

# WaM Workshop Hand Tools Induction



{{Insert location Map}}

## OUR WORKSHOP OPENING HOURS ARE:

**MONDAY - FRIDAY    9.00AM - 1PM / 2PM - 5.00PM**

## **WAM WORKSHOP HAND TOOLS:**

- **MEASURING TOOLS,**
- **CORDLESS DRILLS**
- **SCALPEL AND KNIFES**
- **HAND SAWS**
- **HAMMERS AND MALLETS**
- **CHISELS**
- **FILES**
- **CLAMPS AND VICES**

## MEASURING TOOLS

Measuring tools are very useful and necessary items when it comes to making objects. A measuring tool allows you to work accurately and repetitively with ease. Different types of measuring tools are available for measuring lengths, thicknesses, diameters, weights, angles, levels and volume.

### Basic list of measuring tools

- Ruler
- Tape measure
- Vernier calliper
- Micrometre
- Scales
- Adjustable sliding bevel
- Spirit levels and Set Squares
- Measuring jug
- Syringe



### How to provide a cutting list for a Technician

Often it is required to provide a material cutting list for technicians to cut materials on the table saw or drop saw.

- Always work in millimetres (mm) when referencing dimensions.
- Provide all dimensions: length(L), width(W), and thickness (H) and Quantity required.
  - Example: 1500mm x 90mm x 45mm pine Qty x 8  
1200mm x 70mm x 35mm pine Qty x 10  
1200mm x 1000mm x 19mm ply wood Qty x 1
- Draw a diagram if necessary to help facilitate your request.

**Measuring Tools** generally impose minimal safety risks to users, however, knowing how to correctly use any of these items requires some basic knowledge and practice.

Watch the following videos for instructions on how to use the various measuring tools.

**Ruler/tape measure**

<https://www.youtube.com/watch?v=m9cBpaKYG2c>

**Vernier calliper**

<https://www.youtube.com/watch?v=vkPlzmalvN4>

**Micrometre**

<https://www.youtube.com/watch?v=StBc56ZifMs>

**Scales (ruled)**

[https://www.youtube.com/watch?v=w6\\_oQQI3oE](https://www.youtube.com/watch?v=w6_oQQI3oE)

**Adjustable sliding bevel**

<https://www.youtube.com/watch?v=nzQYd8wxCQE>

**Spirit level**

<https://www.youtube.com/watch?v=jwHD5bePFEW>

**Measuring Jug**

[https://www.youtube.com/watch?v=-Ue-o\\_txQAw](https://www.youtube.com/watch?v=-Ue-o_txQAw)

<https://www.youtube.com/watch?v=s5u5cmA9Dp0>

**Syringe**

<https://www.youtube.com/watch?v=SEZeXcY4q4o>

**Scales (weight)**

[https://www.youtube.com/watch?v=Ls\\_5Mk6bDuo](https://www.youtube.com/watch?v=Ls_5Mk6bDuo)

## CORDLESS DRILLS

WaM workshop has many Makita cordless drills available for student use. Be sure to familiarise yourself with their operation by watching the cordless drill instructional video and reading the Standard Operating Procedure document.

<https://drive.google.com/file/d/1xRBmT2tualpLqSO5HjSVucErnyJvLzG/view?usp=sharing>



## SCALPEL AND KNIFES

A Scalpel or cutting-knife is a tool, not a toy, so use it safely and carefully at all times. A very common and easy use item in all workshops. A scalpel is ideal for cutting soft materials such as foam, plastic, thin woods and/or papers and card.



### Before you start:

- Always be sure blades are retracted, or remove the blades from Scalpels or knives prior to storage or transport. Never carry a scalpel or knife in your pocket. Prevent walking around with an exposed blade.

- Always be sure the blade is properly located and locked in the scalpel handle. If using a “Stanley” type knife be sure the two halves of the handle are correctly and securely locked / screwed together.
- When inserting or replacing blades always hold the blade from the NON sharp side. Always request assistance from your area technical officer whenever required.
- Make sure you have enough clear space around you to use the scalpel or knife safely and never cut in the direction of another person.

### **Safe Use or Operation:**

- To prevent and avoid injury always use a “Safe T Cut” straight edge where possible.
- Whenever possible use a cutting mat on the surface to prevent damage occurring to benchtops and working surfaces.
- Always keep your free hand (or any other parts of the body) away from the line of the cut.
- When cutting or scouring ANY material make several light passes rather than one heavy cut, as it is when making heavy cuts that the blade is liable to break or cause injury.
- Always draw the blade towards you rather than push away, as you have more control over the cutting operation and the blade is far less likely to cut you if it breaks.
- When using the scalpel or knife against a “Safe-T-Cut” straight-edge, ruler or square, ensure that the edge is of suitable thickness and that the blade does not jump or skip the edge easily.
- Scalpel / Stanley knives are brittle so never use them in situations where a side load is applied, eg opening a paint tin etc.
- Always use sharp blades. dull or blunt blades require more force to cut resulting in possible breakage.
- Keep your Scalpel / knife clean and dry to prevent slippage and ensure controlled use.
- Never use a scalpel or knife for any other purpose other than cutting in the prescribed manner.

### **Changing Blades.**

- Carefully remove all old or blunt blades and dispose of carefully in the supplied “Sharps Container”. Speak to the technician if you require assistance.

## HAND SAWS

The table below shows some of the common types of hand saws found in the WaM workshop and their applications. It is important to select the correct saw for the type of cutting you require.

	<p><b>Crosscut Saws:</b> are very common handsaws for manually cutting wood across the grain. Each cutting tooth is angled to cut with one edge and push sawdust out with the other. Their blades contain 8 to 15 TPI.</p>
	<p><b>Back (Mitre) Saws:</b> are small handsaws useful for woodworking projects for cutting joints or grooves in wood. The blade is rectangular, 8 to 14 inches in length, with a metal-reinforced back edge to keep it from bending while cutting. Their blades contain 11 to 20 TPI and cut similar to crosscut saws.</p>
	<p><b>Japanese Saws:</b> are an accurate type of woodworking saw that <u>cut on the pull stroke</u>. As a result the blade cuts under tension and can be thinner with a finer kerf and is more efficient. They can be rigid back saws or more flexible such as a flush cut saw.</p>
	<p><b>Coping Saws:</b> are used to make curved cuts on thinner materials. They use a very thin metal blade with a U-shaped frame and wood or plastic handle to make turning cuts on wood, plastic, or metal depending on the selected blade. Blades usually have 12 to 15 TPI, but coarser and finer blades are available for specialized applications.</p>

	<p><b>Flush Cut Saws:</b> are double edged tools designed for trimming the ends of dowels, tenons, and other protrusions flush with the surface. The blade bends to lay flat on the flush surface and its teeth are angled upwards to prevent surface marring. The blade is about 6 inches long and usually has 11 TPI on one side and 20 TPI on the other for versatility.</p>
	<p><b>Hacksaws:</b> are used primarily for cutting plastic and metal pipes and other small household materials. Hacksaws utilize the same U-shaped frame structure as coping saws, and some models include adjustable frames to accommodate blade sizes from 8 to 12 inches. They have 14, 18, 24, or 32 TPI depending on the application needs.</p>

### Safety Considerations:

- Always carry a saw by its handle with the point and/or cutting edge facing down
- Select the right saw for the job! Think of the material type, size and the TPI required.
- Inspect saw prior to use. Do not use damaged or blunt saws.
- Inspect material for imbedded objects such as nails that may damage the saw.
- Secure work firmly wherever possible with clamps or vices.
- Ensure your cutting line is clearly marked. Measure twice – cut once!
- Start cut slowly and gently guide the saw blade to prevent jumping until cut is started.

## HAMMERS AND MALLETS

Hammers and mallets are common handheld tools intended to deliver impact force to an object with linear direction. They can deliver accurate blows to the head of a fastener, such as a nail, join or forge malleable metal components or chisel/degrade objects.

The main difference between hammers and mallets is the construction of the hammer head and its intended application.

**Hammer heads** are almost universally steel. The hammers mass is concentrated in the strike zone to impart as much force as possible.

**Mallet heads** are composed of rubber, wood, copper, or plastic. The mass of the mallet head is distributed evenly throughout, meaning that mallets are intended to forge or alter the shape and appearance of materials. They impart a mild-to-moderate force to the workpiece.

	<p><b>Claw Hammer:</b> a common and universal style carpentry hammer used for driving in nails. The claw can be used to lever out fasteners (nails) and also be used like a pry bar for leverage in dismantling objects and works.</p>
	<p><b>Ball Peen Hammer:</b> a common metal working hammer used for driving punches with the flat head or using the rounded (peen) head for rounding off rivet heads etc. Also a general purpose hammer.</p>
	<p><b>Wooden Mallet:</b> used in woodwork for gently knocking timber pieces or joints together or driving in dowels. The wooden head will not damage or mark other timbers like a metal hammer. Also commonly used for hitting chisels as they will not damage the chisel handle.</p>

 <small>www.eifaco.com.au</small>	<p><b>Rubber Mallet:</b> Used for driving chisels in woodworking much like a wooden mallet. Also a general purpose mallet used for assembly where damage or marking of the work is not desirable.</p>
	<p><b>Sledge Hammer:</b> heavy metal head hammers designed for delivering strong blows for demolition such as knocking down brick walls or breaking up concrete or large moulds.</p>

## CHISELS

Chisels found in the WaM workshop are primarily used for woodwork and are ideal for shaping or removing wood in applications such as timber joining.



### Before you start:

- Always ensure the chisel is in good condition and the cutting edge is sharp. Blunt chisels and gouges require far more pressure and force to remove material and thereby the possibility for accidents is far more prevalent.
- Always check that the handle of the chisel or gouge is not loose, split or damaged.
- Report blunt or damaged chisels to the lecturer or workshop technician immediately.
- Never carry a chisel or gouge in your pocket.

- When moving around the workshop ALWAYS keep the sharp end of the chisel pointed towards the ground.

### Safe Use of Chisels:

- Always wear safety goggles or a face shield when using a chisel or gouge
- Always ensure the work that the chisel is to be used on is firmly located in place by a bench vice or clamp.
- Make sure you have enough clear space around you to use the chisel or gouge safely and never cut in, or in the direction of a walkway.
- Always use the chisel or gouge to cut outward or away-from your body.
- ONLY strike chisels with a wooden/rubber mallet or soft face hammer.
- When striking a chisel with a hammer ensure that you hit the struck face of the chisel squarely with the hammer face.

## FILES AND RASPS

Files and rasps are useful hand tools often used in finishing or shaping processes as they generally remove 'fine' amounts of material from a workpiece. They can be used for woodwork or metal work and in some cases for other materials. It is important to only use files and rasps found in the wood workshop on timber. Similarly, those found in the metal workshop are for metal use only.

	<p>Files are ideal for removing burs and sharp edges after cutting processes or shaping metal materials and enlarging holes. They come in rectangular, round and half round styles and in numerous sizes. Coarser teeth "bastard" files remove material faster, while finer teeth "smooth" files are used for finishing.</p>
	<p>Rasps are distinguished by much coarser teeth than files and are generally used for woodwork. They also come in numerous shapes and sizes. The coarser the teeth the more material it will remove.</p>



Surforms are similar to rasps as they have coarse cutting teeth for removing large amounts of material and are ideal for shaping sculptures etc. They can be used on timber, foam, rubber and plastics also.

### **Safe Use of Files and Rasps:**

- Ensure the file is not damaged and that the handle is securely attached to the tang of the file or rasp.
- Be sure to select the correct file/rasp for the job.
- Always ensure the work that the file is to be used on is firmly located in place by a bench vice or clamp.
- Always hold firmly with both hands. One on the handle and the other guiding the tip of the file in your fingers.
- Apply pressure on the forward stroke only and gently lift and return.

## CLAMPS AND VICES

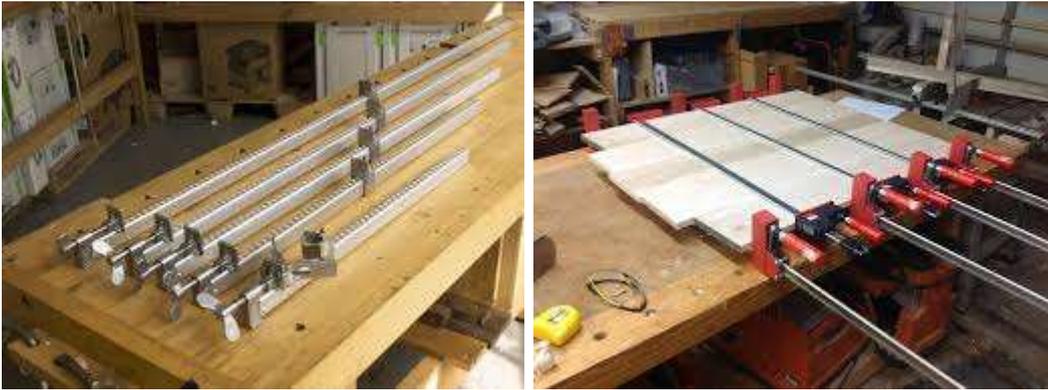
Clamps and vices will be one of the most useful tools to you in the workshop and should not be underestimated. They will be your extra set of hands, save you time, ensure quality of work and most importantly be essential for safety when using other tools. Take the extra time to set up your workpiece properly. Don't take short cuts and rush.



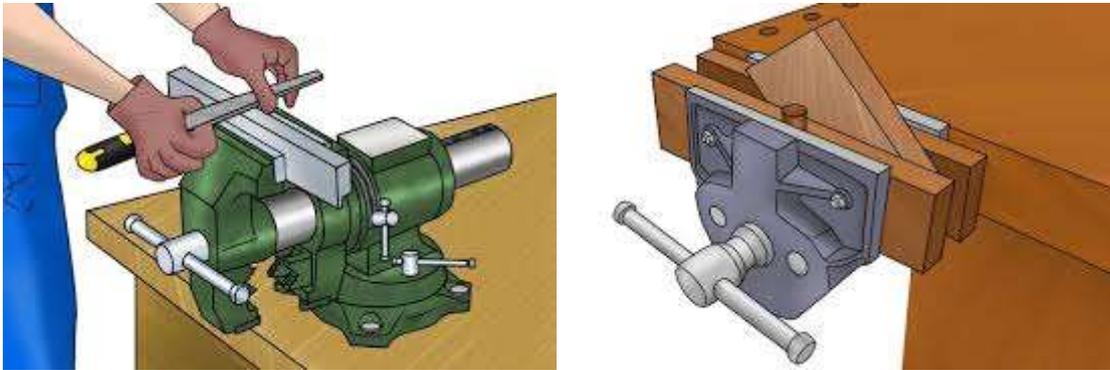
Quickgrips are extremely versatile and easy to use to hold your workpiece to a bench or hold multiple pieces of material together. Ideal for assembly of projects and holding material while you use a cordless drill to drill holes, etc. The soft jaws won't mark or damage most timber.



Metal G – Clamps can be used similar to quickgrips but require a little more dexterity to do up in place but can be tightened to clamp much firmer. Ideal for clamping work to be glued together or for securing work to a drill press. Be sure to use packing timber to protect your work from the metal clamp.



Large Bar clamps are ideal for glueing pieces of timber together to make large pieces of work such as table tops.



Vices are located on many workbenches throughout the WaM workshop. They are ideal for firmly holding your work in place while you use other tools to modify the workpiece. Be aware that some vices have metal jaws and will mark or damage timbers.