Safety & Compliance in the Arts





Environmental Health & Safety

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Contacts and Objectives

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- Waste Management
- Industrial Hygiene
- Asbestos/Indoor Air Quality
- Fire Safety

- Occupational Safety
- Insurance/Risk Management
- Lab Safety
- Building Code Administration



Working in the Arts carries risk of exposure and injury due to hazardous materials. Research has shown that an artist's craft has the potential to adversely affect his/her health. Art materials and processes can cause physical injury, illness, or cause fires if not properly used. It is essential for artists to understand studio hazards and how to protect themselves and those working around them.

Training Objectives

- To provide safety guidelines for workers and researchers in USF studios, shops, and studios
- To increase awareness of environmental compliance regulations
- To provide safety-related contact information and resources

Individual Responsibilities

The key to having a safe art environment lies with an individual's commitment to safety. The <u>USF Chemical Hygiene Plan</u> outlines the responsibilities of individuals working in chemical "laboratories" including art studios, ceramic studios, photography darkrooms, etc. All individuals are required to:

- Follow all University safety procedures as outlined by the Chemical Hygiene Plan, EH&S, and the Instructor/Area Manager
- Attend all required safety trainings
- Report any conditions deemed unsafe to the Instructor/Area Manager, Safety Supervisor, or EH&S

Supervisor Responsibilities

The <u>USF Chemical Hygiene Plan</u> also outlines the responsibilities of Supervisors/Area Managers working in chemical "laboratories" including art studios, ceramic studios, photography darkrooms, etc. All supervisors are required to:

- Determine job-specific safety and compliance procedures
- Provide required safety equipment to staff
- Ensure that everyone receives appropriate safety training
- Ensure that everyone follows safety and compliance procedures
- Ensure correction of identified hazards
- Report all injuries/illnesses to Environmental Health & Safety

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Recognizing Hazards: Hazard Classes

FLAMMABLE

- A material that may catch fire and burn in air
- Any liquid having a flashpoint below 100°F (37.8°C)
- Flammable vapors are usually heavier than air (vapor density > 1), so it is
 possible for the vapors to travel along floors and, if an ignition source is present,
 result in a flashback fire
- Store flammable liquids only in specially designed flammable storage cabinets and refrigerators/freezers or explosion-proof refrigerators/freezers away from ignition sources and oxidizers



OXIDIZER/REACTIVE

- An unstable material that may ignite, explode, or produce toxic gas under certain conditions
- Examples include sodium, t-butyl lithium, aluminum nitrate, perchloric acid, nitric acid, and sodium peroxide
- Store away from flammable materials and place in a secondary containment when stored with incompatible materials



CORROSIVE

- A material that destroys metal and can cause destruction of tissue upon exposure
- Has a pH of less than 2 or greater than 12.5
- Examples include strong acids such as hydrochloric acid and sulfuric acid, and strong bases such as potassium hydroxide and sodium hydroxide



POISON/TOXIC

- A material that is harmful or fatal if ingested or absorbed
- Toxic chemicals have an LD50 of 50 500 mg/kg, single oral dose for rats
- Highly toxic chemicals have an LD50 of < 50 mg/kg, single oral dose for rats
- Store in a secure, sealed container below shoulder level. Use only in designated areas



Recognizing Hazards: Resources

1. Manufacturer's Label

The manufacturer of a chemical must provide a label that indicates:

- Full name of chemical
- Hazard warnings
- Name and address of manufacturer
- * Contact the manufacturer for instructions on how to handle missing labels. EH&S can take unlabeled chemicals for disposal.

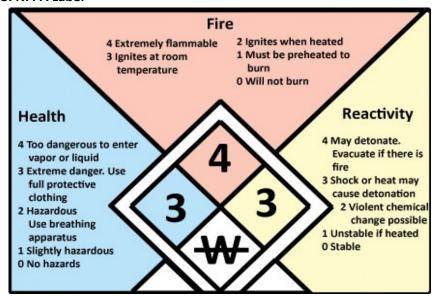
2. Safety Data Sheets (SDS)

An SDS is a document, prepared by the manufacturer, which contains safety information for materials containing hazardous chemicals. It contains information about:

- Material components
- Dangers
- Safe handling of material

SDS sheets are shipped with the chemical, but can also be found online. Be sure that you have immediate access to the SDS for chemicals you are working with.

3. NFPA Label



This label was developed by the National Fire Protection Association to identify and rank a material's hazards. Hazards are rated from 0 (no hazard) to 4 (extremely hazardous).

Fire Hazard – labeled in red Health Hazard – labeled in blue Reactivity Hazard – labeled in yellow Specific Hazard – labeled in white (OX=oxidizer, W=use no water, CORR=corrosive, ALK=alkali)

4. GHS Classification

The Globally Harmonized System of Classification and Labeling of Chemicals (GHS), is a universal approach to defining chemical hazards, criteria to compare these hazards, and hazard communication. Hazardous chemical labels and SDSs will present information in alignment with the GHS. It is important to remember that, within the GHS, hazards are rated from 1 (extremely hazardous) to 4 (no hazard), which is the opposite of the NFPA system.

Minimizing Hazards: Exposure and Risk

Exposure Routes of Entry:

- Absorption through the skin
- Inhalation
- Ingestion (eating and drinking)
- Injection (needles or sharp pieces of glass, plastic, or metal)

Effects:

- <u>Acute effects</u> cause severe symptoms develop rapidly and lead quickly to a health crisis. These symptoms often subside when the exposure stops.
- <u>Chronic effects</u> result in symptoms developing slowly, due to long and continuous exposure to low
 concentrations of a hazardous substance. Such symptoms do not usually subside when the exposure
 stops.

Exposure risk can be minimized by:

- Substitution of less hazardous materials
- Engineering controls (example: working in the fume hood)
- Administrative controls (Chemical Hygiene Plan, training, signs)
- Personal protective equipment (PPE)

Minimizing Hazards: Chemical Storage

All art facilities that use hazardous chemicals must:

- Keep an up to date inventory of all chemicals
- Provide all workers with access to SDSs (electronic or paper format)
- Label all chemical containers with the full chemical name no abbreviations
- Ensure that chemical containers remain closed when they are not being used

Chemicals should be stored in compatible containers. Do not use containers that are not compatible with chemicals such as food containers. Store chemicals in cabinets or on shelves segregated by hazard class. For example, flammable chemicals should be stored in a flammable-rated cabinet and away from oxidizing chemicals.

Minimizing Hazards: Gas Cylinders

Gas cylinders should be handled appropriately due to the health and physical hazards associated with their contents.

- Read SDS and cylinder labels for safety information.
- Never rely on the color of the cylinder for identification.
- Do not use an open flame to detect leaks from flammable gases.
- Never roll, drag or drop cylinders; move cylinders with proper equipment.
- Inspect regulators and hoses before use.
- Protect valve from damage and do not store anything over a valve.
- Remove empty cylinders from work area.
- Cylinders must be secured upright to a permanent fixture in a cool, dry place.
- Oxygen and flammable gases must not be stored within 20 feet of each other.
- Remove empty cylinders from studio as soon as possible.

Minimizing Hazards: Personal Protective Equipment

There are various types of personal protective equipment (PPE) that can protect the eyes, face, respiratory system, and skin. PPE is used as a last line of defense against the hazards associated with tasks being performed and can be used alone or in conjunction with engineering and administrative controls.

EYE PROTECTION

- Safety glasses protect against flying debris
- Splash goggles protect against liquid splashes, vapors, aerosols, dust
- Full face shields over splash goggles provide extra protection when working with corrosive chemicals or debris from power equipment
- Prescription eyewear alone is not considered sufficient eye protection

GLOVES

- For handling hazardous materials, sharp, or very hot or cold items
- Latex, vinyl, or nitrile gloves are appropriate for most chemical hazards
- Glove compatibility charts provide information for specific chemicals, and are available online through glove manufacturers

PROTECTIVE GARMENTS

- Coveralls, smocks, aprons, etc.
- Protect the arms, legs, or front of the body from chemicals, flying objects, molten metal, and sparks
- Impervious aprons provide extra protection against corrosive liquids







RESPIRATORS

 Consult EH&S before use. Federal regulations prohibit the use of respirators by untrained personnel. If EH&S determines use is necessary, the individual must participate in the University's respiratory protection program. This includes initial and annual medical evaluation, respirator fit test, and training.



HEARING PROTECTION

- Earplugs or earmuffs
- Exposure to machine noise can result in hearing loss
- Use when noise levels exceed 85 decibels



Minimizing Hazards: Exposure Management

These are safety guidelines that should be followed to minimize your risk of exposure when working with hazardous chemicals:

- No eating, drinking, chewing gum, or applying cosmetics in areas where chemicals are handled or stored.
- Appropriate personal protective equipment (PPE) must be worn by personnel when working with chemicals. These may include smocks, coveralls, face shield, gloves, and respirators.
- Avoid generating hazardous dust.
- Never use lips or teeth to point a paint brush.
- Wash hands thoroughly and frequently.
- Post signs to inform personnel about safety hazards when working with chemicals or equipment.
- Keep work areas free of slip, trip, and fall hazards.

Ventilation Systems

If you are using a chemical or working with a material that poses inhalation hazards, use ventilation controls such as a fume hood, ventilation hood, dust collection system, or snorkel to reduce the risk of being exposed to any hazardous particles, vapors, fumes, or mists. Art processes such as silk screen printing, acid etching, paint spraying, welding, woodworking operations, and photographic development often use local exhaust ventilation.

Fume hoods are tested annually by Environmental Health & Safety. If the fume hood's monitor alarms, please contact Environmental Health & Safety at 813-974-4036. Do not mute. An alarming monitor indicates that there may be a low or high face velocity in the fume hood that can increase the potential for chemical vapors to enter the work environment. This also increases your exposure to the chemical. Additional guidelines that should be followed when using a fume hood include:

- Performing all applications at least 6 inches inside the hood.
- Avoiding rapid movements that create cross drafts and disrupt airflow.
- Keeping the sash as low as possible while using hood. The glass is the primary barrier between the worker and a possible spill, splash, or explosion.
- Not storing chemicals or equipment in hood.
- Closing sash when hood is not in use.

Minimizing Hazards: Potential Hazards

Activity	Hazards	Recommended Safety Precautions
Painting	 Pigments - metal based Solvents - thinners Resins - varnishes, lacquers Spray application methods 	 Use tube or pre-mixed and commercial paints whenever possible. Use water based instead of solvent based. Never use your lips to point the paint brush or use teeth to hold the paint brush.
Printmaking Photography - Black & White	 Ferric Chloride Ink Pigments Acids - Nitric Acid Acids and caustics are used to etch and clean various media in intaglio and lithography. These materials are very corrosive to the skin, eyes and respiratory system, especially when concentrated. Acids-glacial acetic acid Photochemicals found in 	screens, and other equipment. - Use barrier creams to prevent casual contact with toxins. - Substitute less-toxic alternatives for highly toxic photochemical developers,
Processing/Color Processing	fixers, developers, toners, etc., i.e. silver nitrate, amines - Stop Baths	toners, and bleaches. Consult the product's SDS. Never put your bare hands in working solutions (particularly developer solution, which may contain a strong sensitizer). Use tongs instead. If you come in contact with any solutions, wash the affected area immediately with soap (acidic cleanser such as pHisoderm) and water. When finished working or when leaving the darkroom, wash hands thoroughly Store concentrated photochemicals (particularly stop baths) on low shelves where they will not spill and splash in your face or eyes. Store photochemicals in original or polypropylene containers—never glass. Cover working solutions when not in use.
Clay Modeling/ Glazing	 Glazes - silica, metals Colorants - vanadium pentoxide, metals Firing Kiln Clay/Plaster-silica Silica, if inhaled over the course of many years can lead to the debilitating lung disease silicosis. Loading and mixing dry 	 Kilns should be locally exhausted and vented to the outside. Keep combustible materials, particularly flammable materials, away from kilns Keep a fire extinguisher close by and know how to use it. Wear appropriate shaded eye protection when looking directly into the kiln. Purchase prepared glazes without toxic components whenever possible.

	clay in a clay mixer creates an opportunity for exposure - During firing, clay releases combustion products and gases such as carbon - monoxide, formaldehyde	 If possible, avoid using or mixing glazes containing highly toxic metals such as lead, cadmium, arsenic, or uranium. Wash your hands thoroughly when you finish working or leave the studio. Practice good hygiene methods.
Sculpting/Modeling	 Plaster-irritants such as line, calcium sulfate Clays -plastic resins, oils Wax - overheating Cement - lime, alumina, silica - strong skin, eye, and respiratory system irritants 	 Wear chemical protective gloves, apron, and goggles as necessary when handling bulk quantities of resins. If you will be applying a pint or more of a product that contains a flammable solvent, remove all sources of ignition from the area. Store flammable materials in a flammable storage cabinet.
Woodworking	 Sawdust Loud machinery Paints/solvent based finishes Treated wood Carving tools 	 All floor-mounted woodworking equipment should be fitted with local exhaust ventilation at the point of operation and filtered. Wear hearing protection such as earplugs or muffs when using noisy hand tools or machines. Make sure all equipment is equipped with guards and consider panic buttons for shutting off equipment in an emergency. When using hand-carving tools, keep your hands behind the tool and cut away from your body.

Emergency Response: Spills

Small spills may be cleaned up by workers if they have proper supplies, knowledge, PPE, and are comfortable doing so.

- Consult the SDS of the spilled chemical & wear proper PPE prior to clean-up.
- Spread absorbent around spill site and over liquid's surface and wait 15 minutes.
- Collect wet absorbent & transfer to a plastic bucket or bag using dustpan & brush.
- Properly label and dispose of as hazardous waste.

If any of the following conditions occurs, call EH&S:

- Spill is large.
- Spill involves extremely hazardous chemicals.
- Ventilation is inadequate.
- No spill clean-up materials.
- Personnel uncomfortable handling clean-up.
- If a spilled chemical enters the drain, soil or water body.

Emergency Response: Incidents

If there is an emergency, call 911 or University Police and be prepared to give detailed information about your location.

EYEWASH

- If chemicals get into eyes, flush eyes for 15 minutes.
- Seek medical attention.
- Lab personnel must flush eyewash weekly and keep a record.
- Do not block with glassware or equipment.

SAFETY SHOWER

- If chemicals get onto clothes/skin, rinse for 15 minutes, removing contaminated clothing.
- Seek medical attention.
- FM-Ops flushes showers quarterly and conducts annual maintenance inspections during one of the quarterly flushes.
- Do not store items under shower.

FIRST AID KIT

- Know location.
- Check for completeness and expiration dates.
- Administer first aid for minor injuries and follow incident reporting procedures below





Emergency Response: Incident Reporting

Call 911 for all emergencies. Complete the online incident reporting form on the EH&S website.

Students who are injured or become ill while working may visit Student Health Services, a walk-in clinic, or hospital.

Workers' Compensation (WC) covers faculty, staff, and official volunteers at the University of South Florida. Teaching and graduate assistants are included as employees.

If you are injured on the job:

- Notify your supervisor
- Supervisor will contact AmeriSys at 800-455-2079
- Proceed to approved medical facility
- Send injury report to EH&S within 24 hours
- Forms are available on the **EH&S** website

Hazardous Waste

In 1976, Congress passed the Resource Conservation and Recovery Act (RCRA). This law gave the Environmental Protection Agency (EPA) the authority to regulate all individuals who generate and accumulate hazardous wastes. All labs, studios, and shops that generate and accumulate hazardous wastes are subject to unannounced inspections from the Florida Department of Environmental Protection and/or EPA and are thus subject to fines for noncompliance.

Universal Waste

These materials are subject to hazardous wastes regulations unless they are managed or recycled according to the universal waste regulations. Contact Facilities Management-Services at (813) 974-2500 for disposal.

- Nickel cadmium, lithium ion, nickel metal hydride, lead acid, mercury or silver hydride batteries must be segregated and collected in a container labeled with its contents.
- Intact, used fluorescent and high intensity device (HID) lamps must be stored in a closed box or metal container labeled with its contents.



- Broken fluorescent and high intensity device (HID) lamps must be stored in a closed box or metal container with a plastic liner and labeled with its contents.
- Mercury thermometers, thermostats, and barometers must be stored in a plastic lined box or metal container labeled with its contents.

Chemical Waste

- Continuously evaluate your processes to minimize waste and to produce waste that is less hazardous.
- At USF, all chemical waste must be treated as hazardous waste and must be collected. No hazardous waste can be put in the trash, down the drain, or on the ground.
- Empty chemical containers can be disposed in the trash or reused to store hazardous wastes, EXCEPT for empty containers that stored acutely hazardous wastes (EPA P-listed). These have green warning labels. They cannot go in the trash and must be disposed of through EH&S.
- For non-P-listed waste containers, remove or deface the label with a marker and write "Empty" on the bottle before disposing to the regular trash.
- Lead solder remnants must be collected and disposed of as hazardous waste.

Common Studio Waste Streams

- Contaminated rags
 - Solvent-contaminated wipes that must be collected in closed, labeled, metal containers and stored for no longer than 180 days before being sealed and disposed of as regular trash.
 - These may also be collected and disposed as hazardous waste.

The following items should be managed as hazardous waste as described below:

- Solvents
- Acids
- Paints
- Glazes
- Aerosol cans

Hazardous Waste: Container Management

According to EPA regulations:

- All hazardous waste containers must be labeled "Hazardous Waste" and the label must include the contents, percentages of the waste constituents, and an indication of the hazard (for example:toxic).
- Attach a completed yellow hazardous waste tag with this information as soon as waste is added.
- Do not use chemical abbreviations or formulas on the container label full names only.
- Hazardous waste must be stored in a container compatible with the contents.
- Do not store hazardous wastes in food or drink containers.
- Hazardous waste containers must always be kept closed except when adding or removing contents.

- Contents in leaking containers must be transferred into another labeled container.
- A container is empty when it has been completely emptied using the normal methods of removing its contents, and it contains 3% or less than its total capacity.
- Unless they held P-listed wastes, empty containers can be defaced, marked as empty, and disposed in the trash.
- Empty containers that contained acutely hazardous wastes (EPA p-listed) are considered hazardous waste and must be disposed of as such.

Hazardous Waste: Accumulation & Storage

All hazardous wastes accumulated in the lab must be kept in a Satellite Accumulation Area (SAA).

- SAA must be located at or near the related work process and be under the control of the generator.
- Store a maximum of 55 gallons of regular waste or 1 quart acutely hazardous wastes (P- listed) in an SAA.
- Labels with the contents of the container, the words "Hazardous Waste", and a description of the hazard must be placed on containers the first time waste is added into the container.
- Secondary containment and weekly inspections for lids, leaks, and labels are strongly recommended.
- Always remove funnels after disposing of hazardous waste into a container, and keep containers closed except when adding waste.

Wastes should be segregated, based on compatibility of chemicals, to prevent potential reactions.

- Read the SDS before segregating wastes.
- Always keep unused chemicals in their original containers to prevent exposure to harmful vapors and dusts.
- Divide wastes into separate waste streams such as acids, bases, oxidizers, photographic wastes, solids, mercury, halogenated solvents, and non-halogenated solvents.

Hazardous Waste Pick-Up

USF uses CHEMATIX to track chemical inventory and to request waste supplies and waste pick-ups. To gain access to CHEMATIX, you must submit a CHEMATIX Access Form to EH&S. This form can be found on the EH&S website. Login to CHEMATIX to request a hazardous waste pick-up.

Stormwater Management

Stormwater pollution can have a significant impact on the quality of surface waters and surrounding ecosystems. USF strives to mitigate the impact of stormwater runoff from its facilities.

An <u>illicit discharge</u> is defined as any discharge into a storm drain that is not composed entirely of stormwater.

Examples of illicit discharges include:

- Rinsing buckets of paint or other materials in the grass, sidewalks, and near storm drains.
- Dumping wash water on ground or down storm drains.
- Performing auto repairs involving oil and other mechanical fluids in parking lot.



Fire Safety

Common fire safety violations:

- Extension cords can be used as temporary wiring only. Unplug them after use. As an alternative, use a surge-protected power strip which does not have to be unplugged after each use.
- Do not daisy chain power strips by plugging them into one another. Each power strip must be plugged directly into an outlet. Do not run cords through doors, across walkways, into ceilings, or under carpets.
- Do not block exits, fire alarms, fire extinguishers, or electrical panels.
- Store all flammables (glues, aerosols, wood finishes, etc....) in a flammable storage cabinet. At the end of the day return all flammables to the flammable storage cabinet.
- Do not store flammables near any exits or escape routes.
- Electrical/mechanical rooms may not be used as a storage area.
- Keeps storage at least 18 inches from the sprinkler heads in a sprinkled building and 24 inches below the ceiling in non-sprinkled buildings.
- Do not hang any object(s) from sprinklers or their piping.

Art studios may contain many fire hazards. These hazards include flammable and combustible solvents, oily rags, chemical oxidizers, and compressed welding gases. When working with flammable or combustible solvents:

- Be aware of the solvent's flashpoint and volatility, which influence its ability to initiate a fire.
- Choose solvents with the highest flashpoint and lowest volatility.
- Ventilate the area and do not use open flames or electrical equipment that may generate sparks (always bond and ground metal containers when dispensing flammable solvents).
- Store organic solvents away from chemical oxidizers.
- Purchase in as small a quantity as possible; having large quantities of flammable or combustible liquids is a serious fire hazard.
- Do not smoke or burn candles in any studio.
- Manage solvent-soaked rags as described in the Common Studio Waste Streams section above.
- Clean up solvent spills immediately.

Emergency Response: Fire

You are not expected to fight the fire. Follow these emergency procedures to assure your safety:

- 1. Alert others in the area by yelling out FIRE FIRE!
- 2. Activate the fire alarm by using the manual pull station.
- 3. Attempt to extinguish fire, if it is small and you know how to use an extinguisher.
- 4. Close all doors behind you as you evacuate the building.
- 5. Call 911 as soon as possible from outside the building.
- 6. Give as much information as possible to the emergency dispatcher.
- 7. Meet in the designated relocation area at least 150 feet from the building.
- 8. Remain in a grassy area, clear of parking lots where emergency vehicles will need to travel.

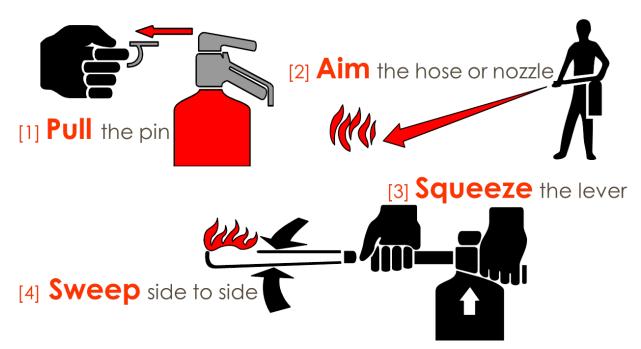
There are three components needed to create a fire: fuel, oxygen, and heat. In order to extinguish a fire, one of these components needs to be removed. A fire extinguisher is a fire protection device used to extinguish or control small fires, often in emergency situations. It is important to know what types of fire extinguishers are in your workplace and their locations.

EH&S conducts a monthly inspection of the fire extinguisher to ensure that:

- the extinguisher is not obstructed
- the pin and seal are intact
- the extinguisher hose is not plugged
- the fire extinguisher is not dented or damaged

The PASS method should be used to extinguish fires. EH&S offers free fire extinguisher training. Contact EH&S for more details.

The PASS Method



Additional Resources

USF Policies & Procedures:

USF Chemical Hygiene Plan: https://www.usf.edu/administrative-services/environmental-health-safety/documents/chemical-hygiene-plan.pdf

USF Hazardous Waste Management Procedure: https://www.usf.edu/administrative-services/environmental-health-safety/documents/hazwaste-managementprocedure.pdf

USF Biomedical Waste Plan: http://www.usf.edu/administrative-services/environmental-health-safety/documents/bmwplannov2016.pdf

Chemical Standard Operating Procedures: https://www.usf.edu/administrative-services/environmental-health-safety/documents/sop-template.docx

Laboratory Safety Training

Hazardous Waste Refresher

Biomedical Waste Refresher

Hazardous Communication

Personal Protective Equipment

Slips, Trips, and Falls

Hearing Conservation

Golf Cart Training

Asbestos Awareness Training

Fire Prevention Safety Training



Environmental Health & Safety

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