OVERVIEW

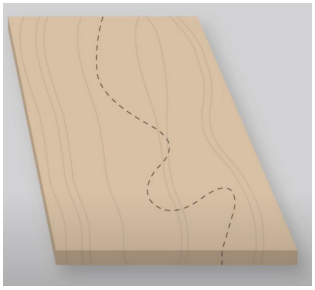
The section offers a comprehensive introduction to the band saw and its application within a woodworking setting. It covers essential aspects such as the capabilities of the band saw, its suitability for cutting specific materials like wood and Plexiglas, and the advantages it provides, such as uniform cutting and the ability to handle curved and irregular shapes.

The statement further delves into the key components of the band saw, including the table, guard assembly, guard band locking nut, and the blade itself. It also highlights the devices that assist in cutting, such as the miter gauge for specific angles and the rip fence for straight cuts. The importance of selecting the appropriate band saw for a project is emphasized, considering the width of the blade and the type of cut required. Additionally, the statement provides crucial tips for safe cutting practices, including considerations for kerf, the necessity of relief cuts, and the use of the V-block for round stock. A step-by-step guide to the cutting process is provided, along with reminders to turn off the machine in case of blade breakage or material entrapment. Overall, this comprehensive overview serves as a valuable resource for individuals working in a woodshop, equipping them with the necessary knowledge and guidelines to effectively and safely utilize the band saw.

What is a band saw?

- The band saw is a versatile tool used for cutting intricate curves, as well as thicker materials and irregular or curved shapes.
- It utilizes a continuous tooth, metal band blade that rotates on opposing wheels to cut through various materials.

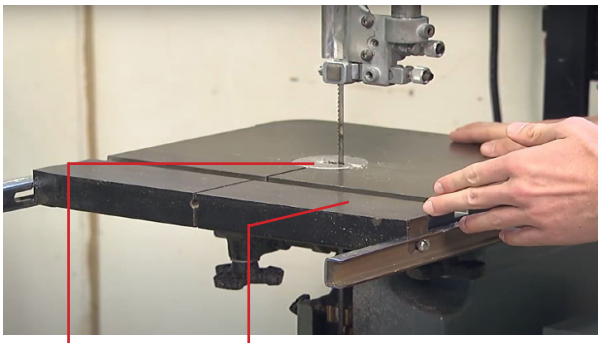
Materials:
The band saw is suitable for cutting wood and Plexiglas only.



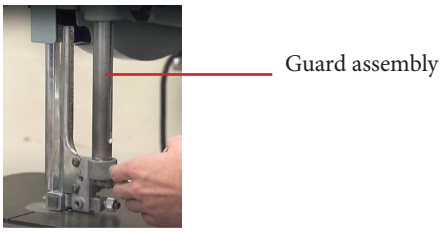
Advantages of using the band saw:
- Uniform cutting and the ability to cut irregular or curved shapes.
- Used for cutting only wood or Plexiglas.

Important parts of the band saw:

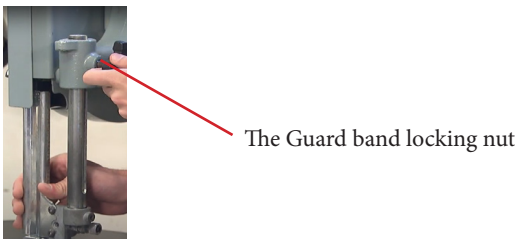
1. Table and Table insert
- It supports the material as the operator moves it through the blade to be cut.
- The table insert is a removable piece around the cutting blade that enables the removal of chips and pieces of wood that build up around the blade.



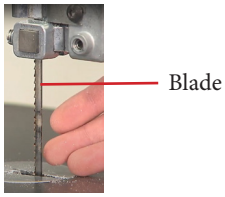
2. Guard assembly
- An adjustable safety component on the band blade that shields the unused portion of the blade from the operator while the machine is in use



3. The Guard band locking nut
- A locking mechanism used to secure the guards into place.



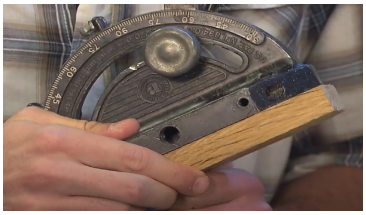
4. The Blade
- A continuous tooth metal band blade that rotates on opposing wheel and does the cutting.



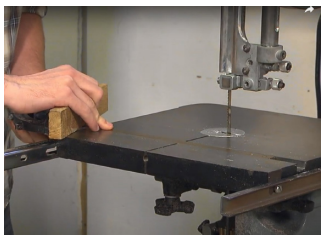
TOOLS THAT ASSIST YOU WHILE CUTTING

1. Miter gauge

- Meant to cut specific angles in stock by loosening the knob, rotating the gauge to the desired angle, and tightening it back up.



- It fits into the slot on the table band saw and holds your stock in place as you feed it through the blade.



2. A rip fence.

- A guard that runs from the front edge of the table to the back edge to allow you to perform straight cuts.

- To ensure safety, make sure you have the longer edge of your stock up against the rip fence. Putting the short end of the stock against the fence creates an unsafe situation.

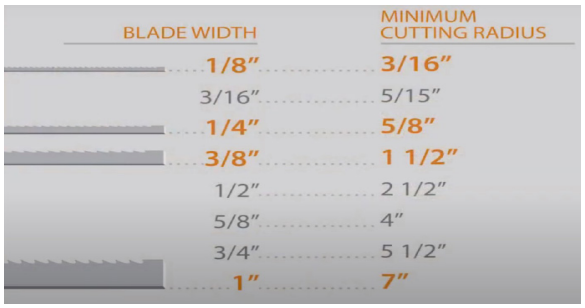
- The distance of the fence to the blade can be adjusted to suit your cut.

3. V – Block

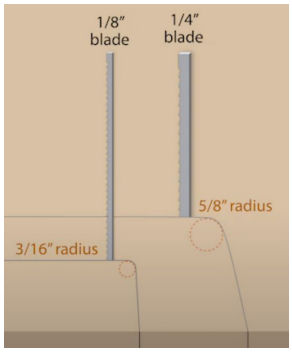
- It is used to support round stock when cutting.

CHOOSING THE RIGHT BAND SAW FOR YOUR PROJECT

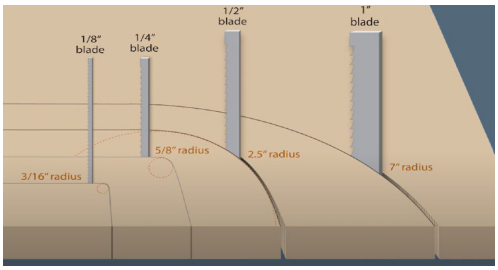
- CAP wood shop has 4 band saws with-different blade widths.



- For cutting small and complex curves, a blade that can bend and flex, such as a 1/8" blade or a 1/4" blade, is needed. Blades ranging from 3/16" to 5/8" can be used for cutting radius.



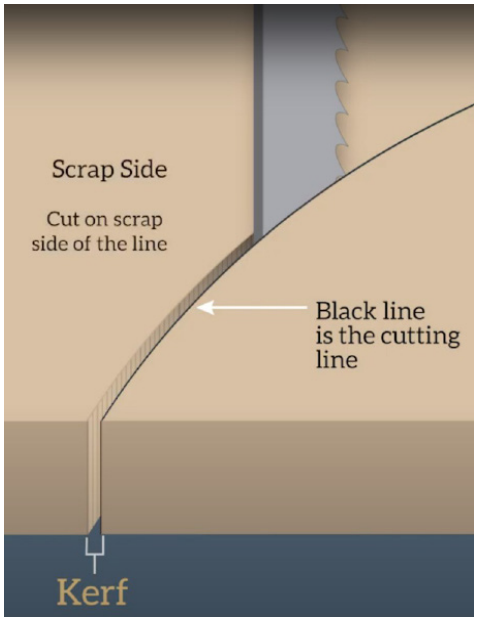
- For straight cuts or large arcs (7" radius cut), a wider blade such as 3/8" or 1" should be used.



FEW THINGS TO KEEP IN MIND WHEN CUTTING

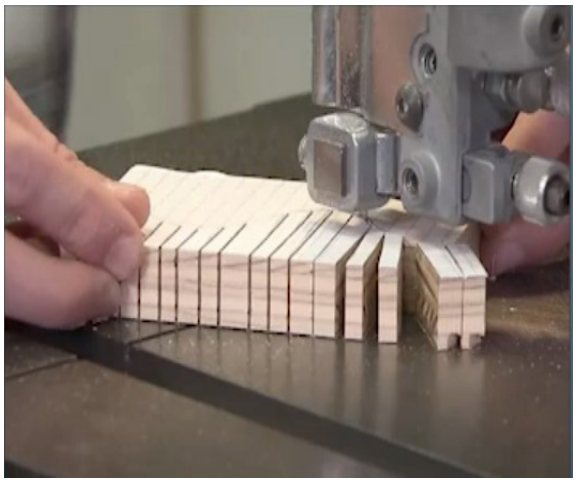
1. Kerf

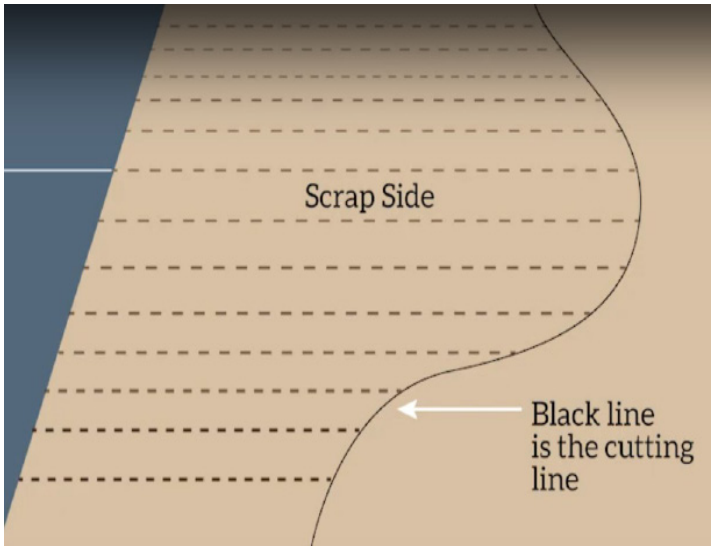
- Kerf is the space created by the width of the cutting blade after it has passed through the material.
- Cutting directly on the line will result in a smaller shape than desired.
- Cut on the outside or scrap side of the line to maintain the original size.
- Accurately following the edge of the line, especially curved lines, takes practice. Until you have mastered this skill, it is best to cut far away from the cut line on the scrap side to leave some extra material.
- Sanding may be required, but it is easier to gradually remove material than to start over.



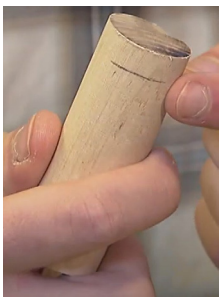
2. Relief cuts

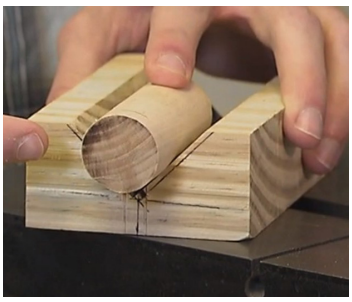
- When cutting anything other than a straight line, it is necessary to make relief cuts.
- Relief cuts are cuts on the scrap side of the material up to the edge of the cut line and then back out straight.
- This process is repeated several times to relieve the tensile stress on the blade.
- Once you have made the relief cut, go back and cut the shape out, staying on the scrap side of your line.
- When cutting curves, never turn your material unless you are pushing forward at the same time.
- If your cut begins to drift off from the line you made, turn off the machine, wait until it comes to a complete stop before backing out to start your curve all over again.
- Never overcompensate by twisting the blade, as it can break or be pulled off the wheels.



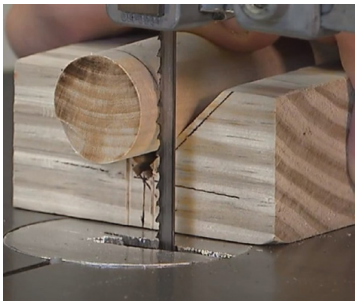


- If you are cutting a round stock, you need a device called a V-block.
- Mark the point on your stock that you would like to cut, place it in the deepest part of the V-block with the scrap end hanging over the edge.



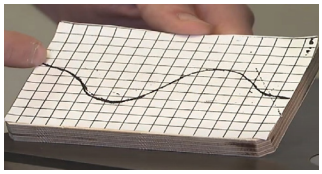


- Then set your line and hold your stock securely in the V-block as you make the cut on the scrap side of the line.



STEP BY STEP GUIDE TO THE ENTIRE CUTTING PROCESS OF THE BAND SAW

- Mark and study your cut to plan out the cutting process.

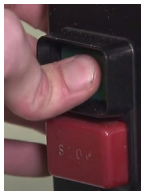


1. Band saw safety precaution

- Decide which machine you would like to use and ensure it is prepared for use.
- The belt guard door should be closed, and the table insert should be properly installed, free from any scraps lodged between the blade and the insert, and positioned flat so that it cannot move.
- When positioning yourself for the cut, keep your fingers at least two inches away from the blade and use a miter gauge or rip fence if needed.
- Before you begin, put on your safety glasses and earplugs, then turn on the dust collector.
- Raise the blade guard to a proper height; it should be no more than a quarter inch above your stock.

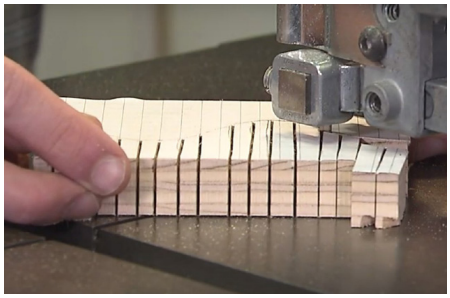
2. Power on the band saw

- Turn on the band saw and wait until it reaches its full speed before cutting your stock.
- Note: Never turn on your band saw if your stock is touching the blade.



3. Operation begins

- Always concentrate and avoid getting distracted while operating the machine.
- Keep your fingers at least two inches away. - Follow the cut line that you would like to make. Just before ending your cut, lift up the pressure you are applying so that your hand does not surge forward at the end.



4. Switch off the band saw

At the end of the cut, turn off the machine and wait for it to come to a complete stop before reaching in to clean up any scrap left behind from your cutting process.

When to turn off the machine:

- If a blade breaks, shut off the machine and notify a shop attendant.
- If a wood piece gets trapped between the blade and table insert, do not reach in to try and remove it. Instead, shut off the machine and notify the shop attendant.

OVERVIEW

In this section, we will explore the topic of belt and disc sanders, which are power tools commonly used for shaping and finishing wood. These tools utilize either a continuous abrasive belt or a rotating disc to achieve desired results. We will delve into the various parts of sanders, such as the power switch, table, and belt/disc, understanding their functions and importance in the sanding process. Safety precautions, including the use of protective gear and proper handling techniques, will be highlighted.

Additionally, we will discuss specific guidelines for using the disc sander and belt sander, emphasizing the correct positioning of stock, avoiding potential hazards, and ensuring even wear of the sanding components. Lastly, tips on cleaning up the work zone and handling any potential issues will be addressed. By the end of this section, you will have a comprehensive understanding of belt and disc sanders and the necessary precautions to take when using them.

What is Belt and Disc Sander?

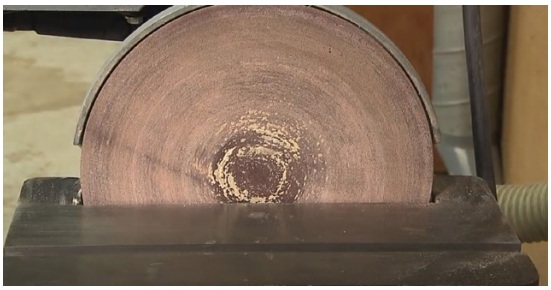
- The belt and disc sanders are power tools with either a continuous abrasive belt or a disc that rotates in one direction for shaping and finishing wood.

Parts of sanders:

a. Power switch:
- It is located below the disc sander.

b. Table:
- It is used to support the workpiece while using the sander.

c. Belt/disc:
- It holds the sandpaper or cloth in place. The paper is coated with an abrasive material or grit, which allows you to smoothen or shape your workpiece. Sandpaper surfaces are classified by grit number, indicating how rough the sandpaper is. A higher number means a finer grit. Coarse sandpapers are used for very rough surfaces or shaping materials, while finer sandpapers are used to refine surfaces and make them smoother with each pass.



PROCEDURES

- Before you begin, study the surfaces you would like to sand and determine whether an abrasive belt or disc is appropriate based on the size of the material you would like to work with.
- Put on your safety glasses and protective gear, and turn on the dust collector.

- Make sure the belt is in a centered position or notify the shop attendant if it is not; do not try to adjust the belt yourself. If the belt begins to drift or if the brakes fail while using the sander, turn off the machine and notify the shop attendant.

f. Turn on the machine and let it reach full speed before you begin working with your material.

- Always keep your fingers at least one inch away from the sander.

h. Sand gently; do not force your stock into the belt or disc.

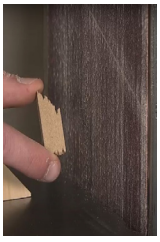
- Keep your material on the table while sanding.
- When you are done, shut off the machine and stay in the work zone until it comes to a complete stop.
- Finally, clean up the work zone.

BELT AND DISC SANDERS

- When using the disc sander, only position your stock on the downward spinning side of the disc. Placing stock on the upward spinning side may cause it to fly out of your hands and cause personal injury.

- Unlike the disc sander, when using the belt sander, move stock across the belt from left to right to avoid burning a portion of the belt and ensure even wear.

- In either case, do not sand very small pieces with the belt or disc sander; instead, you can sand those by hand.



- If a piece of wood gets trapped between the belt or disc and its table, turn the sander off and wait for it to come to a complete stop before clearing it out. If it is difficult to remove, notify the shop attendant.

OVERVIEW

In this section, we will explore the essential components and procedures related to operating a drill press. We will cover the different parts of the drill press, including the hand feed, chuck, chuck keys, and wood table. Proper techniques for inserting and tightening the drill bit will be explained, along with tips for ensuring its alignment. Safety precautions, such as wearing protective gear and maintaining focus, will be emphasized. Additionally, we will discuss the positioning of materials and the importance of using scrap wood for protection.

What is a drill press?

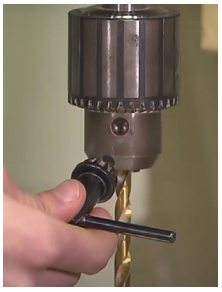
- The drill press is a stationary machine that raises and lowers a spinning drill bit to bore holes into a piece of stock.

Part of the drill press

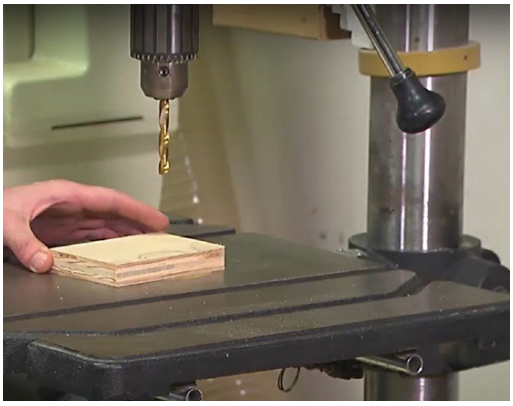
a. Hand feed
- Allows the operator to raise and lower the drill bit.

b. Chuck
- Is the specialized type of clamp that holds the drill bit in place.

c. Chuck keys
- Are used to tighten down the jaws that hold the drill bit in place.
- After tightening the drill bit, place it in the holder.
- Never leave the chuck key in any of the holes, especially if you are going to turn the machine on; the chuck key can fly out and become a dangerous projectile.



d. Work Table
- The wood table in the drill press is attached to the column.
- The wood table is the supporting surface on which the stock is placed for drilling.



PROCEDURES

1. Drill Bit Insertion
- Before starting, determine the size of the hole you need, then select the appropriately sized drill bit.
- To insert the bit, rotate the chuck counterclockwise until the jaws at the bottom are open enough to fit the bit.
- Insert the drill bit and push upward until it is completely inside the chuck.
- While holding the drill bit in place, rotate the chuck clockwise to tighten
it. Only tighten it enough to hold the bit in place.

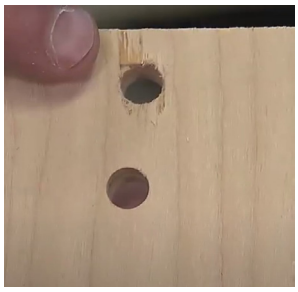
- Use the chuck key to finish tightening the bit so that it is snug and centered.
- Insert the key into each of the holes on the chuck, turning clockwise and equally tightening each one.

2. Turn the machine on

- Turn the machine on and watch the drill bit spin to ensure it is straight.
- If there is any wobble in the drill bit, it might be because you inserted the bit crooked in the chuck.
- Shut the machine off and use the chuck key to open the jaws of the chuck.
- Remove the drill bit, re-insert it, and tighten the chuck again.
- Check again for any wobble by turning the drill on and watching it spin. If it continues to wobble, the bit might be bent; try using a different bit.
- Another adjustment is to make sure the table is set to avoid drilling through the wood table.

3. Worktable Safety Measure

- Use a piece of scrap wood to protect the worktable. The scrap wood also prevents splintering on the underside of your project as the drill breaks through.
- **Note:** Do not bore into the work table or any clamp.



4. Hand Feed Adjustment

- Turn the hand feed to see how deep the drill will go.
- The wood table should be high enough to accommodate the depth of the hole you want to make.

5. Adjusting Drill Table

- If it goes all the way through, make sure the drill bit extends past the depth of your material.
- Notify the shop attendant if you need the table to be raised or lowered.

6. **Put on safety equipment:**
- Before starting, put on safety glasses, insert earbuds, or use earmuffs.

7. Material Penetration Control
- Stay focused on the task at hand. Distractions can result in injury from wood spinning or the drill bit breaking.
- Begin by positioning your marked piece of wood on the worktable under the drill bit.
Position long stock so that it is in contact with the left side of the column.
- Test the positioning by lowering the hand feed, stopping short of your material, to ensure the bit is aligned with your mark.

8. Begin drilling and monitor the drilling process:
- Raise the hand feed all the way to the top.
- Then turn on the machine.
- Use your left hand to secure the material you are drilling into and use your right hand to lower the drill bit.
- Apply steady pressure, try not to stop in one place; this would create too much friction and burn your material.
- Do not try to drill holes in small pieces unless you have the proper jigs and fixtures in place.

9. Withdraw the drill bit and power off the drill press
- Once the drill has cut through your material, raise the hand feed and turn off the machine.
- Use the chuck key to loosen the chuck holding the drill bit.
- Remove and put away the drill bit.
- Return the chuck key to its hook on the side of the drill press.

10. Clean the work area
- Clean up the work area using a brush or broom.

OVERVIEW

In a woodshop, safety is of utmost importance to protect individuals working with woodworking tools and equipment. Safety measures in a woodshop include identifying potential hazards such as sharp tools, machinery, and flying debris. Risk assessment is conducted to determine the necessary precautions and preventive measures.

This may involve using appropriate personal protective equipment such as safety glasses, gloves, and hearing protection. Adhering to established safety protocols, such as proper tool usage, maintaining clean work areas, and securing loose clothing, helps minimize the risk of accidents and injuries. By prioritizing safety in a woodshop, individuals can create a secure environment that allows for the enjoyment of woodworking activities while minimizing potential risks and promoting the well-being of all involved.

SAFETY MEASURES

1. SAFETY GLASSES:

- We have different sizes, slim styles, and larger styles.
- Please remember that prescription glasses are not safety glasses.
- If you are working with chemicals, we have larger glasses that provide a tighter seal around the eyes and can also be used for protection.
- If safety glasses or goggles are not convenient or if you need more protection, there is a face shield available for your use. This shield protects the entire face from larger chips. The table saw being used is in good condition and has been properly maintained.

2. HEARING PROTECTION:

- A popular option is the earbuds, which are in the dispenser.
- Ensure that you use them properly by rolling the end between your fingers until it becomes slim, then push it into your ear canal and hold it there for 30 to 60 seconds to allow the earplug to expand.
- Release and press it back into your ear for about 5 more seconds to ensure a snug fit. You should still be able to hear conversations clearly. When you are done, dispose of the earplug.

- Another option is safety **earmuffs,** which have adjustable bands and provide a higher level of hearing protection than earplugs. These are suitable when using louder equipment like table saws and planers.

3. Dust mask:
- Use this when producing fine dust.
- To ensure a snug fit, bend the aluminum strip over your nose.

4. Respirators:
These are used to filter particles in the woodshop.

5. Gloves:
Wear gloves to protect your hands from paint and solvents.

6. Safety wears
- Wear closed-toed shoes and avoid wearing baggy clothing or dangling objects that can get caught in the machinery. This includes sweatshirts with long tassels or hoods.
- Also, tuck in baggy shirts or roll up your sleeves when using the equipment. Do not wear headphones, necklaces, long earrings, or rings on your fingers.

7. FIRST AID AND EMERGENCY

- Notify the shop attendant or faculty if an injury occurs.
- For serious injuries, safety posters with emergency care information and numbers are located throughout the woodshop.
- Emergency postal: There is an emergency post in the workshop.
- First aid box: There is a first aid box available, equipped with basic first aid supplies such as bandages, tweezers, and antiseptics.