



# TEXAS WOMAN'S UNIVERSITY™

## Shop Safety Program

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Office of Environmental Health & Safety

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<https://twu.edu/health-safety>



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## **I. Introduction**

Texas Woman's University (TWU) is dedicated to the protection of its employees and students from work and/or school-related injuries. Employees and students of TWU have the responsibility to work safely on the job, and in classes and research, respectively. The Shop Safety Program provides a framework of hazard identification, control methods, training, and record-keeping that is designed to minimize potential shop hazards. It may be necessary to tailor the program for each shop space, addressing unique hazards. Specific procedures developed for different shop situations must be created. Shop personnel must have access to, be familiar with, and follow the program requirements for working safely in TWU shop spaces.

### **A. Scope**

This Shop Safety Program is applicable to any TWU departments that operate machine shops and/or machine shop-type equipment and power tools. This program is in compliance with Texas Woman's University Regulations and Procedures [Policy 04.430: Environmental Health and Safety](#).

### **B. Purpose**

This program is designed to enable employees and students to recognize the hazards that may be present in shop operations at TWU and to establish the procedures that are to be followed in order to prevent injury to persons or equipment. This document sets forth the minimum safe work practice requirements for TWU's machine shops. It is intended to provide TWU departments that have machine shop areas and/or machine shop-type equipment and power tools with general guidance on developing or improving their own safe work practices and procedures based on the types of hazards, activities, machines, and power tools present.

### **C. Review of Program**

The Shop Safety Program will be reviewed at least annually by the Office of Environmental Health & Safety. This review will encompass changes in regulations, newly identified safety hazards related to shops, changing demands of the program for the campus, and changes in technology.

## II. Definition

A shop at TWU is defined as a space utilized for instruction, research, or maintenance activities, including but not limited to spaces with power-driven tools used for fabricating, machining, finishing, and repairing physical, electrical, and electronic items.

Work may include:

- Woodworking
  - Cutting, drilling, sanding, carving, routing, grinding, lathing, planing, gluing, bonding, and fastening
- Equipment development
  - Model building, machine building, hydraulics building and their use, compressed air use, research equipment development, modifications, destructive testing, and other kinds of equipment repairs/maintenance
- Glass work
  - Blowing, glazing, annealing, tempering, bonding, grinding, drilling, and hot work with glass materials
- Material handling
  - Craning, hoisting, rigging, lifting, transporting, and movement of process materials or equipment
- Metal work
  - Sheet metal forming, machining, grinding, riveting, cutting, threading, smelting, casting, forging, heat-treating, quenching, welding, brazing, soldering, and drilling
- Plastics
  - Machining, bending, burning, bonding, cutting, drilling, gluing, melting, and forming
- Plumbing
  - Repairing, installing, and modifying piping fixtures and systems
- Surface modification
  - Sandblasting, painting, surface preparation, laminating, burning, etching, and masking

### III. Responsibilities

#### A. Departments

Departments should:

- Develop and implement shop policies, requirements, and procedures.
- Replace damaged or broken equipment, including guards and signs.
- Ensure that adequate supervision and controlled access are provided in accordance with TWU and department policy.
- Assure that necessary personal protective equipment (PPE) is provided to all faculty, staff, students, and visitors, as applicable, and that it is worn in the shop area(s).

#### B. Environmental Health & Safety

TWU's Office of Environmental Health & Safety (EH&S) must:

- Provide support in implementing the Shop Safety Manual and assist with regulatory compliance.
- Conduct periodic shop safety inspections, in accordance with EH&S policy.
- Update relevant training through TWU's employee learning system ([Bridge](#)).
- Update the Shop Safety Program as regulations or University requirements change.

#### C. Shop Supervisor

The person who supervises the shop space, students, faculty, and/or staff using the shop space must:

- Develop specific shop safety policies, requirements, and procedures required by the Shop Safety Manual and ensure that they are being followed.
- Advocate PPE use as required by this program, departmental policy, or hazard assessment.
- Develop emergency response procedures and ensure they are communicated to users.
- Establish a safe work culture by modeling safe work practices.
- Ensure that faculty, staff, students, and monitors who use the equipment are properly trained.
- Implement corrective actions and report any unsafe acts or conditions to the department.
- Routinely inspect and remove from service and/or lock out any equipment deemed to be unsafe or in need of repairs.
- Submit annual chemical inventory to EH&S, if required.
- Ensure all waste materials and chemicals are properly disposed.

- Post an Emergency Action Plan and Safety Rules Poster near the shop entrance and manage any emergencies.
- Perform an annual shop safety self-inspection.
- Report injuries and/or incidents to EH&S and the Department of Human Resources within 24 hours.

#### **D. Shop Monitor**

The person who supervises student shop users (typically a lead tradesperson, faculty member, or graduate assistant) must:

- Ensure shop safety policies and procedures outlined in the Shop Safety Manual are followed.
- Encourage a safe work culture by modeling safe work practices.
- Aid in the prevention of unsafe acts in the shop and report them to the shop supervisor (and EH&S, as appropriate).
- Assist in the event of an emergency.

#### **E. Shop Users**

Shop users include faculty, staff, students, and visitors using the shop space. Shop users must:

- Follow specific policies and procedures outlined in the Shop Safety Manual and as noted elsewhere in the shop on posters or other signage.
- Complete all required training through TWU's Bridge training site.
- Inspect each piece of equipment before and after use.
- Report hazards, unsafe conditions, and damaged or missing equipment to a monitor and/or supervisor.
- Use, maintain, and properly store required PPE.
- Perform general housekeeping tasks.
- Report all work-related injuries to a monitor and/or supervisor.
- Refrain from interfering with on-going shop activities.

## **IV. Guidelines**

The hazards associated with shop work require special safety considerations. Whether you work in a shop that fabricates or modifies metal, wood, glass, plastic, electrical, or mixed-media items, the potential hazards for personal injury are numerous. This section highlights essential safety information for working in a shop.

**A. Shop Access**

Only authorized users (as defined by the department and its representatives) should have access to shop spaces. Training may be required before shop access is granted.

**B. Disposal of Oily Towels/Rags**

Oil- or solvent-soaked rags are a fire hazard and should be disposed of in an approved metal container.

**C. General Shop Safety**


The following general safety practices apply to all shops at TWU. Shop supervisors may apply rules and enforce requirements that are more restrictive than the minimums listed below:

- Always wear appropriate personal protective equipment (generally, closed toe shoes and safety glasses at a minimum).
- Avoid practical jokes, pranks, or other disruptive behavior.
- Tie back long hair and restrict loose clothing and jewelry.
- Food, drink, tobacco products, gum, medications, and cosmetics are not allowed in work areas.
- Avoid distractions (headphones, cell phone, etc.) when working with equipment.
- Avoid working alone in the shop; when unavoidable, make arrangements with the shop supervisor, TWU's Department of Public Safety (DPS), or a colleague to check on your status periodically.
- Obtain approval from the shop supervisor before using any machines or tools.
- Know the hazards associated with the work.
- Ensure you are fully educated on the proper use and operation of any tool before beginning work.
- Ensure adequate ventilation to prevent exposure when working with glues, lacquers, paints, dusts, and fumes.
- Ensure equipment guards and shields are in place.
- Return tools to their proper locations when you are finished using them.
- Report damaged equipment to the shop monitor and/or supervisor.
- Keep all work areas and aisles clean and unobstructed.
- Know emergency procedures.
- Report injuries to the shop monitor and/or supervisor.



#### D. Hazardous Chemicals or Waste

A shop using hazardous chemicals (solvents, paints, etc.) must comply with TWU's [Chemical Hygiene Plan](#) and [Regulated Waste Program](#). Disposal of hazardous/chemical waste should be done through EH&S. Fill out the online [Waste Pickup Request Form](#) to schedule a pickup. All containers of Hazardous Waste or other regulated wastes must be labeled when the first drop of waste is placed in the container. Do not date the label until it has been moved out of its original point of generation. An example of the TWU Hazardous/Regulated Waste label can be found below:

 <b>HAZARDOUS/REGULATED WASTE</b>	
Waste ID: _____	Dept: _____ Contact: _____
Accum. Start Date: _____	
Contents: <i>(no formulas)</i>	
_____	%
_____	%
_____	%
_____	%
<b>Hazards: <i>(check all hazards that apply)</i></b>	
<input type="checkbox"/> Flammable	<input type="checkbox"/> Toxic <input type="checkbox"/> Corrosive (pH ____)
<input type="checkbox"/> Oxidizer	<input type="checkbox"/> H <sub>2</sub> O Reactive <input type="checkbox"/> Air Reactive <input type="checkbox"/> Other _____

Wastes must be stored in appropriate containers and must always remain closed other than when waste is actively being added. Waste must also be segregated into appropriate hazard classes for storage.

Wastes must be transported off the Denton campus for disposal within 180 days of the date on the label. This transport is coordinated by EH&S.

#### 1. Spill Response

##### a) *Large, Unknown, Highly Toxic, or Flammable Spills*

If the chemical spilled is unknown, too large to contain (over 1 liter of hazardous materials), highly toxic, or poses a fire hazard, do NOT clean the spill. Spills should only be cleaned by those who are appropriately trained and have the proper materials to safely clean the spill (e.g., PPE, absorbent, etc.). Contact DPS at 940-898-2911 or call EH&S at 940-898-4001 to assist in cleanup.

##### b) *Minor Chemical Spills*

Minor chemical spills can be addressed using the following steps:

- Notify everyone in the shop and isolate the area.

- For flammable materials, extinguish ignition sources and unplug nearby electrical equipment.
- For volatile materials, establish exhaust ventilation: turn on fume hoods and open windows if possible.
- Locate SDS and [spill kit](#).
- Choose appropriate PPE and spill cleanup materials based on the SDS.
- Contain the spill using absorbent materials and/or neutralizers, working from the outside in.
- Spill response materials, including recovered chemicals, must be placed into appropriate, sealable containers for disposal through EH&S.
- Mop area after cleaning as much of the chemical as possible.

More detailed information on major and minor spills can be found at TWU's [Chemical Spill Response Guideline](#).

#### **E. Housekeeping**

The shop supervisor will ensure the shop is properly cleaned at the end of each work period and that all waste is disposed of in accordance with TWU policies. Tools, materials, and equipment should be returned to their proper storage locations at the end of the work period.

#### **F. Maintenance and Inspection**

Shop equipment must be maintained according to manufacturer's specifications or established guidelines. Inspections of equipment for damage, corrosion, wear, and/or contamination must be performed and documented on a routine basis. Damaged or defective equipment must be tagged or removed from service. Unsafe equipment tags are available from EH&S.

Shop supervisors are encouraged to perform annual self-inspections using the appropriate form on [BioRAFT](#), TWU's safety inspection and chemical inventory software. EH&S will periodically conduct routine shop safety inspections to assess unsafe conditions, identify areas of improvement, and provide assistance to help protect faculty, staff, and students from accidents, illnesses, and the environment from harm.

### **G. Site Specific Safety**

Site specific safety measures, in addition to general shop safety guidelines, will be developed based on specific hazard analysis of the shop space and equipment. Site specific safety measures can include, but are not limited to, additional or specific PPE, training, rules, competency validation, or environmental controls.

### **H. Standard Operating Procedures**

Written [standard operating procedures \(SOPs\)](#) are recommended for all operations involving hazardous chemicals, machinery, or processes. An SOP provides a standardized reference during instruction, training, and competence verification on individual machines or processes.

### **I. Tool Inventory**

Shop equipment should be inventoried using an equipment inventory form that includes the equipment type, size, manufacturer, model number, serial number, and TWU access control number.

## **V. Safety Practices for Specific Hazards**

The following safety practices apply to TWU shops where specific hazardous materials or processes are encountered or present.

### **A. Compressed Gases**

Compressed and liquified gases pose significant chemical and physical hazards to shop users. The following safety practices should be followed if compressed gases are present:

- Ensure gas cylinders are secured, stored away from heat sources, and capped when not in use.
- Ensure hazardous gas (corrosive, flammable, and toxic) quantities are below maximum allowed volumes and are stored in a ventilated cabinet when required.
- Use an appropriate hand truck or cart to transport gas cylinders (do not drag or roll) to ensure the valve protection caps are in place and handle only one container at a time.
- Ensure proper maintenance and use of regulators, manifolds, and safety valves.
- Always wear safety goggles when performing any operation with compressed or liquefied gases. Additional protection may be required based on the gases used (face shield, insulated gloves, chemical resistant gloves, and/or apron/lab coat).
- After assembly of a gas supply system, test all connections using a soapy water

solution or gas detection device. Retest the system periodically and when leaks are suspected.

## **B. Electrical Safety**

Electrical voltages as low as 12 volts can be dangerous and cause injury. As with all electrical work on campus, shops should follow TWU's [Electrical Work Safety Program](#) and [Lockout/Tagout Program](#) when necessary. When working with or around electrically powered equipment, follow these general precautions:

- Shop equipment must be powered by an appropriate electrical source matched to the power requirements recommended by the manufacturer.
- All electrical equipment must be UL listed and have either a grounded plug (three prong) or be double insulated.
- Protect electrical power cords from damage. Immediately replace cords that are worn, frayed, or otherwise damaged.
- Extension cords are only to be used temporarily. Extended use of an extension cord to power equipment can cause damage to the extension cord, the equipment, the user, or all of the above.
- Do not “daisy chain” or “piggyback” surge protectors or multi-plug power strips by plugging one into another to create a longer cord from the power outlet to the equipment. Instead, use a surge protector or multi-plug power strip with a longer cord.
- Electrical equipment used within six feet of water or in wet/damp environments must be plugged into a Ground Fault Circuit Interrupter (GFCI).
- Do not connect multiple pieces of equipment to the same power source. Shop equipment should be plugged directly into a wall outlet and not a multi-plug power strip or surge protector.
- Grasp the plug to remove it from the socket; never pull the cord.
- Always unplug electrical equipment and power cycle its energy source before attempting any repair or maintenance.

## **C. Hand, Portable, and Stationary Power Tools**

Hand tools are non-powered tools such as saws, screwdrivers, hammers, chisels, and wrenches. Hand tools should be properly maintained after each use.

Portable power tools are powered by an electrical power source (cord or battery) or by a

gas power source (gasoline or diesel). Examples include drills, circular saws, grinders, routers, jigsaws, and sanders. Pneumatic tools are powered by compressed air, with examples including drills, impact wrenches, grinders, ratchets, sanders, and cut-off tools.

Stationary power tools are large, non-portable and are powered by sources such as electricity, gravity, pneumatics, or hydraulics. All equipment and tools used in shops should be maintained in a comprehensive tool inventory.

Follow these guidelines for general tool safety:

- Use a tool for its intended purpose, and only do so if you have been trained to use the tool.
- Inspect all tools before use. Repair or replace them when damaged or defective, and report problems to the shop supervisor.
- Keep tools sharp and in good working order.
- Direct sharp cutting tools away from yourself and others.
- Keep all guards in place.
- Avoid distractions and pay attention when operating power tools.
- Do not rely on strength to perform an operation. The correct tool, blade, and method should not require excessive force.
- Never reach into the point of operation while equipment is running.
- Disconnect or unplug the power source and power cycle the energy before clearing jams or blockages.
- Never disable or tamper with safety releases or switches.
- Whenever possible, use a push stick or pad to move material through a machine.
- Keep a firm grip on portable power tools.
- When possible, secure work pieces with a clamp or vise.
- Keep bystanders away from moving machinery.
- Store tools in a manner that prevents them from being damaged.

#### **D. Laser Safety**

Class 3B and 4 lasers emit amplified visible and non-visible light radiation and may cause immediate harm to eyes and skin. These classes of lasers fall under the purview of TWU's [Radiation Safety Program](#). All users of Class 3B and 4 lasers must be pre-approved by the

Radiation Safety Officer for the university and must adhere to the safety requirements outlined in the Radiation Safety Program, approved by the State of Texas.

**E. Lockout/Tagout (LOTO)**

Lockout/tagout (LOTO) procedures are required when unexpected energization of equipment during maintenance or service could cause injury. LOTO procedures are described in [TWU's Lockout/Tagout Program](#) and must be performed by trained personnel authorized to perform maintenance or service on powered equipment. LOTO procedures are not required for work on equipment that can be unplugged from the power source and controlled by a single person.

**F. Machine Guarding**

Moving machine parts must be safeguarded to protect operators from injury. Belts, gears, shafts, fly wheels, chains, and other moving parts must be guarded to prevent contact with the operator. Guards must prevent individuals from coming into contact with the hazard without creating additional hazards or preventing the individual from performing routine tasks. If at any point the guard needs to be removed, LOTO procedures must be followed, and the guard must be replaced after performing the required task/maintenance.

**G. Noise**

As many pieces of shop equipment produce sound levels that can be damaging to hearing, hearing protection may be required during use. The shop supervisor must ensure that noise hazard areas or equipment requiring hearing protection have signs or are labeled. Refer to TWU's [Hearing Conservation Program](#) for more information.

**H. Respiratory Hazards**

Fabrication, finishing, mixing, or painting operations may produce hazardous levels of airborne dusts, particulates, or vapors. Engineering controls, such as ventilation hoods or snorkels, may be in place to mitigate these hazards. However, if these controls are not feasible, respirator use may be an appropriate means of protection. The issuance of respirators to faculty and staff must be completed as specified in the [TWU Respiratory Protection Program](#) to ensure proper respirator selection, training, medical clearance, fit-testing, and to meet regulatory requirements. In some cases, shop users may choose to voluntarily use a respirator even if it is not required. Voluntary respirator use is also subject to certain requirements as outlined in the [TWU Respiratory Protection Program](#).

**I. Welding and Cutting**

Welding and cutting are two forms of hot work that require special safety considerations. These operations must be performed in a designated area by trained individuals with appropriate SOPs, including PPE requirements and ventilation instructions. Hot work operations that cannot be performed in designated areas must be conducted according to the [TWU Hot Work Procedure and Permit](#).

When welding, ensure that the welding helmet visor is dark enough to provide adequate protection; see OSHA guidance [1910.252\(b\)\(2\)\(ii\)\(H\)](#) to select the correct shade numbers. Wear fireproof apron and gloves. If necessary, use a welding curtain to protect bystanders from UV radiation. Common hazards associated with welding include electrocution, burns, UV radiation exposure, oxygen depletion, and sparking.

In addition to the general guidelines for welding and cutting, follow these specific guidelines for safe welding operations:

- Ensure the welding area has a non-reflective, non-combustible surface.
- Ensure that adequate ventilation is installed and functional.
- Ensure that electrical cords are properly grounded.
- Keep cylinder fittings and hoses free from oil and grease.
- Ensure acetylene/oxygen systems are equipped with flame or flashback arrestors.
- Replace defective or damaged hoses.
- Carefully purge hoses and torches before connecting to a cylinder.
- Always use the minimum acceptable flow rate.
- Never use a match to light a torch. Use an approved lighter or striker.
- Do not tamper with or attempt to repair cylinders, valves, or regulators.
- Ensure flammable and combustible materials are not in the vicinity during hot work operations.
- Close cylinder valves after each use.

## VI. Fire and Life Safety Procedures and Equipment

### A. Fire Alarms

If the fire alarm sounds in the building, quickly and calmly **evacuate the building immediately**. Do not assume it is a false alarm; do not go back into the building until an all-clear order is issued by DPS. If there is a fire in the building and the alarm has not

sounded, immediately begin evacuating and report it to DPS (940-898-2911) or 911.

Learn the location of staircases and exit doors leading from your area for efficient evacuation. **Never** use the elevators when the fire alarm is activated. If you are mobility impaired, navigate to an enclosed stairwell landing or elevator lobby and wait for emergency responders. Consult with your department for the designated evacuation meeting area outside of the building.

DPS dispatch officers are automatically notified when there is a full fire alarm or there is a “trouble” in the system (including tampering with smoke detectors, valves, etc.). Never attempt to disable or silence any part of the alarm systems. Only authorized DPS and EH&S personnel should attempt to operate fire alarm panels.

#### **B. Fire Extinguishers**

TWU faculty, staff, and students are ***strongly discouraged*** from using fire extinguishers; instead, it is advised for occupants to immediately evacuate the building as we want you to protect your life over property. However, fire extinguishers may be used if doing so is necessary to escape the fire. To use a fire extinguisher, follow the P.A.S.S. method:

- Pull the extinguisher’s safety pin
- Aim the extinguisher at the source of the flames
- Squeeze the trigger and hold it
- Sweep the source of the flames until the extinguisher runs dry

#### **C. Automated External Defibrillators (AEDs)**

AEDs are used to help those experiencing sudden cardiac arrest and are located in buildings that are highly frequented or could put people at a higher risk of experiencing a cardiac arrest event, such as fitness centers. In addition, DPS carry them in all vehicles. Only trained personnel should attempt to operate an AED, which includes DPS staff members. Consult EH&S for more information on receiving CPR and AED training.

#### **D. Evacuation Procedures**

Aisles, exits, and clear access to emergency equipment must be maintained to ensure the ability to respond in emergency situations. Ensure that faculty, staff, and students who use



the shop are aware of evacuation routes and meeting locations for emergencies such as fire, severe weather, and chemical spills. Building maps for selecting an appropriate tornado shelter are available on TWU's [Emergency Management website](#).

#### **E. Eyewash Stations and Emergency Showers**

An eyewash station must be readily accessible in all areas where corrosive, hot liquids, or other eye-irritating materials (such as formaldehyde) are used or stored. If you work with hazardous chemicals, it is important to know the location and how to use the nearest eye wash and emergency shower.

Be sure to keep the path to these safety devices clear and unobstructed to allow easy access in an emergency situation. In particular, energized electrical equipment should be kept away from eye washes and emergency showers.

Use the emergency eye wash immediately if your eyes are exposed to a hazardous chemical. The first few seconds after exposure to a hazardous chemical (especially a corrosive chemical) are critical. Delaying treatment, even for a few seconds, may result in irreparable eye damage. Don't hesitate! To use an emergency eye wash:

- **Immediately flush eyes for at least 15 minutes.**
- Keep the eyes open and rotate the eyeballs in all directions to remove contamination from around the eyes. An injured person may need help holding the eyelids open.
- Call the National Poison Control Center (1-800-222-1222) for advice, then seek medical attention immediately.
- Have someone send the Safety Data Sheet for the chemical to the medical provider. Safety Data Sheets (SDSs) for all chemicals on TWU's campus can be found on [BioRAFT](#).
- Report the injury or exposure to your supervisor, EH&S, and Human Resources.

Similar to an emergency eye wash, use an emergency shower immediately if your skin is exposed to a hazardous chemical. It is critical to flush the chemical from your skin as soon as possible to reduce the amount of tissue damage it may cause. Don't hesitate!

To use an emergency shower:

- **Immediately flush the affected area with copious quantities of water for at least 15 minutes.** Protect the eyes from inadvertent contamination if they have not been affected.
- Remove contaminated clothing, jewelry, and shoes. Don't let modesty slow you down- every second counts.
- Call the National Poison Control Center (1-800-222-1222) for advice, then seek medical attention immediately.
- Have someone send the Safety Data Sheet for the chemical to the medical provider. Safety Data Sheets (SDSs) for all chemicals on TWU's campus can be found on [BioRAFT](#).
- Report the injury or exposure to your supervisor, EH&S, and Human Resources.

Eye washes and emergency showers are inspected periodically to ensure their functionality and are tagged with the last date of inspection.

Never use safety equipment for cleaning lab or shop equipment, personal objects, or for other non-emergency purposes. Notify EH&S to report equipment problems, if you notice that the eye wash or emergency shower has not been inspected, or to report unsafe use.

#### **F. Flammable Safety Cabinets**

Flammable safety cabinets are storage cabinets (typically metal) manufactured to isolate flammable materials from a potential fire that may occur in the shop. Flammable storage cabinets are required for storage of flammable liquids in shop areas. Larger amounts of acids or other corrosives should be stored in corrosive cabinets. Reach out to EH&S if you need flammable storage or corrosive cabinets. Smaller amounts of acids and other corrosives can be stored outside of specialty cabinets, but care should be taken to ensure proper chemical segregation and use secondary containment as needed to prevent spillage.

#### **G. Personal Protective Equipment**

Minimum personal protective equipment (PPE) requirements for entering a shop will be determined by the shop supervisor and conspicuously posted at the entrance of the shop area. Any PPE required above the minimum will be determined through completion of a job hazard assessment or development of a standard operating procedure (SOP). PPE should be included in the SOP for the process.

Shop users are expected to use assigned PPE when called for by the hazard assessment, standard operating procedure, container label, or safety data sheet. PPE shall be maintained by the user in a clean, sanitary, and usable condition. Soiled PPE should NEVER be taken home for laundering.

For assistance on conducting a job hazard assessment or selecting appropriate PPE, reach out to EH&S.

## **H. Spill Kits**

A properly stocked spill control kit shall be available in each shop that uses materials that could cause harm or damage to persons or the environment if spills occur. Spill kits are available from safety equipment suppliers. In lieu of purchasing a kit, personnel may choose to assemble a kit. At a minimum, spill kits should include:

- A labeled bucket with tight-fitting lid
- Chemical-compatible gloves
- Absorbent pads
- Sorbent socks
- Oil-Dri® or other granular absorbent material
- Disposal bag with hazardous waste label

If you have questions about spill kits, reach out to EH&S.

## **VII. Training**

Training plays a role in preventing injuries and promoting safe work practices. Training should be undertaken by new shop users, refreshed at regular intervals, and should be documented and kept on file.

### **A. Risk Management Training**

Many of the training courses from Risk Management are available in a computer-based format; some have a hands-on component of training included in the program. Safety courses are available in the TWU employee learning management system, [Bridge](#). Bridge includes the ability to track training requirements and completion records for employees, including student assistants.

A similar learning management system has been set up for volunteers and students who are not employees but may need to complete safety courses. Access to this system is via invitation and requires the creation of separate login credentials. Email [risk@twu.edu](mailto:risk@twu.edu) if you or your students need to be set up with an account to access safety training for the tasks they complete in the shop area.

#### **B. Site Specific Training**

Training beyond the minimum, site-specific training will be determined by the shop supervisor based on the hazards present and activities performed in each shop space. Shop users must receive site-specific training on topics such as:

- Procedures for responding for emergencies.
- Procedures and proper use of all tools in the shop area.
- Location of references describing hazards and safe practices associated with materials, procedures, or tools, such as safety data sheets (SDSs), [standard operating procedures \(SOPs\)](#), and equipment safety procedures.
- Physical and/or chemical hazards in the work area, including signs and symptoms of exposure, allowable chemical exposure limits, and protective measures users should take to avoid exposure or injury.
- Proper waste management and disposal procedures.

Document any additional training, including an agenda describing the training and a dated sign-in sheet for all attendees, and keep with departmental records.

### Appendix A: Shop Inspection Checklist

<b>Location</b>		<b>Date</b>	
<b>Shop Supervisor</b>		<b>Inspected By</b>	
<b>General Safety</b>		<b>Not applicable to this shop</b> <input type="checkbox"/>	
Does the employee/student have a TWU ID?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is the employee/student authorized to work alone?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is the employee/student appropriately dressed for working on machines?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Did the employee/student complete relevant online safety training?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Did the employee/student receive proper safety training by the shop supervisor prior to using equipment?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is long, loose hair tied back when operating machinery?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is loose clothing, loose neck wear, and dangling jewelry taken off or secured when operating machinery?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are safety signs (danger, warning, caution, etc.) posted where necessary?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is an "Authorized Personnel Only" sign posted where necessary?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is employee/student access limited to regular hours of operation, if appropriate?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is protective eyewear worn when working on or near any machine creating eye hazards?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are there manufacturer's manuals or other references available?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>Housekeeping</b>		<b>Not applicable to this shop</b> <input type="checkbox"/>	
<i>Inspect all shop areas for the following:</i>			
Is the shop floor free from slip, trip, and fall hazards (water, oil, debris, etc.)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are shop materials, including scrap, stored in a safe manner?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are shop tools safely stored away and not left on machines?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are oily rags stored in appropriate metal containers?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>Electrical Safety</b>		<b>Not applicable to this shop</b> <input type="checkbox"/>	
<i>Inspect all power tools, machinery, electrical receptacles, and extension cords for the following:</i>			
Have damaged, defective equipment been removed from service (i.e. missing ground pins, cut/pinched cords, etc.)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are hand-held power tools either grounded or marked as "double insulated"?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are GFCIs used in wet or damp locations?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is the area free of recognized electrical hazards that are likely to cause death or serious physical harm (i.e. missing knockouts, missing circuit breakers, missing/broken/damaged covers, exposed live electrical components, open/unlocked electrical panels, etc.)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are circuit breaker panels unobstructed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are extension cords rated for "heavy duty"?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are extension cords in good condition (i.e. no missing ground pins, cord sheath not damaged)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are extension cords protected from damage (i.e. not run through doors, windows, floors with heavy traffic)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are extension cords for temporary use only?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

<b>Eyewash Stations</b>	<b>Not applicable to this shop <input type="checkbox"/></b>		
<i>Inspect all eyewash stations for the following:</i>			
Is the required eyewash station available?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is the eyewash flushed on a weekly basis?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is the eyewash station ready to use (i.e. access not blocked)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is the eyewash station clearly labeled?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is the eyewash station functioning properly (i.e. water flows at the appropriate rate)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>Fire Safety</b>	<b>Not applicable to this shop <input type="checkbox"/></b>		
<i>Inspect flammable liquids, combustibles, and other fire issues for the following:</i>			
Are flammable liquids stored in approved flammable liquid cabinets?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are flammable liquid cabinets located away from ignition sources and emergency exits?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are combustibles minimized and stored properly (i.e. at least 3 feet away from ignition sources, not violating proper ceiling clearances)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are exits, corridors, stairways, and aisles unobstructed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are exits marked with appropriate exit signs?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>Hazard Communication</b>	<b>Not applicable to this shop <input type="checkbox"/></b>		
<i>Inspect hazardous chemical products for the following:</i>			
Is the chemical inventory up-to-date, and has it been submitted to EH&S to upload in BioRAFT?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Do employees/students know how to readily access the Safety Data Sheets (SDS) for hazardous materials in the shop?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are hazardous substances properly labeled, used, and stored?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are satellite accumulation areas properly maintained?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is universal waste (used fluorescent bulbs, batteries, etc.) labeled and stored properly?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>Machinery</b>	<b>Not applicable to this shop <input type="checkbox"/></b>		
<i>Inspect each piece of machinery for guarding and safety issues:</i>			
Are all machines and rotating equipment properly adjusted and stored?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are all machines free of debris?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are stationary machines securely anchored to prevent "walking"?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Do dust-generating tools and machinery have adequate controls to minimize dust?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are all emergency shut-off switches, brakes, etc. working properly and labeled?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is there a hook or brush available to remove debris from machinery?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>Personal Protective Equipment (PPE)</b>	<b>Not applicable to this shop <input type="checkbox"/></b>		
<i>Inspect all PPE use:</i>			
Are safety glasses made available to visitors before entering the shop area?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is PPE available and being worn by shop personnel and/or students?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are signs for PPE use posted?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>Welding/Cutting (Hot Work)</b>	<b>Not applicable to this shop <input type="checkbox"/></b>		
<i>Inspect welding/cutting areas for the following:</i>			
Are protective screens or dividers provided to protect against welding arc, sparks, and slag?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is the area free from flammables and combustible materials?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

Are welders wearing appropriate clothing and PPE to protect from sparks, slag, and UV light?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is there adequate ventilation in the area?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are the welding leads in good condition?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>Compressed Gas Cylinders</b>	<b>Not applicable to this shop <input type="checkbox"/></b>		
<i>Inspect all compressed gas cylinders for the following:</i>			
Are oxidizers and fuel gases in storage separated by at least 20 feet or by a 5-foot wall with a 30-minute fire resistance rating (if not supplied on demand)? <i>Exception: oxygen and acetylene when in active use</i>	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are individual cylinders labeled as to their contents?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are cylinders properly secured by a chain or stand to prevent tip over and damage?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are oxygen/acetylene cylinders in use kept in an approved cart?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are regulators removed and replaced with cylinder caps when not in use?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are all regulators at 0 psi when off?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>Cranes, Hoists, Rigging</b>	<b>Not applicable to this shop <input type="checkbox"/></b>		
<i>Inspect all cranes, hoists, chain falls, etc. for the following:</i>			
Is rigging (i.e. slings, shackles, etc.) in good condition (no broken strands, kinking, damage)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are chains and hoists inspected in accordance with manufacturer's requirements?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are load capacity signs clearly posted?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are cranes/hoists and the lift path properly barricaded?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Are hard hats available and used during lifts?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A