WOODWORK HAND TOOLS

Tools are needed to work on wood. The production of good wood products or jobs is made possible by good and functional tools. Tools can be hand tools or power tools. Hand tools are those used without electricity. Power tools are operated with electricity. Woodwork hand tools are classified into the following: measuring, setting and marking out, driving, boring, and cutting tools. To work efficiently with these tools holding and supporting devices are also needed.

Measuring Tools

Metric Ruler. This is usually made of wood or steel. It can also be made of plastic. It comes indifferent lengths such as 150mm and 300mm. Some rulers can be folded. All rulers have a straight edge and are calibrated. Rulers are used to measure lengths, widths, or breadths or objects.

Callipers. There are three types of callipers. They are inside callipers, outside callipers and odd-leg callipers.

- Inside callipers are used to measure the inside diameter of a hole. They measure the inside dimensions of any object within their capacity.
- Outside callipers measure the outside dimensions of any object within their capacity.
- Odd leg callipers are used for centring. In other words, they are used in locating the centre of bars and in taking distances from the edges of holes.
- Dividers are two-legged steel instruments used for scribing arcs, circles, curves and for setting off distances. They are made in various sizes. Dividers may be spring loaded at the upper part with a fine adjustment screw or firmly joined at the head.

Setting and Marking Out Tools

Try Square. The try square is a marking out tool, made of a stock and a blade fixed at right angles to each other. It is used for checking the square-ness of edges. It is also used to mark out straight lines at right angles to a given edge.

Sliding Bevel. This is made up of a steel blade and a wooden stock. It can be adjusted and set to any angle. It is used to mark out lines that cross at an angle to check bevels.

Mitre Square. The mitre square is made up of a steel blade and a wooden stock fixed at 45° to each other. It is used for setting out and checking angles of 45° and 135°.

Compasses. They are made of steel. These are used for scribing circles and arcs and marking out distances.

Trammels. Trammels are made of a combination of both wood and metal. They are used for marking out large diameters where compasses cannot serve.

The Marking Gauge. The marking gauge is made of wood and a metal printer. It is used to mark off lengths by the action of its nail or iron pin. It is adjustable.

Driving Tools

Hammers, screwdrivers and punches are classified as driving tools. They are used for driving in or driving out nails and other objects.

Hammers. Hammer is one of the most commonly used of all hand tools. It consists of a metal head and a wooden or rubber handle. There are many types of head shapes with a common striking face and special pein for riveting. The head is hardened and tempered. The common types of hammer are ball pein, cross pein, straight pein, blocking head and planishing head. There is also the claw hammer that has claws for

extracting nails. Hammers should be firmly gripped at the handle to avoid slipping off and to make striking easier.

Mallets. Steel head hammers may be too strong for certain types of work. To avoid damage to the work, soft-faced hammer are used. Soft faced hammer are generally called *mallets*. The faces of mallets are made of lead, copper, raw hide, wood, plastic or rubber. Mallets should be treated with care since they are not as strong as steel-head hammers. This is to avoid damage.

Screwdrivers. A screwdriver consists of a metal and a handle. The handle may be made of wood, plastic or rubber. Screwdrivers are made in different forms, sizes and shapes. They are used for fixing or removing screws with slotted heads. The common types of screwdrivers are flat screwdriver, star screwdrivers (or Philips-head screwdrivers), offset screwdrivers and Allen screwdrivers (or Allen Key). The star screwdriver is used for driving in or out screws with star heads. The offset screwdriver is used where the straight or flat screwdriver cannot be used. Allen screwdriver is used on screws with hexagonal or square slotted heads.

Punches. Punches are made from tool steel that is hardened. There are three types of punches. The dot punch point is ground at 60^{o} inclined angle while the centre punch is 90^{o}. The dot punch is used in marking out jobs. For striking small dots on scribed lines. It is also used for locating hole-centres for drilling operations. The centre punch is used in enlarging points before drilling. The pin punch is used for driving out tapered pins, rivets, cotters, etc.

Boring Tools

Boring tools are tools used for making holes on wood. The major types are the ratchet brace, the wheel brace, the bits, twist drills, the bradawl and gimlets.

The Brace. The brace is a tool used for holding and turning the drill bits or twist drill when boring a whole. There are two types of brace. They are the plain brace and the ratchet brace. The brace has four main parts,

namely the head, crank, and ratchet. The head is a block of hardwood shaped to fit the hand. Other parts of it are made of metal. The ratchet is a mechanical device fitted to the brace so that holes can be bored in confined places such as close corners where it is not possible to make a complete sweep of the crank. The ratchet may be set to allow the bit to rotate in one direction, either on the forward or return stroke.

The Wheel Brace. The wheel brace functions in the same way as the ratchet brace. It can be fitted with any of the drills' bit and twists. The wheel brace makes the task of boring holes easier. A large number of holes can be bored without exhaustion.

Gimlets and Bradawls. Gimlets and bradawls perform the same function. They are used manually to bore holes before inserting screws and nails. They are most useful when the wood is hard. A screw would be difficult to drive in without the aid of an initial small hole. To be effective, the holes made with the gimlet or bradawl should be smaller in diameter than the size of the nail or screw.

Holding Devices

Holding devices are provisions and tools used to hold work pieces on the bench. Workbenches are usually designed to be about 2.0 metres long, 0.8 metres high and 0.9 metres wide. The centre of the bench is made lower to create a depth for keeping hand tools while working. This depth is called a well. It runs from one end to the other. Hand tools in use, such as planes, measuring tools, saws and gauges are kept in the well. Tools which are not being used are kept away from the bench. Other bench appliances include the vice and bench hook.

The Bench Vice. The bench vice is fixed to the side of the bench. It is used for clamping wood in place before working on it. It is made of cast iron. The bench vice has a release lever, which allows quick adjustment and grip.

Bench Hook. This is used for holding jobs during cutting and chiselling on the bench. It is made up of two pieces of planed wood fixed on the workbench.

Clamps. Clamps unlike the well, bench vice and hook are not permanently fixed on the bench. The three main types of clamp are G-clamp, F-clamp, and sash-clamp. All clamps are made of metal.

- G-clamp: this is called the G-clamp because of its shape is like letter 'G.' It is advisable to place scrap of wood between the jaws and work to prevent making marks on the work. It is used for holding smaller work pieces together when assembling or gluing
- The Sash clamp: the sash clamp is larger than the G-clamp. It is used for holding or clamping wood tightly together when assembling or gluing work. Also, when using the sash clamp, a piece of wood should be placed between the jaws of the clamp and the job being worked on to avoid making marks on the job.
- The F-clamp: This is so called because it is shaped like letter 'F.' It is used just like the G-clamp. It has a quick action adjustment.

Cutting Tools

Saws. Saws are cutting tools made of high quality tool steel. The teeth of saws are set alternatively left and right to allow for clearance. There are different types of saws designed to perform different jobs. These are the rip saw, cross-cut saw, tenon saw, bow saw, dovetail saw, coping saw and fret saw.

Planes. Planes are cutting tools used for plaining wood to a smooth and fine finish. The cutting edge is made of metal, while the body may be made of metal or wood. Planes are gripped with one hand and guided with the other hand for smooth operations. The common planes used in woodwork are the jack plane, fore plane, smoothing plane, trying plane and spoke shave.

Chisel. A chisel is a chipping tool made from carbon steel. It is used for shaping wood where finishing by other means, such as filing can be carried out. There are basically four types of chisels. These are the flat nose, round-nose, crosscut and diamond nose chisels.

Care of Hand Tools

Hand tools need to be properly cared for and stored well for future use. Here are some guidelines:

1. Always use the right tool for the right operation. Using the wrong tool can damage the tool and work. It can also lead to an accident.
2. Clean the tools after use and store very well. They should be stored in a tool rack if one is available.
3. Store them in an orderly manner. Arrange tools in proper order to make it easy to pick them for use in future.
4. Store tools away from pathways so that they do not cause obstruction to free movement.
5. Do not keep tools in a damp place as this will make them to spoil fast.