Machine Shop Safety General Rules
and
Specific Machine Safety Guidelines

Note: The following information is provided as a guide for the minimum safety training that shall be provided to personnel. Additional training on the equipment including review of manual, specific instruction for the specific type of equipment owned, and hands-on instruction/demonstration must also be provided prior to authorizing the use of any of the following machining tools or pieces of equipment.

Machine Shop Safety

GENERAL SHOP DRESS (CLOTHING, ATTIRE, ETC.) RULES

1. Safety glasses with side shields (ANSI Z87.1 approved) must be worn at all times.
2. Rings, watches, bracelets, and large earrings may not be worn in the shop. Necklaces may be worn if securely contained inside the shirt. Remember: remove or secure any item that may be caught in moving/rotating machinery.
3. Long, loose hairstyles must be restrained in a cap, bonnet or other appropriate manner to no longer than chin-length. Bangs must also be restrained tight to the forehead.
4. Facial hair that might become entangled in rotating equipment must be securely restrained.
5. Only close-fitting clothing made of smooth, close-woven fabrics may be worn in the shop. Neckties, sweaters, and bulky shirts may not be worn. Full length pants are required when operating shop equipment that may generate hot or sharp debris.
6. Long sleeves on shirts must be rolled up, and maintained, above the elbows.
7. Leather, closed-toe, shoes should be worn in the shop. Thin fabric shoes, sandals, open-toed shoes, and high-heeled shoes are prohibited.
8. A machinist’s apron with quick break-away straps should be worn.

GENERAL SHOP SAFETY RULES

1. NEVER operate equipment until you have been given instruction in its operation, and permission to use it, from the shop administrator. a. If you are in doubt about its safe operation ask the shop administrator before proceeding.
2. NEVER work alone. (Implement the “buddy” system.) a. If after hours use is allowed by the shop administrator then you MUST sign-in with a buddy, i.e., another Authorized User when using this shop after hours. NO exceptions. Two people must be present in the shop at ALL times.
3. NEVER operate a machine unless you are in complete control of your physical and emotional faculties. a. You may not operate a machine if you are sick, tired, intoxicated/drugged, stressed or angry.
4. NEVER use your hands to stop a moving machine part such as a drill press or lathe chuck. a. Always keep
hands, and other body parts, a safe distance from moving machine parts, work pieces, and cutters.

5. **NEVER** clean, oil, adjust, or change gears or belt pulleys unless a machine has completely stopped. a. When making repairs or accessory changes, such as changing a lathe chuck, shut-off power to the machine at its electrical box or pull its power plug so that it cannot be accidentally powered on. Follow OSEH Guideline, Lock-out/Tag-out – Control of Hazardous Energy Sources.

6. **NEVER** allow more than one person to operate a machine at any time.
7. **NEVER** be distracted by daydreaming or conversation while running a machine.
8. **NEVER** walk away from a machine that is powered and operational.
9. **NEVER** startle anyone who is operating a machine. a. If it is necessary to get the machine operator’s attention, do so in a careful manner.

10. **NEVER** sit or lean on a machine – keep your hands off unless you are operating it! a. Maintain an upright, well-balanced stance while operating a machine.

11. **NEVER** allow large quantities of chips or debris to accumulate around a work piece.
12. **NEVER** use compressed air guns to clean clothing, hair, or aim at another person.
13. **NEVER** move metal chips with bare hands. a. Use a brush, stick, pliers or other mechanical method.

14. **NEVER** attempt to take measurements on a work piece while the machine is running.
15. **NEVER** engage in any form of horseplay, or pranks, in the shop.
16. **NEVER** lay tools on the machines – use carts or workbenches for storage.
17. **NEVER** use damaged hand tools such as a hammer with a loose head or a file without a handle.
18. **NEVER** remove or deactivate guards or other safety devices from machinery and equipment except when necessary for servicing.
19. Use hand tools for their designed purposes only. For example, never use a scriber as a center punch or a file as a hammer.
20. Report defective machinery, equipment (including any safety devices) or hand tools to the shop administrator/monitor.
21. When moving heavy objects, lift with your legs instead of your back. Get help moving something that might be too much for you to handle alone.
22. Keep work areas neat and free from clutter. Clean machines after each use.
23. If you suffer an injury, no matter how slight you may think it is, report it immediately to the shop administrator/monitor.
24. **ALWAYS** wash your hands thoroughly when finishing in the shop, especially before eating or smoking.
25. The use of personal listening devices, e.g., iPods, MP3 players, etc., is prohibited.
26. Turn off power to applicable equipment in the event of power loss to the shop.
LATHE SAFETY GUIDELINES
http://www.lathes.co.uk/latheparts/index.html Reference for picture and parts descriptions

1. Must obtain basic shop safety training and equipment specific training before using this tool. Must wear appropriate PPE and follow all shop rules. Refer to the manufacturer’s operating manual for all operating procedures.
2. All stock must be properly secured in the lathe chuck or mounted prior to the machining process taking place. Use the correct sized clamp or vise for the stock being machined.
3. Turn the chuck or faceplate by hand to ensure there is no binding or danger of the work striking any part of the lathe.
4. Check to ensure the cutting tool will not run into the chuck or lathe dog. If possible, feed away from the chuck or dogs.
5. Before starting the lathe, ensure the spindle work has the cup center imbedded; tail, stock and tool rests are securely clamped; and there is proper clearance for the rotating stock.
6. Prior to starting the lathe, ensure that small diameter stock does not project too far from the chuck without support from the tail stock center.
7. When using wood, do not mount a split workpiece or one containing knots.
8. When roughing stock, do not force the tool in the work piece or take too big a cut.
9. The operator must always be aware of the direction and speed of the carriage or cross-feed prior to engaging the automatic feed.
10. Never leave the key in the chuck. Do not let go of the key until it is free of the chuck and secured in its proper holding place.
11. Select turning speed carefully. Large diameter stock must be turned at a very low speed. Always use the lowest speed to rough out the stock prior to final machining.
12. The correct speed and feed for the specific material and cutting tool must be used. Stop the machine before making adjustments or measurements.
13. Do not remove metal or wood chips from the table or stock by hand. Use a brush or other tool to properly remove chips or shavings from the table or stock.
14. Never attempt to run the chuck on or off the spindle head by engaging the power.
15. Do not stop the rotation of the chuck by reversing the power to the lathe unless tapping holes.
16. Do not leave tools, bits or excess pieces of stock on the lathe bed.
17. All belts and pulleys must be guarded. If frayed belts or pulleys are observed, the lathe must be taken out of service and the belts or pulleys replaced.
18. Stop the machine immediately if odd noise or excessive vibration occurs.
19. Only properly sharpened drill bits and cutting tools in good condition should be used. Dull drill bits and chipped or broken cutting tools must be removed from service.
20. Never use a file without a handle. If any filing is done on work revolving in the lathe, file left handed to prevent slipping into the chuck.
21. Disconnect the lathe from power source and follow OSEH Guideline Lock-out/Tag-out – Control of Hazardous Energy Sources if making repairs or servicing.
22. When an operator has finished working on the lathe, and before leaving the lathe for any reason, the power must be shut off and the machine must come to a complete stop.
23. When an operator observes an unsafe condition with the lathe or stock being worked, the operator must report it immediately to the designated MSSA and the lathe shall be taken out of service until the problem has been corrected.
MILL SAFETY GUIDELINES

1. Must obtain basic shop safety training and equipment specific training before using this tool. Must wear appropriate PPE and follow all shop rules. Refer to the manufacturer’s operating manual for all operating procedures.
2. Keep all guards in place while operating the machine.
3. While operating the milling machine allow no one else to touch it.
4. Keep hands away from moving cutting tools.
5. Do not make measurements of the stock while the milling machine is powered.
6. Do not allow large quantities of chips to accumulate around the work piece or machine table. After stopping the machine, use a brush or rag to remove all excess chips from the mill bed and stock.
7. Always use cutters which are sharp and in good condition.
8. Use a rag or Kevlar gloves to handle sharp cutting tools.
9. Cutting tools must be securely fastened in the machine spindle with the proper accessory. Never try to tighten cutting bits or tools by hand.
10. Make sure the cutting tool is clear of the work piece before starting the machine.
11. Make sure cutter is rotating in the proper direction before cutting material.
12. Do not power the machine to tighten or loosen cutting bits or tools.
13. Work pieces and stock must be rigidly fastened to the mill bed with clamps, a vise, or special fixtures.
14. Use appropriate speeds and feeds for the type and size of cutter being used and the material being machined.
15. Always use the proper cutting fluid for the material being cut.
16. Do not place anything on the milling machine table such as wrenches, hammers, or tools.
17. Always stay at the machine while it is running.
18. Use the milling machine spindle brake to stop the spindle after the power has been turned off.
19. Before cleaning the mill, remove cutting tools from the spindle to avoid cutting yourself.
20. Follow OSEH Guideline Lock-out/Tag-out – Control of Hazardous Energy Sources if making repairs or servicing.

DRILL PRESS SAFETY GUIDELINES

1. Must obtain basic shop safety training and equipment specific training before using this tool. Must wear appropriate PPE and follow all shop rules. Refer to the manufacturer’s operating manual for all operating procedures.
2. Ensure all safety shields and guards are in place.
3. Know the location of start and stop switches or buttons and keep the drill press table free of tools and other materials.
4. Use only properly sharpened drill bits, sockets and chucks in good condition. Remove dull drill bits, battered tangs, or sockets from service.
5. Do not remove by hand metal or wood chips from the table or stock. Use brushes or other tools to properly remove chips. **Never clean a machine while it is in motion.**
6. Do not place tapered shank tools such as large diameter drills or tapered shank reamers in a drill chuck. Only straight shank tools such as standard drills can be clamped in chucks.
7. Always clean drill shank and/or drill sleeve, and, spindle hole before mounting.
8. Remove taper shank tools from spindle or sleeve with a drill drift and hammer.
9. Do not attempt to oil the machine or make adjustments to the work while the drill press is in motion.

10. Do not insert a drill chuck key into the chuck or loosen the drill chuck until the power is shut off and the machine has come to a complete stop.

11. All belts and pulleys must be guarded; if frayed belts or pulleys are observed, the drill press must be taken out of service and the belts or pulleys must be replaced.

12. All stock must be properly secured with a vise or clamps prior to a machining process.

13. If the stock slips in the vise or clamp, the operator must not attempt to hold the work with his/her hand or try to tighten the vise/clamp while the machine is in motion. Shutdown the power to the machine prior to re-tightening the loose stock.

14. Use the correct speed and drill for the type of stock being machined.

15. Use the correctly ground bit for the stock being machined. Bits with feed screw or extremely long bits should not be used.

16. The drill bit should be mounted the full depth and in the center of the chuck.

17. Position the table and adjust the feed stroke to eliminate the possibility of the bit striking the table.

18. Use the proper cutting fluid for the materials being drilled. Ask a shop monitor about the appropriate fluid for the material you are machining.

19. Plexiglas and other brittle plastics may be difficult to drill. Ask shop administrator/monitor for advice on drill and coolant selection when drilling these materials.

20. Feed the bit smoothly into the work. If the hole being drilled is deep, withdraw the bit frequently to remove shaving on the bit.

21. If the bit binds, stop the machine and turn the spindle backwards by hand to release the bit.

22. Ease up on drilling pressure as the drill starts to break through the bottom of the material.

23. Do not drill with too much pressure.

24. Always try to support part on parallels or a backing board when drilling through material.

25. Never attempt to remove a broken drill with a center punch or hammer.

26. Never try to stop the spindle by hand. Let it stop of its own accord after turning power off.

27. When an operator has finished working on the drill press, and before leaving the drill press for any reason, the power must be shut off and the machine must come to a complete stop.

28. When an operator observes an unsafe condition on the drill press, or stock that is being worked on, they must report it immediately to the Responsible Person and the press will be taken out of service until the problem has been corrected.

BENCH/PEDESTAL GRINDER SAFETY GUIDELINES

1. Must obtain basic shop safety training and equipment specific training before using this tool. Must wear appropriate PPE and follow all shop rules. Refer to the manufacturer’s operating manual for all operating procedures.

2. Abrasive wheel machinery should not be operated without the appropriate guards in place.

3. Inspect the wheels before turning on the power. Do not use wheels that are chipped or cracked.

4. The machine shop safety administrator/monitor should mount and balance new wheels.

5. Never use a wheel that has been dropped or received a heavy blow, even though there may be no apparent damage. It may be weakened or unbalanced enough to fly apart upon startup.

6. Stand to one side of the wheel when turning on the power. Damaged wheels will sometimes fly apart, and this is most likely to happen upon startup.

7. Prior to adjusting the work rest or tang, unplug the power to the grinder from the wall receptacle. If the grinder is hardwired into a box, follow OSEH Guideline Lock-out/Tag-out – Control of Hazardous Energy.
Sources.
8. Keep the tool rest as close to the grinding wheel as possible without touching it. The tool rest must be minimally within 1/8 of an inch of the grinding wheel.
9. Prior to starting the grinder, ensure the tang at the top of the wheel opening is located within 1/4 inch of the wheel.
10. Before starting the grinder, make absolutely sure that the grinding wheel clears the top of the work piece. Approach the work piece manually to ensure this. Do not feed the table in automatic grind mode.
11. Be alert and cautious when a grinding operation requires locating fingers close to the wheel.
12. Feed the stock into the wheel with light to medium pressure. Do not force the piece.
13. Do not use the side of the grinding wheel to shape stock.
14. Stand erect in front of the grinder with both legs straight and slightly apart. Avoid stooping or leaning into the machine.
15. Keep the grinding wheel dressed. Dressing a small amount frequently is better than having to dress a lot later and will allow the wheel to cut faster, cooler and with a better surface finish. Dressing is cleaning and smoothing the surface of the grinding wheel.
16. Hold work securely while grinding, use the tool rest to support the work when off-hand grinding on bench or pedestal grinders.
17. Do not grind aluminum. Aluminum dust is explosive. Check with shop staff for safety instructions if aluminum must be ground.
18. If a magnetic chuck is being used on the surface grinder, make sure it is holding the work securely before starting to grind.
19. Report to the shop supervisor immediately any cracked, broken or otherwise defective wheels.

PLANER SAFETY GUIDELINES

1. Must obtain basic shop safety training and equipment specific training before using this tool. Must wear appropriate PPE and follow all shop rules. Refer to the manufacturer’s operating manual for all operating procedures.
2. Inspect cutter head for sharpness.
3. Do not use the planer if the cutter head is dull or if there is visible rust on it.
4. Check stock for loose knots, nails and other defects before planing.
5. Remove shavings only after the cutter head has come to a complete stop after turning off the power.
6. Keep hands away from the top surface of the board near the feed rolls.
7. When planing bowed stock, always turn the concave side of the stock toward the table and cut with the grain.
8. Disconnect and follow OSEH Guideline Lock-out/Tag-out – Control of Hazardous Energy Sources if servicing is required.

BAND SAW SAFETY GUIDELINES

1. Must obtain basic shop safety training and equipment specific training before using this tool. Must wear appropriate PPE and follow all shop rules. Refer to the manufacturer’s operating manual for all operating procedures.
2. Ensure the guard doors are closed and the blade is properly adjusted prior to turning on the machine.
3. Adjust the upper guard assembly to within 1/4 inch of the stock prior to starting the machine. Set the
band saw at the appropriate speed for the type of stock being machined.
4. Check to ensure the band saw blade is sharpened.
5. Examine the blade before installing to see if it is cracked, do not install a cracked blade.
6. Use the proper pitch blade for the thickness of the material to be cut. There should be at least 2 teeth in
   the material when cutting aluminum and three teeth when cutting steel.
7. Check to ensure the band saw is correct for the type of stock and correct speed being used.
8. Allow the saw to reach full set speed prior to cutting stock.
9. Do not force stock into the saw blade. Let the speed of the blade cut stock appropriately.
10. Make “release” cuts before cutting long curves.
11. Plan saw cuts to avoid backing out of curves in the stock.
12. Never push a piece of stock with hands in front of the saw blade. Use a push stick. Keep hands at a
    safe distance on either side of the stock being machined.
13. Use a push stick or board to push small or irregular sized stock. Small work pieces can also be secured
    with a tabletop vise or clamp.
14. All round stock must be secured in a tabletop vise or clamp prior to starting the cut.
15. Hold the stock flat on the table prior to starting the cut.
16. If the saw blade binds on a piece of stock, turn the saw off and wait until it comes to a complete stop
    before attempting to remove the blade from the stock.
17. If the band breaks, immediately shut off the power and stand clear until the machine has stopped.
18. Follow OSEH Guideline Lock-out/Tag-out – Control of Hazardous Energy Sources if making repairs or
    servicing.

**TABLE SAW SAFETY GUIDELINES**

1. Must obtain basic shop safety training and equipment specific training before using this tool. Must wear
   appropriate PPE and follow all shop rules. Refer to the manufacturer’s operating manual for all operating
   procedures.
2. Inspect the blade before using it to make sure it is the proper blade and is sharp and free from cracks.
3. Appropriate guards must be in place at all times. Never remove a guard.
4. Use the proper blade for the material and type of cut. Do not use a rip blade for cross cutting or a crosscut
   blade for rip sawing. Only use a plywood blade on plywood.
5. The circular blade of the table saw should be set to 1/8 inch above the work.
6. Stand to one side, never directly in line with the work being fed through the saw.
7. Never allow your fingers to get near the blade when sawing. Use a push stick to rip narrow pieces of
    stock.
8. Do not use a push stick to remove scrap. Shut off the machine and wait until the blade stops before
    clearing scrap.
9. If the material to cut is too large, get assistance in supporting the material as it is fed through. Never try
    this alone.
10. Never reach over the saw to get something on the other side.
11. When shutting off power, never attempt to stop the saw quickly by shoving anything against the blade.
    Make sure the saw is stopped before leaving it.
12. Never make any adjustments to the saw while it is running. Turn off the power and make sure the saw is
    completely stopped before attempting to adjust it.
13. Do not allow material to collect on or around the table. Sweep us sawdust and material scraps regularly
    and before leaving area at the end of your usage of the saw.

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14. Follow OSEH Guideline Lock-out/Tag-out – Control of Hazardous Energy Sources if making repairs or servicing.