SUFFOLK COUNTY COMMUNITY COLLEGE

SAFETY RULES OF THE MANUFACTURING MACHINE SHOP

The purpose of this document is to provide safety rules and guide lines to be followed by those who use the shop facilities in the Workforce Development Technology Center.

Machine shops are by nature hazardous environments, the potential for personal injuries are numerous. It is not possible to detail all the risks involved with shop work but it is possible to foresee many hazards by careful planning. To prevent accidents utilize your knowledge, training, and common sense. Evaluate potential sources of injury, and attempt to eliminate any and all hazards.

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Class Policy:

- Classroom disruption will not be tolerated
- No cell phones or IPods are to be used during class time.
- All food and drink are prohibited in machine shop.
- Report any unsafe conditions to your supervisor immediately.
- If you break a piece of tooling, discover broken tooling or machinery that is not operating correctly; notify the instructor immediately.
- Machine use will be initialed and dated on machine report attached to each machine. Any violators will forfeit their ability to use machines.
- It is the responsibility of all shop users to follow the class procedures at all times and monitor the actions of others also working in the shop.
- It is expected that all students will:
    - ✓ Practice personal academic integrity
    - ✓ Respect the dignity of all persons
    - ✓ Respect the rights and property of other's opinions
    - ✓ Demonstrate concern for others, their feelings, and their needs for conditions which support their work and development .

Machine Shop Usage:

In order to perform any work in the WDTC Lab one must:

1. Read this safety manual.
2. Sign the accompanying Student Safety Agreement.
3. Return the Student Safety Agreement to the class instructor.
4. Demonstrate competency on the machinery or tools that are to be used.
5. Comply with all College safety guidelines and policies.
6. A machine usage log will be kept, and all users need to sign in and out.

General Safety Rules- The hazards associated with working in a shop require special safety considerations. Working safely is the first thing the student should learn because the safe way is the correct way.

- Know the hazards associated with your work. Be sure you are fully educated on the proper use and operation of any tool or machine before beginning a job. If you are not sure what you are doing, "ASK".
- Do not set up or operate any tool or machinery unless an instructor is in the shop.
- Always wear personal protective equipment (PPE), including glasses or face protection.
- Do not work in the shop if tired, taking medication, ~~or~~ in a hurry, or otherwise impaired in any way.~~.~~
- Always store oily rags in an approved container
- Never use damaged or malfunctioning equipment.
- Check the condition of power cords and plugs on portable tools before using them. Do not use a tool that has a worn or damaged power cord or plug.
- A brush, hook, or special tool is preferred for removal of chips, shavings, etc. from the work area. Never use your hands.
- If you cannot do a job safely in this shop, don't do it.
- Do not walk behind a person operating a machine; you may bump him/her by accident or startle them and cause an accident.
- Follow all appropriate precautions when working with solvents, paints, adhesives or other chemicals. Use appropriate protective equipment.
- If you have not worked with a particular material before, check the materials safety data sheet (M.S.D.S) for any specific precautions to be taken while working with the material. Also, ask the instructor before cutting any unusual material.
- Avoid excessive use of compressed air to blow dirt or chips from machinery to avoid scattering chips.

- Never use compressed air guns to clean clothing, hair, or aim at another person.
- Clean up after yourself before you leave the shop, each day all tools must be returned to the toolbox, the machines cleaned and wiped down and the floor swept. Leave 10-15 minutes for cleanup.
- Anyone behaving in an unsafe manner will be asked to leave the lab. Any safety violation or abuse of equipment may be a cause for immediate dismissal from class.
- No horseplay or loitering allowed in the shop.

Appropriate dress: All students and instructors must adhere to appropriate dress while in the lab environment. This includes work boots, jacket, eyewear, and any other safety items deemed necessary for class training.

- Appropriate dress for lab: tight-weaved cotton shirts, good fitting jeans and hard soled work boots.
- No tennis shoes or athletic attire is permitted,
- Safety glasses must be worn in all areas of the shop when machines or tools are in use.
- Do not wear the following when working around machinery:
    - Loose fitting clothing
    - Neckties
    - Jewelry
    - Long loose hair

General Machine Safety: A person learning to operate machine tools must first learn the safety regulations and precautions for each tool or machine. Most accidents are caused by not following prescribed procedures.

- Obtain the instructor's permission before operating any machinery.
- No student is permitted to work alone in the machine shop.
- Do not use any tools or equipment without proper safety and use instruction.
- Machines must be shut off when cleaning, repairing, or oiling.
- All machines must be operated with all required guards and shields in place.
- Keep fingers clear of the point of operation of machines by using special tools or devices, such as, push sticks, hooks, pliers, etc.
- Never use a rag near moving machinery.
- Keep the floor around machines clean, dry, and free from trip hazards. Do not allow chips to accumulate.
- All equipment must be locked out prior to any repairs or maintenance. Never attempt to open the switch or operate any equipment that is under repair.
- Lockouts may only be removed by authorized personnel.
- Never tie down, block out or otherwise make inoperative any type of safety device, attachment, or guard.
- Securely clamp down all work pieces, this will prevent work from being lifted up or spun around.
- Use all guards that are available and be wary of points of contact with rotating cutters and chucks.
- Do not leave machines running unattended!

Before using a machine, think about what you are going to do before doing it. Go over the following safety checklist before operating a machine:

- Am I familiar with the operation of this machine and able to operate it in a safe and competent manner?
- What are the potential hazards involved with using this machine?
- Are all safety guards in place?
- Are my procedures safe?
- Am I doing something that I probably should not do?
- Have I made all the proper adjustments and tightened all locking mechanisms?
- Is the work piece secured properly?
- Do I have proper safety equipment?
- Do I know how to turn off the machine quickly if necessary?

Housekeeping: It is everyone's responsibility to ensure that we have a safe facility to work in.

- Practice cleanliness and orderliness in the shop areas.
- Aisles should be clear at all times to avoid tripping or other accidents.
- Keep floors free of oil, grease, or any other type of liquid, as well as any items that may obstruct movement or result in accidents, such as falls. Clean up spilled liquids immediately; they are slipping hazards.
- Keep the floor clear of metal chips and scrap pieces. Put them in the containers provided for them.
- Place all scrap pieces in the containers.
- Put tools away when not in use.
- Tools must be returned to the proper location or the instructor.
- No job is to be left set-up in machines.

General Hand Tool Safety- All tools are dangerous if used improperly or carelessly. Even though hand tool injuries tend to be less severe than power tool injuries, hand tool injuries are more common. Because people take everyday hand tools for granted, they forget to follow simple precautions for safety.

The most common hand tool accidents are caused by the following:

- Failure to use the right tool
- Failure to use a tool correctly
- Failure to keep edged tools sharp
- Failure to replace or repair a defective tool
- Failure to store tools safely

Use the right tool to complete a job safely, quickly, and efficiently. Follow these guidelines for general hand tool safety:

- Always wear safety glasses
- Do not use a screwdriver as a chisel.
- Do not use a chisel as a screwdriver.
- Do not use a knife as a screwdriver.
- Replace loose, splintered, or cracked handles.
- Use the proper wrench to tighten or loosen nuts.
- Do not use impact tools, such as chisels, wedges, or drift pins, if their heads are mushroom shaped.
- Always carry pointed tools by your side with the points and heavy ends down.
- Secure all small work & short work with a vise or clamp.
- After using a tool — clean it and return it to its proper storage place.
- Never place tools & materials where they hang on the edge of a bench.
- Cut away from yourself when you use chisels and other edged tools.

General Power Tool Safety- Common accidents associated with power tools include abrasions, cuts, lacerations, amputations, burns, electrocution, and broken bones. These accidents are often caused by:

- Touching the cutting, drilling, or grinding components
- Getting caught in moving parts
- Suffering electrical shock due to improper grounding, equipment defects, or operator misuse
- Being struck by particles that normally eject during operation
- Touching hot tools or work pieces
- Falling in the work area
- Being struck by falling tools

In additional to general shop safety guidelines, follow these guidelines for working with power tools:

- Use the correct tool for the job. Do not use a tool or attachment for something it was not designed to do.
- Select the correct bit, blade, cutter, or grinder wheel for the material at hand. This precaution will reduce the chance for an accident and improve the quality of your work.
- Keep all guards in place. Cover exposed belts, pulleys, gears, and shafts that could cause injury.
- Always operate tools at the correct speed for the job at hand. Working too slowly can cause an accident just as easily as working too fast.
- Watch your work when operating power tools. Stop working if something distracts you.
- Do not rely on strength to perform an operation. The correct tool, blade, and method should not require excessive strength. If undue force is necessary, you may be using the wrong tool or have a dull blade.
- Before clearing jams or blockages on power tools, disconnect from power source. Do not use your hand to clear jams or blockages, use an appropriate tool.
- Never reach over equipment while it is running.

- Never disable or tamper with safety releases or other automatic switches.
- When the chance for operator injury is great, use a push stick to move material through a machine.
- Keep a firm grip on portable power tools. These tools tend to "get away" from operators and can be difficult to control.
- Remove chuck keys or adjusting tools prior to operation.
- Keep bystanders away from moving machinery.
- When possible, secure work pieces with a clamp or vise to free the hands and minimize the chance of injury. Use a jig for pieces that are unstable or do not lie flat.
- Inspect wiring and mechanisms before operating.

Vertical Band Saw Safety Rules – In additional to general shop safety guidelines, follow these guidelines for working with the Vertical Band Saw:

- The upper guide and guard should be set within ¼ of an inch or as close to the work as possible.
- If the blade breaks, immediately shut off the power and stand clear until the machine has come to a complete stop.
- Examine the blade for excessive wear or cracks. If blade is cracked or has excessive wear notify the instructor immediately.
- Use the proper pitch blade for the thickness of the material to be cut.
- If the saw stalls in the work piece, turn the power and call the instructor.
- Stand to one side of the saw when doing a power on test of the blades tracking in case the blade breaks or comes off the wheel.
- The blade alignment tracking should be at the center of the wheels.
- Make sure that the upper and lower wheel guard doors are closed when running.
- Always keep your fingers and hands away from the path of the blade.
- Cut at a moderate feed rate into the blade. Do not force a cut.
- Cut relief cuts prior to cutting long or tight curves. The relief cuts will free the blade of the tension of the tight curve
- If you need to back out of a cut, shut the machine off, after blade stops, and then back out.
- Always disconnect the power before changing the blade or performing any other maintenance operation.

Horizontal Band Saw- In additional to the general shop safety guidelines, follow these guidelines for working with the Horizontal Band Saw:-

Pre-operational safety checks

- Ensure no slip/trip hazards are present in workspaces and walkways.
- Check that all guards are in position.
- Ensure hydraulic damping mechanism functions.
- Check that the blade is in good condition.
- Ensure that blade speed, blade tension and blade tracking are properly adjusted.
- Check coolant delivery system to allow for sufficient flow of coolant.
- Locate and ensure you are familiar with the operation of the ON/OFF starter and E-Stop (if fitted).
- Faulty equipment must not be used. Immediately report suspect machinery.

Operational safety checks-

- Lift the head of unit up and lock it in the upward position.
- Set the angle of the vice, or check it to ensure its squareness.
- Clamp work piece firmly into the vice. Long material must be supported.
- Adjust blade guards to cover unused portion of blade.
- Ensure hands are away from the blade, and then turn the machine on.
- Allow the upper head assembly to come down slowly until the teeth are cutting the material.
- Keep hands away from the point of operation during cutting.
- Turn off the machine and bring it to a complete standstill if the blade is to be lifted out of an uncompleted or jammed cut.
- Stop the machine and bring it to a complete standstill before removing scrap pieces from the vice area or making adjustments.

- Ensure the cutting head is locked in the upward position before removing work piece from vice.

Housekeeping

- Switch off the saw and reset all guards to a fully closed position.
- Leave the machine in a safe, clean and tidy state.

Forbidden

- Pushing down on the cutting head while it is cutting
- Leaving the machine running unattended

Drill Press Safety- In additional to general shop safety guidelines, follow these guidelines for working with the drill press :-

1. Run drill at correct RPM for diameter of drill bit and material. Ask the instructor for the correct RPM if not listed in your information book.
2. Always hold work in vise or clamp it to the drill table.
3. Use a correct drill bit for the material being drilled. The instructor will help you select the correct drill configuration.
4. Use the proper cutting fluid for the material being drilled. Ask the instructor about the appropriate cutting fluid for the material you are machining.
5. Remove chips with a brush. Never by hand or with a rag.
6. Ease up on the drilling pressure as the drill starts to break through the backside of the material.
7. Inspect the drill before using it. Do not use a dull or cracked drill..
8. Do not drill with excessive pressure.
9. Never place a taper shank tool, such as large diameter drill or tapered shank reamers in drill chuck. Only straight shank tool such as standard drills can be clamped in a drill chuck.
10. Always clean the drill shank and/or drill sleeve, and spindle bore before mounting.
11. Never try to loosen the drill chuck while the power is on.
12. Lower the drill spindle close to the table when releasing the drill chuck or taper shank drill to reduce the risk of damage to the drill and/or machine in the event of a fall
13. Never clean the machine while in motion!
14. If the drill binds in a hole, stop the machine and turn the spindle backwards by hand to release the drill bit from the material.
15. When drilling a deep hole, withdraw the drill bit quite frequent to clear out the chips. If the chip sticks to the drill bit use a small brush to remove it.
16. Always remove the drill chuck key or the drill drift from the spindle immediately after using.
17. Wear safety eye protection while drilling.

18. Let the spindle stop of its own accord after turning the power off. Never try to stop the spindle with your hands.

Lathe Safety- Lathes require special safety precautions while being used, which are in addition to those safety rules covered earlier for general shop safety, hand tool, and machine safety. When working with the lathe follow these additional guidelines:-

1. Make sure that the chuck or faceplate is securely tightened onto the lathe spindle.
2. Move the tool bit a safe distance from the collet or chuck when inserting or removing work.
3. Don't run the machine faster than the proper cutting speed.
4. In setting up the tool post holder, place it to the left side of the compound slide to prevent the compound slide from running into the chuck or spindle attachments.
5. Always clamp the tool bit as short as possible in the tool holder to prevent it from breaking or vibrating.
6. Always make sure that the tool bit is sharp and has the proper clearance angles. Ask for assistance in making the proper adjustment.
7. If any filing is done on work revolving in the lathe, file left handed to prevent slipping into the chuck and never use a file without a handle.
8. If work is being turned between centers, make sure that the proper adjustments are made and that the tailstock is locked in place.
9. Do not grasp or touch chips with your fingers, but get rid of them using a blunt instrument. It is safer to turn off the lathe before clearing chips than to leave it running.
10. Set the tool bit to the proper centerline height to prevent work from climbing over the tool bit or cutting above the centerline which causes drag between the tool bit and the material.
11. Do NOT cut work completely through when turning between centers.
12. Remove chuck key from chuck immediately after using.
13. Turn chuck or face plate through by hand before turning the power on, to make sure that there is no binding or clearance issues.
14. Always stop the machine before taking measurements.
15. Before cleaning the lathe, remove tools from the tool post and tailstock.

Milling Machine Safety- Mills require special safety precautions while being used, in addition to those safety rules covered earlier for general shop safety, hand tool, and machine safety. When working with the mill follow these additional guidelines:-

1. Work must be clamped securely in a vise and the vise clamped firmly to the table.
2. Never use a rag to clean the machine or part, when it is in motion!
3. Make sure cutter is rotating in the proper direction before cutting the material. Normally this is a clockwise direction when looking from above.
4. Before running a machine, the spindle should be rotated by hand to make that there are no clearance issues.
5. Make sure the power is off before changing cutters.
6. Always use the proper cutting fluid for the material being cut.
7. Never run the machine faster that the correct cutting speed.
8. Make sure that the machine is fully stopped before taking any measurements.
9. Always use cutters which are sharp and in good condition.
10. Don't place anything on the milling machine table such as wrenches, hammers, or other tools when in operation.
11. Always stay at the machine while it's running.
12. Do NOT make heavy cuts or use the rapid feed when milling. Always refer to speed and feed tables.
13. Remove the Collet tightening wrench immediately after each use.
14. Use the milling machine spindle brake to stop the spindle after the power has been turned off.
15. Before cleaning the mill, remove cutting tools from spindle to avoid cutting yourself.

CNC Mill Safety - While Computer Numerical Control (CNC) technology is generally much safer than traditional manufacturing and production technology, it is still very important that workers know and follow all safety precautions. Machines used for CNC milling are very sensitive, sophisticated and expensive pieces of equipment.

All milling machines contain hazards from rotating, belts and pulleys, high voltage electricity, noise, and compressed air. When using CNC machines and their components, basic safety precautions must always be followed to reduce the risk of personal injury and mechanical damage.

Along with all other safety guidelines listed previously:

- Only authorized personnel should work on the CNC. Untrained personnel present a hazard to themselves and the machine.
- Check for damaged parts and tools before operating the machine. Any part or tool that is damaged should be properly repaired or replaced by authorized personnel. Do not operate the machine if any component does not appear to be functioning correctly. Contact your instructor.
- Use appropriate eye and ear protection while operating the machine. ANSI approved impact safety goggles and OSHA-approved ear protection are recommended to reduce the risks of sight damage and hearing loss.
- Do not operate the machine unless the doors are closed and the door interlocks are functioning properly. Rotating cutting tools can cause severe injury. When a program is running, the mill table and spindle head can move rapidly at any time in any direction.
- The Emergency Stop button is the large, circular red switch located on the Control Panel. Pressing the Emergency Stop button will instantly stop all motion of the machine, the servo motors, the tool changer, and the coolant pump. Use the Emergency Stop button only in emergencies to avoid crashing the machine.
- The CNC is automatically controlled and may start at any time.
- Never place your hand on the tool in the spindle and press ATC FWD, ATC REV, NEXT TOOL, or cause a tool change cycle. The tool changer will move in and crush your hand.
- To avoid tool changer damage, ensure that tools are properly aligned with the spindle drive lugs

- Improperly clamped parts machined at high speeds/feeds may be ejected and puncture the safety door. Machining oversized or marginally clamped parts is not safe.
- Windows must be replaced if damaged or severely scratched - Replace damaged windows immediately.
- Do not process toxic or flammable material. Deadly fumes can be present. Consult material manufacturer for safe handling of material by-products before processing.
- The spindle head can drop without notice. Personnel must avoid the area directly under the spindle head.

CNC Lathe Safety- All turning machines contain hazards from rotating parts, belts and pulleys, high voltage electricity, noise, and compressed air . When using CNC machines and their components, basic safety pre cautions must always be followed to reduce the risk of personal injury and mechanical damage.

Along with previously discussed safety practices:

- Do not operate with the door open.
- Do not operate without proper training, and permission from the instructor.
- Always wear safety goggles.
- The machine is automatically controlled and may start at any time, be alert.
- Improperly or inadequately clamped parts may be ejected with deadly force.
- Do not exceed rated chuck rpm.
- Higher rpm reduces chuck clamping force.
- Unsupported bar stock must not extend past draw tube end.
- Chucks must be greased weekly and regularly serviced.
- Chuck jaws must not protrude beyond the diameter of the chuck.
- Do not machine parts larger than the chuck.
- Follow all of the warnings of the chuck manufacturer regarding the chuck and work holding procedures.
- Hydraulic pressure must be set correctly to securely hold the work piece without distortion.
- Never service the machine with the power connected.
- Improperly clamped parts at high velocity may puncture the safety door. Reduced rpm is required to protect the operator when performing dangerous operations (e.g. turning oversized or marginally clamped parts). Turning oversized or marginally clamped parts is not safe.
- Windows must be replaced if damaged or severely scratched - Replace damaged windows immediately.

- Do not process toxic or flammable material. Deadly fumes can be present. Consult material manufacturer for safe handling of material by-products before processing.
- Normal operation - Keep the door closed and guards in place, while machine is operating.
- Part loading and unloading – An operator opens the door or guard, completes task, closes door or guard before pressing cycle start (starting automatic motion).
- Tool loading or unloading – A machinist enters the machining area to load or unload tools. Exit the area completely before automatic movement is commanded (for example, next tool, ATC/Turret FWD/REV).
- Machining job set-up – Press emergency stop before adding or removing machine fixtures.
- Maintenance / Machine Cleaner– Press emergency stop or power off the machine before entering enclosure.

CNC Mill/Lathe Checklist

Pre-start- No one should attempt to operate any power equipment unless they are familiar with its operation and they have authorization to do so.

- ☐ Check coolant level.
- ☐ Check way-lube lubrication tank level.
- ☐ Clean chips from way covers and bottom pan.
- ☐ Clean chips from tool changer.
- ☐ Wipe spindle taper with a clean cloth rag and apply light oil.
- ☐ Clean off the window of the door and the light.
- ☐ Check that the work area is clear.

Start/Run- Never tamper with a machine safety guard.

- ☐ Power up machine
- ☐ Home machine
- ☐ Check Messages for alerts

Shutdown- Always leave the machine, tools, and equipment in the same or better condition than when you found them.

- ☐ Send machine axes to proper shut down locations

(On Mills, X axis should be in the center of travel, Y and Z axes at home.)
(On Lathes, X and Z should be at home position.)

- ☐ Wipe spindle with a soft clean rag to remove coolant and prevent rusting
- ☐ Clean machine
- ☐ Power off
- ☐ Clean up work area
- ☐ Put all tools away
- ☐ Dump chips bin

It is important to clean the machine after each use to prevent corrosion, promote a safe work environment, and as a professional courtesy to others. Allow at least 15-30 minutes at the end of each day for cleaning. At the very least, put away all tools and tooling, wash down the machine with coolant, remove standing coolant from the table, and run the chip conveyor.

Welding Safety Rules-

- Shop staff approval is required before using any welding equipment.
- Welders, assistants, and anyone else in the welding area must wear proper glasses or shields of recommended shades during welding operations. Proper face shielding prevents burns to the retina of the eyes that may cause blindness.
- Welders are prohibited to wear any contact lens. Lens can be fused to the cornea of the eyes, which may also cause blindness.
- A screen shall be erected around the welding area to protect other personnel in the shop from injury or accident.
- Always inspect all welding equipment to be used, for any possible damage. Report any damage to your supervisor immediately.
- Avoid handling oxygen bottles with greasy hands, gloves, or rags.
- Always strap tanks to a welding cart or a fixed object. Never allow a gas cylinder to be freestanding.
- Replace the safety cap on all cylinders when not in use.
- When arc-welding, make sure the work and/or worktable is properly grounded.
- Do not arc, mig, or tig weld in a wet area.
- Be alert to all possible fire hazards. Move the object to be welded to a safe location or remove all flammable materials from the work area.
- Never weld in the same area where degreasing or other cleaning operations are being performed.
- Keep suitable fire extinguishing equipment nearby and know how to operate it.
- Shut off the cylinder valves when the job is completed, release pressure from the regulators by opening the torch valves momentarily and then by back out regulator adjusting valves. Never leave the torch unattended with the pressure in the hoses.
- Utilize all protective equipment and clothing.

Angle Grinder- Portable grinders are one of the most potentially dangerous tools on any work site. The majority of injuries associated with portable grinder use are foreign bodies to the eyes and lacerations to the body.

Safe Grinder Operations- Along with previously discussed safety practices:

- Wear the correct personal protective equipment.
- Allow the grinder to "run up to speed" before applying it to the work surface.
- Hold the grinder with two hands applying minimum pressure against the work surface.
- Apply the correct face of the abrasive wheel to the work surface.
- To prevent kickback don't bump the grinder onto the work surface or let the abrasive wheel contact adjacent surfaces while grinding.
- Adopt a comfortable stance with feet apart, well balanced and with a clear view of the work surface.
- Stop the grinder at regular intervals to rest your arms.
- Do not lay the grinder down while the abrasive wheel is still rotating.
- Replace abrasive wheels made to small by use. (Never wear an abrasive wheel to its backing flange/plate.)
- Install new abrasive wheels in accordance with the manufacturer's instructions.
- Unplug the power cord before changing abrasive wheels.
- Position the power cord in a manner that prevents damage to the hose from the grinding operation and prevents tripping hazards.
- Make sure that the surface to be ground is secure and will not move as the result of he rotation of the grinding wheel.
- Guards- Never remove guards, they are there for your safety.

A grinder safety checklist-

- Is the grinder outer body free of visible defects, missing parts or damage?
- Is the power cord/plug or air hose free of visible damage?
- Are guards and handles in place and secure?
- Does the guard cover a minimum of 50 percent of the abrasive wheel circumference between the wheel and the user?
- Is the grinder equipped with a functioning automatic cut off or "dead man" switch?
- Is the abrasive wheel rated for the maximum possible speed (RPM) of the grinder?
- Is the abrasive wheel free of visible damage?
- Does the abrasive wheel fit snuggly around the grinder spindle?
- Is the abrasive wheel attached to the grinder spindle with the correct flanges, backing plate and locking nut?

Links

The OSHA guidelines for industrial machine safety and machine guarding can be found at the following link.

http://search.usa.gov/search?affiliate=usdoloshapublicwebsite&query=machinery+safety

Lincoln Welding Safety.

http://www.lincolnelectric.com/en-us/education-center/welding-safety/Pages/welding-safety.aspx

Lincoln interactive safety.

http://www.lincolnelectric.com/en-us/education-center/welding-safety/Pages/welding-safety-interactive-guide.aspx

References:

http://safety.ag.utk.edu/safetyplan/17shopweb/17shopsafety.htm#17.2General Shop Safety

http://www.ehs.harvard.edu/programs/machine-shop-safety

http://ehs.berkeley.edu/images/ehs/healthsafety/shopsafetysafeworkhndout.pdf

The University of Notre Dame's Engineering Machine Shop Student, Faculty, and Staff Machine Shop Safety Manual

http://www3.nd.edu/~hessmach/index_files/Engineering%20Machine%20Shop%20Safety%20Manual.pdf

http://hseinsider.com/Search%20Index/files/Toolbox%20Talk%20-%20Angle%20Grinders.pdf

Oklahoma State Machines Shop Guidelines

Machine Shop Safety Policy, Wyss Institute

South Dakota State University Shop Safety Manual

UCSB College of Engineering Machine Shop Safety Handout

New York City College of Technology Student Machine Workshop Safety-

http://www.citytech.cuny.edu/adminfinance/ehs/docs/StuMachineWorkshopSafetyPolicy.pdf

STUDENT SAFETY AGREEMENT & ASSUMPTION OF RISK

THIS IS A RELEASE OF LEGAL RIGHTS - READ AND UNDERSTAND BEFORE SIGNING

Student Name: _____ *Student I.D.:* _____

By signing below, I hereby agree as follows:

1. **Receipt of "Machine Shop Safety Rules."** I have received and reviewed a copy of the *Manufacturing Machine Shop Safety Rules* ("*Machine Shop Safety Rules*") relevant to my participation in the Manufacturing Program ("the Program") at Suffolk County Community College ("the College"). I fully understand, and will comply at all times with the information set out in the "*Machine Shop Safety Rules*", as well as directions provided by instructors. If I violate any of the "*Machine Shop Safety Rules*," I understand and accept that I will be subject to disciplinary action, including, but not limited to, the loss of my shop privileges.
2. **Risks of Participation.** I understand and accept that use of machine tools is inherently dangerous and that my participation in the Program is undertaken at my own risk, which includes, but is not limited to, the possibility of injuries, deaths, losses, claims or other matters resultant from, while participating in, or related to, the performance of activities, duties or undertakings relevant to the Program. I acknowledge that all risks cannot be prevented. I have made my own investigation into, and am willing to accept, these risks.
3. **Institutional Arrangements.** I understand that the College does not represent, or act as an agent for, and cannot control the acts or omissions of, any service provider or other person/entity affiliated with the Program. I understand that the College is not responsible for any matters that are beyond its control and I assume those risks. I hereby release the College from any injury, loss, damage, accident, delay or expense arising out of any such matters.
4. **Health and Safety.** There are no health-related reasons or problems that preclude or restrict my participation in this Program.
5. **Assumption of Risk and Release of Claims.** Knowing the risks, and in consideration of being permitted to participate in the Program, I agree, on behalf of myself, my heir(s), my executor(s), assignee(s) and personal representative(s), to assume all the risks and responsibilities surrounding my participation in the Program. To the maximum extent permitted by law, I release and indemnify the County of Suffolk and the College, its officers, employees and agents, from and against any present or future claim, loss or liability for injury to person or property which I may suffer, or for which I may be liable to any other person, during my participation in the Program.

I have carefully read this Release Form before signing it. No representations, statements, or inducements, oral or written, apart from the foregoing written statement, have been made. This agreement shall become effective only upon execution and shall be governed by the laws of the State of New York, which shall be the forum for any lawsuits filed under or incident to this agreement or to the Program.

X _____ _____

Signature of Student *Date*

Safety is the responsibility of everyone involved ... from project conception to project completion.