

Chapter 2 GENERAL SAFETY

Introduction

The following sections provide general safety guidelines and procedures. This chapter covers the following topics:

TOPIC	PAGE
Accident Reporting	2-1
Americans with Disabilities Act	2-2
Asbestos	2-2
Dress Code	2-2
Graphic Arts Media	2-2
Hearing Conservation Program	2-5
Heat Stress	2-6
Housekeeping	2-7
Indoor Air Quality	2-8
Lead Paint	2-9
Lifting	2-9
Polychlorinated Biphenyls (PCBs)	2-10
Preventing Slips and Falls	2-11
Smoking	2-11
Visitor Safety	2-12

Accident Reporting

An accident is an unplanned occurrence that may result in damage to people, property, equipment, or the environment. When accidents are reported promptly, injured employees, students, and visitors receive timely medical care and unsafe conditions receive prompt corrective action. The Office of Environmental Safety & Health investigates accidents to identify accident trends, determine the effectiveness of current safety programs, and prevent future accidents. To minimize confusion, all accident reporting should be made to the University Police Department who will call the Office of Environmental Safety & Health as needed. All accident reports written by University Police Department should be forwarded to environmental safety & health for review.

IMPORTANT:

All accident should be reported both to your supervisor and the University Police Department. If an injury or exposure occurs on-the-job, complete the WCI Form, Employer's First Report of Injury or Illness available from the Personnel Office.

EXAMPLE:

Report accidents to the University Police Department (UPD).

Report unsafe conditions or potentially hazardous situations to the Office of Environmental Safety & Health as quickly as possible. The Office will then contact other departments and outside agencies as appropriate.

Americans with Disabilities Act

UTPB complies with the requirements and guidelines of the Americans with Disabilities Act. This means that new facilities and renovations to existing facilities are designed to provide accessibility for handicapped people.

Handicapped parking and wheelchair ramps must remain accessible at all times. Do not block these areas or tamper with other accessibility equipment. In addition, do not remove Braille tabs on elevator controls or other signs.

Report accessibility violations such as blocked wheelchair ramps and blocked handicapped parking to the University Police Department.

Contact the Office of Environmental Safety & Health for more information on accommodating handicapped individuals or making your workplace more accessible.

Asbestos

Asbestos is a mineral fiber that causes cancer and various respiratory illnesses. Older buildings constructed prior to 1980 may contain asbestos. Asbestos is commonly found in older appliances, insulation, shingles, siding, putties, and caulking. Generally, it is not a problem unless the material that contains it crumbles or flakes.

The Texas Asbestos Health Protection Rules do not require building owners to conduct inspections and identify all asbestos locations. Inspections are required, however, prior to renovation or dismantling activities.

Physical Plant is responsible for removal and disposal of all asbestos waste.

NOTE:

Call the Physical Plant before performing work on campus that will disturb building fixtures, walls, or ceiling (e.g., installing computer cables in the ceiling). The Physical Plant will help ensure that the work does not affect asbestos containing materials.

IMPORTANT:

Do not handle asbestos or suspected asbestos or try to remove it yourself.

Dress Code

Dress in a manner that does not impair safety. Loose clothing, long hair, dangle jewelry, and sandals may be dangerous around moving equipment.

Always wear clothing that is appropriate for your job. Refer to the chapters on Personal Protective Equipment and Office Safety for more information.

Graphic Arts Media

The art supplies and chemicals associated with graphic media are often extremely hazardous. Depending on the type of art supplies used, artists can develop the same types of occupational diseases as industrial workers. Studies show that people who work with hazardous graphic media chemicals can develop

dermatitis, lead poisoning, silicosis, liver and kidney damage, nerve damage, reproductive problems, carbon monoxide poisoning, cancer, and other ailments.

The risk of chemical hazards is directly linked to the following factors:

- Duration and frequency of exposure
- Chemical toxicity
- Chemical amount

Workers are exposed to graphic media hazards through skin contact, inhalation, and ingestion.

Follow these safety guidelines for working with graphic media materials:

- Wear protective clothing and follow Material Safety Data Sheets (“MSDS”), as appropriate.
- Use nontoxic or less toxic solvents and chemicals when possible.
- Eliminate toxic metals such as lead and cadmium. Instead, use cadmium-free silver solders and lead-free paint, glazes and enamels.
- Use water-based instead of solvent-based materials.
- Use liquid materials to replace powders.
- Use wet techniques (such as wet sanding) instead of dry techniques.
- Apply coatings by brushing or dipping instead of spraying.
- Eliminate cancer-causing chemicals.

Solvents

Solvents are used to dissolve oils, resins, varnishes, and inks. They are also used to remove paint and lacquer. Due to their common usage, solvents are one of the most underrated media hazards. Most organic solvents are poisonous if swallowed or inhaled in sufficient quantities. They also cause dermatitis and narcosis.

Use the least toxic solvent possible. Denatured or isopropyl alcohol, acetone, and odorless mineral spirits are less toxic than solvents such as chloroform or ethylene.

Aerosol Sprays

Aerosol sprays, such as fixatives, paint sprays, and adhesive sprays, are extremely dangerous if someone inhales the fine mists produced by these products. Air brushes and spray guns are equally hazardous. Use aerosol sprays in a well-ventilated area and wear a dust/vapor mask to protect you from the hazardous vapors.

Acids and Alkalis

The acids and alkalis used in ceramics, photo chemicals, paint removers, and similar materials can be very caustic to the skin, eyes, respiratory system, and gastrointestinal system. Likewise the acids and alkalis used to etch metals and glass can be very dangerous. Strong acids, such as hydrochloric, sulfuric, and perchloric acid require special handling as outlined in the MSDS. Alkalis, such as caustic potash, caustic soda, quicklime, and unslaked lime, also require special treatment. Remember to add acid to water, not water to acid, when mixing chemicals.

Paints and Pigments

Many paints and color pigments contain hazardous chemical compounds. Lead paint, for example, is extremely dangerous, and should never be used in its powder form. Other paint components, such as chromate, cadmium, and cobalt pigments, are equally hazardous. Do not inhale powdered paint or spray

paint vapors or accidentally ingest pigment by placing the brush tip in your mouth. In addition, do not eat, drink, or smoke while painting. Any of these activities could result in chronic poisoning.

The table below outlines common paint pigments and their hazardous chemical component:

Hazardous Chemical	Pigment (Paint Name)
Arsenic	Emerald Green Cobalt Violet
Antimony	True Naples Yellow
Cadmium	All Cadmium Pigments
Chromium	Zinc Yellow Strontium Yellow Chrome Yellow
Cobalt	Cobalt Violet Cobalt Green Cobalt Yellow Cerulean Blue
Lead	Falk White Lead White Creminitz White Mixed White
Manganese	Manganese Blue Manganese Violet Burnt Umber Raw Umber Mars Brown
Mercury	Vermilion Cadmium Vermilion Red

Photography

Many of the chemicals used for photographic processing can cause severe skin and lung problems. The greatest hazards associated with photography include the preparation and use of concentrated chemical solutions. Never touch chemical powders or solutions with unprotected hands. In addition, take care not to stir up and inhale chemical dusts.

IMPORTANT:

Good ventilation is essential when working with photographic chemicals.

The following are common photographic agents and their hazards:

Developer:	May cause skin irritation and allergic reactions.
Stop-bath:	May cause burns and throat irritation.
Fixer:	Highly irritating to lungs.
Intensifier:	Very corrosive and may cause lung cancer.
Reducer:	Contact with heat, concentrated acids, or ultraviolet radiation produces poisonous gas.
Toners:	Highly toxic.
Hardeners and stabilizers:	Often contain formaldehyde which is poisonous, a skin irritant, and a known carcinogen.

Plastics, Acrylics, Epoxy Resins

Plastic hazards result from making plastic and working with finished plastic. The greatest hazards associated with making plastic come from the monomers, solvents, fillers, catalysts, and hardeners that are commonly toxic. The hazards involved with finished plastics result mainly from the methods used to work the plastic. For example, overheating or burning plastic produces toxic gases. Polishing, sanding, and sawing plastic produces harmful dusts.

Certain types of plastics, such as acrylics and epoxy resins are also hazardous. The components in acrylic, for example, include irritants, explosives, and flammables. The main hazard associated with acrylic compounds, however, is inhalation. Always maintain good ventilation when working with acrylic.

The epoxy resins used in laminating, casting, glues, and lacquer coatings, are also skin irritants, sensitizers, and suspected cancer-causing agents. Avoid skin contact and inhalation when working with epoxy resins.

Pottery and Ceramics

Pottery clay contains silicates that can be hazardous if inhaled. Many low-fire clays and slip-casting clays also contain talc, which may be contaminated with asbestos. Long-term inhalation of asbestos can cause cancer and respiratory diseases. When mixing clay dust or breaking up dry grog, use exhaust ventilation and/or wear a toxic dust respirator. Work with wet clay when possible. Pottery glazes also contain free silica, including flint, feldspar, and talc. Wear a toxic dust respirator when mixing or spraying glazes.

Toxic fumes and gases are often produced during the firing process. Ensure that all kilns are ventilated. In addition, use infrared goggles or a shield to look in the kiln peephole. Proper eye protection will help prevent cataracts.

Woodworking

The hazards associated with woodworking include sawdust inhalation, exposure to toxic solvents and adhesives, and excessive noise from woodworking tools. Long term inhalation of sawdust can cause chronic respiratory diseases. Depending on the type of wood, short-term sawdust inhalation may also produce allergic reactions. Toxic preservatives, such as arsenic compounds and creosote, may cause cancer and reproductive problems. Epoxy resins and solvent-based adhesives also pose potential hazards. Use dust collectors around woodworking machines, ensure proper ventilation, and wear personal protective equipment, as appropriate.

Hearing Conservation Program

If you are concerned about noise levels please contact Office of the Environmental Safety & Health. Excessive noise levels may permanently or temporarily damage a person's hearing. Whenever possible, employees should reduce noise levels to an acceptable level. The following table outlines OSHA limits for acceptable noise exposure indicated as decibels (dB).

Duration/Day (Hours)	Sound Level (dB)
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

Hearing loss can be permanent — wear protective equipment when noise levels are high.

Before using personal protective equipment, such as ear plugs or muffs, to reduce noise exposure, try to reduce noise levels by changing work procedures. Maintenance practices such as the following can reduce noise levels:

- Replacing worn or loose machine parts
- Performing high-noise operations during hours when people are less likely to be affected
- Maintaining and lubricating equipment to eliminate rattles and squeaks

Engineering controls, such as the following, can also reduce noise levels:

- Replacing noisy materials
- Using large, low speed fans
- Considering the noise level of new equipment or processes before purchasing or implementing
- Placing heavy machines on rubber mountings
- Using sound-absorbing acoustical tiles or baffles
- Placing noisy machinery or operations in a separate area or room
- Enclosing noisy conveyors

Areas that may require hearing protection include machine shops, the power plant, etc. Observe all warning signs and wear hearing protection whenever necessary. Do not interfere with, remove, or modify noise abatement equipment. Keep all equipment properly maintained, and report any malfunctions immediately.

Refer to the chapter on Personal Protective Equipment for more information on hearing protection. Direct all questions regarding hearing conservation to the Office of Environmental Health & Safety. When requested and necessary, the Safety & Health Office monitors noise levels.

Heat Stress

People may suffer from heat stress during hot, humid conditions. Because the climate at UTPB is conducive to heat stress, people must take preventive measures to reduce their risk. To prevent heat stress, employees should limit strenuous physical activity during the hottest portion of the day, wear a brimmed hat when in the sun, take frequent breaks, and drink plenty of fluids.

Heat stress occurs in two forms: heat exhaustion and heat stroke.

Heat Exhaustion

Heat exhaustion is usually caused by strenuous physical activity and hot, humid conditions. Because heat exhaustion is the body's response to insufficient water and salt, it should be treated as quickly as possible.

Signs and symptoms of heat exhaustion include the following:

- Exhaustion and restlessness
- Headache
- Dizziness
- Nausea
- Cold, clammy, moist skin
- Pale face
- Cramps in abdomen and lower limbs
- Fast, shallow breathing

- Rapid, weak pulse
- Falling body temperature
- Fainting

Take the following steps to administer first aid for heat exhaustion:

1. Have the victim lie down in a cool or shaded place.
2. If the victim is conscious, have him/her slowly sip cool water.
3. If the victim is unconscious or is conscious but does not improve, seek medical aid as soon as possible.
4. If the victim is sweating profusely, have him or her sip cool water that contains one teaspoon of table salt per pint of water

Heat Stroke

Heat stroke is usually caused by exposure to extreme heat and humidity and/or a feverish illness. Heat stroke occurs when the body can no longer control its temperature by sweating. Heat stroke is extremely dangerous and may be fatal if not treated immediately.

The signs and symptoms of heat stroke include the following:

- Hot, dry skin
- Headache
- Dizziness
- High temperature
- Strong pulse
- Noisy breathing
- Unconsciousness

Immediately take the following steps to administer first aid for heat stroke:

1. If possible, move the victim to a cool place.
2. Seek medical attention as soon as possible.
3. Remove the victim's clothing.
4. If the victim is conscious, place him in a half-sitting position and support the head and shoulders. If the victim is unconscious, place him on the side with the head facing sideways.
5. Fan the victim and sponge the body with cool water.

Housekeeping

Good housekeeping skills are essential for personal safety. UTPB employees are responsible for reducing potential hazards and keeping their work areas safe and clutter-free. Good housekeeping guidelines include keeping aisles and stairways free from clutter, cleaning spills, minimizing combustibles in workplace and storage areas, and keeping all exits free from obstructions.

Maintain clear and unobstructed access to emergency equipment, such as fire extinguishers, pull stations, eye wash units, showers, etc.

For more specific information on housekeeping, refer to the section in this manual that corresponds to your workplace (i.e., Laboratory Safety, Office Safety, etc.)

Indoor Air Quality

Indoor air quality refers to the condition of air within an enclosed workplace. The indoor environment of any building is based on several factors including location, climate, building design, construction techniques, building occupant load, and contaminants.

Four key elements are involved in the development of poor indoor air quality:

1. Multiple contaminant sources
2. Poor ventilation systems
3. Pollutant pathways
4. Building usage and occupant load

Outside sources for indoor air contaminants include pollen, dust, industrial pollutants, vehicle exhaust, and unsanitary debris near outdoor air intake vents. Other outdoor agents, such as underground storage tanks or landfills, may also affect indoor air quality.

Indoor contaminants are classified according to these categories:

- Combustion products (e.g., smoke)
- Volatile organic compounds (e.g., solvents and cleaning agents)
- Respiratory particulates (e.g., dust, pollen, and asbestos)
- Respiratory by-products (e.g., carbon dioxide)
- Microbial organisms (e.g., mold, mildew, fungi, and bacteria)
- Radionuclides (e.g., radon)
- Odors (e.g., perfume, smoke, mold, and mildew)

Additional examples of indoor contaminants include dust, dirt or microbial growth in ventilation systems, emissions from office equipment, and fumes or odors from any source.

Employees are in part responsible for the quality of their indoor air. Because indoor air often contains a variety of contaminants at levels far below most exposure standards, it is difficult to link specific health problems with known pollutants. Employees must minimize all contaminants to reduce the low-level pollutant mixtures that commonly cause health problems.

The following practices will help ensure optimum indoor air quality:

- Fix leaks and drips. (Moisture promotes microbial [i.e., mold and mildew] growth.)
- Clean mold and mildew growths with a bleach/water mixture to prevent regrowth.
- Ensure that indoor ventilation filters are changed regularly.
- Keep laboratory doors closed.
- Minimize chemical and aerosol usage. Ventilate your area when chemical or aerosol usage is required. (These compounds include paint, cleaning agents, hair spray, perfume, etc.)
- Do not block air ducts to control the temperature in your office.
- Avoid smoking or cooking in enclosed areas. (Smoking is strictly prohibited within University facilities and vehicles.)
- If possible, open windows when it is cool and dry outside.

If you have any questions concerning indoor air quality, please contact the Office of Environmental Health & Safety.

Lead Paint

According to the Centers for Disease Control, lead poisoning is a leading environmental health risk. Lead accumulation in a person's system may lead to fatigue, sudden behavioral change, abdominal pain, anorexia, chronic headaches, joint aches, depression, anemia, impotence, and severe fetal damage in unborn infants.

Buildings that were constructed or painted prior to the early 1980's may contain lead paint. Because common sources of lead exposure include ingestion (lead paint) or inhalation (lead-containing dust), it is important to identify all areas that contain lead paint. If lead paint flakes or chips, it must be encapsulated or removed by qualified persons.

The following locations should also be inspected for lead paint:

- Areas where young children or pregnant women are present
- Areas with flaking or deteriorating paint
- Areas that were built or painted prior to the early 1980's (Lead testing is particularly important before beginning renovation on older buildings.)

Contact the Office of Environmental Health & if you have any questions about lead paint hazards.

Lifting

All employees must use proper lifting techniques to avoid injury when lifting heavy objects. In general, employees should seek assistance when lifting objects that weigh 50 pounds or more. Use your good judgement to determine if you need assistance, a dolly, back support belt, or other tool to safely lift an object.

The back supports the weight of the entire upper body. When you lift objects or move heavy loads, your back has to support even more weight. If you exceed your body's natural limits, your back cannot support both your body and the extra load. The excess, unsupported pressure is transferred to the lower back, where injury is imminent. By using the muscles in your arms and legs and exercising proper lifting techniques, you can move loads safely and protect your back from possible injury.

Follow these guidelines to help avoid back injuries:

- Avoid moving objects manually. Plan jobs and arrange work areas so that heavy items may be moved mechanically.
- Keep in good physical condition. If you are not used to lifting and vigorous exercise, do not attempt difficult lifting tasks.
- Think before you act. Use proper lifting techniques and lifting aides such as back support belts, dollies, etc. Get help if you need it.

When lifting heavy objects, follow these steps:

1. Test the object's weight before handling it. If it seems too heavy or bulky, get assistance.

2. Face the object; place one foot behind the object and one foot along its side.
3. Bend at the knees.
4. Get a firm, balanced grip on the object. Use the palms of your hands, and use gloves if necessary.
5. Keep the object as close to your body as possible. (Pull the load in close before lifting.)
6. Lift by straightening your legs and slightly unbending your back.
 - If the object is too heavy or bulky, get help.
 - Do not twist the back or bend sideways.
 - Do not perform awkward lifts.
 - Do not lift objects at arm's length.
1. When moving objects, proceed with caution through doors and around corners.

Polychlorinated Biphenyls (PCBs)

PCBs are found in many oil-based items, electrical fluids, capacitors, light ballasts, and transformers. PCBs are known carcinogens that are toxic to humans through skin exposure, inhalation, and ingestion. PCBs cause skin disorders and they irritate the eyes, ears, nose, and throat.

Before shipping, handling, or disposing of oil-based products, UTPB employees must determine if their products contain PCBs. Common trade names for PCBs include the following:

- Aroclor and Aroclor B
- Abestol
- Askarel and Adkarel
- Chlorextol
- Chlorinol
- Clorphen
- Diaclor
- Dykanol
- Elemex
- Eucarel
- Hyvol
- Inerteen
- No-Flamol
- Pyranol
- Pyroclor
- Saf-T-Kuhl
- Sanotherm

Owners are specifically responsible for properly handling any equipment containing PCBs. For example, PCB transformers must meet the following requirements:

- PCB transformers and owners must be registered with the local Fire Department.
- The PCB transformer and access to the PCB transformer (fences, doors, etc.) must be plainly marked with a PCB label.

- Combustible materials may not be stored within five meters of a PCB transformer or enclosure.
- If a transformer is involved in a fire-related incident, the National Response Center must be notified.
- Radial PCB transformers must be equipped with high current fault protection. Units with secondary voltage of 480 volts or greater must be equipped with low current fault protection.

The TNRCC considers PCBs to be special waste. Contact the Office of Environmental Health & Safety for disposal procedures.

IMPORTANT:

Report all PCB leaks (e.g., transformer leaks) to the University Police Department immediately.

Preventing Slips and Falls

It is easy to prevent falling accidents. Employees should always follow good housekeeping practices and pay attention to their environment to avoid slips and falls.

In addition, employees should follow these guidelines:

- Turn on office lights. Ensure that passageways are adequately lighted.
- Avoid horseplay.
- Avoid unnecessary haste. Do not run in work areas.
- Use ladders or step stools to reach high places. Never climb onto a chair, drawer, or shelves.
- Keep hallways and stairwells neat and free of obstacles.
- Remove items that may pose a potential slipping hazard.
- Clean up spills as soon as they occur.
- Never obstruct your view when walking.
- Do not wear clothing that is too long or shoes that have slippery heels or soles.
- Hold the handrail when using stairs.
- Be careful when walking on wet surfaces or when entering a building while wearing wet shoes.
- Report uneven surfaces, such as loose or missing floor tiles, to the Physical Plant for repair.

Smoking

The United States Surgeon General and the Environmental Protection Agency have determined the following:

- Breathing secondary smoke causes various diseases and allergic reactions in healthy non-smokers.
- Separating smokers and non-smokers within the same air space does not eliminate exposure to environmental tobacco smoke for non-smokers.
- Tobacco smoke and secondary tobacco smoke are Class A carcinogens.
- To promote a safe, healthy, and pleasant environment for employees, students, and visitors, UTPB has instituted a smoke-free policy.

SMOKING POLICY:

Smoking is prohibited in all indoor locations, including buildings, lecture halls, hallways, offices, and lavatories, all University vehicles, and within 20 feet of any outside entrance to any building.

Visitor Safety

Employees must take special care to ensure visitor safety. This is particularly important when bringing visitors to potentially hazardous areas such as construction sites or laboratories.

If a visitor is injured, be sure to report the occurrence to the University Police Department after attending to the injury.