



SECTION 19—ART SAFETY

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19.1 PAINTING AND DRAWING

A. Objective

To provide safety rules and procedures to follow while working with paints and drawing materials.

B. Scope

It is applicable to all college community members including instructors and students. Any questions or comments regarding this manual should be directed to the Office of Environmental Health & Safety in the Department of Risk Management.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in painting and drawing. In addition to this *Section 19: Art Safety, Section 7: Hazard Communication* shall also be followed to ensure compliance with the federal Hazard Communication regulation.

The hazards associated with painting and drawing are of three main types:

1. **Pigment Hazards:** Inhalation hazard, working with raw powdered pigments, using dusty chalks or pastels, sanding or chipping paints, airbrushing or spray painting, and heating or torching paints until pigments fume. Skin contact with pigments is less hazardous. Pigments are not usually absorbed in significant amounts by skin contact, but some can cause dermatitis or skin irritation. Always wash hands after handling pigments, especially before eating.
2. **Vehicle Hazards:** Common vehicles are oils, wax, water, egg yolk, casein, resins, and polymer emulsions and solvent solutions. These vehicles often contain additives for workability and drying time and preservatives. Vehicle ingredients are volatile (will evaporate into the air) and nonvolatile. The nonvolatile ingredients are safer, since they do not become airborne unless used in a technique that makes them airborne, such as spray painting. Acrylic paints usually contain ingredients that release ammonia and formaldehyde gases when they dry.
3. **Solvent Hazards:** Solvents may be found in paints and inks or may be used to thin and clean up materials. Solvents are also found in products used with painting and drawing, such as varnishes, shellacs, lacquers, and fixatives. There are no "safe" solvents. All solvents, natural or synthetic, are toxic. Solvents can irritate and damage the skin, eyes, and respiratory tract, cause a narcotic effect on the nervous system, and damage internal organs, such as the liver and kidneys. Solvents are also a fire and explosion hazard so all solvents should be isolated from sources of heat, sparks, flame, and static electricity.

Refer to the products Safety Data Sheets (SDS) for information.

The following is a summary of some of the types of solvents.

- **Bad Solvents:**
 - **Turpentine:** causes dermatitis, asthma, kidney, and bladder damage, use odorless paint thinner instead.
 - **Limonene, d-limo-nene, citrus oil, citrus turps, methadone, depentene:** a pesticide, cancer, more toxic than turpentine.
 - **N-hexane, normal hexane:** Potent nervous system toxin and extremely flammable, substitute heptane.



- Better Solvents:
 - **VM&P naphtha or “Odorless paint thinner”:** good substitute for turpentine
 - **Alcohols:** ethyl alcohol, ethanol, grain alcohol, denatured alcohol, isopropyl alcohol, propanol and rubbing alcohol.
 - **N-heptane:** good substitute for hexane and other fast-drying solvents.

E. Safety Rules:

1. Obtain & review Safety Data Sheets (SDS) on all paints, inks, thinners, varnishes, and other chemical products.
 - a. See *Section 7: Hazard Communication* for more information on SDS and labeling requirements.
2. Know and explain hazards and/or special precautions from the SDS to students.
3. Label all containers, even temporary baby food jars, with name and hazards of the chemical.
4. Use water-based products over solvent-containing ones whenever possible.
5. Buy premixed paints and avoid working with powdered pigments or dry pastels if possible.
6. Choose brushing and dipping techniques over spray methods whenever possible.
7. Avoid dusty procedures.
 - a. Sanding dry paints, sprinkling dry pigments or dyes on wet paint or glue, and other techniques that raise dust or perform in an area with exhaust or outdoors.
8. Spray and/or airbrush must be conducted in spray booth.
9. Keep fire, heat, spark, and flame away from solvents.
 - a. Amounts larger than one gallon should be stored in a flammable-storage cabinet.
10. Avoid skin contact with paints, pigments, and solvents by wearing gloves.
 - a. Wash off paint splashes with safe cleaners such as baby oil followed by soap and water, nonirritating waterless hand cleaners or plain soap and water.
 - b. Never use solvents or bleach to remove splashes from your skin.
11. Wear goggles if using caustic paints or corrosive chemicals.
12. If respirators are used special rules regarding their use apply.
13. Avoid ingestion of materials; eat, smoke, or drink outside the work area.
 - a. Never hold brushes with your lips or in your teeth.
 - b. Wash your hands before eating, smoking, applying make-up, or other personal hygiene.
14. Keep containers of paint, powdered pigment, solvents, etc., closed when you are not using them.
15. Clean up spills immediately.
 - a. Use spill cleanup kit for spills larger than a paper towel or sponge.
 - b. Evacuate the room and call 911 for spill cleanup of spills larger than the spill kit.
 - c. Wet-mop and sponge dusty surfaces do not sweep.
16. Do not dispose of solvents down the drain.
 - a. Collect all solvents, pigments, and oil-based products in a labeled container for proper disposal by the college.
17. In case of fire or life-threatening emergency dial 911. ☎

19.2 PRINTMAKING

A. Objective

To provide safety rules and procedures to follow while printmaking.

B. Scope

It is applicable to all college community members including instructors and students. Any questions or comments regarding this manual should be directed to the Office of Environmental Health & Safety in the Department of Risk Management

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in printmaking. In addition to this *Section 19: Art Safety*, *Section 7: Hazard Communication* shall also be followed to ensure compliance with the federal Hazard Communication regulation.

Printmaking inks are oil-based or water-based that dry or set by evaporation, polymerization, or by penetrating the material on which they are printed. The three basic components are pigments, vehicles, and solvents.

- **Pigments** can be classified as inorganic or organic chemicals, both of which can contain toxic substances. Benzidine is one of the chemical classes of organic dyes and pigments, which is a known bladder carcinogen. There is also evidence of toxicity and cancer with anthraquinone dyes and pigments. Some natural pigments can also be toxic, so it is important to research and obtain the SDS on all pigments used in printmaking.
- **Vehicles** are the mixtures of oils, solvents and oils, and polymer emulsions. Safety Data Sheets are important to know the chemical makeup of the vehicle.
- **Solvents** are used in the ink components, as modifiers, and for clean-up. It is important to select the least toxic solvent for the job. There are no "safe" solvents. All solvents, natural or synthetic, are toxic. Solvents can irritate and damage the skin, eyes, and respiratory tract, cause a narcotic effect on the nervous system, and damage internal organs, such as the liver and kidneys. Solvents are also a fire and explosion hazard so; all solvents should be isolated from sources of heat, sparks, flame, and static electricity.

Refer to the products SDS for information. The following is a summary of some of the types of solvents.

- **Bad solvents:**
 - **Turpentine:** causes dermatitis, asthma, kidney, and bladder damage, use odorless paint thinner instead.
 - **Limonene, d-limo-nene, citrus oil, citrus turps, methadone, depentene:** a pesticide, cancer, more toxic than turpentine.
 - **N-hexane, normal hexane:** Potent nervous system toxin and extremely flammable, substitute heptane.

- Better solvents:
 - **VM&P naphtha or “Odorless paint thinner”:** good substitute for turpentine
 - **Alcohols:** ethyl alcohol, ethanol, grain alcohol, denatured alcohol, isopropyl alcohol, propanol, and rubbing alcohol.
 - **N-heptane:** good substitute for hexane and other fast-drying solvents.

Etching: Acid and etching of metal are done by two processes; application using an acid to “eat” into the plate and converting the metal into a soluble salt.

This process uses corrosive such as the following:

- *Strong, dangerous corrosive acid etchers:*
 - **Hydrochloric acid and nitric acid** can cause skin, eye burns, and damage the respiratory system. Other dangers include if nitric acid will spontaneously combust if mixed with sawdust, paper, or other cellulosic material. Hydrochloric acid and nitric acid combined to form “aqua regia” can produce nitrosyl chloride, a highly irritating gas. Nitric acid combined with concentrated acetic acid can explode. Nitric acid can also ignite or explode with many solvents.
 - **Dutch mordant** (potassium chlorate/water/hydrochloric acid) is highly corrosive. During the mixing of the mordant, highly toxic chlorine gas is generated. Potassium chlorate forms an explosive or violent reaction when mixed with nitric acid and with combustible substances, ex. sugar, rosin, charcoal, sawdust, and sulfur. Potassium chlorate mixed with sulfuric acid creates the strongest simple acid known: perchloric acid. A mere drop of perchloric acid on paper has been known to detonate.
 - **Citric acid** added to ferric chloride to make “Edinburgh etch” only creates hydrochloric acid is not any safer.
 - **Phosphoric acid** used to clean stones is corrosive to the skin, eyes, and respiratory tract.
 - **Phenol** (carbolic acid) is highly toxic in both skin absorption and inhalation. Skin contact with concentrated phenol for even several minutes can be fatal.
- *Safer, less corrosive chemical etchers are:*
 - **Ferric chloride** solutions require only a small amount of ventilation to remove gases created during etching.
 - **Copper sulfate** solutions in various concentrations can be used to etch zinc.

E. Safety Rules:

1. Obtain & Review Safety Data Sheets (SDS) on all inks, solvents, and other chemical products. (See *Section 7: Hazard Communication* for more information on SDS and labeling requirements.)
2. Know and explain hazards and/or special precautions from the SDS to students.
3. Label all containers, even temporary baby food jars, with name and hazards of the chemical.
4. Use water-based products over solvent-containing ones whenever possible.

19.3 CERAMICS

A. Objective

To provide safety rules and procedures to follow while working with ceramics.

B. Scope

It is applicable to all college community members including instructors and students. Any questions or comments regarding this manual should be directed to the Office of Environmental Health & Safety in the Department of Risk Management

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in ceramics. In addition to this *Section 19: Art Safety, Section 7: Hazard Communication* shall also be followed to ensure compliance with the federal Hazard Communication regulation.

The hazards associated with ceramics include the following:

1. Physical Hazards: Overuse and strain injuries from wedging, throwing, and hand building with clay. Noise from machinery and skin problems that include chapping and drying of the skin and bacterial and fungal infections of the skin and nail beds. Wet clay harbors bacteria and molds and dry clay is dusty, so people with asthma or allergies should avoid the area.

2. Glaze Hazards: Glazes are a mixture of minerals, metallic compounds, and water. The metallic elements function in glazes as fluxes and colorants. Their toxicity varies greatly. Lead glazes shall not be used. Mixing and applying the glazes should be done with appropriate ventilation.

3. Firing Hazards: When clays and glazes are fired, they release various gases, vapors, and fumes. All firing processes require ventilation. A carbon monoxide detector shall be located near indoor kilns.

E. Safety Rules

- Keep all tools, machinery, and potter's wheels in good condition.
- Use proper eye protection. Clear impact goggles should be worn when grinding or chipping. Infrared-blocking goggles should be worn when looking into glowing kilns, use shade number 3 or 4.
- All materials should be labeled with the name of the substance and hazard warnings. It is best to keep materials in their original containers, with original labels.
- Safety Data Sheets (SDS) should be easily accessible for all chemicals.
- Practice good hygiene, wash hands carefully, and use a nail brush after glazing. Clean all surfaces and wipe up spills immediately.
- Do not eat or drink in the studio.
- Avoid skin problems. Keep broken skin from contact with clay and glazes. People with skin conditions can wear medical gloves, be aware of latex glove allergies.
- Avoid ergonomic injuries by taking frequent breaks, never work to the point of exhaustion or pain. When wedging, keep the wrist in a neutral position and use the weight of the upper body rather than just the muscle of the upper arm.



- Avoid lifting injuries. Buy supplies in 25 lb. containers or less and keep heavy supplies stored at waist level to avoid bending at the back. Always remember to lift with the legs, not with the back.
- Avoid processes that create airborne toxins such as mixing clay, purchase pre-mixed instead, sanding greenware, spraying glazes (apply with a brush) and similar processes.
- Use cold-wax emulsions when possible. If wax is melted, do so in a ventilated area, use electric heat (no open flame) and double boiler to keep wax from being heated above 100 degrees C.
- Clean floors without creating dust. Do not sweep. Wet mop and use a HEPA vacuum.

19.4 WOODWORKING

A. Objective

To provide safety rules and procedures to follow while woodworking.

B. Scope

It is applicable to all college community members including instructors and students. Any questions or comments regarding this manual should be directed to the Office of Environmental Health & Safety in the Department of Risk Management

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in woodworking. In addition to this *Section 19: Art Safety*, *Section 7: Hazard Communication*, and *Section 20: Machine Guarding* shall also be followed to ensure compliance with the federal safety regulations.

The hazards associated with woodworking include the following:

1. Machine Hazards: From woodworking machines, also see *Section 20: Machine Guarding*.
2. Dust Hazards: This includes fire hazards and occupational illnesses. Fine wood dust can explode with tremendous force if ignited with a spark or match. Good housekeeping along with ventilation must be maintained to clean up wood dust and wood scraps.

There are 4 main occupational illnesses associated with wood dust:

- **Dermatitis (Irritant and Sensitization):**
 - This includes irritant dermatitis associated with exposure to the sap and bark of some trees.
 - There is also sensitization dermatitis that results from an allergy to sensitizing substances in some wood; this is especially the case with dark and exotic woods. The darker the color, the more chemicals are likely to be in the wood. This is because the major ingredient in wood is cellulose, which is white and is not an allergen.
- **Respiratory System Effects:** This includes damage to the mucus membranes and dryness and soreness of the throat, larynx, and trachea, caused by some woods, especially sequoia and western red cedar. The dust can also cause lung problems like asthma and alveolitis (inflammation of the lungs' air sacs).
- **Cancer:** Most prevalent cancer is of the nasal cavity and nasal sinuses. Hardwoods are more often associated with cancer than softwoods, but both should be used for ventilation and good housekeeping.

3. Chemical Hazards: This includes chemicals such as glues, adhesives, and paint strippers. Many skin conditions and allergies can be caused by wood glues and adhesives. In general, polyvinyl acetate (PVA) emulsion glues or white glues are safer than other types of wood glue. Paint removers are either highly toxic solvent mixtures or strong caustic removers. Gloves, goggles, protective clothing, and ventilation are all needed for chemical stripping. Sanding, chipping, and torch or heat-gunning paint is also very hazardous.



E. Safety Rules

1. Prevent fires by providing good shop ventilation, dust collection and control, sprinkler systems or fire extinguishers and good housekeeping.
2. Maintain Safety Data Sheets (SDS) on all products, glues, solvents, and chemicals.
3. Avoid wood treated with Polychlorinated Biphenyl (PCB), arsenic, or creosote.
4. Prevent hearing damage with quiet machines and keep machines well-oiled and maintained.
5. Prevent vibration syndrome by using tools that are ergonomically designed and produce low vibrations. Also, do not grasp tools too tight or work in frigid conditions.
6. Wear dust goggles and dust masks when dust cannot be controlled, such as during hand sanding.
7. Practice good hygiene. Wash hands often, especially before eating and when leaving the studio. Vacuum rather than sweep wood dust.
8. Follow all rules for solvents and solvents containing paints and glues. Never dispose of solvents down the drain. Store in flammable cabinets and away from heat or flame.

19.5 WELDING

A. Objective

To provide safety rules and procedures to follow while welding.

B. Scope

It is applicable to all college community members including instructors and students. Any questions or comments regarding this manual should be directed to the Office of Environmental Health & Safety in the Department of Risk Management

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in welding. In addition to this *Section 19: Art Safety*, *Section 7: Hazard Communication*, and *Section 23: Cutting and Welding (Hotwork)* shall also be followed to ensure compliance with the federal safety regulations.

Welding safety is an extraordinarily complex subject due to the diverse types of welding: oxyacetylene, arc, Metal Inert Gas (MIG), Tungsten Inert Gas (TIG), and plasma arc welding and cutting. The safety rules differ depending on the type of welding, the kind of work, and on the shop or on-site conditions.

The hazards associated with welding and safety precautions include the following:

1. Good Housekeeping: Welding shops should be kept clean and organized. Combustible materials should be eliminated from the area or covered with a fireproof tarp or other protective material. Floors should be free of trip hazards; often the welder's vision is limited by face shields or goggles.

2. Electrical Safety: Shocks are a hazard when working with welding equipment. Only use welding equipment that meets standards. Follow all equipment operating instructions. Keep clothes dry and do not work in wet conditions. Maintain all electrical connections, cables, electrode holders, etc., and inspect each before starting to weld.

3. Compressed Gas Cylinder Safety: The compressed gas cylinders are potential rockets or bombs. All cylinders must be secured upright to a stable surface (wall, table, or cart).

There are also hazards associated with the gas:

- Oxygen will only burn at the proper air concentration, but with the proper concentration and fuel source, it can create violent explosions. Never use oxygen as a substitute for compressed air. Oxygen should not be stored with fuel cylinders or combustible materials.
- Fuel gas is acetylene, propane, and butane. They are all flammable and can burn and/or explode.
- Shielding gases are used in MIG and TIG welding. They are inert gases that include argon, carbon dioxide, helium, and nitrogen. If used in enclosed spaces, they can displace the air and cause asphyxiation.



4. Fire Safety: Many fires start by welding sparks. Welding shops must always be kept free of combustible materials. OSHA regulations require welding to be kept at least 35 feet away from any area where wood dust and chips may be located or created. This also applies to portable welding units. Fire extinguishers should be easily accessible.

5. Health Hazards: This includes radiation, heat, noise, fumes, and gases from welding process and from compressed gases.

- a. **Radiation** takes three forms: visible, infrared, and ultraviolet.
 1. **Visible light** is the least hazardous, intense light produces only temporary visual impairment; eyes should still be protected from bright light.
 2. **Infrared (IR)** is produced when metal is heated until it glows. IR can cause temporary eye irritation and discomfort. Repeated exposure can cause permanent eye damage that occurs slowly and without notice.
 3. **Ultraviolet (UV)** is the most dangerous. All forms of arc welding produce UV radiation. Eye damage is called "flash burn" and can be caused in less than a minute's exposure. Symptoms do not appear until several hours after exposure. Severe burns become excruciatingly painful, and permanent damage may result. UV can also damage exposed skin, with long term exposure resulting in benign and malignant skin tumors.
- b. **Heat** can harm welders by causing burns and by raising body temperature to hazardous levels causing heat stress.
- c. **Noise** can damage hearing; most welding processes are not at damaging levels (except air carbon arc cutting). If you do wear hearing protection such as earplugs make sure they are fire resistant.
- d. **Fumes and Gases** are produced during the welding process. Fumes come from vaporized metal and gases come from the compressed gas in cylinders or can be created when substances burn during welding. Many occupational illnesses are associated with substances found in welding fumes and gases. Have Safety Data Sheets (SDS) for all compressed gases and all welding and brazing rods. Avoid materials that emit toxic fumes such as beryllium, thorium, cadmium, antimony, and lead. Never work with metals of unknown composition, painted metals, or junk/found metals unless ventilation is certain to provide complete removal of the welding plume. Welding should be done only in areas that provide proper ventilation.

6. Personal Protective Equipment: This includes respiratory protection, eye protection, and protective clothing. If adequate ventilation cannot be provided, respiratory protection may be appropriate depending on the material and type of welding. HEPA filters will protect individuals from metal fumes but offer no protection from gaseous contaminants. Use eye protection such as goggles or face shields to protect each welder for the specific type of welding being done. Visitors or other workers should also wear safety glasses. Protective clothes should include long-sleeved shirts and long pants. Preferred fabrics are wool, or flame retardant treated cotton. Never wear polyester or synthetic fabrics that can melt and adhere to skin when heated. Pants and shirts should not have pockets, cuffs, or folds into which sparks may fall. Hair should be covered or at least tied back. Gloves should be worn when welding.

19.6 BRAZING, SOLDERING, CASTING, AND SMITHING

A. Objective

To provide safety rules and procedures to follow while brazing, soldering, casting, and smithing.

B. Scope

It is applicable to all college community members including instructors and students. Any questions or comments regarding this manual should be directed to the Office of Environmental Health & Safety in the Department of Risk Management

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in brazing, soldering, casting, and smithing. In addition to this *Section 19: Art Safety, Section 7: Hazard Communication* shall also be followed to ensure compliance with the federal Hazard Communication regulation.

The hazards associated with brazing, soldering, casting, and smithing and safety precautions include the following:

1. **Brazing and Soldering:** Brazing alloys can contain an array of toxic metals. Silver and copper brazing alloys may contain cadmium, antimony, and arsenic. Solders can contain many metals including lead, tin, cadmium, zinc, arsenic, antimony, beryllium, indium, lithium, and silver. Solders made for use on copper water pipes and cooking utensils are safer.

The following are precautions for soldering and brazing:

- Obtain Safety Data Sheets and complete alloy composition for all solders and brazing metals. Avoid toxic metal-containing alloys, such as those containing arsenic, cadmium, and beryllium. Do not use lead solder.
- Obtain ingredient information on fluxes. Choose the safest flux for the job. Avoid fluoride fluxes and do not mix fluxes.
- Wear goggles that will protect the eyes from infrared radiation and irritating vapors. Use gloves when working with solvents, acids, or caustic cleaning agents. Minimize skin contact with fluxes. Wear clothes that are resistant to heat.
- Work in areas with proper ventilation.
- Braze at the lowest temperature possible. Use gun or electric soldering iron methods over open flame joining or heating of irons. Avoid open dip pot tinning unless excellent local exhaust is established.
- Obtain ingredient information on metal cleaners and degreasers and choose the safest ones. Do not mix cleaning agents. Use putty or whiting to clean when possible.
- Practice good housekeeping. Always clean using wet methods, to control dust which may be contaminated with metal fume particles.



2. **Metal Casting and Foundry:** This involves forcing molten metal (by gravity or centrifugal force) into a mold. The hazards involve exposure to mold materials, burning out patterns and working with molten metals.

The following are precautions for casting and foundry:

- Obtain Safety Data Sheets and ingredients lists for all metals, molds, and patterns used. Choose the least toxic products.
 - Choose foundry sands over cold-setting sands and resin binders. Use non-silica materials such as zircon when possible.
 - Use the safest mold-release agents, such as graphite or asbestos-free talc.
 - Work in areas with appropriate local exhaust ventilation for burn-out of any pattern materials. If possible do not use nitrogen containing plastic patterns when heated, they generate hydrogen cyanide gas.
 - Avoid using metals that contain arsenic, antimony, cadmium, nickel, or chrome. Do not cast in lead.
 - Wear protective clothing for casting and foundry.
 - When centrifugal casting, make sure the equipment is well balanced and that the protective shield is in good condition.
3. **Smithing (or Forging):** This is the process of hammering hot or cold metals into shape. Hazards include the noise that is created with hammering on metal can cause hearing damage. There are also toxic combustion products such as carbon monoxide from the forging furnaces and infrared radiation from furnaces and hot metal that can damage eyes and cause skin burns. Fires are also a constant threat.

The following are precautions for smithing:

- Install fireproof, sound absorbing materials on the floors and walls of the shop when possible.
- Provide good stack exhaust and canopy hood ventilation for forges and furnaces. Carbon monoxide detectors shall also be installed.
- Eliminate all combustibles from areas around forges and furnaces.
- Wear earplugs or other suitable hearing protection and wear goggles to protect the eyes from infrared radiation.
- Wear fire/burn protective clothing and wear gloves and goggles when handling acids, caustics, or solvents.

19.7 STAINED GLASS

A. Objective

To provide safety rules and procedures to follow while working with stained glass.

B. Scope

It is applicable to all college community members including instructors and students. Any questions or comments regarding this manual should be directed to the Office of Environmental Health & Safety in the Department of Risk Management

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in stained glass. In addition to this *Section 19: Art Safety*, *Section 7: Hazard Communication* shall also be followed to ensure compliance with the federal Hazard Communication regulation.

The major hazard in stained glass was the use of lead solder, but there are now new lead-free solders that should be used. These lead-free solders are made of silver, tin, copper, and zinc. The other hazard is the scoring and breaking of glass.

E. Safety Rules

1. Floors and work surfaces should be made of materials that are easily sponged and mopped clean.
2. Only use lead-free solders and avoid solders that contain significant amounts of arsenic, cadmium, antimony, and other highly toxic materials.
3. Wear protective eyewear that is rated for both impact and dust exposure for cutting, grinding, and/or polishing glass.
4. Use wet grinding, polishing, and cutting methods whenever possible.
5. Practice good housekeeping. Clean the studio with wet methods and sponge surfaces. Clean up shards and scraps as you work.

19.8 PHOTOGRAPHY & PHOTOPRINTING

A. Objective

To provide safety rules and procedures to follow while working in photography and photo printing.

B. Scope

It is applicable to all college community members including instructors and students. Any questions or comments regarding this manual should be directed to the Office of Environmental Health & Safety in the Department of Risk Management

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in photography and photo printing. In addition to this *Section 19: Art Safety, Section 7: Hazard Communication* shall also be followed to ensure compliance with the federal Hazard Communication regulation.

The diseases associated with photo printing include some of the following:

- **Skin Diseases:** Many types of dermatitis have been seen in photographers:
 - **Irritant contact dermatitis and chemical burns** from exposure to irritating chemicals, such as acids and bleaches.
 - **Allergic contact dermatitis** comes from chemicals used for developing, such as metol and p-phenylenediamine.
 - **Hyper- and hypopigmentation** (dark and light spots) from exposure to developing chemicals, such as hydroquinone.
 - **Lichen planus** (an inflammatory condition characterized by tiny red-dish papules that may darken and spread to form itchy, scaly patches, and ulcerations) thought to be caused by some color developers.
 - **Skin cancer** from exposure to ultraviolet light sources, such as carbon arcs. (There is also a potential for cancer to develop in lichen planus.)
- **Respiratory Diseases:** Photochemical baths emit substances that are recognized by their typical darkroom odor. There can be various respiratory diseases depending on the dose of exposure to darkroom chemicals.

Common darkroom air contaminants include:

- Acetic acid used in stop baths is a respiratory irritant
- Formaldehyde a hardener and preservative are a sensitizer, irritant, and animal carcinogen.
- Hydrogen sulfide is emitted by some toners, it is highly toxic to nervous system and an irritant.
- Sulfur dioxide is created due to a breakdown of sulfites in baths and in some toners; it is a respiratory irritant and sensitizer.

E. Safety Rules

1. Obtain & review Safety Data Sheets (SDS) on all chemical products. See *Section 7: Hazard Communication* for information about SDS and chemical labeling.
2. Choose the safest materials. Do not use extremely toxic chemicals such as those containing chromic acid, lead, mercury, uranium, or cyanide.
3. Know and explain hazards and/or special precautions from the SDS to students.
4. Label all containers, with name and hazards of the chemical.
5. Replace dry chemicals with premixed chemicals when possible.



6. Do not use or store glacial acetic acid. Purchase acetic acid diluted to a concentration of 50% or less.
7. Dilute or mix chemicals where there is exhaust ventilation. Always add acid to water, never the reverse.
8. Store photo chemicals in the original containers when possible. Never store photo chemicals in glass bottles, which can explode under pressure.
9. Use proper personal protective equipment such as chemical splash goggles, tongs, gloves, and aprons. If chemicals do not allow it to dry, wash the affected skin with water.
10. Silver-containing solutions, complex photo chemicals, solvents, and metal containing toners must not be poured down the drain, but must be collected in a separate, labeled container for pick up and proper disposal by the college.
11. Do not allow heat or ultraviolet (UV) light (from carbon arcs or the sun) to affect stored photo chemicals. For example, Ferri- and ferro-cyanides can release hydrogen cyanide gas if it is exposed to heat or UV light. These chemicals must also not be poured down the drain.
12. Clean up spills immediately. Use spill cleanup kit for spills larger than a paper towel or sponge. Evacuate the room and call 911 for spill cleanup of spills larger than the spill kit. Wet-mop and sponge dusty surfaces do not sweep.
13. In case of fire or life-threatening emergency dial 911.

19.9 TEXTILE ARTS

A. Objective

To provide safety rules and procedures to follow while working with textiles.

B. Scope

It is applicable to all college community members including instructors and students. Any questions or comments regarding this manual should be directed to the Office of Environmental Health & Safety in the Department of Risk Management

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in textile arts. In addition to this *Section 19: Art Safety, Section 7: Hazard Communication* shall also be followed to ensure compliance with the federal Hazard Communication regulation.

The hazards associated with Textile Arts are exposure to dye products and fiber hazards. The related safety precautions include the following:

1. Dye Products: Dyes are the most hazardous in the powdered state. Skin contact and inhalation of even small amounts of dyes in a concentrated form should be avoided. Dyes in liquid form are the safest to handle. However, liquid dyes can still be hazardous, because they have strong preservatives and inhibitors to keep the dye from degrading.

The following are precautions for using dyes:

- Obtain Safety Data Sheets (SDS) on all dyes and textile paints. If dyes and pigments are not identified by their Color Index names and numbers or by their Chemical Abstracts Service numbers, ask the supplier for the information.
- Choose water-based products over solvent-containing.
- Buy premixed dyes or dyes that are packaged in packets that dissolve when dropped unopened into hot water that can be handled safely.
- Avoid procedures that raise dust or mist such as sprinkling dry dyes or pigments on wet cloth or airbrushing.
- Avoid skin contact with dyes by wearing gloves.
- Melt and remove wax at the lowest possible temperature. Do not heat wax with open flames or on gas stoves. Use electric stoves or frying pans with good heat control. Use wax emulsion products when possible.
- Wear protective clothing and protect your eyes by wearing chemical splash goggles.

2. Fibers: Working with fibers have resulted in occupational diseases such as dermatitis, skin, and pulmonary diseases (weaver's cough or cotton lung is also known as brown lung or byssinosis).

The following are precautions for working with fibers:

- Only purchase fibers and textiles from reliable suppliers who will provide information on the origin of the materials and what dyes, or fiber treatments have been applied.
- Purchase cleaned or washed fibers or textiles when possible.
- Do not use mildewed or musty materials. Store fibers in clean, dry places to avoid microorganism growth.
- Avoid dust. Damp-mop or sponge up dust rather than sweeping or vacuuming.



- Obtain information on treatments applied to materials. If the work is to be installed in a public building it needs to be certified that it meets fire-retardant standards.
- Adjust chair heights, looms, etc. for ergonomic comfort. Take breaks, stretch, and exercise to relieve strain.