Art Safety Guidelines

Environmental Health, Safety, and Risk Management Department

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I. Purpose & Scope

This guide establishes procedures to protect faculty, staff, students, and visitors from hazards associated with art shops and work spaces at Stephen F. Austin State University (SFA). This guide provides an overview of some of the most common risks and precautions associated with painting, drawing, ceramics, metal work, sculpture, photography, and printmaking. All faculty, staff, and students must be trained, by the shop supervisor or faculty instructor, in the safe operation of the tools and materials prior to starting work in any SFA art shop, studio, or work space.

II. Responsibilities

A. Environmental Health, Safety and Risk Management (EHSRM)

1. Review, audit, and revise this plan every 3 years or anytime processes or regulatory guidance changes.
2. Evaluate and inspect art shops, studios, and work spaces on campus in collaboration with art faculty and staff on a regular basis or when safety concerns are reported or identified.
3. Stop or suspend work when safety hazards are reported or observed until the appropriate safety measures are put in place.
4. Provide and/or assist with safety training to art faculty, staff, and students as needed or upon request.

B. Art Shop Supervisors (Faculty & Staff)

1. Ensure all faculty, staff, and students have received safety training appropriate for the work space prior to being allowed access to the space.
2. Evaluate art shops and work spaces for hazardous conditions and make necessary corrections prior to allowing staff and students access to the space.
3. Provide all required personal protective equipment (PPE) necessary for the work.
4. Stop or suspend work in art shops or work spaces when safety hazards are reported or observed until the appropriate safety measures are put in place.

III. General Art Safety

Many art work spaces share common safety concerns including chemical use, machines, electrical hazards, compressed gasses, and the need for proper ventilation. The SFA Hazard Communication Manual addresses safe chemical usage and is available on the EHSRM website at: https://www.sfasu.edu/safety/290.asp. Additionally, proper disposal of hazardous waste generated from the use of chemicals, oil base paints, stains, and other hazardous materials is required by law and coordinated through the EHSRM department. For additional information on hazardous waste disposal, see the SFA Hazardous Waste manual at: https://www.sfasu.edu/safety/220.asp or contact EHSRM at 936-468-6034 or safety@sfasu.edu.

Proper ventilation is essential when using chemicals or any activity that produces excessive dust or hazardous vapors. Always use ventilation systems where available (e.g. paint booths, metal work, wood shop, etc.) and conduct work where the dust or vapors will be adequately removed

from the area. When ventilation is not enough to protect the user from exposure to these agents, a respirator is needed. Refer to the SFA Respiratory Protection Plan also found on the EHSRM website at: https://www.sfasu.edu/safety/documents/2017_Respiratory_Protection_Program.pdf.

IV. Painting and Drawing

Various health hazards exist when using paints, pigments, solvents, thinners, aerosolized paints, and dust creating drawing media. Always refer to the manufacturer's Safety Data Sheet for the product being used and follow the safety guidelines. Spent solvents, oil-based paints, and stains should never be poured down the drain. These materials must be disposed of properly as described in the previously mentioned SFA Hazardous Waste manual.

A. Pigments vs. Hues

1. Most paints used in visual arts do not contain metal pigments and are considered non-toxic. These are most easily identified by the product name. If the paint is described as *hue*, such as "chromium yellow hue", there is no (or too little to be concerned about) toxic metal contained in the product.
2. Poisoning can occur if toxic pigments are inhaled or ingested. The main hazard in standard painting techniques is accidental ingestion of pigments due to eating, drinking or smoking while working, inadvertent hand to mouth contact, or pointing the paint brush with the lips. If methods such as spraying, heating, or sanding are employed then there is an opportunity for inhalation of toxic pigments. Always wash your hands with soap and water after using paints or chemical solvents such as paint thinner.
3. If you do use a pigment, use the least toxic pigments possible. Do not use lead or carcinogenic pigments.
4. Avoid mixing dry pigments whenever possible. If dry pigments are mixed, do it inside a glove box (a box with a glass or plexiglass top and holes in the sides for arms) or inside a laboratory-type fume hood.
5. Wet mop and wipe all surfaces when using dry pigments.
6. Never use dishes, containers, or utensils from the kitchen to mix and store paints and pigments.

B. Water Based Paints

1. Acrylic paints contain a small amount of ammonia. Some sensitive people may experience eye, nose, and throat irritation from the ammonia.
2. All water-based paints contain a preservative to prevent mold or bacterial growth. Sometimes artists add preservatives when they make their own paints. Although present in small amounts, certain preservatives may cause allergic reactions in some people.
3. If you add your own preservative, avoid using sodium fluoride, phenol, or mercury compounds. For tempera, a small amount of pine oil works for short periods of time.
4. If you mix casein paints using ammonium hydroxide, you will need to do this under an exhaust ventilation system.

C. Oil Based and Other Non-Water Based Paints

1. Oil paints, encaustic, and egg tempera use linseed oil, wax, and egg as vehicles, and solvents (such as turpentine and mineral spirits) are often used as a thinner and for

cleanup. Alkyd paints use solvents as their vehicle. In addition, many commercial paints used by artists also contain solvents.

2. Inhalation of solvents can cause serious health problems and they are also irritating to the skin. Always wear proper PPE when working with solvents such as gloves and safety glasses. Only use solvents under an exhaust ventilation system.
3. Ingestion of either turpentine or mineral spirits can be fatal. Whenever possible replace turpentine or ordinary mineral spirits with the less toxic odorless mineral spirits.
4. Paint can be removed from your hands with baby oil, and then soap and water. Don't use solvents to remove paint from your skin.
5. Epoxy paints consist of an epoxy resin component containing the pigment, and a hardener component. The epoxy resin may contain ethers which are irritants, may cause bone marrow damage, and are suspect carcinogens. Epoxy hardeners may cause skin and respiratory allergies and irritation. Use caution when handling these materials by wearing disposable gloves and use only outside or under an exhaust ventilation system.

D. Airbrush, Spray Cans, and Spray Guns

1. Spray mists are particularly hazardous because they are easily inhaled. If the paint being sprayed contains solvents, then you can be inhaling liquid droplets of the solvents. The pigments are also easily inhaled, creating a much more dangerous situation than applying paint by brush.
2. Aerosol spray paints contain propellants, usually isobutanes and propane, which are extremely flammable and can easily ignite a fire. Other aerosol spray products such as retouching sprays, spray varnishes, etc. also contain solvents, propellants, and particulates.
3. Waste or "empty" aerosol cans are still under pressure even though they may seem empty and no longer spray. Waste or "empty" aerosol cans should not be placed in the regular trash, they are a regulated hazardous waste. Look for the aerosol can disposal bin for collection of waste aerosol cans or contact EHSRM at 936-468-6034 for more information.
4. Airbrushing produces a fine mist which is a serious inhalation hazard. Airbrushing solvent-containing paints is especially dangerous.
5. Use water-based airbrushing paints and inks rather than solvent-based paints.
6. Use spray cans or an airbrush in a spray booth or outside away from people and building entrances.
7. If ventilation is not adequate, then respiratory protection is necessary while air brushing or spraying. See the previously mentioned SFA Respiratory Protection Plan for more information.
8. Spray guns are less common in art painting but usually involve spraying much larger quantities of paint than either spray cans or airbrush. Spraying solvent-based paints is a serious fire hazard.
9. Never try to spray paint by blowing air from your mouth through a tube. This can lead to accidental ingestion of the paint.

E. Dry Drawing Media

1. Charcoal and dry pastels have the potential to create significant inhalation hazards by the amount of dust they create.
2. Use the least dusty types of pastels, chalks, etc. People with Asthma might want to switch to oil pastels or similar non-dusty media.
3. Spray fixatives should be used in a spray booth that exhausts to the outside.
4. Don't blow off excess pastel or charcoal dust with your mouth. Instead, tap off the built-up dust so it falls to the floor (or paper on floor).
5. Wet-mop and wet-wipe all surfaces clean of dust.

F. Liquid Drawing Media

This includes both water-based and solvent-based pen, ink, and felt tip markers.

1. Use water-based markers and drawing inks if possible.
2. Alcohol-based markers are less toxic than aromatic solvent-based markers.
3. Solvent-based drawing inks and permanent markers should be used with good ventilation.
4. Never paint on the body with markers or drawing inks. Body painting should be done with cosmetic colors.

V. Ceramics

A. Clay

1. Clay mixing should be done outside in the area designated for mixing clay. Always wear a respirator or dust mask when mixing clay and clean up the are when finished.
2. All mechanical clay mixers should use local exhaust ventilation to remove fine silica dust particles from the air.
3. Clay mixers should be equipped with proper machine guards so that they cannot be opened to add clay or water while the mixer blades are turning.
4. Bags of clay (and other pottery materials) should be stacked on palettes or grids off the floor for easier clean-up.
5. Wear separate work clothes, smock, or apron while in the studio.
6. Avoid contact of clay with broken skin. Use a skin moisturizer.
7. To prevent back problems, always lift with knees bent and back straight. Keep wrists in unflexed position as much as possible to prevent carpel tunnel syndrome.
8. Finish green ware while still wet or damp with a fine sponge instead of sanding when dry. Do not sand greenware.
9. Wet mop floors and work surfaces daily to minimize dust levels and prevent dry scraps from becoming pulverized.

B. Glazes

1. Use only lead-free glazes. Glazes containing lead are not permitted on the SFA campus and any glazes used must be indicated as “Lead Free” on the label.
2. If possible, don't use colorants that are known human carcinogens. There is no known safe level of exposure to carcinogens.

3. A respirator is required when weighing and mixing powdered glazes. Wet glazes are not an inhalation hazard. Only approved faculty, staff, and students who have been trained and fit-tested for a respirator are allowed to mix dry glazes.
4. Good housekeeping procedures and cleanup of spills reduce the risk of inhalation or ingestion of toxic dusts. Wet mop spilled powders.
5. Gloves should be worn while handling wet or dry glazes.
6. Local exhaust ventilation should be available when applying solvent-containing glazes.
7. No eating or drinking in the ceramics studio. Wash hands with soap and water after working with clay and glazes.

C. Kilns

Kilns operate at extremely high temperatures and can cause serious injury or fires if not operated properly. Firing temperatures can vary from as low as 1382°F for raku and bisque wares, to as high as 2372 °F for stoneware, and 2642 °F for certain porcelains.

1. Chlorine, fluorine, sulfur dioxide, nitrogen dioxide, and ozone are highly toxic by inhalation. Bisque firings of high-sulfur clay have caused the production of great amounts of choking sulfur dioxide. Inhalation of large amounts of these gases can result in severe acute or chronic lung problems. Long-term inhalation of low levels of these gases can cause chronic bronchitis and emphysema. Fluorine gas can also cause bone and teeth problems.
2. Many metal fumes generated at high temperatures are highly toxic by inhalation. Since lead vaporizes at a relatively low temperature, it is especially hazardous.
3. Carbon monoxide from fuel-fired kilns or the combustion of organic matter in clays is highly toxic by inhalation and can cause oxygen starvation.
4. Hot kilns produce infrared radiation, which can damage your eyes. There have been reports of cataracts, from years of looking inside the hot kilns. Infrared goggles approved by the American National Standards Institute (ANSI) or hand-held welding shields should be used when looking into the operating kiln. Shade number from 1.7 to 3.0 is recommended, but a darker shade may be required if spots appear in front of one's eyes after looking away from the kiln.
5. Heat generated by the kiln can cause thermal burns. Allow ceramics to cool and use protective gloves to remove them from the kiln to prevent burns.
6. Heat produced by even small electric kilns can cause fires in the presence of combustible materials or flammable liquids.
7. If an electric kiln fails to shut off, the heating elements will melt which can cause a fire. Gas kilns also generate a lot of heat, and room temperatures often exceed 100 °F.
8. Kilns may only be located areas designed for kiln use.
9. Do not use lead compounds at stoneware temperatures since the lead will vaporize.
10. Lumber, paper, solvents, or other combustible and flammable materials should not be stored in kiln areas or within 20 feet of a kiln.
11. Always check that the kiln has shut off after use.
12. If gas leaks are suspected (e.g. gas odor): shut off gas at the source and call UPD at 468-2608.

D. Raku Firing

Raku involves first firing ware at a low temperature in a regular gas kiln, and then removing the still hot pieces and placing in them in sawdust, leaves or other organic materials for a reduction phase.

1. The reduction step produces large amounts of smoke and carbon monoxide. Raku is only allowed outdoors because of the smoke. Be careful to not locate raku near air intakes or open windows of buildings.
2. Treated wood or other materials can yield an exposure to highly toxic preservatives or pesticides, such as arsenic and chromium compounds. Never use materials that have been treated with preservatives or pesticides for the reduction phase.

VI. Metal Work

Serious safety hazards exist in metal work mainly caused by fumes associated with soldering, brazing and welding. Always use the available exhaust ventilation systems when conducting this type of work.

A. Welding Hazards

1. Galvanize poisoning is a very serious health risk caused when a person is overexposed to the zinc oxide which is formed when the galvanized coating on steel evaporates at a very high temperature such as the temperatures needed for welding. For this reason, galvanized metal work is not allowed on the SFA campus.
2. Hot metal and flying sparks can cause several thermal burns on exposed skin.
3. Intense visible light causes eyestrain resulting in headaches, inflammation, and other temporarily painful symptoms.
4. Ultraviolet light produced in oxyacetylene welding may cause skin cancer, severe sunburn, and very painful eye damage.
5. Always use appropriate PPE such as a welding hood, gloves, and shield when welding.
6. Chemicals such as acids and alkalis are sometimes used to clean parts before brazing and can produce chemical burns if allowed to come in contact with the skin.

B. Welding Precautions

1. Welding surface shall be fire proof. Preferably made of steel with fire proof work surface.
2. For heavy welding, use a welding helmet.
3. Solder is a mixture of lead and tin. When soldering, some lead fumes can be produced if temperature exceeds 350 degrees Inhalation of lead fumes from soldering may cause chronic lead poisoning.
4. For soldering, use general or local exhaust ventilation.
5. Use a fan to blow soldering fumes away from the face.
6. Fumes generated during brazing can be a serious hazard. Brazing fluxes generate fluoride fumes when heated. Cadmium in silver brazing alloys vaporizes when over-heated and produces cadmium oxide. Fumes are inhaled into the respiratory tract and they can cause pulmonary distress, shortness of breath, and in cases of severe exposure, may cause death.

VII. Sculpture

A. Plaster

1. Plaster dust (calcium sulfate) is slightly irritating to the eyes and respiratory system. Use exhaust ventilation systems or work outdoors when generating excessive dust from plaster and waste molding where the plaster is chipped away.
2. Concentrated acetic acid is highly corrosive by ingestion, inhalation, and skin contact.
3. Burnt lime (calcium oxide) is moderately corrosive by skin contact (especially if the skin is wet), and highly toxic by inhalation or ingestion.
4. Wear gloves and goggles when mixing acetic acid and burnt lime.
5. Careless use and storage of sharp tools can cause accidents. Chipping set plaster can result in eye injuries from flying chips. Always wear safety glasses or goggles when chipping plaster.
6. Always carve or cut in a direction away from you, and keep hands behind the tool. If the tool falls, don't try to catch it.
7. Benzene used with many mold releases is moderately toxic by skin contact and inhalation, and is highly toxic by ingestion and is also flammable. Only pour benzene under a laboratory type fume hood and wear gloves and goggles. Store benzene and other solvents in flammable storage cabinets and do not use near open flames.
8. Making plaster casts of hands, legs, and other body parts can be very hazardous due to the heat released during the setting process. Do not use plaster for body part casts. Instead, use a plaster-impregnated bandage (such as Johnson and Johnson's Pariscraft), along with vaseline or similar mold release as protection.

B. Woodworking

Wood can be hand carved with chisels, rasps, files, hand saws, sandpaper, and the like, or they can be machined with electric saws, sanders, drills, lathes and other woodworking machines. Woodworking tools and machines can present serious safety hazards and must be used with extreme caution. Additionally, dust generated from woodworking can be irritating if inhaled and be a fire hazard. Always use the local exhaust ventilation systems when generating dust from working with wood.

1. Woodworking machinery and tools present serious physical hazards from accidents. Machinery accidents are often due to missing machine guards, faulty equipment, or using the wrong type of machine for a job. Tool accidents are often caused by dull tools or improper use.
2. Electrical equipment can also present electrical shock and fire hazards from damaged wiring.
3. Sawdust and wood are fire hazards. Fine sawdust is even an explosion hazard if enclosed.
4. Wear goggles when using machines that create dust. For lathes and similar machines which may produce wood chips, use a face shield and goggles, and make sure the machines are properly shielded.
5. Be sure that all woodworking machines are equipped with proper guards to prevent accidents. Never remove a machine guard!

6. Use the proper machine for the job and report defective or damaged machines immediately. Don't use the machine until repairs have been made.
7. Do not wear ties, loose clothing, necklaces, long earrings or other items that could get caught in the machinery. Always tie back long hair before using machinery.
8. Keep hand tools sharpened, and cut away from your body. Do not place your hands in front of the tool.

VIII. Photography and Photo Processing

Photo processing often utilizes hazardous chemicals and thus the need for proper ventilation. Use the local exhaust ventilation system when using hazardous chemicals for photo processing.

A. Color Processing

1. The developing bath and mixture area should be well ventilated since organic solvents are being used.
2. Pour liquid solution carefully into bottle containing Tertiary Botylamine Borane (TBAB) Powder. Never add (TBAB) to liquid solution. Use exhaust hood when completing this step.
3. Wear gloves and goggles when handling color developers. Wash gloves with an acid type hand cleaner and then water before removing them.
4. Never pour used chemicals down the drain. Spent processing chemicals must be disposed of properly as described in the previously mentioned SFA Hazardous Waste manual. Contact EHSRM at 468-6034 for more information on hazardous waste disposal.

B. Black and White Processing

1. Wear rubber gloves when handling developers in powder form or liquid solution. Wear approved dust respirator when pouring developer dust.
2. Never put bare hands in developer baths, use tongs instead. If developer solution splashes on your skin or into eyes, immediately rinse with lots of water. For eye splash, wash for 15 minutes and call physician. Eye wash fountains are important for photography dark rooms.

IX. Printmaking

Various health hazards exist when using powdered pigments and rosins, solvents, thinners, aerosolized paints, and corrosive chemicals. Always refer to the manufacturer's Safety Data Sheet for the product being used and follow the safety guidelines. Spent solvents, oil-based paints, and stains should never be poured down the drain. These materials must be disposed of properly as described in the previously mentioned SFA Hazardous Waste manual. The printmaking area houses equipment and tools capable of creating bodily injury if misused. All proper precautions must be employed to avoid injury.

A. Corrosive Chemicals

1. Always wear the proper protective equipment, specifically safety glasses and chemical resistant gloves when handling any corrosive chemical.
2. Be aware of the procedures for safely cleaning up any spills of a corrosive chemical.

B. Solvents

1. Always use proper ventilation and PPE when using solvents.
2. Store unused solvents in their properly sealed containers and in the flammable storage cabinet.
3. Never dispose of solvents by pouring them down the drain. Ask your supervisor or call EHSRM at 468-6034 for proper disposal methods.
4. Any cloth saturated in flammable solvents must be disposed of in the red flammable waste containers.

C. Aerosols

1. Spray mists are particularly hazardous because they are easily inhaled. If the paint being sprayed contains solvents, then you can be inhaling liquid droplets of the solvents. The pigments are also easily inhaled, creating a much more dangerous situation than applying paint by brush.
2. Aerosol spray paints contain propellants, usually isobutanes and propane, which are extremely flammable and can easily ignite a fire. Other aerosol spray products such as retouching sprays, spray varnishes, etc. also contain solvents, propellants, and particulates. Never use these products near a spark or heat source.
3. Always use spray cans in a spray booth or outside away from people and building entrances.
4. Waste or "empty" aerosol cans are still under pressure even though they may seem empty and no longer spray. Waste or "empty" aerosol cans should not be placed in the regular trash, they are a regulated hazardous waste. Look for the aerosol can disposal bin for collection of waste aerosol cans or contact EHSRM at 936-468-6034 for more information.

D. Powdered Pigments and rosins

1. Powdered pigments and rosins can be inhaled and cause lung damage. Wear a dust mask when using these materials.
2. Ensure that all powdered residues resulting from normal use are cleaned up using wet methods and properly stored after use.

E. Equipment Use

1. Printing presses produce a significant amount of pressure and can trap digits and appendages. Users should be aware and trained in proper use in order to avoid injury.
2. Several materials, such as lithography stones, weigh in excess of 100 pounds and can cause injury from falling if mishandled. Get help when lifting and moving these materials.
3. Tools used in carving and engraving can cause lacerative injury. Users should employ the proper PPE and use proper technique when utilizing such tools.
4. Pressure washers produce a high amount of water pressure capable of causing personal injury. Use of proper PPE and safety measures is required to avoid injury.