation of the solvent-containing spray mist.
3. Sanding collagraph plates which have been treated with acrylic modeling compounds or similar materials can involve inhalation of irritating dusts.

Precautions

1. Know the hazards of materials used.
2. Obtain the MSDSs from the manufacturer.
3. Use the least toxic materials available. In particular use water-based glues and mediums (e.g. acrylic medium) whenever possible. Some rubber cements should not be utilized as they are made with the solvent heptane, which is less toxic than n-hexane, primarily because peripheral neuropathy is not associated with its use.
4. Wear gloves when using epoxy glues.
5. Wear a NIOSH-approved toxic dust respirator when sanding collagraph plates.

Monoprints

Monoprints involve standard intaglio, lithographic and other printmaking techniques, but only one print is made. Monoprints have the same hazards involved in plate preparation and printing as the parent techniques as concerns the use of solvents and inks.

Photoprintmaking

Photoprintmaking involves exposing a light-sensitive emulsion or film to ultraviolet light through a transparent support containing an opaque image to transfer the image to a plate. The transparency through which the photoemulsions are developed can include drawings on a transparent support such as Mylar or acetate, or photographic images processed on graphic arts film to yield a positive image. Several photoprintmaking methods will be discussed. **At GSU only Photo Screenprint for which no developers are required is currently in regular use. On rare occasions for an advanced Independent Study project a type of safety photo-Intaglio is used. This requires only a highly dilute ammonia solution as a developer.**

Photolithography

Tradition photolithography as described in this paragraph is **not currently utilized at GSU within the Printmaking Program**. An example of a case where it might be utilized in the future is when a Graduate Student has a specific project that cannot be achieved through one of the other processed already commonly utilized for class projects. Photolithography involves transferring graphic images to stones or metal plates that are coated with a light-sensitive emulsion. One can coat the

stone or metal plate, or use presensitized metal plates. Light-sensitive emulsions used on stone consist of a mixture of powdered albumin, ammonium dichromate, water, and ammonia; commercial emulsions are usually based on diazo compounds. Developing solutions for these mixtures often contain highly toxic solvents. Diazo-sensitizing solutions, developers with highly toxic solvents, plate conditioners containing strong alkali, and other brand name mixtures are used for metal plates.

Hazards

1. Diazo photoemulsions are the least hazardous although they can cause eye irritation.
2. Ammonia is a skin irritant and highly toxic by inhalation. Ammonia is highly corrosive to the eyes. It has good odor-warning properties
3. Light exposure sources include photoflood lamps, vacuum Poly- Lite units, and carbon arcs. Carbon arcs produce large amounts of ultraviolet radiation which can cause skin and eye damage and possible skin cancer. Carbon arcs also produce hazardous metal fumes, and ozone and nitrogen dioxide (which can cause emphysema), and toxic carbon monoxide.
4. Screen cleaning solutions include strong caustic solutions, enzyme detergents which can cause asthma, and chlorine bleach. These are skin and respiratory irritants.
5. Many solvents used in developing solutions are toxic both by inhalation and skin absorption.

Precautions

1. Obtain a MSDS for all materials used.
2. See Solvents section for more precautions with solvents.
3. Use presensitized plates if possible. If you cannot substitute, wear gloves and goggles. Store it away from heat, solvents and other organic materials.
4. Use ammonia solutions or solvent-containing photolithographic solutions inside a laboratory hood, or in front of a slot exhaust hood. Wear gloves, goggles, and if ventilation is inadequate, a respirator.
5. Do not use carbon arcs unless they are equipped with local exhaust ventilation exhausted to the outside. Quartz mercury or metal halide lamps are safer.
6. Wear gloves, goggles and plastic apron or laboratory coat when mixing hazardous chemicals

Photoetching

Traditional photoetching as described in this paragraph is **not currently utilized at GSU within the Printmaking Program**. Photoetching is usually done using the KPR products. Photoresist dyes often contain a variety of highly toxic solvents, including ethylene glycol monomethyl ether acetate (2-ethoxyethyl acetate, cellosolve acetate), ethylene glycol monoethyl ether, and xylene, and benzaldehyde. The developers contain xylene and ethylene glycol monomethyl ether acetate (2-methoxyethyl acetate or methyl cellosolve acetate). Developers used for safer presensitized plates also also contain solvents. Exposure of the

plate is done with ultraviolet sources such as metal halide lamps.

Hazard

1. See the [Solvents section](#) for the hazards of various solvents.

Precautions

1. See [Solvents section](#) for precautions with solvents.
2. Use photofloods or other light sources instead of carbon arcs. Precautions with carbon arcs is discussed in the Photolithography section.
3. Use presensitized plates if possible.
4. Use photoresist solutions with local exhaust ventilation, or wear an organic vapor respirator.

GSU PRINTMAKING STUDIO ROOM 454 - LIST OF SAFETY RULES

Safer printmaking seeks to replace hazardous printmaking processes with safer alternatives. Guidelines for maintaining a safe printmaking environment are as follows. Let your class instructors know about any safety concerns you have and inform them of any potentially unsafe incidence occurring within the printmaking studio:

1. **Wearing neoprene gloves is required** when working with ammonia, denatured alcohol, ferric chloride, lacquer thinner, acetone or nitric acid. **Wearing nitrile or neoprene gloves is required** when handling and working with ink or odorless mineral spirits
2. **Wear a respirator and goggles** if using lacquer thinner, spray paint, spray fixative or lacquer for aluminum plates. Wear a **dust mask** when using powdered asphaltum, and powdered rosin.
3. **Wear goggles when working with any harsh chemical that might get in your eyes.** Even the diluted Simplegreen water-based cleaner used in the Printmaking laboratory can be hazardous if the spray gets in your eyes.
4. **No eating, drinking, or smoking in the studio.**
5. Provide adequate ventilation and wear goggles when using ammonia and other harsh chemicals.
6. Avoid eye contact with the light of the UV exposure unit. During longer exposures it is best to leave the room.
7. There are fire extinguishers available in the event they are needed. If the fire alarm sounds, leave the building immediately.
8. Always place rags soaked with solvent in special covered metal containers. Be sure to clean any solvents off of counter tops, tables, and tools after use.
9. Turn the vent on and **use safety goggles when working around or with acids**. Keep face away from the acid trays and replace tray lids when putting a plate in or taking a plate out. Rinse plates immediately in tray containing water. Do not get your face too close to the acid tray. **Replace**

lids on acid trays immediately after you are done etching a plate.

Within the booth, the tray on the left side should contain plain water. Use it to rinse your plate immediately after removing it from the acid. The plate should then be rinsed with a hose.

10. If acid gets on skin or clothes wash area immediately under running water for about 15 minutes. If acid gets in eyes wash in eye bath continuously for 30 minutes no matter how uncomfortable it may be. **Immediate washing is important.** After washing thoroughly, seek medical attention
11. Do not wear loose clothing or sleeves, they can get caught in the presses.
12. Do not work when overly tired. This can result in frustrating mistakes and serious accidents. Printmaking demands concentrated attention.
13. If you are working outside of class hour's work in pairs. The red telephone next to the elevator is a line directly to the campus police.
14. Report all accidents to the instructor as soon as possible.
15. Work in pairs while in the studio after class hours.
16. It is ill advised to work around toxic chemicals when pregnant.
17. Never force tools or equipment. They are to be treated gently and with craftsmanship.
18. Do not look at the light emanating from the exposure table in the printmaking dark room, it is bad for your eyes.
19. **Linocut and woodcut** tools can easily slip across the surface of a linoleum or wood surface. For this reason **never place either of your hands in front of the tool while you are cutting.** Even when you are holding the block steady, both hands should be behind the blade of the tool.
20. Keep our fingers away from the etching press cylinder. If you are holding a plate steady as it moves toward the cylinder, always turn the press handle yourself. It would be dangerous to allow another person to operate the handle, as they might inadvertently pull your finger or hand under the cylinder of the press.
21. To clean up ink laid out on a glass slab do not use solvent. First scrape off all of the ink with a razor blade scraper, and then use Simplegreen cleaner to clean up the ink residue.
22. Acid fumes can cause problems to those who wear contact lenses. If possible, wear.
23. Eyeglasses or safety goggles that completely seal you eyes when working with acids
24. **The last person to leave the studio must:**
 - a. **Secure the room (never leave the doors open.**
 - b. **Unplug the hotplate**
 - c. **Shut off the vent systems**
 - d. **Shut off all appliances**

CLEAN UP – FOLLOW ALL OF THE RULES BELOW

Students must clean their work area and clean up communal areas after use.

MATERIALS SHOULD BE RETURNED TO THEIR PROPER CABINETS!

If you do not clean up, you will be emailed or addressed about this in person to come and correct the situation during school hours. If the student does not respond, a notice *will* be sent to the Associate Director.

If **three (3)** notices on an individual student are sent to the Associate Director over the course of a semester with no response from the student, a Disruptive Student Complaint will be filed with the Dean of Students' Office. Students who continually violate Printmaking area policies and procedures will be barred from taking classes in Printmaking and barred from use of Printmaking materials and facilities.

Unidentifiable objects and belongings left on the floor will be considered trash. The clean-up people will be directed to remove it.

General use worktables should be kept cleaned for other classes to use. Finished work and clutter should be cleared off and tables swept immediately upon completion of each work session. Do not use tabletops for storage.

Trash containers should not be overloaded. Heavy materials must be taken directly to the dumpster.

Each studio has specific rules for clean-up which should be followed, students should familiarize themselves with these rules.

MANDATORY CLEAN UP DAY

A clean-up day is scheduled at the end of every semester. Attendance for a two-hour time slot on cleanup day is MANDATORY for ALL students enrolled in a Printmaking course and for students in other courses that make significant use of the printmaking studio. Any materials left in the studio after the pre-cleanup deadline will be considered the property of the studio and either discarded or stored for common use. Students who fail to attend cleanup will have a registration bar placed on their record that will be lifted only after they complete their cleanup responsibility.

BANNED SUBSTANCES

Illegal drugs are not allowed in the studio at any time. Use of illegal drugs in the studio will result in the student's dismissal.

Legally prescribed and over the counter drugs should be used with caution when working in the studio.

Alcohol use is not permitted in the studios without prior university consent and approval procedures being followed. If university permission has been granted, all university procedures must be followed, a police officer must be present.

Certain Chemicals and Materials may be prohibited from use in the studio if it is determined that adequate protection for the student, his/her associates, or the environment is not available or in use.

Possession or use of banned substances in the studio is grounds for dismissal from the Printmaking program.

STUDIO/UNIVERSITY POLICY

Studio policies are in conjunction with and do not supersede but include all Georgia State University policies covered in the current catalog.

When a student is determined by faculty or the shop technician to be in violation of studio policy, a notice will be sent to the Associate Director of the School of Art & Design. Such notice is considered an official warning under the University Disruptive Student Policy (<https://deanofstudents.gsu.edu/files/2013/03/Disruptive-Student-Conduct-in-the-Classroom-or-Other-Learning-Environment-April-2006.pdf>) If a student receives 3 notices in the course of a single semester procedures will be initiated to withdraw the student from the course in accordance with the policy. Students who continually violate Printmaking area policies and procedures will be barred from taking classes in Printmaking and barred from use of Printmaking equipment and facilities.

"In the event that a student is unable to follow the procedures and policies outlined herein, and absent any emergency situation, prior approval must be given by a Printmaking faculty before any activity takes place. If policies are ignored or disregarded, the Printmaking area will file "A Disruptive Student Complaint" will be filed with the Dean of Students' Office. Multiple violations will be cause for dismissal from the university.