

# Machine Shop Safety Rules

*These rules are designed to make the shop a safe place to work. Your cooperation will help to make this a safe workplace. Safe procedures for shop operations are described in the Machine Shop Health and Safety Procedures book.*

## Machine Shop Requirements

1. Everyone working on machines must:
  - a. Have a SBU ID
  - b. Successfully complete specific shop course or work under the supervision of the instructor
  - c. Successfully complete EH&S Shop Safety course EOS 029
  - d. Sign Machine Shop Safety Rules (or other equivalent documents) and agree to abide by all rules
2. No undergraduate student is permitted to work on machines unless there is someone else with appropriate safety training present. All others are strongly discouraged from working alone. Graduate students and postdoctoral Associates must discuss their planned activities with their Principal Investigator (PI) or supervisor prior to conducting the work alone and the practice should only be allowed after a careful risk-based determination.
3. Everyone must be appropriately dressed for working on machines. All long hair must be secured.
4. Everyone working in machine shops when eye hazards are present must wear appropriate eye protection (safety glasses must have Z87.1 logo on them to assure they qualify as impact resistant)
5. Report all accidents.
6. Shops will post specific information on operating machines and emergency numbers.

**All rules will be strictly enforced. 1st violation: written warning, 2nd violation: lose “independent authorized user” status, 3rd violation: no longer allowed to work in machine shop.**

**Independent Authorized User** must have

- a. SBU ID
- b. Successfully completed specific shop course or work under the supervision of the instructor
- c. Successfully completed EH&S Shop Safety course EOS 029
- d. Signed Machine Shop Safety Rules (or other equivalent documents) and agree to abide by all rules

## **Personal Protective Equipment and Appropriate Attire**

1. No loose garments. Long sleeve shirts or coats must not be worn when working with rotating machinery. Long pants and closed-toe shoes must be worn. Wear appropriate clothing for the

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- job (e.g. do not wear short sleeve shirts or short pants when welding). Do not roll up long sleeves unless they are secure. Do not wear highly flammable clothes.
2. No jewelry, rings, hanging earrings, neckties, chains etc. can be worn. Remove or secure hoodie drawstrings, all rings, wristwatches, necklaces and other jewelry before operating machinery. Remove or secure anything that might get caught in moving machinery.
  3. Hair that is shoulder length or longer must be tied up and secured (not hanging), or in a hat or hair net. Long beards must be covered with hair net.
  4. Always wear closed-toe shoes in the shop to protect feet and toes. Leather shoes are preferred.
  5. Eye protection must be worn when working on or near any machine creating eye hazard. All safety eyewear must have side protection and be stamped "Z87+" to confirm that they are in compliance with ANSI Z87.1 protective eyewear for high impact.
  6. Additional protection using face shields may be necessary while working in the metal grinding area and if flying particles are expected during the machining process. Welding eye and face protection must be appropriate for the work being conducted.
  7. Hand protection in the form of suitable gloves should be used for handling hot objects, glass or sharp-edged items.
  8. Do not wear gloves while operating rotating machinery. Holding objects with a rag near moving machinery is also not permitted. Gloves, rags, etc. can be easily caught in machines that are in motion, pulling the operator into the equipment.

## Housekeeping

9. Each user is expected to clean up after themselves. Clean up any mess. Wipe up any spilled liquids. Pick up materials. Sweep up dust and debris. Keep the work area clean. Keep the floor free of scraps and oil.
10. All machines and surroundings must be cleaned after use. Keep the floor around machines clean, dry and free from trip hazards. Do not allow chips to accumulate.
11. Before you leave the shop each day all tools must be returned to the toolbox, the machine cleaned and wiped down and the floor swept. Leave 10-15 minutes for cleanup.
12. No rags may be used near machines. If cleaning is necessary, use paper towels.
13. A brush, hook, or special tool is preferred for removal of chips, shavings, etc. from the work area. Never use your hands to clean cuttings – they are sharp and often very hot. Clean up the work area using a brush and dustpan.
14. Never use compressed air guns to clean clothing, hair, or aim the gun at another person.
15. Avoid excessive use of compressed air to blow dirt or chips from machinery to avoid scattering chips. Compressed air used for cleaning work areas, such as work benches, table saws, and drill presses, must not exceed 30 psi at the outlet, statically or dynamically, and is only permitted with effective chip guarding or personal protective equipment to protect the operator and other employees from flying debris. Do not use compressed air to blow chips off machinery unless there is a safety nozzle that reduces the pressure to below 30 psi. Vacuum the machine and sweep the floor area of any remaining chips.

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16. Storage: Return tools to their correct storage place. Don't store tools, supplies or spare parts in the aisle or on the floor where they become tripping hazards. Keep other flammable materials away from heaters and welding areas to prevent fire. Grease, oil, paint and solvents should be stored in a closed metal container. Gasoline must be stored in a plastic can with self-closing lid. Flammable and combustible liquid in excess of 25 gallons (total load) shall be stored in an acceptable or approved flammable storage cabinet. Supplies and equipment should be stored in an area designed specifically for them.

## Behavior

17. A safe attitude will protect you and others. Think, practice, and develop good safety habits. If you cannot do a job safely in this shop, don't do it. There are limits to what we can build here.
18. Think through the entire job before starting. Ask for help if you have questions.
19. No smoking, eating or drinking in shop. Do not bring food or snacks into the shop.
20. Respect the rights and property of other students. Be thoughtful and helpful to other students in the shop.
21. Respect your shop staff. They are highly trained individuals and are looking out for your safety.
22. Horseplay, running, yelling, and or fighting is absolutely forbidden in the shop.
23. Always keep your eyes on your fingers, ears tuned to the sound of the machine, and nose tuned to the smell of smoke. Avoid distractions. Keep your mind on your work. Talking or listening to the radio while running machinery can lead to accidents. Stop working and turn off the power tool you are working with if distracted by something or someone. Never look away from your work when operating a power tool.
24. Ear phones or head phones to listen to personal music devices are prohibited within the shop. (iPods, Mp3 players, CD players, etc.)
25. Do not operate power tools when you are ill, taking strong medications, fatigued or consuming alcoholic drinks. Do not drink alcoholic beverages before or during work in the machine shop area. Never work when you are impaired. This includes when you are too tired, stressed or hurried to work carefully. Do not work in the shop if you are tired or in a hurry – this almost always ruins the work, and often results in injury.
26. Ensure the safety of yourself and others by being aware of your surroundings. If you see someone committing an unsafe act, report it to the supervisor immediately. As the machine operator you are responsible for the safety of the people in your immediate area. It is your responsibility to look around and be sure that everyone within your range is wearing safety glasses. Likewise a welder must be sure not to start welding if people without welding helmets are watching him/her.

## Machine/Tool Use

27. Do not use equipment until you have received appropriate instruction and feel comfortable operating it.

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28. Follow all special rules and regular safety procedures while using the equipment. Guidelines are posted on individual pieces of equipment.
29. If you're unsure about the safe operation of a tool or any aspect of a job – ask for help! You are not authorized to use equipment on which you have not had appropriate instruction.
30. Use equipment for its intended use. Use the correct tools for the job. Do not use a tool or attachment for something it was not designed to do. Machine shop tools are not to be used for processing samples unless the tool has been specifically designated for that purpose. Select the correct bit, cutter or grinding wheel for the material with which you are working. This saves time and improves the quality of work and reduces the risk of mishap. If necessary, consult the instructions, shop manual or ask shop supervisor.
31. Know the machine. Before using any tool, read the operator's manual, or comparable literature including the specific information posted in the shop, to learn the applications, limitations, and potential of each power tool. Never use a tool unless trained to do so.
32. Know the emergency-stop switch location(s). Remember where the switch is located so you can turn off the machine quickly.
33. Inspect all tools and machinery before each use and replace or repair if parts are worn or damaged. Inspect screws, nuts, bolts and movable parts to make sure they are tightened. Repair tools only if you are trained to do so.
34. Check the power cords and plugs on portable tools for before using them. Make sure the cord will not become caught or angled. The cord should be flexible, but not easy to knot. Clean the cord regularly and inspect the grounding connections.
35. Machine guards must be kept in place while operating equipment, when appropriate. If machine guards need to be adjusted or removed under special circumstances, permission must be granted by machine shop supervisor. Once the task is completed, machine guards must return to their original position.
36. Make sure the machine work surface is clean, unobstructed and ready for use.
37. Before starting a machine, always check it for correct setup and always check to see if machine is clear by operating it manually, if possible.
38. Keep your fingers clear of the point of operation of machines by using special tools or devices, such as, push sticks, hooks, pliers, etc. Keep your hands away from sharp tools.
39. Never use a rag near moving machinery. Use paper towels if necessary.
40. If a machine, tool or other piece of equipment breaks or operates improperly, stop using it and report the problem to the supervisor immediately. Do not use broken or damaged equipment. Students are not to attempt to make repairs to tools or equipment. Everyone must comply with this rule in order to prevent injuries caused by broken or malfunctioning equipment. Hiding or concealing broken tooling only slows the replacement of that piece of tooling, so it won't be there next time you need it.
41. If you have made an adjustment to a piece of equipment, report to shop supervisor
42. Used lumber should not be used on machines. If used lumber must be used, it must be thoroughly checked for nails, etc.
43. A hard hammer should not be used to strike a hardened tool or any machine part. Use a soft faced hammer.

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44. When working with metal, secure the metal materials with clamps or in a vise to keep it from moving.
45. Securely clamp down all work pieces in drill press and milling machines. This will prevent work from being lifted up or spun around with the cutters. Use all guards that are available and be wary of points of contact with rotating cutters and chucks.
46. Work only at operating speed. Do not use a power tool before it has reached operating speed or while it is coming to a stop. Never force a tool by applying too much pressure. Let each tool work at its own speed without forcing it. Once a power tool has been turned off, allow it to coast to a stop. Never force an object into moving parts to stop a machine.
47. Keep tools clean and in good repair. Always clean up power tools before putting them away.
48. Avoid using tools that are or appear to be in disrepair. Use power tools only for their intended functions.
49. Always turn off and unplug a power tool before adjusting, oiling, cleaning or repairing it; attaching an accessory; or changing bits, blades or grinding wheels. Before making adjustments or changing bits or cutters, disconnect the power cord to avoid accidentally touching the switch and possible injury when the tool starts. Unplug or lockout tools when not in use.
50. Unplug tools by pulling directly on the plug. Jerking on the cord can cause damage to the tool.
51. Do not leave a machine running unattended unless it was designed for this. Make sure all moving parts have come to a complete stop before you leave the work area or before you make minor adjustments.
52. Use a ground fault circuit interrupter when working with portable power tools near water.
53. Use safe blades. Never use cracked or kinked saw blades. Keep saw blades sharp and properly set.
54. Personal power tools may not be brought from home for use in the machine shop unless they have been inspected by the Machine Shop Supervisor for safe operation.
55. Do not machine, grind, or cut any radioactive or other solid toxics, such as magnesium, beryllium and asbestos (e.g. transite board). Magnesium alloy is safe to use.
56. Do not leave keys on chucks of lathes, drill presses, and milling machines. The key can be thrown out with great force when machinery is turned on. This also applies to wrenches used to tighten the cutting tools into the spindles of the milling machines.
57. Clean and replace tools where you found them. All tools must be returned to their proper place after use. The toolboxes and cabinets are organized according to the character of their contents. People expect to find tools in their 'usual' locations, so clean and replace everything where it belongs when you're finished.
58. Stack and store projects neatly in assigned areas labeled with your name and date.

### Chemicals, Cleaners, Solvents, and Hazardous Materials

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59. If you have not worked with a particular material before, check the Safety Data Sheets (SDS) for any specific precautions to be taken while working with the material. Also, ask the shop personnel before cutting any unusual material.
60. Heavy sanding and grinding should only be done in well-ventilated areas.
61. Follow all appropriate precautions when working with solvents, paints, adhesives or other chemicals. Use appropriate protective equipment.
62. Used rags, especially oily and greasy ones, must be kept in a covered, marked container. Rags must be a safe distance from the welder and other sources of ignition. Always store oily rags in an approved metal container.
63. No welding, cutting or brazing or work that produces noxious vapors may occur in the shop unless it has ventilation designed for this.
64. Handle fiberglass with care. Its particles can irritate the skin, eyes and respiratory system.
65. Know what you are soldering with. Lead solder is toxic and must be collected as hazardous waste.
66. Dispose of solvents, cleaners, chemicals and other hazardous materials of any kind in the proper containers.

### Accidents

67. All accidents must be reported to the supervisor immediately. Complete an accident form.
68. Do not attempt to remove foreign objects from the eye or body. If chemicals get in the eye(s), wash eye(s) for 15 minutes in an open flow of water before getting medical treatment.
69. Know the emergency numbers! Call University Police for medical or other emergencies from a campus phone 333 or cell phone 631-632-3333.
70. Shop fires can be any one or a combination of three fire classes: Class A, ordinary combustibles; Class B, combustible liquids; and Class C, fires in live electrical equipment. Class D fires are flammable solids (e.g., magnesium). ABC Class extinguisher is located in close proximity to the shop. Everyone should be familiar with its location and know how to use it in case of emergency. For fire safety training, please contact the fire marshals at 631-632-9678.

# Machine Shop Safety Rules

## ***Machine Shop Safety Agreement***

***I have read, understood, and agree to abide by the above Machine Shop Safety Rules. I accept responsibility for following good safety practices when working in the Machine Shop and for reporting any unsafe conditions therein.***

I have:

- Successfully completed the EH&S Machine Shop Safety Course EOS 029,

I understand that my next steps are

- To have shop policies and procedures explained to me
- To receive demonstrations on all the major machines
- Being instructed to ask for help on any machine with which I am not familiar. I will not operate any machine without such instruction
- Wearing eye protection when working on or near any machine creating eye hazard.

Date: \_\_\_\_\_

SBU ID: \_\_\_\_\_

Print Name: \_\_\_\_\_

Signed: \_\_\_\_\_

Shop Safety Instructor: \_\_\_\_\_

A signed copy of this agreement must be kept in each shop.