Two General Safety Rule for CNC Machines

− Never operate a CNC machine without proper training or consulting the specific operator’s manual for that particular machine and control type.

− Never attempt to program a CNC machine without proper training or consulting the specific programmer’s manual for that particular machine and control type.

CNC machine safety system
The built-in safety system on a CNC machine includes guards and protective devices which should be securely fitted and always kept in position while the machine is being used. It may include:

Emergency Stop Button
Used to shut down the machine immediately. It is located on the control panel and at other points on the machine, for example the hand held unit.

Soundproof Casing
Reduces noise emission generated by the operating section and protects the operator from the risk of flying objects or tool fragments.

Curtain Guards
Made of PVC and designed to protect the operator from the risk of airborne chips or tool fragments.

Guard Fence
The fence marks the working area in which the machine moves. It protects the operator from the risk of interference with moving parts. The guard may be of an open type or made of mesh.

Contact Mats
When the operator stands on the mat, the machine stops immediately, protecting the operator from moving parts of the machine.

Below are some general personal safety rules that you can use as a guide only. You might like to add any other rules that apply to you.

DO:

• Always wear safety glasses and hearing protection when operating CNC machines.

• Always wear safety glasses when closely observing cutting tools.

• Always wear safety boots or other suitable footwear.

• Always keep long hair covered when operating CNC machines.

• Always keep hands clear of moving parts during machining operations.

• Always stand clear of the machine while it is running and warn others of the dangers of being too close.

• Always avoid contact with cutting edges when handling tools or changing tools by hand.
- Always turn the CNC machine off completely and clean it up when you have finished using it.

**DON'T:**
- Never wear gloves.
- Never wear loose clothing or jewellery.
- Never reach into a CNC machine while it is running.
- Never place hands near a revolving spindle.
- Never leave the machine so that someone else is able to start it by pressing the cycle start button.

Below are some general tooling safety rules that you can use as a starting guide. You might like to add any other rules that apply to you.

**DO:**
- Always check that the machine is not operating when loading a tool magazine.
- Always check that tools are in good condition, for example, sharp and free of cracks.
- Always check that tools are set correctly.
- Always check that the correct tool data is entered into the CNC program.
- Always test tools before use.
- Always check that the seating surfaces are clean before installing tools.
- Always check that spindle direction is correct for right-hand or left-hand operation.
- Only use tools within the limits specified by the manufacturer.
- Only tighten tools to recommended torque values.

**DON'T:**
- Never use blunt tools.
- Never use cracked or chipped tools.
- Never use tools with damaged tungsten tips.

Below are some general machine safety rules that you can use as a guide only. You might like to add any other rules that apply to you.

**DO:**
- Always keep the area around the machine clear of obstacles.
- Always stack material where you can reach it but where it is clear of the moving parts of the machine.
• Always check that tools are sharp and set correctly.
• Always check that the correct tool data is entered into the CNC program.
• Always make sure that all guards are in position while the machine is in operation.
• Always make sure that all work and fixtures are clamped securely before starting machine.
• Always make sure spindle direction is correct for right-hand or left-hand operation.
• Always conduct a dry run to ensure the program is correct.
• Always follow company policy on correct procedures when handling or lifting parts or tooling.

DON’T:
• Do not use the machine table as a workbench.
• Do not use compressed air to blow chips from the parts of the machine, machine surfaces, cabinets, controls or floor around the machine.

Carrying Methods for Safety
1. Never twist your body – Change direction by moving your feet.
2. Always have clear vision – Shouldn't trip over or bump into anything.
3. Slide the load – It's a lot easier than lifting.
4. To place the load on the bench – put it on the edge and slide it forward.

Personnal Protective Equipmt (PPE)

Before entering a machine shop you must wear personal protective equipment at all times. These should include:

Eye protection

It is necessary to wear safety glasses, goggles or face shields at all times in areas where small flying fragments or dust can be encountered when working in the machine shop.

Hearing protection

Hearing protection must be worn at all times. The type of hearing protection chosen will depend on:

• personal choice by the operator for comfort and fit
• noise reduction required (ear muffs will give better noise reduction than ear plugs).

Footwear
Suitable footwear must be worn. A closed shoe with leather uppers or safety boots would be appropriate.

**Clothing**

It is important to remember that while you are working in the machine shop you should not be wearing loose clothing or jewellery, which may get caught in revolving cutters. The moving parts of a machine revolve at high speeds and if any loose clothing or jewellery is caught in the revolving cutters you will be dragged into the machine causing serious injury or death.

<table>
<thead>
<tr>
<th>Risk</th>
<th>Risk control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long hair</td>
<td>Keep long hair covered.</td>
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<tr>
<td></td>
<td>Tie hair back.</td>
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<tr>
<td></td>
<td>Wear a hair net.</td>
</tr>
<tr>
<td>Noise</td>
<td>Wear earmuffs.</td>
</tr>
<tr>
<td></td>
<td>Wear ear plugs.</td>
</tr>
<tr>
<td>Eyes</td>
<td>Wear safety glasses.</td>
</tr>
<tr>
<td></td>
<td>Wear safety shield.</td>
</tr>
<tr>
<td>Footwear</td>
<td>Wear closed shoe with non-skid sole.</td>
</tr>
<tr>
<td></td>
<td>Never dust yourself or a workmate down with an air hose. (Compressed air)</td>
</tr>
<tr>
<td>Dust</td>
<td>Wear dust mask.</td>
</tr>
<tr>
<td>Chemicals</td>
<td>Wear gloves or protective clothing.</td>
</tr>
<tr>
<td></td>
<td>Wear face mask.</td>
</tr>
<tr>
<td>Guards</td>
<td>Guards on machines must be used at all times.</td>
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</tbody>
</table>

**Hazards**

Here are the three steps involved in dealing with hazards:

**1. Spot the hazard**

A hazard is anything that could hurt you or someone else, is unsafe, or could cause an accident. Use all your senses to spot hazards – look around, listen, notice any strange smells (like smoke or chemicals) and use your knowledge about things that might be dangerous.
2. **Assess the risk**

Work out how likely is it that the hazard will hurt someone, and how badly they could be hurt. Always tell someone about hazards you can't fix yourself, and remember it is more urgent to make the changes if the hazard is likely to cause serious injury.

3. **Minimise the risk**

Fix the hazard yourself if you can, or tell someone who is able to fix it. The best way to fix the hazard is to get rid of it, but as this is not always possible there are some ways you can make the hazard less dangerous:

- Substitute it for a less hazardous material or item.
- Isolate it to an area where it’s more out of harm’s way, such as a locked room.
- Add safeguards – for example, put clear guards around cutting or slicing equipment or warning signs for people to see.
- Use personal protective equipment and clothing any time you are working with hazardous materials and/or equipment.

**HAZARD CONTROL**

**Hierarchy of Control**

How to control a hazard and minimise the risk of an injury.

<table>
<thead>
<tr>
<th>Example of hazard</th>
<th>What to do</th>
<th>How to do it</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical hazards</td>
<td>Eliminate</td>
<td>Install electric droppers instead of using extension cords.</td>
</tr>
<tr>
<td>Toxic chemicals</td>
<td>Substitute</td>
<td>Introduce less toxic materials (polishes, adhesives etc.).</td>
</tr>
<tr>
<td>Noise</td>
<td>Enclose</td>
<td>Install canopies to the noisiest machines.</td>
</tr>
<tr>
<td>Flying particles</td>
<td>Isolation</td>
<td>Set aside specific areas for grinding.</td>
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<tr>
<td>Machining dust</td>
<td>Engineer controls</td>
<td>Install and use dust extraction equipment.</td>
</tr>
<tr>
<td>Slip / trip hazards</td>
<td>Work practices</td>
<td>Adopt better housekeeping procedures.</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Administrate</td>
<td>Rotate job tasks amongst workers.</td>
</tr>
<tr>
<td>New equipment</td>
<td>Training</td>
<td>Staff development programs.</td>
</tr>
<tr>
<td>Dust / noise, etc</td>
<td>PPE</td>
<td>Use personal protective equipment.</td>
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