

BGSU

Bowling Green State University

Machine Shop Safety Program

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INTRODUCTION

Forward

In 1970, the United States Congress established the right of workers to "safe and healthful working conditions" through the Occupational Safety and Health Act. This act created the Occupational Safety and Health Administration (OSHA). House Bill 308 incorporates by reference all federal OSHA standards found in the Code of Federal Regulations (CFR), Title 29 Parts 1910, 1926 and 1928 as Ohio Public Employment Risk Reduction Program (PERRP) standards. All Ohio PERRP standards are found in Chapter 4167 of the Ohio Revised Code and the Ohio Administrative Code.

This program has been established by Bowling Green State University to comply with a multitude of OSHA's regulations. Those that are not covered by another written program include 29CFR1910 Subpart O – Machinery and Machine Guarding and Subpart P – Hand and Portable Powered Tools and other Hand-Held Equipment.

Objective

The objective of this program is to establish safe operational requirements for mechanical and maintenance shops across campus. This program shall be used in conjunction with other BGSU policies and procedures involving the protection of workers and others on our premises.

Applicability

This program applies mainly to anyone who will be operating equipment or tools in BGSU mechanical and maintenance shops for their protection and the protection of others in the area. There will also be some applicability to visitors and contractors addressed in a small section of this program.

Responsibilities

Environmental Health & Safety (EHS) is responsible for:

- Overseeing this program to include at a minimum, an annual review and updating as needed;
- Providing consultation to BGSU employees who work in machine/maintenance shops;
- Training on basic shop safety upon request;
- Maintaining applicable records such as training rosters, shop audits, injury investigations, etc.; and
- Performing annual shop audits (content used can be found in Appendix B).

Shop Department Chair/Manager is responsible for:

- Providing the resources necessary to ensure those areas under their supervision meet the expectations of and are complying with this program;
- Providing applicable training to employees expected to utilize hand and power tools as part of their job duties or at a minimum, testing or ensuring in some way their competency to do so;
- Ensuring machine shop equipment is properly maintained and any equipment deficiencies are addressed to ensure everyone's safety; and
- Developing and implementing Standard Operating Procedures for operations requiring specialized knowledge and/or skills.

Shop Supervisor is responsible for:

- Being knowledgeable of and enforcing all components of this program;
- Authorizing personnel to utilize equipment;
- Providing all appropriate personal protective equipment (PPE) and ensuring personnel use and wear it properly;
- Ensuring appropriate shop specific safety programs are implemented where needed;
- Ensuring and/or providing task and machine specific training, including proper safety precautions, for all shop personnel (students, employees, visitors, etc.);
- Maintaining all appropriate records, including training and maintenance and repair records;
- Controlling access to hazardous machinery;
- Approving authorized equipment/tool operators;
- Identifying existing and predictable hazards in the shop which include unsanitary, hazardous, or dangerous conditions in the area and taking prompt corrective measures to eliminate them;
- Ensuring that all machine safeguards are in place and operational;
- Ensuring shop personnel follow machine safety operating procedures such as not bypassing, removing or defeating machine safeguards, etc.; and
- Maintaining the operating manuals for each piece of equipment.

Authorized Personnel are responsible for:

- Using PPE and all equipment and tools in an appropriate manner including following all machine specific standard operating procedures;
- Following all components of this program;
- Operating machines and equipment with all safeguards in place;
- Conducting visual pre-operation inspections of machines and equipment to ensure proper operating condition;
- Not bypassing, removing or defeating safeguards;
- Maintaining proper housekeeping of work area;

- Reporting all missing or damaged safeguards to the Shop Supervisor or designee immediately and not operating any machine or equipment with missing or defective safeguards;
- Completing any required training; and
- Not operating any equipment or tools until properly trained.

Program Enforcement

Any violation of this program should be reported to the Shop Supervisor for appropriate action. Any violation of this program by the Shop Supervisor should be reported to the Department Chair/Manager for appropriate action. EHS is available for consultation in determining if a true violation occurred or where enhancements to the program are needed. If employees feel their concerns are not being addressed, they always have the option of reporting them to the Public Employment Risk Reduction Program (PERRP) through the State using the procedure listed on the document in Appendix C.

Recordkeeping

The EHS department will make available upon request copies of this program, corresponding regulatory standards, and any other applicable supporting material. This applies to employees, former employees, representatives designated by the individual employee, and Public Employment Risk Reduction Program (PERRP) representatives.

FIRE SAFETY AND EMERGENCY INFORMATION

Equipment

First Aid Kits

Having basic first aid supplies on hand in shops is recommended but not required. If shop supervisors choose to have these supplies on hand, they must be evaluated annually at a minimum to ensure all expired products have been disposed of. A recommended list of supplies can be found in the First Aid Program on EHS's website.

Emergency Stop Buttons and Disconnects

Emergency stop buttons or the like, when in a location other than directly on the machine in which it is intended for, shall be legibly labeled with the machine's general name, model number, and location so it is easily identifiable in an emergency when power needs to be cut. All shop personnel should be made aware of the location of these devices and an understanding of appropriate circumstances to engage them. Emergency stop buttons and electrical disconnects must be accessible at all times.

Shower/Eye/Face Wash and Drench Hose Station Requirements

- All units must remain free of items in front of or around them that would prevent immediate access and usage of the units.
- All units shall have a sign posted above the unit or near it indicating its presence so it is easily identifiable in the event of an emergency.
- The shop Supervisor or designee is responsible for flushing units weekly to ensure water remains clear/clean.
- The EHS department is responsible for checking flow and other important operability requirements of these units on an annual basis and will submit work orders through Campus Operations as needed for any repairs or adjustments.
- In the event of a chemical splash into the eye, flush with water for a minimum of 15 minutes and seek medical attention.

Fire

Flammable and Combustible Materials

Flammable and combustible loading should be kept at a minimum in shops and away from potential ignition sources. Where more than 10 gallons of flammable chemicals exist (this includes spray paints), materials must be placed in an approved flammable safety cabinet.

Fire extinguishers

All units must be hung on a wall or other partition with an approved hook and remain free of items in front of or around them that would prevent immediate access and usage of the units. Units must remain fully charged and have an up to date inspection tag attached to them. If there are deviations from any of this, please complete a work order through Campus Operations. All shop personnel should be aware of extinguisher locations and how to operate them. If training is needed, contact the EHS department.

Fire Blankets

New fire blankets shall not be purchased. Existing fire blankets must remain free of items in front of or around them that would prevent immediate access and usage of the units. The containers housing the blankets, must remain hung and intact to keep them clean and protected. If shops would like to dispose of their fire blankets, DO NOT throw them in regular trash because they often contain hazardous materials. Contact EHS for free pick up and disposal.

Fire Doors

Fire doors prevent the spread of fire and smoke, and are identifiable by a metal tag on the door side or top, or a stamped description on the doorframe. Fire doors at stairwells and in corridors should be kept closed at all times unless held open by the door's magnetic device. This device will release automatically when a fire alarm sounds. Fire doors should never be blocked or wedged open when the room is unoccupied.

Hot Work

Hot work is any work involving burning, welding, or similar operations that are capable of initiating fires or explosions. Areas where routine and regular hot work will be performed can undergo an approval process to be designated as permanent hot work areas, which means permits are not required. A permit must be obtained each time hot work is performed for all other campus areas. For more specific information, see the university's Hot Work program on EHS's website.

Injury/Illness Reporting

All injuries, which are work or educationally related regardless of where they occur (on or off campus) and any injury on BGSU property, must be reported. All illnesses, which are work or educationally related regardless of where they occur (on or off campus), must be reported. All other illnesses need not be reported i.e. personal medical illnesses. Reporting shall occur using BGSU's online injury/illness form, which can be found on EHS's website along with more information on this topic.

Procedures

Security

When no one is present in a shop, the doors shall be closed and locked to prevent entry of unauthorized personnel. Working alone inside a shop is strongly discouraged. However, if work must be performed while alone inside a shop, it is the responsibility of the shop supervisor to establish a check-in/check-out system for each shop they supervise. If working alone is necessary, no hazardous equipment or chemicals should be used.

Emergency Procedures Poster

BGSU's emergency procedures poster must be displayed in every shop on the inside of a door, near the door, or near a telephone that is accessible at all times (see Appendix D for a copy). All shop personnel should be aware of these procedures, especially fire procedures, evacuation routes, and tornado shelter areas.

Shop Contacts

For shops ran by academic departments, EHS requires that contact names and phone numbers (office and home or cell) be displayed outside of the shop using a template provided on EHS's website and that the information be updated a minimum of once per academic year. In the event of an emergency, this allows police, fire, and other emergency personnel to provide a quick and appropriate response.

Standard Operating Procedures (SOPs)

When performing a hazardous task or working with a chemical that is hazardous and the safety procedures are not adequately addressed in the standard shop procedures, it is the responsibility of the shop supervisor to develop safe procedures and train shop personnel on them. Written SOPs are required for Particularly Hazardous Substances (PHSs), which include carcinogens, reproductive toxins, and substances that display a high degree of acute toxicity. For a template and more information regarding SOP's, please see the university's Laboratory Safety and Chemical Hygiene Plan on EHS's website.

GENERAL SHOP SAFETY RULES AND INFORMATION

Behavior

- Behave professionally at all times.
- Do not engage in horseplay.
- Visitors and contractors must be approved by and be under the direction of the shop supervisor or designee at all times. They shall also be provided with any necessary personal protective equipment specific to hazards present in the shop.
- Minors are not permitted inside BGSU shops without proper authorization.
- Animals are not permitted in shops at any time. The only exception is for service animals and service animals in training (documentation must be provided).

Personal Attire

- Wear closed toe shoes in shops. Sandals and Crocs are not permitted.
- Long pants need to be worn at all times.
- Do not wear porous or absorbent watch straps in shops where liquid chemicals are used.
- Avoid excessively loose or baggy attire, which may include loose sleeves, long neckties, long unrestrained hair, and hanging jewelry.

Personal Hygiene

- Do not apply cosmetics in shops.
- Do not eat or drink in shops.
- Do not drink from eye/face wash stations, drench hoses, shower stations, etc.
- Avoid skin contact with chemicals.
- Wash hands often while in shop and thoroughly before leaving.
- Do not wear PPE outside of the shop to prevent external contamination.

Contact Lenses

- It is recommended that contact lenses not be worn inside shops that work with chemicals injurious to the eyes. They can make an exposure worse by keeping the chemical against the eye and by preventing proper flushing.
- Contact lenses do not serve as eye protection because they do not protect against chemicals and flying particles.
- Individuals who wear contact lenses must wear proper eye and/or face PPE when working with chemicals, flying particles, etc. just like any other shop personnel.

Working Alone

- Working alone inside a shop is strongly discouraged. However, if work must be performed while alone inside a shop, it is the responsibility of the shop supervisor to establish a check-in/check-out system for each area they supervise.
- If working alone is necessary, no hazardous chemicals or machinery should be used.

Safety Inspections

- Shop supervisors should conduct periodic safety evaluations of their areas and share those results with shop personnel.

- EHS will conduct annual shop evaluations. Results will be submitted electronically to the shop supervisor through an online auditing tool.
- Shop personnel have the responsibility to report all deficiencies seen at any time to the shop supervisors. Should shop personnel feel that the deficiency is not being corrected in a timely manner, they should report it to EHS.

Fume Hoods

The types of fume hoods addressed in this section are the standard industrial type with sashes that are typically found in science laboratories for vapor and low level particulate and heat capture. Homemade units and department level installed units are prohibited unless part of a construction project to ensure all applicable standards and codes are followed. If fume hoods are present in a shop, personnel should follow these guidelines for proper operation and protection:

- When working in the hood, position the bottom of the sash to be in line with the 100 feet per minute arrow located on the front of the hood. The arrow is located where proper airflow velocities are achieved at the hood's face.
- Set up work inside the hood at least six (6) inches from the face opening. This will avoid turbulence at the sash edge and provide greater protection.
- Separate and elevate large or bulky instruments. Use blocks or racks to elevate equipment 1-2 inches off the hood work surface so that air can easily flow around them with no disruption.
- Keep only items needed for ongoing operations inside the hood. Excess materials in the hood disrupt airflow and can act as a barrier or cause airflow to exit across the face of the hood.
- Keep the back bottom slot clear at all times because it serves as an exhaust port for fumes and heat generated near the surface.
- Minimize traffic near and around the hood. A person walking past the hood can create competing air currents. Other cross drafts should be eliminated, such as open doors, open windows, or fans.
- Use extreme caution with ignition sources inside a fume hood. Ignition sources such as electrical connections and equipment, hot plates, controllers, and open flames will ignite flammable vapors or explosive particles present in the hood. All electrical equipment used inside a fume hood must be designed or certified as intrinsically safe, unless it can be absolutely established (and enforced) that flammable or explosive materials will not be used in the hood while general electrical equipment is being used.
- Never put your head inside a hood while operations are in progress. The plane of the sash is the imaginary boundary that should not be crossed except to set up or dismantle equipment.
- Do not dismantle or modify the hood's physical structure or exhaust system without approval from the EHS department. Modifications can result in a decreased airflow and could make the hood less protective. Modifications can also have an impact on other fume hoods that are connected to the same exhaust fan. In addition, no fume hoods can be removed from service without the approval of Campus Operations unless it is part of a formal construction project that has prior approval.
- Do not use hoods for general chemical storage. Only chemicals that require ventilation while in storage may be stored in a hood specified for that purpose.
- Position gas phase or particle generating sources well within the hood for proper contaminate capture.

Maintenance

- Keep shop clean, uncluttered, and free of tripping hazards.
- Inspect and maintain shop equipment regularly.
- Report any chemical fume hood malfunctions to the EHS department.

Drugs/Alcohol

It is the policy of BGSU to prohibit the unlawful use, sale, distribution, transfer or possession of controlled substances, alcoholic beverages, drugs not medically authorized, and any other substance that may impair an individual's academic or work performance or pose a hazard to the individual, the public, students or employees of the University on its property or at any of its sponsored activities.

Training

Task and tool training specific to the shop is the responsibility of the shop supervisor or instructor of courses utilizing the shop. EHS provides training on many occupational safety and health topics and can provide general shop safety training upon request. Call EHS or visit our website for more information.

Hazard Labels

Hazard labels are often used on equipment and tools to warn users of potential harm if used improperly or not as intended and they are:

- **Danger** - Immediate hazards which WILL result in severe personal injury or death; label color is predominantly red
- **Warning** - Hazards or unsafe practices which COULD result in severe personal injury or death; label color is predominantly orange
- **Caution** - Hazards or unsafe practices, which COULD result in minor personal injury or product or property damage; label color is predominantly yellow

WASTE

Hazardous Waste

Collection

Hazardous waste should be collected in a structurally sound container compatible with the chemical. If using the original container and it is in questionable condition, immediately contact EHS for proper handling and disposal.

Collection sites for waste within the shop should be in an area that is safe for the characteristics of the waste (for example, not keeping flammable solvents near heat sources).

Labeling

Containers with missing or illegible labels are classified as “unknowns.” Unknown chemicals that require disposal place an unnecessary and costly burden on the University.

Chemical waste containers must be labeled according to these specifications:

- Waste chemicals that are in their original containers require only the words “hazardous waste” above the chemical name.
- Chemical names should be fully written out, no abbreviations.
- All containers used for commingling of wastes must be labeled with the words “hazardous waste” and an identification of the contents. Additional labels may be needed if numerous compatible wastes are placed into one container.

Regulated Waste

Regulated waste, such as batteries, lamps, and ballasts, to name a few, should be handled appropriately. All waste containers should be labeled with the full product name. For proper disposal procedures and other information, please review the Batteries, Lamps and Ballasts Safety Program on the EHS website.

Biosafety and Infectious Waste

Sharps

- Sharps are any object that can penetrate the skin including, but not limited to, needles, scalpels, broken capillary tubes, razor blades, X-Acto knives, and scissors.
- If sharps are chemically contaminated but don't contain bio-hazard material, any biohazard labels should be removed from the container and labeled properly with the chemicals used.
- If sharps are contaminated with bio-hazard material, an official sharps container shall be used and labeled properly.
- All containers used for sharps must also be puncture resistant and leak proof on the sides and bottom.
- EHS should be contacted for proper disposal.

Note: See BGSU's Biosafety and Infectious Waste Safety Procedure on EHS's website for more information on other products that fall into this category of waste and what the proper handling, labeling, and disposal procedures are.

Other Waste

Glass Disposal

- Broken or cracked glass products that are not contaminated with chemical residue must be disposed of inside a designated glass disposal container. Contact Campus Operations for one of these containers through their work order system. Do not throw it in regular trash for the safety of personnel who empty the trash for your location.
- If cracked or broken glassware containers are contaminated with residual chemicals, do not place them in the designated glass disposal container until they have been properly cleaned.
- When the glass disposal container is $\frac{3}{4}$ full, submit a work order to Campus Operations for proper disposal and a replacement box. Information required on the work order includes: Building, Room number, and specifically state "Broken glass disposal box is full and needs disposed of. Replacement needed."

CHEMICAL HANDLING, LABELING, AND STORAGE

Handling

- Never smell or taste chemicals.
- Always assume a chemical is hazardous.
- Place chemicals back from the edge of shelves, tables or benches (1-2 inches).
- Keep work area clear and uncluttered.
- Use only the amount needed to avoid excess waste accumulation.

Labeling

- Label hot surfaces.
- Do not remove or deface labels on incoming containers from manufacturers.
- Secondary containers that will be stored (will not be completely used in a consecutive 8-hour period) must be labeled with the chemical's name (written in full) and associated health warnings.
- Secondary containers where contents will be used immediately or within a consecutive 8-hour period must be labeled with the chemical's name at a minimum.

Storage

General

- Only authorized shop personnel shall have access to chemicals.
- Segregate incompatible materials to prevent contact with one another. Store like with like.
- Separate boxes containing chemicals. Do not stack them.

Flammable Solids and Liquids

- The presence of flammable liquids in a shop presents a significant potential for fires and explosions. To minimize this potential, flammable liquids must be stored in flammable safety cabinets when more than a combined 10 gallons is present. These cabinets do not need to be ventilated for fire protection. However, they can be ventilated to control odors.
- Use only explosion-proof refrigerators to store liquids that could produce explosive vapor concentrations.

Compressed Gases

- Secure compressed gas cylinders to a wall, countertop, hand cart, etc. by chain or strap in an upright position. This is to prevent cylinders from tipping over and releasing gas and pressure.
- When cylinders are not in use, the protective cap must be in place. When cylinders are in use, a regulator valve must be in place.
- Cylinders must be transported on a hand cart where it can be secured by a chain.
- Identify status of cylinders as "full", "in-use", or "empty".

Safety Data Sheets (SDSs)

- SDS's are required to be readily available to shop personnel at all times. This is typically in the form of a SDS station hung on a wall. See the EHS department if one is needed to keep the look consistent throughout campus.
- Shops can choose to keep their SDSs in hard copy or electronic form, however, if the latter, a means to retrieve them in this way must be readily available i.e. a computer setup in the shop. A cover page inside the station's three-ring binder must indicate if the SDS's are stored electronically and if so, how shop personnel can access them. The only two acceptable means of keeping SDS's electronically is through a folder on the computer's desktop or by creating a folder inside Chemwatch, a system the university purchased. See EHS's website for access to and training on this user-friendly system.
- If kept as hard copies or on the Desktop, they must be periodically (annually at a minimum) reviewed to ensure the most updated SDS copy is available. If kept in a folder through Chemwatch, the system updates the SDS's automatically when one becomes available.
- MSDS's are obsolete. They need to be replaced with a SDS unless the product is no longer made, manufacturer is out of business, etc. and one cannot be obtained.
- MSDSs were all different from one to another because chemical manufacturer's had a lot of leeway in how they were written. SDSs are now required to be in 16-section sequential format so that no matter what the product is or who the manufacturer is, they will all have the same look and format so that end users can quickly find the information they need.

Note: For more information about chemical handling, labeling, storage, and SDS's, see BGSU's Hazard Communication Program on EHS's website.

PERSONAL PROTECTIVE EQUIPMENT

By law, PPE must be the last form of protection utilized to protect employees. More favorable protection options include eliminating the hazard, use of engineering controls (i.e. local exhaust ventilation), substitution for less hazardous products, and administrative controls (changing the way employees work with a product). If all of these options have been exhausted and the hazard remains, PPE can be used. Employees are required to inspect all forms of PPE before each use to look for damage and wear. If these things are noted, the item must be replaced so proper protection can be maintained. Below is some information on common forms of PPE. For more information, see the university's PPE Program on EHS's website. Contact EHS for any questions, consultation on control measures, or help with selection of appropriate PPE.

Eye and Face Protection

- Safety glasses must have side shields and they only protect against flying particles and impact hazards. Goggles are also available for this protection (typically have small pinholes on the sides for ventilation).
- Chemical splash goggles have inverted vents to protect the user from liquid chemicals that are injurious to the eyes. When liquid chemicals are also injurious to the skin and large splashes are likely, a face shield positioned over the goggles (not in place of) is also required.
- Other special operations, such as abrasive wheel grinding and chain saw usage, require safety glasses and a face shield. Both have the potential of large particles impacting the face and abrasive wheels can create sparks or the wheels can even explode.
- Welding, cutting, and brazing (hot work) is another operation that often requires face and eye protection due to spark and ultraviolet/infrared radiation.
- All eye and face protection must conform to ANSI Z87.1 standards.
- Wash safety glasses, goggles, and face shields often with mild soap and water.

Gloves and Skin Protection

- Gloves protect from many hazards including heat, chemicals and other hazardous substances, punctures, cuts, abrasions, etc. and can help to provide grip. Ensure the gloves used match the hazard. Glove manufacturers and distributors can help with proper selection.
- If possible, gloves should not be worn while working on or with rotating parts if there is a potential for them to be pulled into those rotating parts. If they must be worn, they should be snug fitting to help prevent this.

Respiratory Protection

- NIOSH approved N-95 respirators (dust masks) can be used in the shops on a voluntary basis, however, all employees engaging in this must obtain a copy of the "Voluntary Use Form" on EHS's website, sign it, and return a copy to the EHS department. BGSU is not required to pay for or supply these when used on a voluntary basis.
- Employees who want to voluntarily wear any other type of respirator, must do the above, receive approval from the corresponding department, and be medically cleared. The corresponding department is then responsible for paying for the medical clearance. Contact the EHS department for the medical forms and instructions. BGSU, however, does not need to pay for the respirator or any of its components.

- When any respirator use is required, as determined by the EHS department through air sampling, all provisions of the University's Respiratory Protection Program apply including medical clearance and annual training and fit testing.
- If there is ever a concern that an overexposure to a substance may exist, contact the EHS department immediately for an evaluation.

Hearing Protection

- A rule of thumb is that if one has to raise their voice to be heard when speaking with a person who is an arm's length away from them, an unsafe level of noise is being approached and the area and/or task should be assessed.
- Hearing protection can always be provided and worn on a voluntary basis but needs to be used and maintained per the manufacturer's instructions.
- If an assessment is conducted and an overexposure exists, all provisions of the University's Hearing Conservation Program apply including use of hearing protection with an appropriate noise reduction rating, annual training, and an annual hearing test.

MECHANICAL AND ELECTRICAL HAZARDS

Electrical

- Do not remove the grounding plug or prong on three-prong electrical plugs. Do not modify them or use in two-prong outlets. If a ground prong is missing, the cord shall be removed from service immediately and either replaced or repaired.
- Electrical cords that are cracked, frayed, or damaged in any way that could pose a safety concern must be repaired or replaced. Electrical tape is not an appropriate repair method. The cord must be repaired back to its original insulating properties i.e. heat shrink sleeve or something similar. All repairs should be made by a competent person, such as an electrician.
- Use only approved (UL/FM listed) electrical equipment. Equipment labeled “Household Use” shall not be permitted.
- Extension cords are not to be used as a replacement for permanent wiring. There is a maximum use of 90 consecutive days at one time per National Electric Code (NEC).
- Power cords shall not be run above a drop ceiling, through a doorway/wall/ceiling, under carpet, or across an aisle way.
- If using an extension cord or hand power tool, temporary power is being obtained. This requires that the cord be plugged directly into a GFCI outlet or a portable GFCI must be used (this still applies if the tool being used in double insulated).
- If equipment is shut down due to servicing and/or maintenance, it must be locked/tagged out by an authorized person per the University’s Lockout/Tagout Program.
- If the equipment’s power is being locked out/controlled for other reasons i.e. security, the lock must look different than the lock used for servicing/maintenance and must be accompanied with a tag, sticker, or something indicating for security purposes only.
- There must be 3 feet of clearance around all electrical panels.
- Outlets within 6 feet of water sources must be a GFCI type.
- If an extension cord must be used on a temporary basis, it cannot be plugged into another extension cord (daisy-chaining). See Appendix E for good and poor cord management.
- All exposed wires in boxes, outlets, panels, etc. shall have an appropriate cover to prevent accidental exposure.

Power and Hand Tools

Power tools should be inspected before every use but at a minimum, before each day or shift’s use. All of the information regarding cord condition in “Electrical Hazards” above apply. In addition, the following shall apply:

1. Check the casing to ensure it is in good condition (no cracks, missing parts, gouges, pits, holes, etc.);
2. Correct guards, shields, and attachments are present; and
3. Tools are grounded or double insulated.

Overhead Lighting

Lighting fixtures that are not more than 7 feet above the working surface, must have the bulbs guarded by either protective sleeves or fixture covers/guards.

Guarding

General

- One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks, which includes machine components such as pulleys, gears, shafts, and any other moving parts.
- Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself. Examples of guarding methods include barrier guards, two-hand tripping devices, electronic safety devices, etc.
- Machines designed for a fixed location shall be securely anchored to prevent walking or moving.

Machine Specific Requirements

Wood working and abrasive wheel machinery are the common types seen throughout campus. There are many machines within these groups that have machine specific guarding requirements. Instead of citing all applicable information within this program, below are a few of the common types of equipment seen in shops across campus and what the OSHA expectations are. For a more exhaustive equipment list and requirements, visit OSHA's website, listed in Appendix F of this program, and access 29 CFR 1910.213 (woodworking) and 29 CFR 1910.215 (abrasive wheel).

1. Hand-Fed Ripsaws

- a. Each circular hand-fed rip saw shall be guarded by a hood, which shall completely enclose that portion of the saw above the table and that portion of the saw above the material being cut. The hood and mounting shall be arranged so that the hood will automatically adjust itself to the thickness of and remain in contact with the material being cut but it shall not offer any considerable resistance to insertion of material to saw or to passage of the material being sawed.
- b. Each hand-fed circular rip saw shall be furnished with a spreader to prevent material from squeezing the saw or being thrown back on the operator. The provision of a spreader in connection with grooving, dadoing, or rabbeting is not required. On the completion of such operations, the spreader shall be immediately replaced.
- c. Each hand-fed circular rip saw shall be provided with non-kickback fingers or dogs so located as to oppose the thrust or tendency of the saw to pick up the material or to throw it back toward the operator. They shall be designed to provide adequate holding power for all the thicknesses of materials being cut.

2. Radial Saws

- a. The upper hood shall completely enclose the upper portion of the blade down to a point that will include the end of the saw arbor. The upper hood shall be constructed

- in such a manner and of such material that it will protect the operator from flying splinters, broken saw teeth, etc., and will deflect sawdust away from the operator. The sides of the lower exposed portion of the blade shall be guarded to the full diameter of the blade by a device that will automatically adjust itself to the thickness of the stock and remain in contact with stock being cut to give maximum protection possible for the operation being performed.
- b. Each radial saw used for ripping shall be provided with non-kickback fingers or dogs located on both sides of the saw so as to oppose the thrust or tendency of the saw to pick up the material or to throw it back toward the operator. They shall be designed to provide adequate holding power for all the thicknesses of material being cut.
3. Band Saws
- a. All portions of the saw blade shall be enclosed or guarded, except for the working portion of the blade between the bottom of the guide rolls and the table. Band saw wheels shall be fully encased.
4. Sanding Machines
- a. Feed rolls of self-feed sanding machines shall be protected with a semi-cylindrical guard to prevent the hands of the operator from coming in contact with the in-running rolls at any point.
 - b. Each drum sanding machine shall have an exhaust hood, or other guard if no exhaust system is required, so arranged as to enclose the revolving drum, except for that portion of the drum above the table, if a table is used, which may be necessary and convenient for the application of the material to be finished.
 - c. Each disk sanding machine shall have the exhaust hood, or other guard if no exhaust system is required, so arranged as to enclose the revolving disk, except for that portion of the disk above the table, if a table is used, which may be necessary for the application of the material to be finished.
 - d. Belt sanding machines shall be provided with guards at each nip point where the sanding belt runs on to a pulley. These guards shall effectively prevent the hands or fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt shall be guarded against accidental contact.
5. Abrasive Wheel
- a. The safety guard shall cover the spindle end, nut, and flange projections.
 - b. Work rests shall be kept adjusted closely to the wheel with a maximum opening of one-eighth inch to prevent the work from being jammed between the wheel and the rest, which may cause wheel breakage.
 - c. The distance between the wheel periphery and the adjustable tongue or the end of the peripheral member at the top shall never exceed one-fourth inch.

Compressed Air

Compressed air hoses and nozzles must be maintained in good working order at all times. When not in use, they must be hung to prevent creating a trip hazard. All air nozzles used for any type of cleaning must be equipped with a nozzle that reduces the air pressure to below 30 psi at the output. It is forbidden for shop personnel to use compressed air for cleaning product off their clothing or bodies.

SPECIAL EQUIPMENT AND AREAS

Cranes, Hoists, and Slings

Inspections

Cranes/Hoists (those in regular use)

1. Initial – Prior to initial use, installers will undergo a visual inspection of and test the crane/hoist.
2. Frequent – Required to be conducted monthly at a minimum or more frequently where noted and can be completed by departmental staff as long as they are competent in what to look for. This inspection entails the following:
 - a. All functional operating mechanisms for maladjustment interfering with proper operation (daily).
 - b. Deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of air or hydraulic systems (daily).
 - c. Hooks with deformation (visual, daily; monthly inspection with a certification record that includes the date of inspection, the signature of the person who performed the inspection and the serial number, or other identifier, of the hook inspected). For hooks with cracks, having more than 15 percent in excess of normal throat opening, or more than a 10° twist from the plane of the unbent hook shall be discarded.
 - d. Hoist chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations (visual, daily; monthly inspection with a certification record that includes the date of inspection, the signature of the person who performed the inspection and an identifier of the chain which was inspected).
 - e. All functional operating mechanisms for excessive wear of components.
 - f. Rope reeving for noncompliance with manufacturer's recommendations.
3. Periodic – Annually; recommended that this inspection be conducted by an external company who is trained to perform these inspections, which include everything outlined under “Frequent” as well as the following:
 - a. Deformed, cracked, or corroded members.
 - b. Loose bolts or rivets.
 - c. Cracked or worn sheaves and drums.
 - d. Worn, cracked or distorted parts such as pins, bearings, shafts, gears, rollers, locking and clamping devices.
 - e. Excessive wear on brake system parts, linings, pawls, and ratchets.
 - f. Load, wind, and other indicators over their full range, for any significant inaccuracies.
 - g. Gasoline, diesel, electric, or other power sources for improper performance or noncompliance with applicable safety requirements.
 - h. Excessive wear of chain drive sprockets and excessive chain stretch.
 - i. Electrical apparatus, for signs of pitting or any deterioration of controller contactors, limit switches and pushbutton stations.

*Cranes/Hoists (those **NOT** in regular use)*

- A crane, which has been idle for a period of 1 month or more but less than 6 months, shall be given a frequent inspection and a thorough inspection of any ropes prior to use. The latter shall be for all types of deterioration and shall be performed by an appointed person whose approval shall be required for further use of the rope. A certification record shall be available for inspection, which includes the date of inspection, the signature of the person who performed the inspection and an identifier for the rope which was inspected.
- A crane, which has been idle for a period of over 6 months, shall be given a complete inspection including everything in the bullet above plus everything outlined for a periodic inspection prior to use.
- Standby cranes shall be inspected at least semi-annually in accordance with the first bullet above.

Slings

The two most common types seen around campus include chain and synthetic web. Both must be inspected prior to each use reviewing the following:

- Chains - stretching, wear in excess of the allowances made by the manufacturer, and nicks and gouges
- Synthetic web - acid or caustic burns; melting or charring of any part of the surface; snags, punctures, tears, or cuts; broken or worn stitches; wear or elongation exceeding the amount recommended by the manufacturer; and distortion of fittings.

Note(s): 1) Any of these signs may indicate that the sling is unsafe and must be removed from service. 2) Inspections of any kind should be documented by the department.

Powered Industrial Trucks (PIT)

PITs are commonly referred to as fork trucks, tractors, platform lift trucks, and motorized hand trucks. This also refers to other specialized industrial trucks powered by electric motors or internal combustion engines. This does not apply to compressed air or nonflammable compressed gas-operated industrial trucks, farm vehicles, or vehicles intended primarily for earth moving or over-the-road hauling.

Anyone who needs to operate a PIT is required to receive prior to usage classroom instruction from the EHS department, hands-on training through their department by a licensed PIT operator, a practice period under the direction of a licensed PIT operator, and must pass a driving evaluation administered by the EHS department. Every three years thereafter, licensed PIT operators must pass a driving evaluation administered by the EHS department to maintain licensure. For more information, see the University's Powered Industrial Truck Program.

Mezzanines

Mezzanines used for storage must be labeled with the maximum load capacity and departments shall not exceed this. Mezzanines that will be accessed by personnel for any reason must have standard guardrails on all exposed edges. Where access is needed, a self-closing swing gate can be used. Chains are not recommended.

APPENDIX A - DEFINITIONS

Combustible – Able to be ignited when heated up to 100 degrees Fahrenheit or more but below 200 degrees Fahrenheit

Corrosive - Substance that causes visible discoloration, destruction, or irreversible changes, in living tissue or other substances at the point of contact immediately or up to 4 hours following contact (many times this is in the form of a tissue burn)

Flammable - Able to be ignited at temperatures below 100 degrees Fahrenheit

GFCI – Ground Fault Circuit Interrupter; a type of circuit breaker that shuts off electric power when it senses an imbalance between the outgoing and incoming current; the main purpose of one is to protect people from an electric shock caused when some of the current travels through a person's body due to an electrical fault such as a short circuit, insulation failure, or equipment malfunction

Hot Work - Any work involving burning, welding, or similar operations that are capable of initiating fires or explosions; some examples include welding and allied processes, heat treating, grinding, thawing pipe, powder-driven fasteners, hot riveting, and similar applications producing a spark, flame or heat

Nip Point - a point of convergence between two rolling parts, or a rolling part and a stationary part, where all or part of the human body could become trapped and injured

OSHA – Occupational Safety and Health Administration; OSHA is part of the United States Department of Labor; assures safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance

PERRP – Public Employment Risk Reduction Program; assures safe and healthful working conditions for Ohio's public employees by adopting and enforcing standards, and by providing training, outreach, education and compliance assistance to prevent occupational injuries and illnesses; adopted the Federal OSHA regulations

SDS – Safety Data Sheet; a document that chemical manufacturers, distributors, or importers provide to downstream users to communicate information on the hazards of their product

APPENDIX B – ANNUAL SHOP EVALUATION FORM

Note: This appendix is meant to provide an example of what the EHS department reviews during annual shop audits and is not an exhaustive list. This list is also subject to change at any given time. For the most updated evaluation information, please contact EHS.

Question Group:	Chemical Fume Hoods
Question: 1	Are chemical fume hoods kept free of clutter of equipment and appliances?
Recommendation:	Excess equipment/appliances must not be stored in chemical fume hoods.
Question: 2	Are shop hoods, used for chemical procedures, kept free of general chemical storage? NFPA 45, Standards on fire protection for Laboratories Using Chemicals
Recommendation:	Chemical fume hoods must not be used for general storage of chemicals.
Question: 3	Have the shop hoods been evaluated within the past year?
Recommendation:	All shop hoods must be operational in accordance with OSHA requirements.
Question: 4	Are shop hoods openings kept free of obstructions?
Recommendation:	Openings of all shop hoods must not be obstructed.
Question Group:	Chemical Storage
Question: 1	Chemicals stored according to hazard class (e.g. acids/acids, flammables/flammables, corrosive/corrosive, etc.)?
Recommendation:	Do not store chemicals from different hazard classes together.
Question: 2	Chemical containers stored off the floor?
Recommendation:	All chemical containers must be stored off the floor, unless stored inside a secondary containment and out of an aisle way.
Question: 3	Chemicals stored away from the edges of counters and shelves? (~1 - 2 inches)
Recommendation:	All chemical containers must be stored away from edges of counters, cabinets, and shelves.
Question: 4	Chemicals stored on low shelves rather than on high, out-of-reach shelves?
Recommendation:	Do not store chemicals on high, out-of-reach shelves.
Question: 5	Does the lab have more than 10 gallons of liquids having flash points below 140° F?
Recommendation:	
Question: 6	Are flammable chemicals stored inside of a flammables cabinet?
Recommendation:	Flammable chemicals should be stored inside an appropriate flammables cabinet when not actively being used.
Question: 7	Secondary chemical containers properly labeled?
Recommendation:	All chemical containers, both primary and secondary, must be properly labeled.

Question: 8	Chemical storage cabinets labeled with the class of chemicals stored inside? (e.g. flammables, corrosives, oxidizers, etc...)
Recommendation:	Cabinets utilized for chemical storage should be labeled with the class of chemical stored inside.
Question: 9	All chemical containers closed with a properly fitted cap?
Recommendation:	Keep all chemical containers closed when not actively being used.
Question: 10	Chemical containers structurally sound?
Recommendation:	Keep all chemicals in containers that are structurally sound.
Question: 11	Shop free of old/expired/unused chemicals?
Recommendation:	Properly dispose of unused/expired chemicals from the shop.
Question: 12	Is the chemical inventory updated via BioRAFT ChemTracker?
Recommendation:	Chemical inventories must be updated at least once every six months within the BioRAFT ChemTracker database. BioRAFT ChemTracker can be accessed by visiting the EHS homepage.
Question Group:	Compressed Air
Question: 1	Are all air nozzles equipped with a pressure release valve to ensure air pressure is at 30 PSI?
Recommendation:	Install an appropriate pressure release valve/regulator.
Question: 2	Are all air hoses, nozzles, and equipment in good condition?
Recommendation:	Repair, replace, or discard all equipment in poor condition.
Question: 3	Was anyone NOT seen utilizing the compressed air for personal cleaning versus area cleaning?
Recommendation:	Compressed air is to be used for area/equipment cleaning, not personal cleaning due to the potential for injury.
Question Group:	Compressed Gas Cylinder Hazards
Question: 1	Compressed gas cylinder adequately secured to prevent it from falling/tipping over? NFPA 45, Standards on fire protection for Laboratories Using Chemicals
Recommendation:	Secure compressed gas cylinders.
Question: 2	Regulator or safety cap fastened to the compressed gas cylinder valve? OSHA 29 CFR 1910.101
Recommendation:	If the compressed gas cylinder is in use it must have a regulator valve, and if not in use the cylinder must have a safety cap in place.
Question: 3	Was the compressed gas cylinder hydrostatically tested in the past five years (unless marked with a *, 10 years)?
Recommendation:	All compressed gas cylinders must be hydrostatically tested every five years, unless marked with a *, in that case 10 years.

Question Group:	Cranes and Hoists
Question: 1	Are cranes/hoists free of modifications, unless written approval has been granted by manufacturer?
Recommendation:	Non-approved modifications to this equipment voids the load capacity and makes it permanently out of service. It is suggested to contact the Dept. of Environmental Health and Safety if any modifications need to be made.
Question: 2	Is the rated load marking plainly marked on each side of the crane and on each individual hoist?
Recommendation:	Load rating needs to be legible at all times.
Question: 3	Are exposed moving parts (i.e. gears, set screws, chain sprockets, etc.) guarded?
Recommendation:	Guard exposed moving parts.
Question: 4	Are periodic (annual) thorough inspections completed to analyze any deficiencies?
Recommendation:	Annual inspections need to be completed by a trained person (usually a contracted engineer or technician) to ensure all aspects of the crane or hoist are in functional condition.
Question: 5	Are slings, chains, and wire ropes in good working condition?
Recommendation:	Slings and chains should be free of cuts, snags, bird-caging, and other visual deterioration.
Question Group:	Fire and Emergency Procedures
Question: 1	Emergency phone numbers prominently displayed in the shop or on the exterior of the shop door?
Recommendation:	Emergency contacts and phone numbers need to be displayed in the shop or on the shop door.
Question: 2	Has the shop emergency contact signage been updated to reflect current personnel?
Recommendation:	Ensure that emergency contacts are updated regularly to reflect individuals who are currently affiliated with shop activities.
Question: 3	BGSU Emergency Procedures Poster posted in the shop?
Recommendation:	A current copy of the BGSU Emergency Procedures poster must be located inside the shop.
Question: 4	Fire extinguisher present inside the shop? NFPA 10, Standard for Portable Fire Extinguishers
Recommendation:	Contact the Campus Operations help desk (2-2251) to request a fire extinguisher.
Question: 5	Flammables kept from potential ignition sources?
Recommendation:	Keep all flammable materials stored away from potential ignition sources.

Question: 6	Aisles, emergency exits, and corridors are free of tripping hazards and stored material?
Recommendation:	Keep all aisles, emergency exits, and corridors in the shop free of tripping hazards and stored material.
Question Group:	General
Question: 1	Is personal protective equipment (PPE) being used where applicable and being maintained in good working order?
Recommendation:	PPE shall be worn where required and maintained in good working order.
Question: 2	Chemical Hygiene Plan (CHP) present in the shop? Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1450
Recommendation:	Have the CHP readily accessible within the shop.
Question: 3	'Monthly Self Inspection Checklist' filled out and kept current? (BGSU Chemical Hygiene Plan)
Recommendation:	The Monthly Self Inspection Checklist needs to be completed and kept up-to-date. (Can be found on the EHS Department website).
Question: 4	Does the shop have good housekeeping?
Recommendation:	Maintain all shop areas in clean condition.
Question: 5	Food or drink are not consumed within the shop
Recommendation:	Do not permit the consumption of food or drink within the shop.
Question: 6	Shop door(s) to hallway kept closed? National Fire Protection Association (NFPA) 45, Standards on fire protection for Laboratories Using Chemicals
Recommendation:	Shop doors should remain closed at all times, except for personnel entering and exiting the shop.
Question: 7	Shop fire doors kept closed? National Fire Protection Association (NFPA) 45, Standards on fire protection for Laboratories Using Chemicals
Recommendation:	Shop doors should remain closed at all times, except for personnel entering and exiting the shop.
Question: 8	Shop door locked if nobody is present inside the shop
Recommendation:	If nobody is working inside the shop, door(s) must be locked.
Question: 9	If a first aid box/cabinet is present, is it free of expired material and inspected on a monthly basis by the department?
Recommendation:	If a first aid cabinet is kept, someone from the department is required to inspect it from a monthly basis and keep it in good working order i.e. sanitary, pitching expired product and product in poor condition, etc.
Question: 10	Are there any Urgent safety matters that need addressed?
Recommendation:	
Question: 11	Are there any Intermediate safety matters that need addressed?
Recommendation:	All miscellaneous intermediate safety items should be addressed within two weeks.

Question: 12	Are there any long-term safety matters that need addressed?
Recommendation:	All long-term safety items should be addressed within a month.
Question: 13	Is fall protection (guardrails, PPE, etc) adequate for the workspace?
Recommendation:	Fall protection, such as guardrails, toeboards, and harnesses, etc. must be compliant with State and Federal regulations.
Question Group:	General Fire Safety Inspection
Question: 1	Is storage orderly and proper ceiling clearance maintained?
Recommendation:	Storage shall be orderly at all times. In addition, ceiling clearance should be maintained at least 2 feet below the ceiling in non-sprinklered buildings and at least 18 inches below the ceiling in sprinklered buildings.
Question: 2	Are sprinkler heads, fire extinguishers, pull stations, standpipes, and other fire safety equipment properly maintained?
Recommendation:	All fire safety equipment must be clean and maintained properly.
Question: 3	Are sprinkler heads, fire extinguishers, pull stations, standpipes, and other fire safety equipment unblocked and accessible?
Recommendation:	All types of fire safety equipment must be accessible and not blocked.
Question: 4	Are appliances plugged directly into a wall outlet?
Recommendation:	All appliances should be plugged directly into a wall outlet and not into power strips.
Question: 5	Are all fire doors closed when room is not occupied or at all times if in corridors or hallways?
Recommendation:	All fire doors should be closed at all times unless room is occupied or unless magnetic mechanical closure system is in place.
Question: 6	Are all emergency exit lights illuminated/working properly?
Recommendation:	All emergency exit lights should work properly at all times. A work order should be put in with Campus Operations to make repairs.
Question: 7	Are walls and door surfaces covered with 10% or less of combustible materials in office spaces and 20% in residential areas?
Recommendation:	All walls and door surfaces in office spaces should be covered with 10% or less of combustible material, and 20% or less in residential areas.
Question: 8	Are mechanical spaces free of general storage?
Recommendation:	All mechanical spaces (including electrical closets and transformer rooms) must be free of general storage.
Question: 9	Fire extinguisher present inside room and no additional fire extinguishers are needed?
Recommendation:	If a fire extinguisher is needed for the space, a work order should be put in with Campus Operations.
Question: 10	Space free of daisy-chained power cords?
Recommendation:	Power strips/extension cords must not be plugged into subsequent power strips/extension cords.

Question: 11	Space free of electric cords running under doors/carpet and through ceilings/walls?
Recommendation:	Rearrange cords to prevent these conditions.
Question: 12	Space free of electrical cords in poor condition i.e. frayed, cut, smashed, exposed wires, electrically taped, etc. and poorly positioned?
Recommendation:	Replace electric cords in poor condition
Question: 13	Are all cover plates properly assembled on electrical boxes, panels, and other devices?
Recommendation:	All cover plates must be properly mounted on electrical boxes, panels, and other devices.
Question: 14	Are all paths of egress unblocked and unobstructed?
Recommendation:	All paths of egress must be uncluttered, unobstructed, and free of storage.
Question: 15	Are all fire doors self-closing and self-latching?
Recommendation:	All fire doors must be self-closing and self-latching from any partially open position.
Question: 16	Are ceiling and wall barriers, such as ceiling tiles, fire-stop, and light diffusers, in place and not in need of repair?
Recommendation:	All forms of ceiling and wall barriers must be in place and in proper working condition.
Question: 17	Is room free of combustible curtains?
Recommendation:	Curtains must be fire-proofed or non-combustible. If considering fire proofing curtains yourself, consult with EHS on the proper guidelines to treat them to ensure compliance.
Question Group:	Hazardous Waste
Question: 1	Hazardous waste containers present?
Recommendation:	Store all hazardous wastes in acceptable containers.
Question: 2	Hazardous waste containers removed in a timely manner?
Recommendation:	Remove all hazardous waste from the shop in a timely manner.
Question: 3	Hazardous waste containers properly labeled?
Recommendation:	Properly label all containers of hazardous waste.
Question: 4	Hazardous waste containers closed (except for when waste is being added)?
Recommendation:	Unless actively adding waste, keep all containers of hazardous waste closed (no funnels).
Question: 5	Hazardous waste containers structurally sound?
Recommendation:	Hazardous wastes need stored in containers that are structurally sound.

Question Group:	Hot Work
Question: 1	Is the room/area used to perform hot work a designated, non-permit location? (Or permits are being utilized)
Recommendation:	Hot work is to be conducted using Hot Work Permits, unless designated a non-permit location. If found hot work is being conducted without filing proper permits, the Dept. of Environmental Health and Safety will be contacted to perform fire safety audit.
Question: 2	Are hot work tools (i.e. welders, torches, hoods, etc.) in good working condition?
Recommendation:	Hot work tools are to be maintained in clean working condition at all times.
Question: 3	Are hot work personnel trained properly on how to use the equipment?
Recommendation:	Hot work personnel are to be trained on how to use the equipment properly and how to follow guidelines outlined in the Hot Work Permit or in the Hot Work Program for non-permit required spaces.
Question: 4	Are hot work specific PPE readily available and in good working condition?
Recommendation:	Hot work PPE (i.e. gloves, masks, aprons, barriers, etc.) are to be kept in good working condition and tagged out of service and/or replaced when deemed otherwise.
Question Group:	Shop Materials/Equipment
Question: 1	Flammables Storage Cabinet present?
Recommendation:	
Question: 2	Secondary Containment Trays (Inside cabinets) present?
Recommendation:	
Question: 3	Emergency shower station signage present?
Recommendation:	
Question: 4	Emergency shower station activated regularly?
Recommendation:	
Question: 5	Emergency shower station accessible?
Recommendation:	
Question: 6	Emergency eyewash station signage present?
Recommendation:	
Question: 7	Emergency eyewash station activated regularly?
Recommendation:	
Question: 8	Emergency eyewash station accessible?
Recommendation:	
Question: 9	Emergency drench hose signage present?
Recommendation:	
Question: 10	Emergency drench hose activated regularly?
Recommendation:	

Question: 11	Emergency drench hose accessible?
Recommendation:	
Question: 12	Emergency Fire Blanket present?
Recommendation:	
Question: 13	Emergency fire blanket accessible?
Recommendation:	
Question: 14	First Aid Kits (Evaluated within the past year?)
Recommendation:	First aid kits are to be inspected annually to ensure the proper items are available.
Question: 15	Contents of first aid kits current and up to date?
Recommendation:	
Question Group:	Mechanical and Electrical Hazards
Question: 1	Shop free of electrical cords in poor condition i.e. frayed, cut, smashed, exposed wires, electrically taped, etc. and poorly positioned? NFPA 70, National Electric Code
Recommendation:	Replace electric cords in poor condition.
Question: 2	Electrical panel unobstructed and easily accessible (36" all around)? NFPA 70, National Electric Code & OSHA 29 CFR 1910.303
Recommendation:	Electrical panels need to be unobstructed and easily accessible at all times.
Question: 3	Shop free of daisy-chained power cords? OSHA 29 CFR 1910.303
Recommendation:	Power strips/extension cords must not be plugged into subsequent power strips/extension cords.
Question: 4	Shop free of electric cords running under doors/carpet and through ceilings/walls? NFPA 70, National Electric Code & OSHA 29 CFR 1910.305
Recommendation:	Rearrange cords to prevent these conditions.
Question: 5	All electrical outlets within six feet of a water source equipped with a Ground Faulty Circuit Interrupter (GFCI)? NFPA 70, National Electric Code
Recommendation:	Please submit a Work Order to Campus Operations to retrofit outlets within six feet of a water source with GFCI capabilities.
Question: 6	Room free from extension cord use? NFPA 70E, National Electric Code
Recommendation:	Extension cords are to be used on a temporary basis only, not to exceed 90 days of use.
Question: 7	Are electrical knockouts in place to prevent access and exposure to live electrical wires?
Recommendation:	Submit a work order through Campus Operations to have all missing knockouts replaced. Only electrically authorized employees may perform this work.
Question: 8	Do electrical panel doors open and close properly?
Recommendation:	All electrical panels shall be easily accessible and close properly.

Question: 9	Is lighting 7 foot or lower from a working surface guarded?
Recommendation:	Lighting must be guarded with cage or lamp guard if 7 foot or lower from a working surface.
Question: 10	Are BGSU Lockout-Tagout (LOTO) procedures being followed?
Recommendation:	Lockout-Tagout procedures must be in accordance to the BGSU Lockout-Tagout Program.
Question Group:	Power Tools, Hand Tools, and Guarding
Question: 1	Are all tools and equipment in good condition?
Recommendation:	All power and hand tools should be in good working condition, free of defects and excessive wear.
Question: 2	Are power tools used with the correct guards, shields or attachments?
Recommendation:	Mechanical devices with moving parts need to be shielded to protect the user of fragments or foreign material.
Question: 3	Are power tools grounded/double insulated?
Recommendation:	Electric power tools are required to have 3-prong grounded plugs or be double-insulated.
Question: 4	Is sufficient clearance provided around and between machines to allow for safe operations/servicing?
Recommendation:	For safety of the operators and those providing maintenance, adequate space must be left for operation and maintenance of machines to prevent injury.
Question: 5	Are tool rests (1/8") and tongue guards (1/4") on bench grinders specifically, adjusted properly?
Recommendation:	Adjust these items accordingly.
Question: 6	Are household fans present?
Recommendation:	Household fans are not permitted in the workplace. A grounding prong must be present (industrial type) to be acceptable.
Question: 7	Ladders that are present are in good working order.
Recommendation:	Dispose/tag out of service ladders in the area that are not in good working order. DO NOT just toss in a dumpster. Cut through steps/rails first to render it unusable for liability purposes.
Question Group:	Powered Industrial Truck (P.I.T.)
Question: 1	Are those who use the P.I.T. trained and certified via the Dept. of Environmental Health and Safety?
Recommendation:	Training is required for employees initially and every three years thereafter. If students are using the equipment, employees who have been through the program can transfer their training and knowledge to them.
Question: 2	Is an inspection log readily available with frequent inspections noted?
Recommendation:	At a minimum, the lift must be inspected prior to the first use for every work shift.

Question: 3	Is the I.D. plate notably legible and attached to the P.I.T.?
Recommendation:	This must be present and legible. Call the lift manufacturer for a replacement plate or call a lift service company for assistance.
Question: 4	Are the forks, or other attachments, in functional condition?
Recommendation:	Repair all parts in poor condition.
Question Group:	Safety Data Sheets and Operation Procedures
Question: 1	SDSs available in a location that is readily accessible (e.g. hard copy or computer) to BGSU employees? OSHA 29 CFR 1910.1200
Recommendation:	Maintain SDSs within the lab or identify in the CHP where they are located.
Question: 2	Shop personnel know how to access SDS's? OSHA 29 CFR 1910.1200
Recommendation:	Inform all lab employees where SDS's are located.
Question: 3	Standard operating procedures (SOP's) present for particularly hazardous substances (PHS's)? OSHA 1910.1450
Recommendation:	SOP's must be present for each PHS present inside the shop.

APPENDIX C – PERRP POSTER



Job Safety and Health It's the Law!

All Ohio public employees have the right to:

- A safe workplace.
- Raise a safety or health concern with your employer or the Public Employment Risk Reduction Program (PERRP), or report a work-related injury or illness, without fear of retaliation.
- File a complaint with PERRP about any safety or health concerns you may have about your workplace. You may have a representative file a complaint with PERRP on your behalf.
- Receive information and training about job hazards, including all hazardous substances in your workplace.
- Refuse a work assignment if you believe it presents an imminent (life-threatening) danger to you or your co-workers. You may have a representative contact PERRP on your behalf.
- Participate (or have your representative participate) in a PERRP inspection and speak in private to the compliance officer.
- File a union grievance or file a complaint with the State Personnel Board of Review within 60 days (by phone, online or by mail) if you have suffered retaliation for using your rights.
- See any citations PERRP issues to your employer.
- Request copies of your medical records, tests that measure hazards in the workplace, and the workplace injury and illness log.

All Ohio public employers must:

- Provide employees a workplace free from recognized hazards. It is illegal to retaliate against employees for using any of their rights under the law, including raising a health and safety concern with you or with PERRP, or reporting a work-related injury or illness.
- Comply with all adopted PERRP standards.
- Report to PERRP all work-related fatalities within eight hours, and all incidents resulting in a hospitalization, amputation or loss of an eye within 24 hours.
- Provide required training to workers in a manner they can understand.
- Prominently display this poster in the workplace.
- Post PERRP citations at or near the place of the alleged violations.
- Maintain, post and submit injury and illness statistics to PERRP.

Free compliance assistance to identify and correct hazards is available to all public employers, without citation or penalty.

To request compliance assistance visit our website, or send an email to: PERRPRequest@bwc.state.oh.us



Contact PERRP at 1-800-671-6858. We can help!

Fax 614-621-5754 • TTY 1-800-750-0750 • www.bwc.ohio.gov

This poster is available free from PERRP. Minimum reproduction size is 8 1/2 x 14 inches.

APPENDIX D – EMERGENCY PROCEDURES POSTER

BOWLING GREEN STATE UNIVERSITY EMERGENCY PROCEDURES

FIRE

1. Close door behind you to contain fire.
2. Sound alarm by using fire alarm pull station.
3. Immediately and calmly evacuate building. Do not use elevator – use stairwell only.
4. **CALL 911** – Give location and description.
5. Do not re-enter the building for any reason. Only emergency personnel can authorize re-entry.

Note: Use portable fire extinguishers only if you have been trained and it is safe to do so. Use on very small fires only. Safe evacuation is your main priority.

MEDICAL - SEVERE ILLNESS OR INJURY

1. Check the scene. Do not place yourself in a life-threatening situation.
2. **CALL 911** – Give location and description of incident.
3. If you are trained in CPR and/or first aid, assess the need for support.

CRIMES IN PROGRESS OR SUSPICIOUS PERSONS

CALL 911 and give information on the person and situation.

SUSPICIOUS OBJECT OR PACKAGE

1. Do not touch or disturb the object or package.
2. If there is a written threat or suspicious substance, leave object and vacate room. Wash hands.
3. **CALL 911** and follow Dispatcher's instructions. Wait for emergency officials.

BOMB THREAT

1. Get as much information as possible from the caller (location, when it was placed, etc.)
2. **CALL 911** and follow Dispatcher's instructions.

TORNADO

1. Monitor local weather stations with radio, weather radio, or TV.
2. Know your shelter locations, listed on tornado information posters in building.
3. Seek shelter when tornado warning siren or other warning systems advise.
4. Take battery-powered radio to shelter to monitor weather conditions.

HAZARDOUS MATERIALS INCIDENT - CHEMICAL OR RADIATION SPILLS, LEAKS

1. Evacuate to a safe distance.
2. **CALL 911** – Give location and description of material.
3. Prevent access to area until response team arrives.
4. If chemical or radiation material contacts eyes or skin, flush immediately and continuously for at least 15 minutes. Use eye wash station, safety shower or other water source.

UTILITY EMERGENCIES - GAS LEAK, FLOODING, ELEVATOR OR POWER FAILURE.

CALL 372-7647, M-F 8:00A.M. - 5:00 P.M., After these hours, call Public Safety at 372-2346.

Environmental Health and Safety
BGSU Police Department

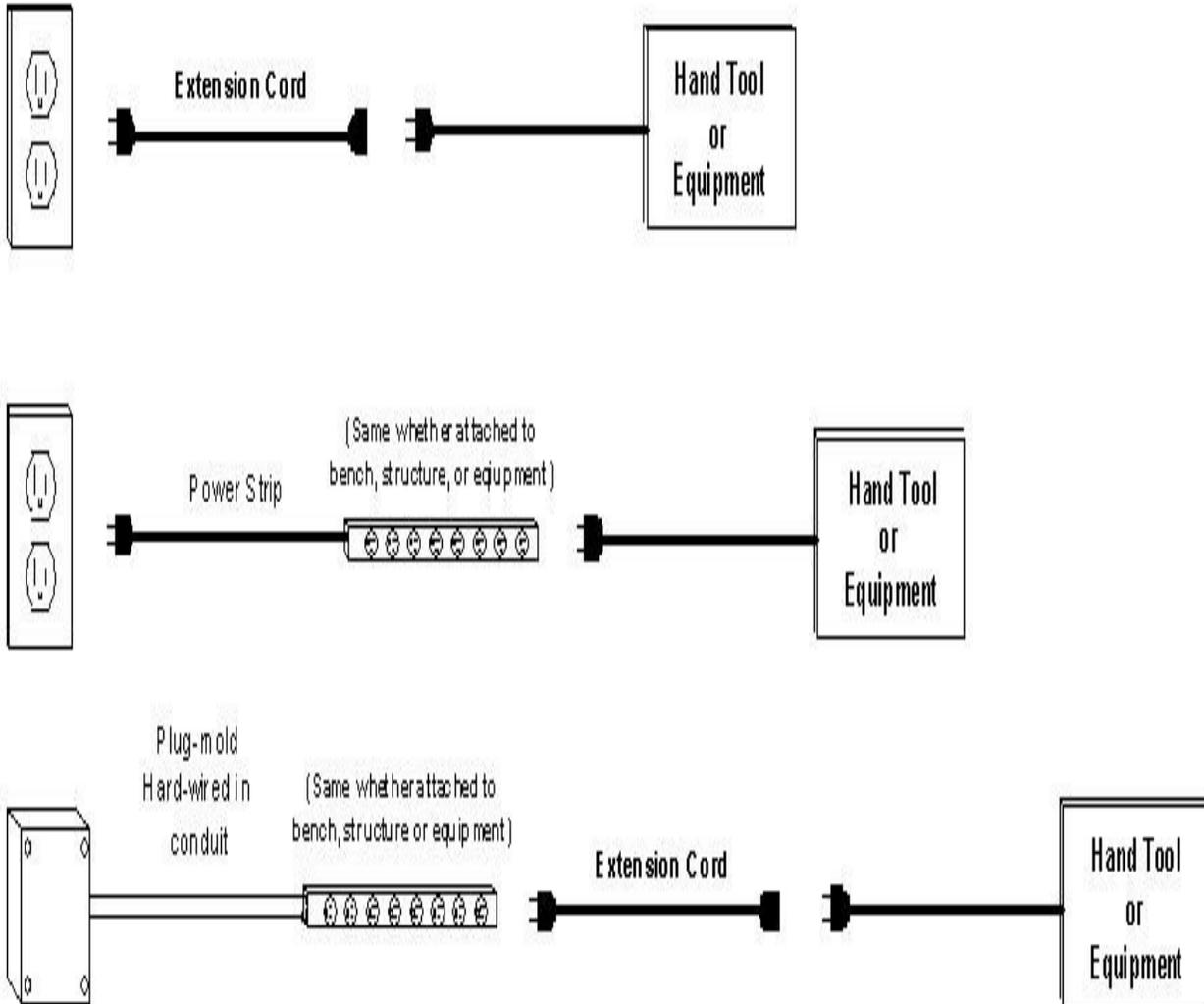
Prepared by:

Risk Management
Office of Residence Life

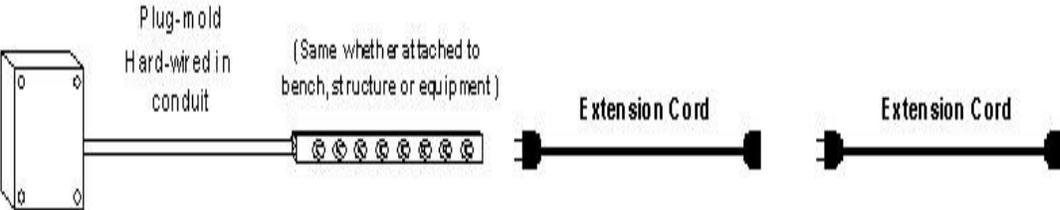
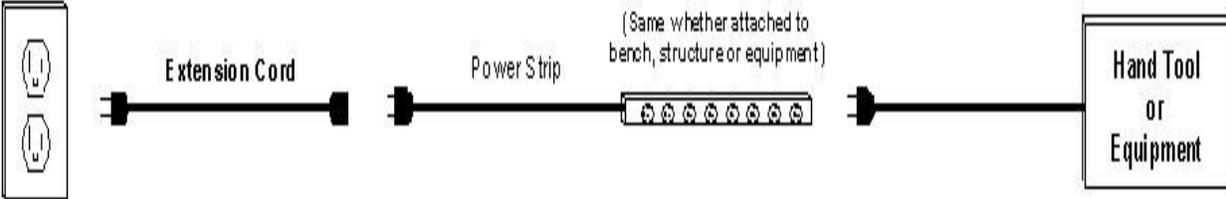
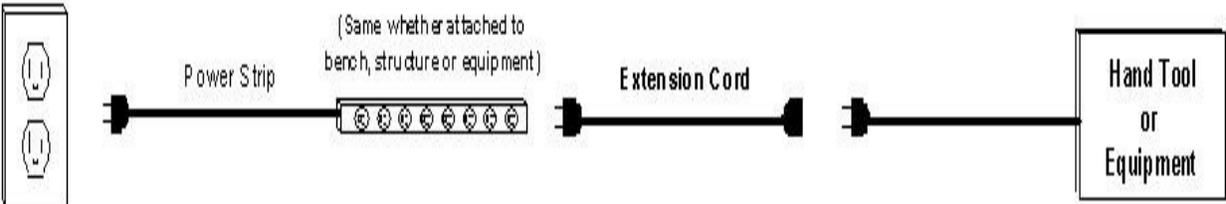
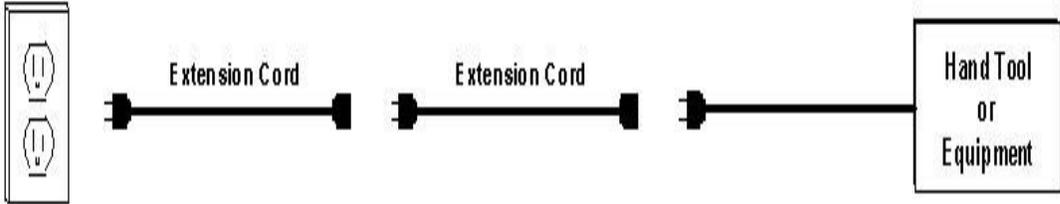
Revised: 12-15

APPENDIX E – CORD MANAGEMENT EXAMPLES

Acceptable combinations of extension cords and power strips.



Unacceptable (Daisy-chain) combinations of extension cords and power strips.



APPENDIX F – REFERENCES

1. Environmental Health and Safety's Website: <https://www.bgsu.edu/environmental-health-and-safety.html>
 - a. Chemwatch (SDS management):
<http://jr.chemwatch.net/chemwatch.web/account/autologinbyip>
 - b. Shop Auditing Tool: <https://infopro.bgsu.edu/>
 - c. Injury/Illness Reporting Form: <https://services.bgsu.edu/InjuryIllnessForm/>
2. Campus Operation's Work order System
 - a. Accessed through MyBGSU. On the left hand side, scroll down to "Misc Services". Click on "Maintenance Request".
3. Public Employment Risk Reduction Program (PERRP):
<https://info.bwc.ohio.gov/wps/portal/bwc/site/safety/safety-consultations/perrp/>
4. Occupational Safety and Health Administration (OSHA): <https://www.osha.gov/>