Indooroopilly Men's Shed
Health and Safety Manual

Part 2

Workshop Practices

March 2024

General Safety Rules

Only members who have been assessed and approved are permitted to use the power tools and equipment.

The following guidelines apply to virtually all machines and power tools available in the workshop.

1. Do not operate machines whilst under the influence of drugs, alcohol or medication.

2. Wear approved eye and ear protection and when necessary a dust mask and a hair cover if necessary

3. Do not wear ties, loose gloves or loose clothing (including long sleeves).

4. Never start a machine before clearing away nearby objects.

5. Always use the guards and ensure they are correctly spaced from the cutter.

6. Ensure there is enough space on the feed and exit sides for the work piece.

7. Where applicable ensure the dust extraction is ON and functioning.

8. Before starting, warn anyone using tools to prevent them adversely reacting to sudden noise.

9. When switching **ON** keep well clear of cutters.

10. Let the machine get to full speed before contacting the work piece.

11. Turn the machine **OFF** if a job is jammed.

12. When finished, turn the machine **OFF** and wait for cutter/blade to stop before removing work piece.

13. Once a machine's power lead is live, always turn it **ON** and **OFF** at the machine's inbuilt switch and NOT at the wall switch to prevent unexpected starts if someone else inadvertently operates the wall switch.

14. Clean up to keep the area safe.

15. Always unplug the machine when carrying out maintenance on the machine.

If a machine does not seem to be functioning correctly:

- **STOP IT immediately using the switch on the machine**
- Turn off the machine at the power point.
- Unplug the machine from the switch.
- Put a 'Warning' notice on the machine.

- Notify a Convenor.

Safe Handling and Processing of Wood and Wood Based Products

i. Storage and Protection

- Storage areas for particleboard, hardboard, plywood and medium density fibreboard (MDF) should be dry and well ventilated.
- Changes in panel moisture content will cause bowing and this may cause the panel to pinch a saw blade during cutting.
- Sawn timber which has been dried should be handled similarly to panel products
- Unseasoned timber, when not immediately used, should be block stacked on level ground or suitable bearers.

ii. Manual Handling

Safe handling practices based on manufacturer's specifications are recommended. For lifting, lowering or carrying loads the following guidelines are appropriate:

- In seated work, it is not advisable to lift loads in excess of 4.5kg
- The risk of back injury increases with objects above 16-20kg, therefore it is advisable to keep the load below this range if lifting from a standing position
- Mechanical lifting and/or team lifting should be used to reduce the risk of injury with heavier lifts
- Generally, no person should be required to lift, lower or carry loads above 55kg unless mechanical assistance or team lifting are used.

iii. Be Aware of Formaldehyde

Exposure to formaldehyde should be minimised because it is a known cancer causing substance. Wood panels such as particleboard, medium density fibreboard and plywood, laminated veneer timber and laminated beams which utilise formaldehyde-based adhesives may emit very small amounts of formaldehyde into the air. To reduce this amount even further it is recommended that products containing formaldehyde-based adhesives are stored in a well ventilated space.

iv. Machinery Safety

The basic principles of machinery safety are:

- Identification of all hazards
- Assessment of risk associated with a hazard
- Elimination or reduction of risk
- Use of guards and other safety devices
- Use of safe work practices

Woodworking machinery needs to be adequately safeguarded against injuries caused by cutting tools.
During operation, access to cutters must be restricted by guards to prevent hands, other parts of the body and clothing coming into contact with them.

Emergency stop buttons should be strategically located and clearly visible.

v. Noise

We are all at an age when our hearing deteriorates. There is no need to accelerate the process by exposing ourselves to excessive noise.

Even if noise levels are below that which may damage hearing, it can contribute to other dangers by masking warning signals and hindering communication. Whenever possible, noise levels should be reduced by engineering controls.

Any person working in a high noise area or adjacent to one should wear personal hearing protection.

vi. Wood Dust Control

Wood dust produced by machining or sanding may be irritating to the eyes, respiratory system and the skin. Prolonged exposure to wood dust may cause nasal and pharyngeal cancer by inhalation.

Particular care should be taken when machining preservative treated wood and panel products containing formaldehyde glues due to the possible health effects from the added chemicals. The best way to control dust inhalation is by the use of a properly designed and maintained dust extraction system plus by wearing a dust mask. Work areas should also be well ventilated.

In the absence of a dust extraction system, an approved dust mask should be used and eye protection worn.

The wood dust produced when machining MDF and hardboard is finer and more readily dispersed into the air than solid wood, plywood or particleboard. This dust requires a higher level of extraction efficiency.

For wood dust from pine timber particleboard, dust extraction systems require a minimum capture velocity of 10 to 20 m/sec, compared with 20 to 30 m/sec for wood dust from MDF, hardboard and some hardwoods.

The higher capture velocity required for these finer wood dusts can often be met by simple modifications to existing equipment. Reducing the size of the collector hood openings and placing them as close as practicable to the point of dust collection will assist in raising capture velocities.

Collection efficiency will also be improved by closing off ducts connected to machines which are not in use subject to maintaining the recommended minimum air velocity in the remaining ducting.

For fine wood dusts, such as that from MDF, the air velocity in the ducting needs to be 15 to 20 m/sec to prevent an accumulation of dust.

High concentration of wood dust, particularly from sanding, can form explosive mixtures with air. It is recommended that ducting should be properly earthed and fitted with explosive vents.

Wood dust which gathers on the floor, ledges, machinery pits etc, should be removed by vacuum or wet sweeping. Use of compressed air or leaf blowers to blow away the dust

should be avoided because that simply puts the dust into the air for everyone to inhale. If it is used, the user should wear a suitable dust mask or respirator and not create a dust hazard for other Shed members.

vii. Protective Clothing

Some woods and wood dusts can contain naturally occurring chemicals which may cause various forms of irritation in some people. The irritation can affect the skin, eyes and respiratory system. Some protection may be afforded by wearing safety goggles, dust masks and barrier creams. If it is safe to do so, long sleeve shirts and gloves may be worn to avoid skin contact. However, long sleeves and gloves should not be worn when using rotating machinery.

Reactions to various woods and their dust are a very individual thing and it is best that you avoid using any timber that produces an adverse reaction. If another Shed member is working on a type of wood that produces an adverse reaction in you, point out the problem and negotiate a solution eg leave the area, postpone work on the noxious wood etc.

viii. Wood Finishes

Many of the finishes applied to wood and wood products, such as paints, lacquers and varnishes, contain solvents and other chemicals which may have possible health effects. It is important that all materials be checked for to ensure their safe use.

A Material Safety Data Sheet (MSDS) should be obtained from the manufacturer and labels on the container should be examined for information about possible health effects and how to avoid them.

ix. Disposal of Wood

Untreated and unpainted wood can be disposed by placing it in the Green Bin or in a firewood collection bag if the pieces are of a suitable size. Sawdust and shavings can be placed in the Green Bin.

Treated wood, painted wood, plywood, particle board and MDF are disposed of by placing such material in the Red Bin.

x. Lichtenberg high-voltage woodburning

The technique of Lichtenberg high-voltage woodburning is not permitted on IMS premises. The safety risks of the Lichtenberg burning technique are unacceptably high and several deaths have occurred in Australia. Members should not even use this technique at home.

USING WOODWORKING MACHINES

Woodworking machines can be dangerous if not used properly.

Only use woodworking machines that you have been trained to use properly and safely.

Make sure you understand instructions before attempting to use any tool or machine. Ask questions if you have any doubts about doing the work safely.

Always wear safety glasses, goggles, or a face shield. When purchasing new prescription glasses, it is a good idea to buy safety glasses made to that prescription for workshop use.

Wear hearing protection that is suitable for the level and frequency of the noise you are exposed to in the woodworking area. If you have trouble hearing someone speak from one metre away, the noise level from the machine is too high. Damage to hearing may occur.

Gloves can be worn to protect hands from splinters when handling wood but do not wear gloves while working wood because gloves can catch in rotating blades and other machinery parts. Gloves may be worn when tailing out and hands are kept well clear of the machine.

Wear protective footwear when required.

Where guards are fitted on a machine make sure the guard is in position, is in good working condition and guards the machine adequately before operating any equipment or machine. Check and adjust all other safety devices.

Check that keys and adjusting spanners are removed from the machine before turning on the power.

Inspect stock for nails or other materials before cutting, planing, routing or carrying out similar activities. New timber may contain staples where labels have been attached. Use the metal detector on all second-hand timber.

Make sure that all machines have start and stop buttons within easy and convenient reach of an operator. Start buttons should be protected so that accidental contact will not start the machine.

Ensure that all cutting tools and blades are clean, sharp, and in good working order so that they will cut freely without forcing.

Turn the power off and unplug the power cord (or lock out the power source) before inspecting, changing, cleaning, adjusting or repairing a blade or a machine. Unplugging the machine is important because that ensures that the machine cannot be turned on accidently by another person.

Use a push-stick or a push block to push material into the cutting area. Jigs are also useful in keeping hands safe during cutting procedures. Keep hands out of the line of the cutting blade.

Clamp down and secure all work pieces when drilling or milling.

Use good lighting so that the work piece, cutting blades, and machine controls can be seen clearly. Position or shade lighting sources so they do not shine in the operator's eyes or cause any glare and reflections.

Ensure that the floor space around the equipment is sufficient to enable you to machine the size of work piece being processed safely without bumping into other workers or equipment. Check that a clear escape route is available if things go wrong.

Use extension tables or roller supports for large workpieces. Supports should be placed on both sides (infeed and outfeed).

Woodworking machines should be fitted with efficient and well-maintained dust extraction systems to remove sawdust or chips that are produced.

Electric power cords should be above head level or on the floor in such a manner that they are not tripping hazards.

Keep work area free of clutter, clean, well swept, and well lit. Spills should be cleaned up immediately. Floor areas should be level and non-slip. Good housekeeping practices and workplace design will reduce the number of injuries and accidents from slips, trips, and falls.

Things to avoid when working with woodworking machines

Do not wear loose clothing, work gloves, neckties, rings, bracelets or other jewellery that can become entangled with moving parts.

Avoid awkward operations and hand positions where a sudden slip could cause a hand to move into the cutting tool or blade.

Do not remove sawdust or cuttings from the cutting head or saw blade by hand while a machine is running. Use a stick or brush when the machine has been turned off and stopped moving.

Do not use compressed air to remove sawdust, turnings, etc. from machines or clothing.

Do not leave machines running unattended (unless they are designed and intended to be operated while unattended). Do not leave a machine until the power off is turned off and the machine comes to a complete stop.

Do not try to free a stalled blade before turning the power off.

Do not distract or startle an operator while he is using woodworking equipment.

Horse play is prohibited. It can lead to injuries.

PUSH STICKS AND PUSH BLOCKS

Push sticks or push blocks should be used when operating standard woodworking machinery, including table saws, band saws, radial arm saws, jointer/planers and shapers. These accessories are made from wood or plastic and are designed to keep hands out of direct harm while allowing good hand control and alignment of the stock as it is pushed through the cutting head or blade. Push blocks for Jointer/Planers should be used in tandem for good control.

Push sticks

1. Always use a push stick for pieces less than 30 cm in length, or for the last 30 cm of a longer cut.
2. Use the push stick to remove the cut piece from between the fence and the blade.

Push blocks

1. Should be rigid and not contain nails or screws.
2. Enable the operator to protect both hands.
3. Allow the operator to exert a firm and steady pressure on the work piece.

POWER SAWS

Basic safety controls

- Wear eye protection
- Wear ear protection.
- Use push sticks, push blocks or sleds
- Use feather boards where appropriate

General procedures for all types of power saws

Wear protective footwear when required.

Pay particular attention to the manufacturer's instructions on reducing the risk of kickback (when the wood can be violently thrown back toward the operator).

Choose proper blades for the type of work being done.

Keep blades clean, sharp, and properly set so that they will cut freely without having to force the work piece against the blade.

Use the guards provided with the saw or ones designed for use with the saw that you are using. Keep them in place and in good working condition.

Check that the fence is locked in position after the desired width has been set.

Remove any adjusting keys and spanners before commencing cutting.

Ensure the blade is running at full speed before commencing cut. Do not hold wood against a saw blade before turning a saw **ON**

Ensure that there is adequate support to hold a work piece. Use extension tables or roller supports at the side or back for larger pieces.

Keep hands out of the line of a saw blade.

Keep the body and face to one side of the saw blade out of the line of a possible kickback.

Provide adequate support to the rear and sides of a saw table for wide or long stock.

Be careful when waxing a saw table or cleaning a saw. Shut off and unplug a saw before doing any work on the saw.

Keep the area clean and clutter-free. Operate machines in a non-congested, well-lit area.

Use the proper sawdust exhaust systems as required by the operation.

Do not saw freehand. Always hold the stock firmly against a mitre gauge, rip fence or back fence or otherwise hold the stock firmly in a sled to position and guide the cut.

Do not reach around or over moving blades.

Do not try to feed the work piece faster than the cutting rate of the saw for that size of timber.

Do not leave a saw running unattended. Turn the power **OFF** and make sure the machine has stopped running before leaving the area.

If the saw blade has been set to a special angle, reset the blade to 90° using a square (NOT the blade angle indicator on the saw) before leaving the saw.

TABLE OR BENCH SAW

The table saw in the workshop is a SawStop model and has a special safety feature built in. This feature is discussed later in this section but firstly general procedures for using a table saw are set out in the following.

- Adjust the height of the safety guard over the saw blade to suit the thickness of timber to be sawn.
- Check that the riving knife is correctly aligned to prevent rip sawn timber closing onto the back of the blade.
- Set the height of the saw blade so it does not extend more than about 3 mm above the height of the piece being cut.
- Check that the saw blade is set exactly to 90° or to another exact required angle.
- When ripping set the fence to produce the required width of cut.
- Move the rip fence out of the way when cross cutting. Never use it as a cut off gauge.
- Check that the dust extractor is **ON** and the gate is open.
- Switch the saw **ON** by following the procedure set out after this section.
- Always feed stock into the blade from the front of the saw against the direction of its rotation.
- Use a push stick when ripping narrow or short stock (e.g., when the fence is set less than about 15 cm from the blade, when the piece is less than 30 cm long or when the last 30 cm of a longer piece is being cut).

- When using the fence while ripping off narrow stock, beware of cut off pieces getting captured between the saw blade and the fence and then getting thrown back towards the user.

- Use a push stick to remove any cut pieces from between the fence and the blade.

- When finished, turn the saw **OFF** and close dust extractor gate.

- Wait for the saw blade to stop before picking up any offcuts near the saw blade.

- Clean up.

SawStop safety system

- The SawStop technology was developed to reduce the potential for a serious injury in the event of accidental contact with the saw blade. SawStop saws are the only saws smart enough to know the difference between human flesh and the wood being cut.

- The SawStop safety system includes two components, an electronic detection unit and a fast-acting brake. The electronic detection unit detects when a person contacts the blade.

- A small electrical signal is induced onto the blade by electrodes placed around the arbour. Although this low voltage, high frequency signal is too small to feel, it can be measured by the detection system.

- When human skin comes into contact with the blade (or arbour), a portion of the signal is absorbed by the body due to the inherent electrical capacitance of the human body. As a result, the signal on the blade gets smaller and the detection unit recognizes this as contact.

- The fast-acting brake includes a small fuse that holds a strong spring in compression. If the electronic detection unit detects contact while the blade is spinning (including during coast down), the fuse is burned by a surge of electric current.

- The spring then pushes an aluminium pawl into the teeth of the spinning blade. The teeth cut into the pawl, stopping the blade. The total time between the detection of contact and stopping the blade is just a few milliseconds.

- If the brake is activated while the blade is at or near full speed, the blade will also quickly retract below the table.

- The electronic detection unit and fast-acting brake are contained in the brake cartridge, which is positioned under the table and just behind the blade. The brake cartridge must be correctly installed before the motor can be started. In the event that the brake is activated, a new brake cartridge must be installed before the saw can be used again.

- Wood and other non-conductive materials such as plastic, foam, cardboard, Corian, melamine, etc., do not cause a drop in the signal because those materials do not absorb the signal on the blade.

- Conductive materials such as wet or green wood, aluminium and other metals, carbon fibre materials, mirrored acrylic, carbon-filled materials, etc., will typically cause the brake to activate. Wet, pressure-treated wood also may cause the brake to activate. The chemicals used to pressure treat wood often contain large amounts of copper, which is conductive. If it is necessary to cut these conductive materials, the safety system can be placed in “Bypass Mode” to temporarily disable the brake.

- The SawStop safety system is active whenever the main power is on. The safety system continuously performs many different self-checks to ensure that the components of the system are operating properly. If any problems are detected, the safety system will disable the motor and display a system status code to identify the problem. If the problem is detected while the motor is spinning, the motor will be shut off. The safety system will not allow the motor to start, even in Bypass Mode, as long as a problem is detected.

- Do not rely on the SawStop safety system to protect against unsafe operation. Although the system is designed to react and stop the blade very quickly in the event of accidental contact, it cannot react until contact is detected. This means that a person may receive at least a minor injury even with the SawStop safety system. Therefore, always use safe operating practices, and use the blade guard, push stick and other safety devices whenever possible. The SawStop safety system, like the airbag in a car, should be considered as a last measure to minimise injury when all other safety practices and devices have failed to prevent an accident.

- In the event of contact, the blade will be stopped in about 3–5 milliseconds Therefore, the seriousness of the injury incurred will depend on the speed at which a person’s hand or other body part is moving toward the blade.

- Do not operate the saw in Bypass Mode unless you are cutting electrically conductive material. When Bypass Mode is engaged, the SawStop safety system will not activate the brake if contact is detected and a serious injury could result if you contact the blade.

- After the safety system is activated, the brake cartridge and the sawblade are irreparably damaged and have to be replaced. In 2024 a replacement brake cartridge costs $160 and a new saw blade costs $85. Anyone who triggers the SawStop safety system will be billed for a replacement brake cartridge and saw blade. A person whose hand or fingers are saved by the system should be only too willing to pay up. Anyone who triggers the SawStop safety system by feeding wet or green wood, aluminium or any other conductive material into the saw blade will be paying a penalty for neglecting safety training.

Starting the SawStop saw.

To start the saw, first make sure the Start/Stop paddle is in the **“OFF”** position (i.e., pushed in) and then turn the red main power switch to the **“ON”** position by flipping the toggle

upward. This will turn on power to the SawStop safety system, and the system will run through a brief initialization routine to test whether the system is operating properly. During this initialization period (approximately 5–10 seconds), red and green lights on the switch box may blink in different patterns as the safety system runs through various self-check steps. These lights are light-emitting diodes (LEDs) and they display the current status of the safety system and saw. Once the safety system completes the initialization routine, the LEDs will display the ***"READY"*** status display (green LED on solid, red LED off). The saw is now ready for use.
To start the motor, pull the Start/Stop paddle out. To stop the motor, push the Start/Stop paddle in. The paddle is designed so that it can be pushed in by the operator's upper leg or knee in an emergency.

Stopping the SawStop saw.

The saw motor is stopped by pushing in the red Start/Stop paddle. If more cuts are to be made with the saw during the session, the saw motor can be started again by pulling out the red Start/Stop paddle. If the session is completed, the red Start/Stop paddle must be pushed in and turn the red main power switch to the ***"OFF"*** position to reduce the likelihood of inadvertent start-up.

Using the Saw in Bypass Mode

If it is necessary to cut electrically conductive materials such as aluminium with this saw, it must be operated the saw in Bypass Mode to prevent the brake from activating. In order to operate the saw in Bypass Mode, the safety system requires following the procedure below to ensure that the saw is never placed in Bypass Mode accidentally.

<u>Because there are several steps involved in setting up Bypass mode, the use of the saw in bypass mode must be supervised by a workshop convenor.</u>

- Make sure the Start/Stop paddle is in the **OFF** position and then switch the Main Power switch to ON. Wait until the safety system completes the initialization routine and the system status code indicates the saw is ready for operation.

- Turn the Bypass Key clockwise and hold it for at least 1 second. The green LED will begin blinking slowly and the red LED will flash once signify when the 1 second has elapsed.

- *Note: to prevent unauthorized use of the saw in Bypass Mode, remove the Bypass Key from the saw when not in use.*

- While still holding the Bypass Key turned, pull the Start/Stop paddle out to the **ON** position. The blade will start to spin.

- Continue to hold the Bypass Key turned for at least 1 second after the motor starts—the red LED will flash once again to indicate when the 1 second elapses.

- When the cut is completed,, push the Start/Stop paddle in to turn off the motor. The safety system will remain in Bypass Mode until the blade comes to a complete stop. Once the blade has stopped, the safety system returns to normal Standby Mode.

- The next time the motor is started, the safety system will be active unless the procedure described above to start the motor in Bypass Mode is repeated.

WARNING! Never run the saw in Bypass Mode unless it is necessary to cut conductive materials. The brake system will not activate when the saw is in Bypass Mode and a serious injury could result.

CAUTION! Always check the saw blade after cutting conductive materials. Sometimes a shard of aluminium or other conductive material will become embedded on the end of a saw blade tooth. If that occurs and the saw is started, then the shard could contact the aluminium brake pawl and cause the brake to activate.

MAKITA SLIDING COMPOUND MITRE SAW

- The Makita Sliding Compound Mitre Saw is intended to cut wood or wood-like products. It cannot be used with abrasive cut-off wheels for cutting ferrous material such as bars, rods, studs, etc. Abrasive dust causes moving parts such as the lower guard to jam. Sparks from abrasive cutting will burn the lower guard, the kerf insert and other plastic parts.

- Do not operate the saw without the blade guard in place. Check the blade guard for proper closing before each use. Do not operate the saw if the blade guard does not move freely and close instantly. Never clamp or tie the blade guard into the open position.

- Check the blade carefully for cracks or damage before operation. A cracked or damaged blade must be replaced immediately.

- NEVER use the saw in circumstances where the operator positioning would be awkward.

- Make sure that the circular protractor base is properly secured so it will not move during operation.

- Make sure that the blade does not contact the circular protractor base in its lowest position.

- Make sure the blade is not contacting the workpiece before the switch is turned on.

- Hold the handle firmly. Be aware that the saw moves up or down slightly during start-up and stopping.

- Before using the saw on an actual workpiece, let it run for a while. Watch for vibration or wobbling that could indicate poor installation or a poorly balanced blade.

- Keep hands out of the path of saw blade. Avoid contact with any coasting blade. It can still cause severe injury.

- Let the blade reach full speed before contacting the workpiece. This will reduce the risk of the workpiece being thrown.

- Push the saw through the workpiece. Do not pull the saw through the workpiece. To make a cut, raise the saw head and pull it out over the workpiece without cutting, start the motor, press the saw head down and push the saw through the workpiece. Cutting on the pull stroke is likely to cause the saw blade to climb on top of the workpiece and violently throw the blade assembly towards the operator.

- To reduce the risk of injury, push the carriage to the full rear position after each crosscut operation.

- While making a slide cut, KICKBACK can occur. KICKBACK occurs when the blade binds in the workpiece during a cutting operation and the saw blade is driven rapidly back towards the operator. Loss of control and serious personal injury can result. If the blade begins to bind during a cutting operation, do not continue to cut and release switch immediately.

- Stop operation immediately if you notice anything abnormal.

- Never leave the saw running unattended. Turn the power off. Do not leave saw until it comes to a complete stop.

- Do not attempt to lock the trigger in the "**ON**" position.

- Use clamps to support the workpiece whenever possible. If supporting the workpiece by hand, you must always keep your hand at least 100 mm from either side of the saw blade. Do not use this saw to cut pieces that are too small to be securely clamped or held by hand. If your hand is placed too close to the saw blade, there is an increased risk of injury from blade contact.

- The workpiece must be stationary and clamped or held against both the fence and the table. Do not feed the workpiece into the blade or cut "freehand" in any way. Unrestrained or moving workpieces could be thrown at high speeds, causing injury.

- Never cross your hand over the intended line of cutting either in front or behind the saw blade. Supporting the workpiece "cross handed" i.e. holding the workpiece to the right of the saw blade with your left hand or vice versa is very dangerous.

- Do not reach behind the fence with either hand closer than 100 mm from either side of the saw blade, to remove wood scraps, or for any other reason while the blade is spinning. The proximity of the spinning saw blade to your hand may not be obvious and you may be seriously injured.

- Inspect your workpiece before cutting. If the workpiece is bowed or warped, clamp it with the outside bowed face toward the fence. Always make certain that there is no gap between the workpiece, fence and table along the line of the cut. Bent or warped workpieces can twist or shift and may cause binding on the spinning saw blade while cutting. There should be no nails or foreign objects in the workpiece

- Do not use the saw until the table is clear of all tools, wood scraps, etc., except for the workpiece. Small debris or loose pieces of wood or other objects that contact the revolving blade can be thrown with high speed.

- Cut only one workpiece at a time. Stacked multiple workpieces cannot be adequately clamped or braced and may bind on the blade or shift during cutting.

- Plan your work. Every time you change the bevel or mitre angle setting, make sure the adjustable fence is set correctly to support the workpiece and will not interfere with the blade or the guarding system. Without turning the saw "**ON**" and with no workpiece on the table, move the saw blade through a complete simulated cut to be assured there will be no interference or danger of cutting the fence.

- Provide adequate support for a workpiece that is wider or longer than the table top. Workpieces longer or wider than the mitre saw table can tip if not securely supported. If the cut-off piece or workpiece tips it can lift the lower guard or the workpiece can be thrown by the spinning blade.

- Do not use another person as a substitute as additional support. Unstable support for the workpiece can cause the blade to bind or the workpiece to shift during the cutting operation pulling you and the helper into the spinning blade.

- The cut-off piece must not be jammed or pressed by any means against the spinning saw blade. If confined, i.e. using length stops, the cut-off piece could get wedged against the blade and thrown violently.

- Always use a clamp or a fixture designed to properly support round material such as rods or tubing. Rods have a tendency to roll while being cut, causing the blade to "bite" and pull the work with your hand into the blade.

- If the workpiece or blade becomes jammed, turn the mitre saw off. Wait for all moving parts to stop and disconnect the plug from the power source, then work to free the jammed material. Continued sawing with a jammed workpiece could cause loss of control or damage to the mitre saw and you.

- After finishing the cut, release the switch, hold the saw head down and wait for the blade to stop before removing the cut-off piece. Reaching with your hand near the coasting blade is dangerous.

- Hold the handle firmly when making an incomplete cut or when releasing the switch before the saw head is completely in the down position. The braking action of the saw may cause the saw head to be suddenly pulled downward, causing a risk of injury.

- Only use a saw blade with a diameter of 305 mm. Use of an incorrectly sized blade will affect the proper guarding of the blade or guard operation which could result in serious personal injury.

PORTABLE CIRCULAR SAW

- Check that the guard drops into place and covers the saw blade when not cutting.
- The workpiece must be firmly held or clamped in place before commencing cutting.
- Set the correct depth of cut.
- Check the line of cut. Do not cut into workbenches or saw horses
- If cutting wide sheet materials, clamp a piece of straight timber to the sheet and run the saw along its edge to ensure a straight cut.
- Keep fingers out of the way.
- Plan how to exit the cut. Do not drop the saw or let the saw fly into space when finishing a cut.
- Do not overreach while cutting..
- Make sure the blade has stopped spinning and the guard has dropped before placing the circular saw down after completing cutting.

BAND SAW

- A one metre perimeter around the saw should be kept clear of people, debris and sawdust that could impair traction or footing to avoid slips and falls.
- Check the blade tension and tracking before starting. Make sure that the upper and lower wheel guard doors are closed when running.
- The blade guard must be adjusted to just clear the work but high enough to see any pencil line that has to be followed.
- .Only cut timber that has a flat bottom surface, i.e., the timber must lie flat on the table;
- Irregular shaped timber or round logs must not be cut on the band saw unless an appropriate jig is used (e.g., V-block for circular pieces, or a clamp block).
- Small pieces of timber that might get jammed should not be sawn on the band saw.
- If the work is too large for one person to handle, get help holding the stock.
- Keep a balanced stance at the band saw.
- After switching on, move timber slowly onto the blade. Do not force a cut.
- Hold the material firmly using push sticks not fingers. Keep hands, thumbs, fingers and arms away from the blade; as a general rule, fingers and hands should be kept no closer than 100 mm from the blade.

- . When cutting freehand move the timber slowly onto blade, following design lines on timber

- Do not attempt to cut circles less than the minimum diameter recommended for the width of the blade being used. When cutting circles or curves, do not turn the work unless this action is accompanied by feed into the blade, otherwise the blade will be twisted and may be damaged beyond repair. The correct line of feed into the blade when cutting curves is along the tangent to the curve so that the blade is not twisted.

- When ripping timber using the fence on the bandsaw be aware of bandsaw drift which if present can cause timber to pull away from the fence/

- Do not trap the blade or go backwards through the cut while the blade is running.

- For complicated patterns use multiple relief cuts at different angles

- Never clear small pieces away from the blade while the blade is moving.

- If the blade jams, switch off the bandsaw before removing the work piece.

- When finished, turn off the band saw and wait until the blade comes to a complete stop. Never stick an object into the blade to stop the machine more quickly. Let it stop on its own.

TABLE SCROLL SAW

Safety warning

A scroll saw has a small blade but do not get complacent using one. The blade oscillates at high speed and can lacerate fingers and hands very quickly. Also remember not to put fingers underneath the table because the blade is exposed there too.

Using the scroll saw

- Select the correct speed and type of blade for the work you are doing. Ensure that the blade is correctly installed, with the teeth pointing downward. (If the teeth are pointing upwards, they will pull the workpiece off the table.)

- Use a narrow blade for curving cuts.

- Adjust the saw blade tension as required before starting the saw.

- Set initial tension so that the blade deflects less than 3 mm when pushed from the teeth side and it makes a medium note when plucked. Over tensioning will cause the blade to break and can cause damage to the saw.

- Do not reach behind the blade or pull material into the blade from behind while cutting.

- Adjust work piece, table and guides.

- Only cut timber that has a flat bottom surface, i.e., the timber must lie flat on the table. Irregular shaped timber or round pieces must not be cut on the scroll saw unless an appropriate jig is used.

- Switch the scroll saw **ON** and wait for blade to reach full speed before commencing cutting.

- Remember that the saw blade oscillating at high speed.

- Select the correct machine speed for the type of scroll sawing task to be performed

- Keep hands, fingers, and body parts well out of the way of the blade. Never have hands or fingers in the line of cut. Keep fingers 50 mm from the oscillating blade.
-
- Always feed the workpiece slowly into the blade

- Hold the work firmly to the table, and using your thumbs for directional control, feed the work into the blade with steady even pressure. Do not force the work forward, but allow the teeth time to work efficiently.

- Guide the workpiece carefully, because scroll saw blades are easily broken.

- Don't turn the workpiece too sharply.

- Always turn the power source off and wait for the saw to stop before making scroll saw adjustments.

- Use a stick of brush to clear away wood scraps from the saw blade. Never use your fingers.

- When cutting cylindrical (round) stock, secure stock in a "V" fixture.

- Do not cut wet wood. Water causes the grain to swell and wet wood will grip the blade with dangerous consequences.

- Step away immediately if the saw blade breaks or comes loose. Turn off the power without endangering yourself.

- To back out of a cut, turn off the saw. Slowly and gently move the board to get it off the blade

When finished, switch off at the machine, then at the power socket.

SHAPING MACHINES

ROUTER BENCH

- Ensure the selected cutter bit is tightly locked in the chuck and free to rotate.

- Lock at the correct height using the machine lock and adjustment lock nuts.

- The rotating cutter is very dangerous. Keep fingers clear of the cutter.
- Set the fence at the required distance from the cutter bit depending on the type of cut.
- Place push blocks in position ready to be taken up as soon as workpiece is properly aligned
- Switch the router ON and allow it to reach full speed.
- Follow the correct cutting direction and avoid kickback from the work piece.
- Hold the workpiece firmly to table and always feed it against the direction of rotation of the bit.
- Use repeated small cuts rather than one deep cut.
- If it is necessary to remove a lot of wood it may be possible to make preliminary cuts on the saw bench along the line of the router cut to save time and wear and tear on the router bit.
- Switch off at the machine (not at the wall) and wait until the bit stops rotating.

PLANING AND THICKNESSING

PLANER/JOINTER

- The operator has to move along the machine while working so check the workspaces are clear and no slip or trip hazards are present.
- Check that the safety guards are adjusted and operate to give maximum protection.
- Adjust the bridge guard to ensure a maximum of 2 mm clearance between the guard and the timber.
- Do not plane stock with structural defects.
- Set the depth of cut and lock the table. Never make a single cut greater than 2 mm.
- Check and lock the fence in position
- Confirm that the dust extraction is connected and operating.
- Hands must not be closer than 100 mm from the cutter head when it is rotating.
- Use push blocks.
- Never leave the machine while it is running.
- Place cupped boards with the concave side against the table.

- Plane with the grain. The grain on the side of the side of the board should slope down towards the operator.

- Hold the workpiece firmly and apply an even feed rate.

- Hold down the front of the board with one hand after it has passed over the cutter head and maintain downward pressure on the back part of the board until it has passed over the cutter head.

- Stand to the side of the infeed table to avoid possible kickbacks.

- Before making any adjustments switch off the machine and wait for the cutter head to stop completely.

PLANER/THICKNESSER

Check the timber first

- Do not plane warped or twisted boards until one face has been straightened and will lie flat on a level surface. Straightening can be done using a hand plane or the jointer.

- Inspect stock for loose knots on the board to be planed. If any of those are present, do NOT plane that board until the knot is removed.

- Run the metal detector over all second-hand timber to checks for nails, screws etc.

- When working with new wood, check that no metal staples etc are found on any surface. (Staples are sometimes used to attach labels to timber at the point of sale.)

- Determine the grain direction of the surface to be planed. Look at the side of the board to determine the grain direction. Feed the board into the thicknesser so that the grain on the side of the board is rising UP towards the operator to obtain a smooth finish. Alternatively if cathedral grain is visible on the upper surface of the board, point the apex of the cathedral towards the operator to avoid chipping.

Using the thicknesser

- A one metre perimeter around the thicknesser should be kept clear of people, debris and sawdust that could impair traction or footing to avoid slips and falls.

- Adjust the depth of cut for light passes to make small cuts. Always make small cuts – 0.5-1 mm for surface cuts, and 1-2 mm for thicknessing.

- Ensure guards are in place

- Ensure dust extraction is on and check that the gate to the thicknesser is open.

- Switch on and wait for the cutters to reach full speed before starting the cut.

- NEVER allow hands or fingers to enter the infeed opening.

- Never start the thicknesser when the cutters are touching the work piece

- Always feed the work against the rotation of the cutter.
- Hold the work piece in position against the guides.
- Use push sticks where required for smaller work pieces.
- Do not feed small pieces of timber through the thicknesser. Small light pieces of timber can be caught by the cutter head and thrown back at the operator. Single pieces of stock fed through the thicknesser should be at least 10mm thick and 300 mm long. If it is necessary to plane smaller pieces, use double sided tape to attach them to a larger piece of flat panel material such as MDF.
- Beware of 'Kick Back'. Kick-backs can be lethal. Do not stand behind the work piece. Observers should be kept well clear of the kick-back region
- Always turn the thicknesser off and wait until it stops moving before making any adjustments.
- NEVER bend down to look into the thicknesser while it is running.
- Only plane one piece of stock at a time.
- Stand to the side of the stock while feeding it into the thicknesser.
- Let go of the stock when the roller in the thicknesser takes hold of it.
- If the stock is very long, get help holding it while it is being fed into the thicknesser. Ensure that the helper is standing to the side of the stock and NOT behind it.
- After half of the stock has entered the thicknesser, walk around to the other side of the thicknesser and hold the end of the stock up if it extends beyond the outfeed table.
- Do not pull the stock out. Simply allow the machine to push it out.
- When finished, switch off at the machine first, then at the power socket.
- Listen to the sound the thicknesser makes while it is operating. If something doesn't sound right, turn the thicknesser off and notify the convenor.

MORTISING

The Shed has a Scheppach Chisa 7.0 machine for cutting mortises. It has several chisels for cutting mortises of different widths and can cut mortises up to 70 mm deep.

Be careful handling the chisel and the bit because both are extremely sharp so be careful where your hands are during the setting up process.

Installing chisel and bit

- Release the lock screw on the right hand side of the mortiser head and insert the chisel bushing (with the hole facing forward) into the head. Tighten the screw just enough to hold the chisel in place.

- Place the chisel in the bushing. Firmly tighten the screw. The slot in the side of the chisel must open to the left or to the right, never to the front or to the back. This slot is for the ejection of chips when making mortises.

- The slot should be set up so that in use the chips will be ejected into the part of the mortise already cut. That determines the left-right orientation of the workpiece on the table whether the workpiece will be moved left or right when cutting the mortise.

- Push the chisel through the chisel opening upwards into the chuck and lock it with the chuck key.

- Adjust the bit at a distance of 0.8 to 1.6 mm between the chisel points, depending on the type of wood.

Cutting a mortise

- Mount the work piece stop on to table. Fasten it by the clamping handles at the desired setting.

- Set the depth stop to the required depth of cut.

- Make sure the mortise is pencilled in on the workpiece.

- Place the work piece on the table and clamp it with the vice.

- Place the starting point of the mortise underneath the chisel by using the adjusting wheels in front of the table.

- With the right hand wheel, move the table forward and backward.

- With the left hand wheel move the table to the left or to the right.

- Adjust the table stops, according to the length of cut for the required mortise and then tighten the thumb screws.

- Turn the machine on and feed the chisel and bit steadily into the work piece by pulling the operating handle down.

- The speed at which the handle is pulled down must be efficient but smooth, in order to avoid burning at the bit. If the chisel and bit are pulled down too quickly, the machine could be overloaded. The different rates of feed for different woods must be learned through experience.

- After the first cut, the work piece is moved along with the left hand wheel for each successive cut. The direction of movement must allow the chips to clear freely.

- Move the work piece so that the slot in the chisel is releasing the chips into the already cut part of the work piece.

- If the slot in the chisel is facing left, use the left hand wheel to move the workpiece to the left.

- If the slot in the chisel is facing right, use the left hand wheel to move the workpiece to the right.

- When cutting deep mortises, make the cut in several stages of approx. 25 mm depth each, to allow chips to clear.

- To prevent breakout at the back of the work piece when cutting through mortises, use a piece of scrap material under the work piece as support.

SANDING

COMBINATION BELT SANDER AND DISC SANDER

- Adjust disc table as required

- Adjust work piece gauges and guides

- Switch on and wait for belt/disc to reach full speed

- Always feed the work against the rotation of the belt.

- Hold the work piece lightly in position on belt/disc- beware of ‘kick back’

- When using the sanding disc always keep the workpiece on the right hand side of the spinning disc so that the downward motion of the disc will hold the workpiece firmly against the table.

- Do not hold a workpiece so that it contacts both sides of the sanding disc at the same time. It will become uncontrollably twisted and dangerous to work.

- Clean the belt or disc with a sandpaper cleaning stick when finished.

OSCILLATING BELT SANDER

- The oscillation of this sander produces a rapid sanding effect but can grab workpieces and hurl them.

- Set the table to the desired height before starting work. This helps to avoid wearing out the belt in one place

- Use the stop on the table to prevent workpieces being grabbed and thrown.
- Set up dust extraction before commencing work
- Clean the belt or disc with a sandpaper cleaning stick when finished.

DRILLING

DRILL PRESS

- Check that the table on the drill press is properly level or set at a required angle.
- Lock the drill the bit in the chuck using chuck key.
- Firmly fix the drill bit by tightening the chuck key in all three holes of the chuck.
- Locate drill bit over target mark. If possible clamp down the work
- Set the depth stop if required. Make sure the drill bit will not drill into the table on the drill press.
- Turn on the drill press and wait for full speed before lowering the bit into the workpiece.
- Using the manual lowering arm, push the drill bit down through the material, backing off to clear swarf if necessary
- Do not move material during the drilling operation
- At the completion of drilling lift the chuck to its rest position, turn off the drill press and wait until rotation of the bit stop
- Remove the work piece

WOODTURNING

SHED WOOD LATHES

The Shed has three variable speed woodlathes.
- Two SEQ Woodworking Supplies MC1420 VF woodlathes.
- One Nova Comet II woodlathe.

Before being turned **ON**, both types of lathes should be set in the neutral position, which on the MC1420 VF lathes is when the switch is in the vertical position and on the Comet II when the toggle switch is horizontal.

The speed knobs must be set to zero by turning the knobs anti-clockwise.

About 10 seconds after the power switch is turned on, the lathes should be switched to the forward rotation position.
- On the MC1420 VF lathes this is done by rotating the central switch on the control panel to the left.
- On the Comet II lathe this is done by pushing the toggle switch upwards.

(Note: These lathes should NEVER be operated in the reverse rotation direction because chucks or faceplates on the headstock will be unscrewed and thrown around the workshop,)

To start both types of lathes rotating turn the speed knob clockwise slowly until the desired speed is shown on the digital readout.

WOODTURNING PRACTICE

- Ensure all major parts of the wood lathe are in good working order, including head stock, pulleys, tool rest assembly, tail stock, motor and switches. Report any defects to the Convenor on duty.

- Read and thoroughly understand any label warnings on the lathe.

- Always wear a high-impact face shield. Safety goggles and safety glasses are not considered adequate protection because of the risk of wood flying off the lathe and striking the operator in other parts of the face or head.

- Be aware of bystanders and keep them out of dangerous locations.

- Check that the tailstock, tool rest and banjo are tightly locked in position.

- After mounting new stock in the lathe or after re-chucking, make sure the spindle lock/indexing pin is unlocked, then rotate work piece by hand to make sure it clears the tool rest and the bed of the lathe before turning the lathe on.

- Stand to one side of the workpiece on the lathe when the machine is first switched on so that if you will not be in the line of fire if anything flies off the workpiece.

- Use a dust mask and proper ventilation in dusty working conditions

- Wear hearing protection as required during noisy operations.

- Use slower lathe speeds for large diameter or rough pieces and increased speed for smaller diameters and pieces that are balanced.

- If the lathe is shaking or vibrating, lower the speed. If the work piece vibrates, always stop the machine to check the reason.

- When using a faceplate, be certain the work piece is securely mounted.

- Utilise the tailstock whenever possible in faceplate work. This provides an added level of safety by preventing the work piece from coming off the lathe during a catch or other mishap. It also provides extra support when turning large, out of balance blanks.

- Turn lathe off before adjusting the tool rest. After adjusting the tool rest, rotate the workpiece by hand to make sure it still clears the tool rest.

- •Exercise caution when using stock with cracks, splits, bark, knots, irregular shapes and protuberances or sub–standard glue joints that may result in the work piece separating or flying apart.

- Don't leave something in the lathe that shouldn't be there, e.g. a knock-out bar in the headstock..

- Hold turning tools securely on the tool rest and hold the tool in a controlled but comfortable manner. Always run the lathe at slower speed when making roughing cuts until the work piece is balanced.

- Select a head stock spindle speed suitable to the diameter of the work being turned.

- When turning bowls or platters, start with an accurate measurement of the thickness of the blank and the length of the screws used to fix it to the faceplate to avoid the screws or screwholes penetrating the bottom of the bowl or platter when hollowing out.

- Generally it is best to turn a spigot/tenon, not a recess, on the base of a bowl to hold the bowl when it is reversed into a chuck. That is because wood is stronger under compression (as when chuck jaws are closed on a spigot/tenon) than when it is under tension (as when chuck jaws are expanded outwards in a recess) with the risk of tearing the base apart or unduly stressing the base. Weakening the base by overstressing increases the risk of the workpiece breaking off the chuck during turning with potentially very dangerous results.

- Recesses can be used on a bowl or platter if the design allows a wide periphery of solid wood around the recess to provide sufficient resistance to tensional forces.

- When turning a green wood blank do not make a recess to hold it in a chuck. Green wood .is very weak under tension and if expansion of the chuck does not tear the base apart it will weaken it so that the bowl is very likely to fly off the chuck during turning with potentially very dangerous results.

- If sapwood is present on a bowl blank, do not make a spigot/tenon or a recess in it because that is a zone of weakness in the wood and the workpiece is liable to shear off when the lathe is spinning,

- When turning between centres, ensure the work piece is secure. If 'whip' or 'chatter' occurs in long material, use the steadyrest.

- Always remove the tool rest before sanding or polishing operations. Just moving it to one side may not be enough to avoid injury.

- Avoid applying finishes with pieces of cloth as they may become entangled and cause injury. Use paper towel instead.

- Never leave the lathe running unattended – turn the power off. Do not leave the lathe until it comes to a complete stop.

- Keep tools sharp, clean and properly ground.

- Don't force a dull tool and don't use a tool for a purpose it is not intended for.

- Do not use a roughing gouge on a bowl blank.

- After turning off the lathe at the completion of turning remove all accessories (chucks, drive spurs, live centres etc) and store them away.

- Do not use a knock-out bar with more enthusiasm than common sense to remove drive spurs and live centres. If these items fall on the concrete floor of the Shed their points get blunted and they are effectively rendered second-rate or useless. The easiest and safest way to remove a live centre from the tailstock is to simply wind back the spindle until it pops out.

- When finished using a lathe, return the speed control knob to zero, leave the rotation direction control switch in the neutral position, put away all tools, unplug the lathe and wrap the power cord around the headstock of the lathe.

METAL LATHE

Risks:

1. Risk of entanglement
2. Injury, cutting, stabbing etc
3. Chuck rotating at high speed
4. Striking injury
5. Swarf in eyes/Noise

Safety Controls:

1. Eliminate loose clothing/long hair
2. All guards in position.
3. Machine is electrically isolated before adjustment
4. Keep hands clear of chuck
5. Check work piece & tooling are secure
6. Wear safety glasses/ear muffs

Procedure:

1. Seek instruction if not fully familiar with the metal lathe
2. Ensure guards are in place
3. Ensure rotation direction set and correct
4. Secure work piece in the chuck and lock
5. Select the right cutting tool for the job
6. Adjust and secure tooling and tail stock in position
7. Switch on and wait for chuck/work to reach full speed
8. Engage tooling smoothly and slowly - make small cuts
9. Switch off at machine - not at the wall
10. When cutter rotation stops, remove work piece
11. Clean up