Powell Makerspace General Safety

Update

Date	What was changed
8-24-16	Added update table
8-24-16	Updated to reflect current tools in space

Shop Safety Manual & Procedures

An important part of your experience at the Powell Makerspace will be learning to follow practices and procedures that will prevent injuries to YOURSELF and OTHERS. Pay close attention to these instructions and the orientation given to you. Study the directions given in this manual for using tools, machines, and various workstations. As you learn to use them the correct way, you'll also learn to use them the safe way.

Develop a good attitude toward safety. This means that you have a strong feeling toward the importance of safety and are willing to give time and attention to learning the safest way to perform your work. It means that you will be certain to work carefully and follow the rules – even when no one is watching you. A safe attitude will protect you and others.

Carefully study the safety rules that follow. Staff may also recommend some additional rules. If you follow the rules and directions carefully, many of them will soon become safety habits that you will perform almost automatically.

GENERAL SAFETY RULES

- **TRAINING.** All members need to be trained in basic shop safety, tool use, and project planning. All members need to be trained on specific tools prior to working with them, or demonstrate their understanding to staff. Only members who have been trained in proper maintenance procedures are allowed to maintain machinery (change oil, blades, belts, cutting heads, etc.).
- **DRESS.** Dress properly for your work. Remove coats and jackets, and roll up loose sleeves. Secure long hair, jewelry, or any other item on your person that could cause you to become caught in a machine or tool.
- **DRUGS & ALCOHOL.** The use of any tool, equipment, or workstation after consuming drugs or alcohol is explicitly prohibited. Violating this rule will result in immediate termination of membership from the Powell Makerspace.
- **CLEAN HANDS.** Keep your hands clean and free of oil or grease. You will do better and safer work, and the tools and your project will stay in good condition.
- **CONSIDERATION OF OTHERS.** Be thoughtful and helpful toward other members in the Makerspace. Be sure that the work you are doing does not endanger someone else. Caution other members if they are violating a safety rule. If a class is in session, ask before using a piece of power equipment that will make a lot of noise. (At least until we have some noise abatement in place.)
- **TOOL SELECTION.** Select the proper size and type of tool for your work. An expert never uses a tool unless it is sharp and in good condition. Inform staff if tools are broken, have loose handles, or need adjustments.
- **CARRYING TOOLS.** Keep sharp-edged and pointed tools turned down. Do not swing or raise your arms over your head while carrying tools. Carry only a few tools at one time, unless they are in a special holder. Do not carry sharp tools in the pocket of your clothes.
- **CLAMPING STOCK.** Whenever possible, mount the work in a vise, clamp, or special holder. This is especially important when using chisels, gouges, or portable electric tools.
- **USING TOOLS.** Hold a tool in the correct position while using it. Most edged tools should be held in both hands with the cutting motion away from yourself and other members. Be careful when using your hand or fingers as a guide to start a cut. Always cut away from yourself. Test the sharpness of a tool with a strip of paper or a scrap or wood. DO NOT USE YOUR FINGERS.
- **WORKING SPEED.** Do not "rush and tear" through your work. The good craftsworker knows that a steady, unhurried pace is safest and produces the best work.

- **BENCH ORGANIZATION.** Keep your project materials carefully organized on your bench with tools located near the center. Do not pile tools on top of each other. Never allow edged or pointed tools to extend out over the edge of the bench. Close your vise when it is not in use and see that the handle is turned down. Keep drawers and cabinet doors closed.
- **FLOOR SAFETY.** The floor should be clear of scrap blocks and excessive litter. Keep projects, sawhorses, and other equipment and materials you are using out of traffic lanes. Immediately wipe up any liquids spilled on the floor.
- **PROJECT STORAGE.** Store and stack your project work carefully in assigned areas. If the storage is overhead, be sure the material will not fall off. Straighten the lumber rack when you remove a board. Do not leave narrow strips protruding from the end of the storage rack, especially at or near eye level.
- **LIFTING.** Protect your back muscles when lifting heavy objects. Have someone help you. Lift with your arm and leg muscles. Secure help with long boards, even if they are not heavy.
- **FIRE PROTECTION.** Many finishing materials, thinners, etc. are highly flammable. Others are toxic. Because of this, it is important that these materials be used only in approved areas. In addition, close cans of finishing materials and thinners immediately after use. Use flammable liquids in very small quantities. Be sure the container is labeled. Dispose of oily rags and other combustible materials immediately, or store them in an approved container. ALL HAZARDOUS MATERIALS AND LIQUIDS ARE TO BE STORED IN THE HAZMAT CABINET.
- **FIRST AID.** A first aid kit is provided for members in both the main space and wood shop.
- **ACCIDENTS & INJURIES.** Report all accidents injuries even though slight, to staff.
- **CLEAN WORKSPACE.** Be sure to leave the workspace as clean, if not cleaner than you found it. No one likes to come in and work in someone else's mess. If find a workspace dirty when you arrive, please let an employee or board member know so that we can look into it, and we would appreciate your help bringing that space back up to par when you are done.

PERSONAL PROTECTIVE EQUIPMENT

The use of personal protective equipment (PPE) is vital to the health and safety of members. The required personal protective equipment will depend on the operation. Staff should be consulted if a member is unsure of the required PPE. Many of these items listed are available to members at the Makerspace for a small donation fee.

- **EYE PROTECTION.** Wear safety glasses or a face shield when doing any operation, observing another member, or any other task that may endanger your eyes. Be sure you have enough good light to see what you are doing without straining your eyes. SAFETY
- **GLASSES ARE REQUIRED AT ALL TIMES IN THE WOOD SHOP.**
- **CONTACT LENSES.** Contact lenses may be worn in the Makerspace. Each individual shall make the decision whether to wear contact lenses based on the procedure being performed.

- **GLOVES.** The use of gloves will be dictated by the particular operation. Refer to specific procedure training documentation or equipment manual to determine if gloves are required, and what type of glove is best suited for the task.
- **RESPIRATORY PROTECTION.** In any procedure that results in the creation of fine dust (sanding, cutting of masonry or painted wood (potential exposure to silicates and heavy metal dust.), spray finishing, etc.), some form of respiratory protection is suggested. At minimum, dust masks should be N95 NIOSH approved. The use of Powered Air Purifying Respirators, Airline or Self Contained Breathing Apparatuses may be used with permission from staff.
- **EAR PROTECTION.** In any procedure in which generates loud noises hearing protection is highly suggested. Either/both headphone style hearing protection and earplugs may be used.

MATERIALS

- New lumber is always preferred over reclaimed materials.
- **RECLAIMED OR RECYCLED WOOD.** All bark shall be removed prior to any tooling, wood must be properly dry, and checked using a metal detector to assure it is free of any metal that may damage the tools, equipment, or other members.
- All materials brought into, donated, or used in the space should be safe, while posing no risk to equipment or other members.

POWERED EQUIPMENT GENERAL SAFETY RULES

Modern power woodworking machines can save large amounts of time. Learning how to use them safely will be an important part of your experience in the shop. Before operating any power tool or machine you must be oriented on how the equipment functions and works, while being completely familiar how to operate it safely. As you learn to use a machine the correct way, you will also be learning to use it the safe way.

Study and know the procedures outlined in the following chapters carefully. Pay close attention to the demonstrations and directions given by your orientation provider. Know and understand the following general safety rules that apply to power machine operation. You must also learn the specific safety rules that apply to each machine. If for any reason you forget how to operate a machine refer to this manual and ask for help!

- Wear appropriate clothing. Remove coats or jackets, and roll up loose sleeves.
- You must be wide-awake and alert. Never operate a machine when you are tired or ill.
- Think through the operation before performing it. Know what you are going to do, and what the machine will do.

- Make all the necessary adjustments before turning on the machine. Some adjustments on certain machines will require the shop hand, director, or orientator approval.
- Never remove or adjust a safety guard without permission.
- Use approved push sticks, push blocks, feather boards, and other safety devices. Some operations may require the use of a special jig or fixture.
- Keep the machine tables and working surfaces clear of tools, stock, and project materials. Also keep the floor free of scraps and excessive litter.
- Allow the machine to reach its full operating speed before starting to feed the work.
- Feed the work carefully and only as fast as the machine will easily cut.
- Maintain the MARGIN OF SAFETY specified for the machine. This is the minimum distance your hands should ever come to the cutting tool while in operation.
- If a machine is dull, out of adjustment, or not working properly, shut off the power immediately and inform staff.
- When you are operating the machine, you are the only one to control it. Start and stop the machine yourself. If someone is helping you, be sure they understand that they are expected to know what to do and how to do it.
- Do not allow your attention to be distracted while operating a machine. Also, be certain that you do not distract the attention of other machine operators.
- Stay clear of machines being operated by other members. See that other members are “out of the way” when you are operating a machine.
- When you have completed an operation on a machine, shut off the power. Wait until it stops before leaving the machine or setting up another cut. Never leave a machine running while unattended.
- Machines should not be used for trivial operations, especially on small pieces of stock.
- Do not play with machines.
- Do not “crowd around” or wait in line to use a machine. Ask the present operator to inform you at your workstation when finished. Common standards of courtesy may slow you down, but they will make the shop a safer and more pleasant place to work.
- Always unplug tools, equipment, and/or machines before making any adjustments.
- Never hand hold material in a machine when a vise should be used instead.

VARIOUS TOOLS & EQUIPMENT SAFETY RULES

Band Saws

- Wheel guard doors must be closed, and the blade properly adjusted before turning on the machine.
- Adjust the upper guide assembly so it is ••• in. above the work.
- Allow the saw to reach full speed before feeding the work.
- The stock must be held flat on the table.
- Feed the saw only as fast as the teeth can easily remove the wood.
- Maintain a 2 in. margin of safety.
- Plan saw cuts to avoid backing out of curves whenever possible.
- Make turns carefully and do not cut radii so small that the blade is twisted.
- Stop the machine before backing out of a long, curved cut.
- Round stock should not be cut unless mounted securely in a jig or hand screw.
- If you hear a clicking noise, turn off the machine at once. This indicates a crack in the blade. If the blade breaks, shut off the power and move away from the machine until both wheels stop.
- Turn off the machine as soon as you have finished your work. If the machine has a brake, apply it smoothly. Do not leave the machine until it has stopped running.

Jig Saws

- Be certain the blade is properly installed. It should be in a vertical position with the teeth pointing down.
- Roll the machine over by hand to see if there is clearance for the blade, and if the tension sleeve has been properly set.
- Check the belt guard to see that it is closed and tight.
- Keep the hold-down adjusted so the work will not be raised off the table.
- When the saw is running, do not permit your fingers to get directly in line with the blade.
- The work can usually be held on either side of the cutting line.

Portable Electric Drills

- Select the correct drill or bit. Mount it securely to the full depth of the chuck.
- Either clamp a scrap piece under work to prevent splintering the underside, or drill from both sides.
- Stock to be drilled must be held in a stationary position so it cannot be moved during the operation.
- Connect the drill to a properly grounded outlet.
- Turn on the switch for a moment to see if the bit is properly centered and running true.
- With the switch off, place the point of the bit in the punched layout hole.
- Hold the drill firmly in one or both hands and at the correct drilling angle.
- Turn on the switch and feed the drill into the work. The pressure required will vary with the size of the drill and the kind of wood.
- During the operation, keep the drill aligned with the direction of the hole.
- When drilling deep holes, especially with a twist drill, withdraw the drill several times to clear the shavings.
- Follow the same precautions and procedures as when drilling holes with the drill press.

Drill Presses

- Check the speed setting to see that it is correct for your work. Holes over ••• in. should be bored at the lowest speed.
- Use only an approved type of bit. Bits with feed screws or those with excessive length should not be used.
- Mount the bit securely to the full depth of the chuck and in the center. Remove the key immediately.
- Position the table and adjust the feed stroke so there is no chance of the bit hitting the table.
- The work should be placed on a wood pad when the holes are drilled all the way through.
- Work that will be held by hand should be center punched.
- Small or irregular shaped pieces must be clamped to the table or held in some special fixture.
- Feed the bit smoothly into the work. When the hold is deep, withdraw it frequently to clear the shavings and cool the bit.
- When using special clamping setups, or a hold saw or fly cutter, have your orientation provider inspect it before turning it on.
- Always have your orientation provider check setups for routing and shaping.

Sanding Machines

- Be certain the belt or disc is correctly mounted. The belt must track in the center of the drums and platen. Do not operate the disc sander if the abrasive paper is loose.
- Check the guards and table adjustments to see that they are in the correct position and locked securely in place.
- Use the table, fence, and other guides to control the position of the work, whenever possible.
- Small or irregular-shaped pieces should be held in a hand clamp, or a special jig or fixture.
- When sanding the end grain of narrow pieces on the belt sander, always support the work against the table.
- Sand only on the side of the disc sander that is moving toward the table. Move work along this surface so it will not burn.
- Always use a pad or push block when sanding thin pieces on the belt sander.
- Do not use power sanders to form and shape parts when the operations could be better performed on other machines.
- Sand only clean new wood. Do not sand work that has excess glue or finish on the surface. These materials will load and foul the abrasive.

Planers

- Be sure you have the orientation provider’s permission to operate the machine.
- Adjust the machine to the correct thickness of cut before turning on the power.
- Stock should be at least 12 in. long, or several inches longer than the distance between the centers of the feed rolls.
- Surface only new lumber that is free of loose knots and serious defects.
- Plane with the grain, or at a slight angle with the grain. Never attempt to plane cross grain.
- Stand to one side of the work being fed through the machine.
- Do not look into the throat of the planer while it is running.
- Do not feed stock of different thicknesses side by side through the machine, unless it is equipped with a sectional in-feed roll.
- Handle and hold the stock only in an area beyond the ends of the table.
- If the machine is not working properly, shut off the power at once and inform the orientation provider.

Laser Engraver

- Be sure you have the orientation provider's permission to operate the machine.
- Place the air vent in the window prior to powering on the machine.
- Adjust the machine to the correct thickness of material and power of laser before turning on the power.
- Materials needs to be larger than the cut/burn you are making
- If the machine is not working properly, press the emergency shut off the power at once and inform the orientation provider.
- Do not open the door to the engraver while it is running.
- Acceptable materials for engraving are:
    - Wood, Acrylic, Fabric, Glass, Coated Metals, Ceramic, Leather, Melamine, Paper, Mylar, Rubber, Wood Veneer, Painted Metals, Tile, Plastic, Cork, Anodized Aluminum, Stainless Steel
- Acceptable materials for cutting are:
    - Wood, Acrylic, Fabric, Cloth, Leather , Matte Board, Melamine, Paper, Mylar, Rubber, Wood Veneer, Fiberglass, Plastic, Cork, Corian
- Remove the air vent from and lock the window when you are done using the equipment.

Finishing

- Wear safety glasses when applying finishing materials.
- Wear rubber gloves, goggles, and rubber apron when applying bleaches and acids.
- Thinners and reducers such as naphtha, benzene, lacquer thinner, and enamel reducer should be applied in a well-ventilated room. Fumes have a toxic effect.
- Store all chemicals and soiled rags in proper safe containers. Many chemicals and rags are highly flammable.
- Wear and approved respirator for finishing operations that involve the use of toxic chemicals such as lacquer thinner and enamel reducer.
- Spraying should be performed in a well-ventilated booth or outside to reduce toxic fumes.
- Wash your hands well after applying a finish in order to remove any toxic materials that you have handled.
- Know where the sink, shower, or eyewash station is located in the event, you are burned by a finishing material.
- Provide an approved fire extinguisher in the finishing area.

OTHER SAFETY PROCEDURES & POLICIES

- **TOOL ACQUISITION.** No member will purchase and donate a tool for the Makerspace without first discussing options with staff. When new tools are procured, all attempts should be made to purchase tools with advanced safety features.
- **TOOL MAINTENANCE.** If a tool breaks or malfunctions, notify a supervisor immediately. Only authorized members are allowed to perform tool maintenance or adjustment. Tools must be unplugged/locked out prior to the start of any maintenance.