

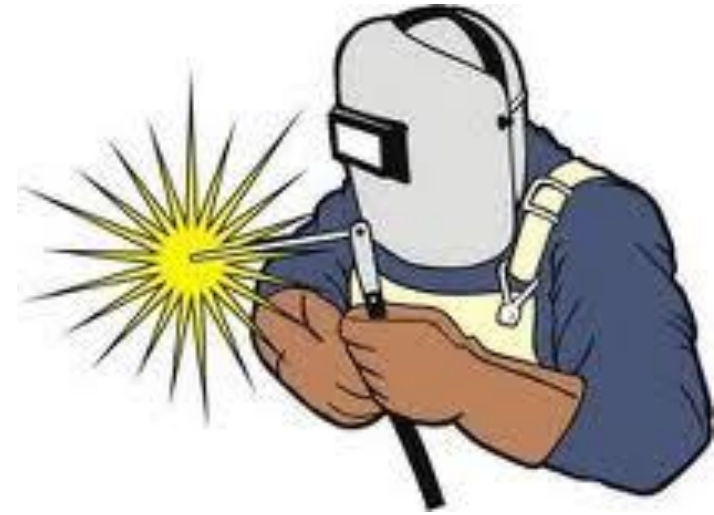
Choose a material



Wood



Plastic



Metal

Press this symbol



at any point to return to the menu page.



Permanent

Temporary



Frames



- [Mitre](#)
- [Dowel](#)
- [Mortise and tenon](#)
- [Halving](#)
- [Bridle joint](#)

Boxes



- [Butt](#)
- [Lap](#)
- [Rebate / Housing.](#)
- [Dovetail](#)
- [Finger / Comb](#)

Adhesives



- [Adhesives guide](#)
- [Other measures](#)



Mitre Joints



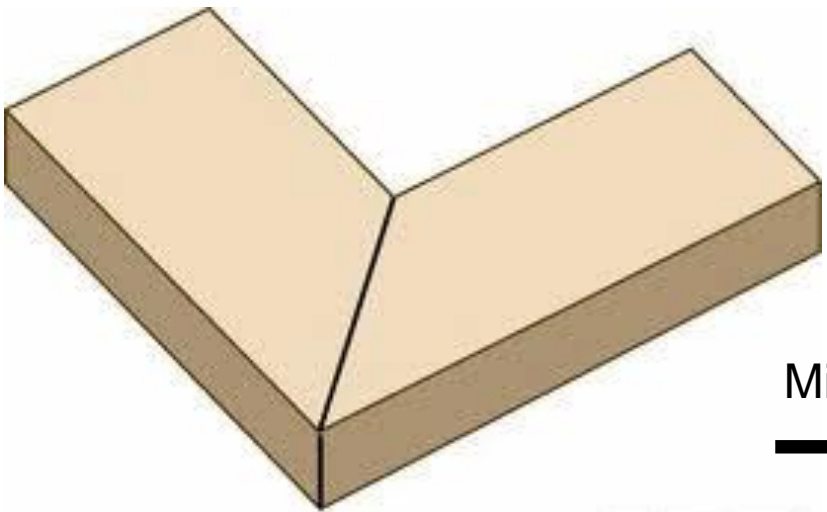
Quick adhesive



Mitre block



45 degree cut

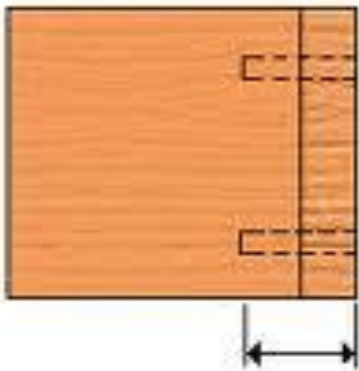
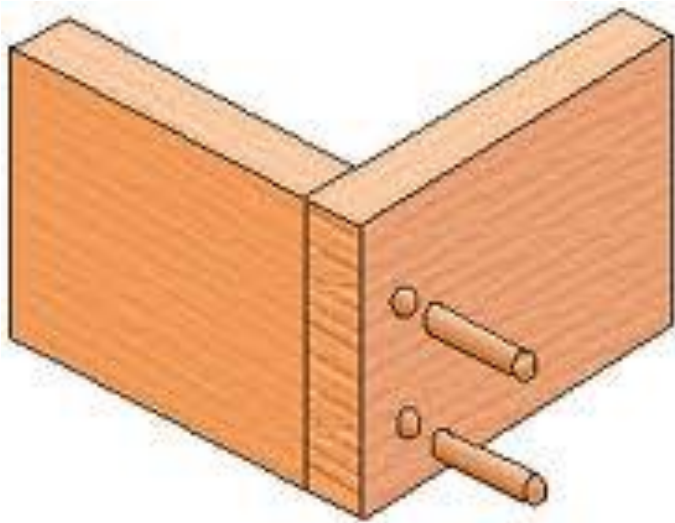


Mitre Square



Dowell Joint

A dowel joint is a butt joint reinforced with wooden pegs.

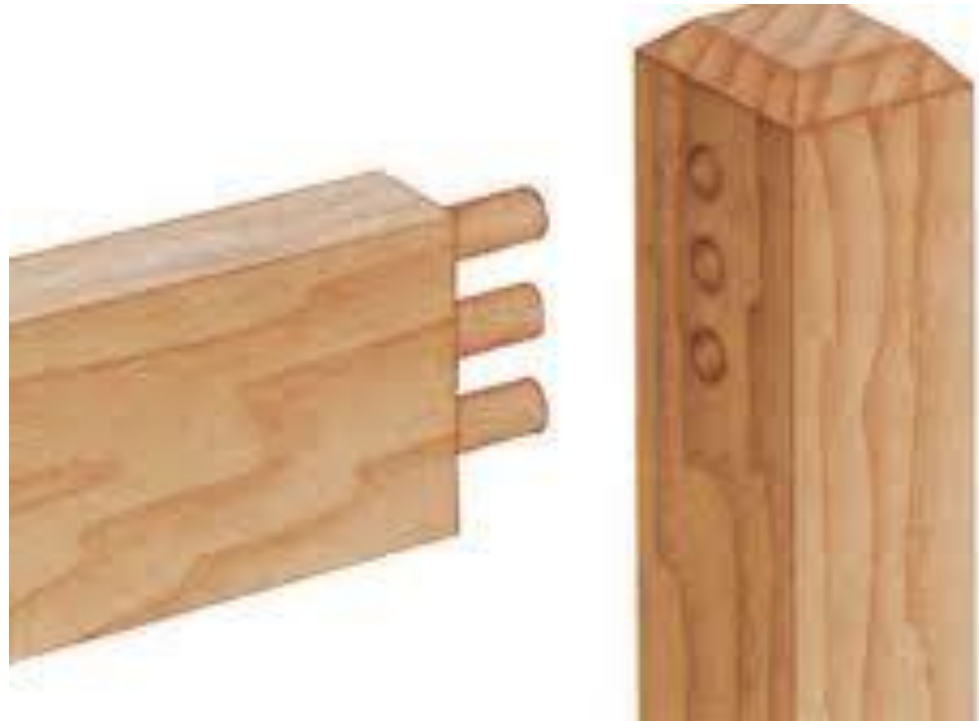


Pros:

- Neat joint
- Simple joint
- Strong if the correct glue is applied

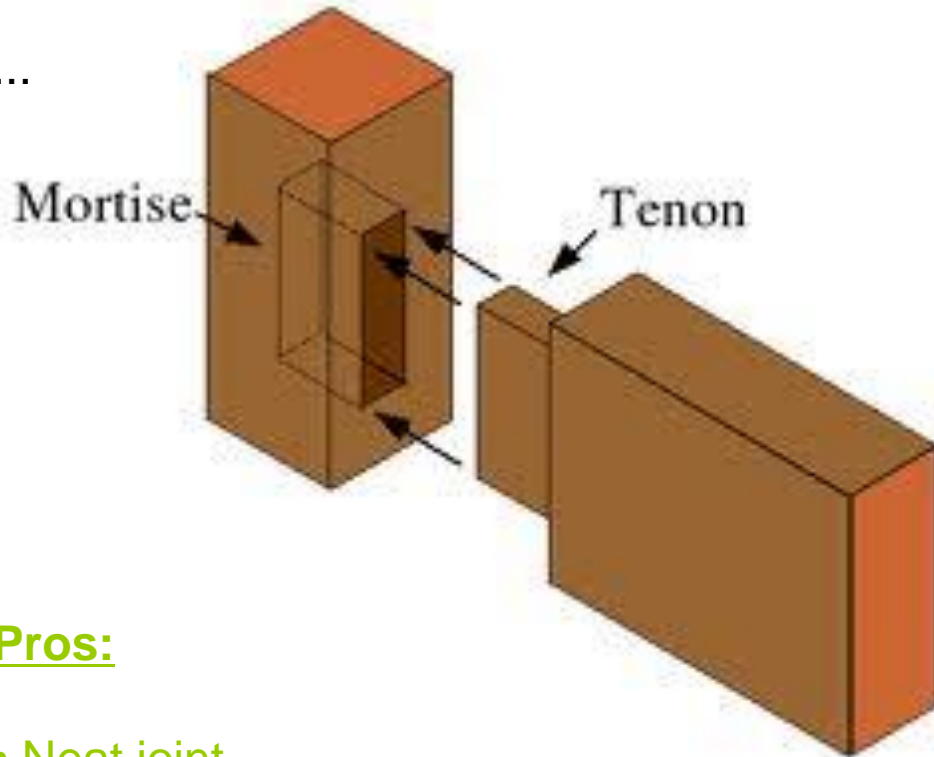
Cons:

- You have to be accurate when drilling the holes



Mortise and tenon

...



Pros:

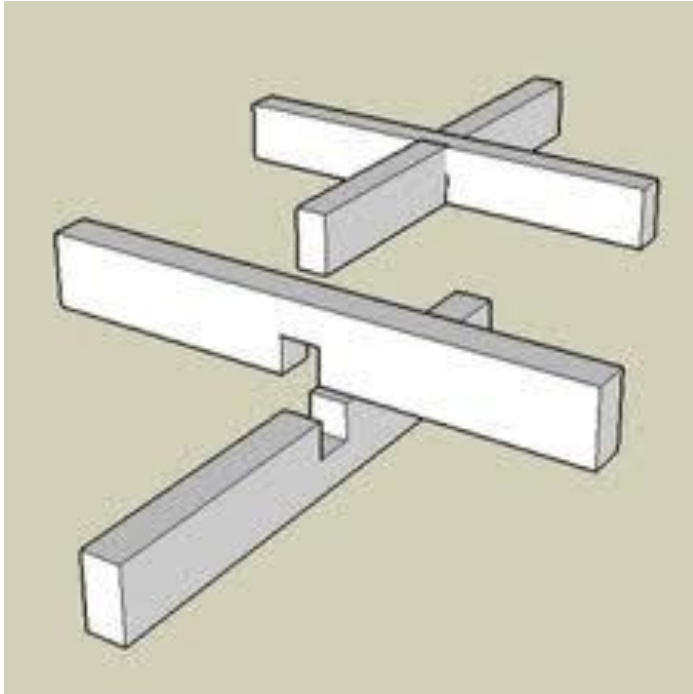
- Neat joint
- Strong, rigid joint due to large gluing area
- Most of the joint is hidden

Cons:

- Difficult to cut the joints
- Poor resistance to tension



Halving joint



Pros:

- Relatively easy to make with hand tools
- Large drying area
- Reasonably strong

Cons:

- Not as strong or as durable as mortise and tenon or dovetailed joints.



Butt Joint

Pros:

- Easy to make
- Easy to use

Cons:

- Basic and weakest wooden joint
- Only glue holding the wood together



Edge to Edge



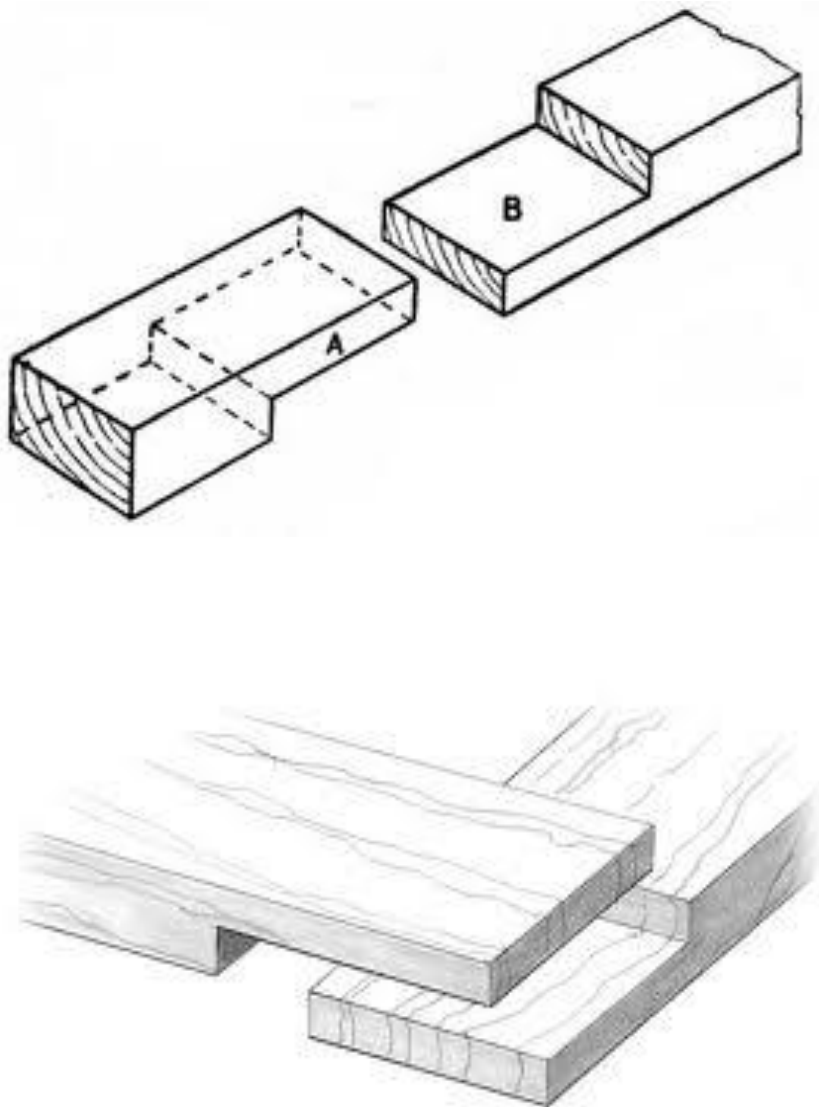
End to Edge



Edge to Face

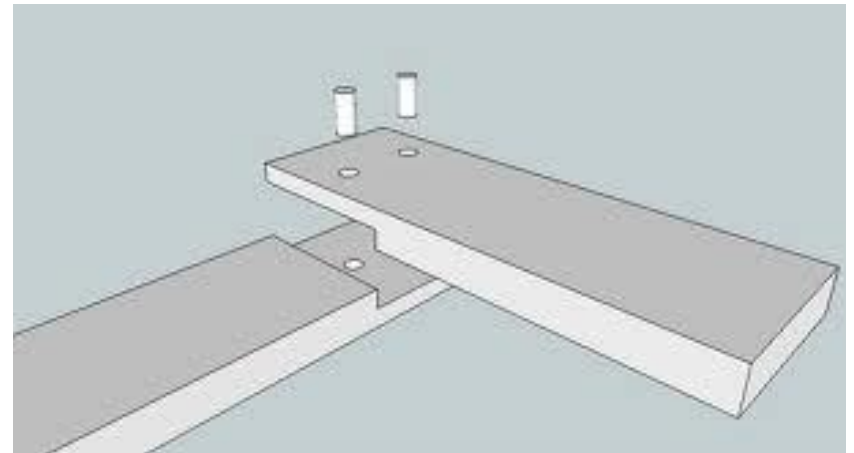


Lap Joint



Pros:

- Easy to make
- Easy to use
- Large gluing area
- Available in a few varieties
- Can be strengthened with dowels

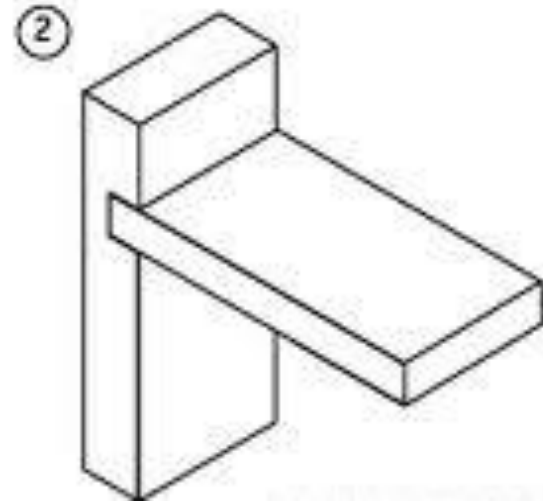
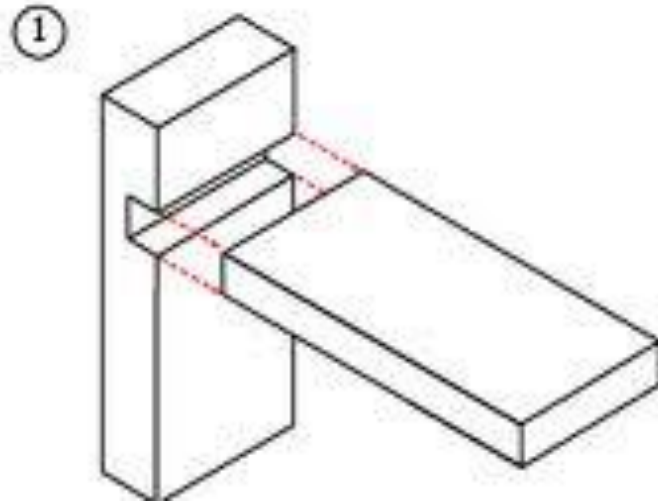


Cons:

- Weak joint
- Can be broken quite easily

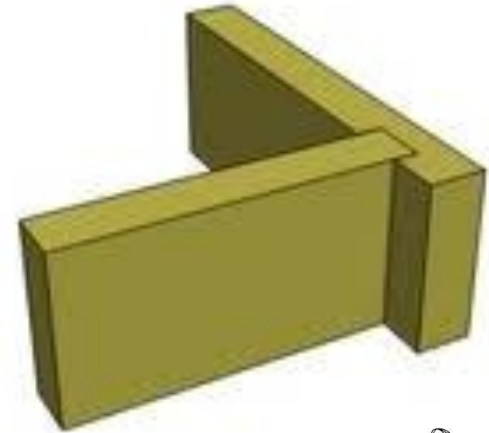
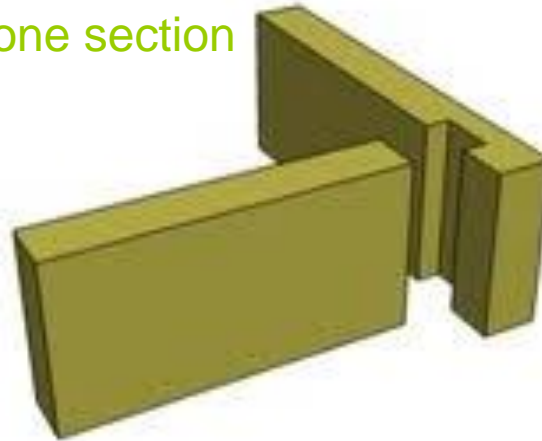


Rebate / Housing Joint



Pros:

- Easy to make – you only make one section
- Strong joint



Cons:

- Accuracy is essential as it's related to strength



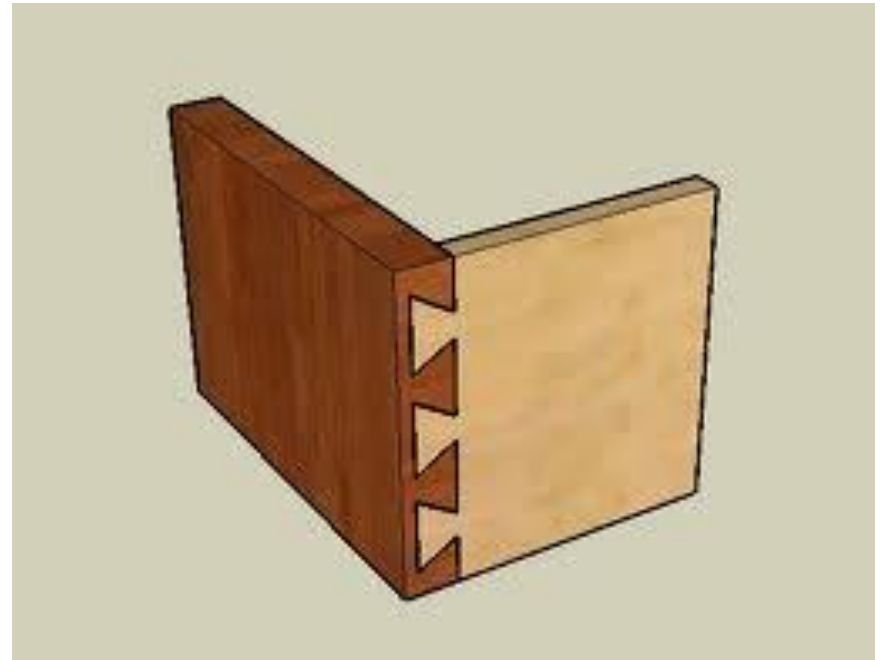
Dovetail Joint

Pros:

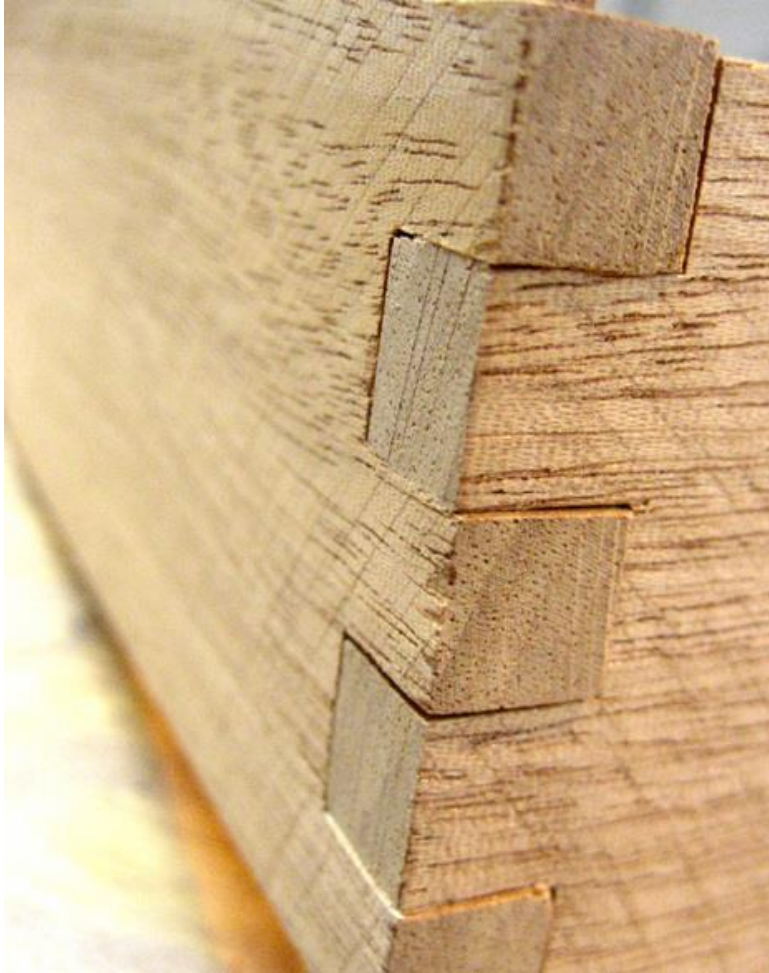
- Strongest of all joints
- Large gluing area
- Interlocking joint
- If done accurately glue is not required
- Attractive appearance

Cons:

- Time consuming to produce
- Joints have to be effectively done to be useful



Comb Joint



Pros:

- Easy to make
- More surface area for gluing
- Strong joint
- Used for many applications
- Nice appearance

Cons:

- Joints have to be accurate to be useful
- Time consuming due to amount of joints

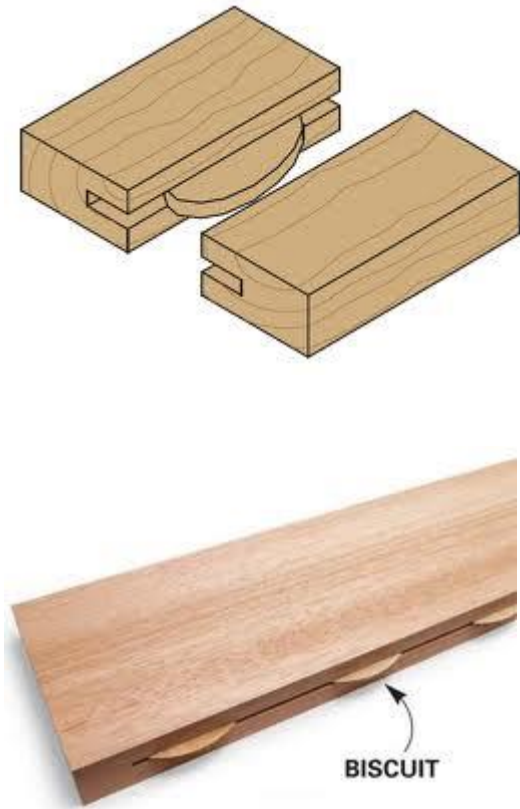


Quick guide to adhesives

	Fabric	Plastics	Metals	Woods
Woods	PVA	Contact Adhesive	Contact Adhesive	PVA or Synthetic resin
Metals	Contact Adhesive	Contact Adhesive	Epoxy Resin	Contact Adhesive
Plastics	Contact Adhesive	Solvent Cement	Epoxy Resin	Contact Adhesive
Fabric	Latex Adhesive	Contact Adhesive	Contact Adhesive	PVA



Biscuit joints



Biscuit are used to strengthen joints, they are concealed within other joints

Nails

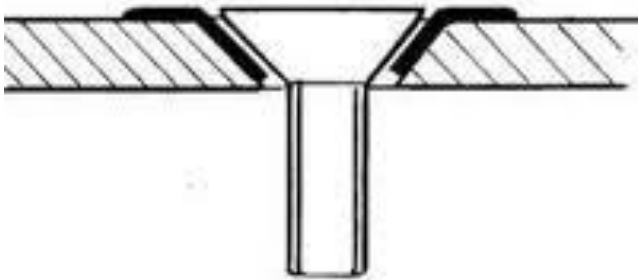


Nails are used in conjunction with Joints such as butt joints to strengthen the joints



Types of wood screws

Counter sunk screws:



These are added for additional strength. they are countersunk to so they can be disguised

Round head screw



These are used for decoration purposes

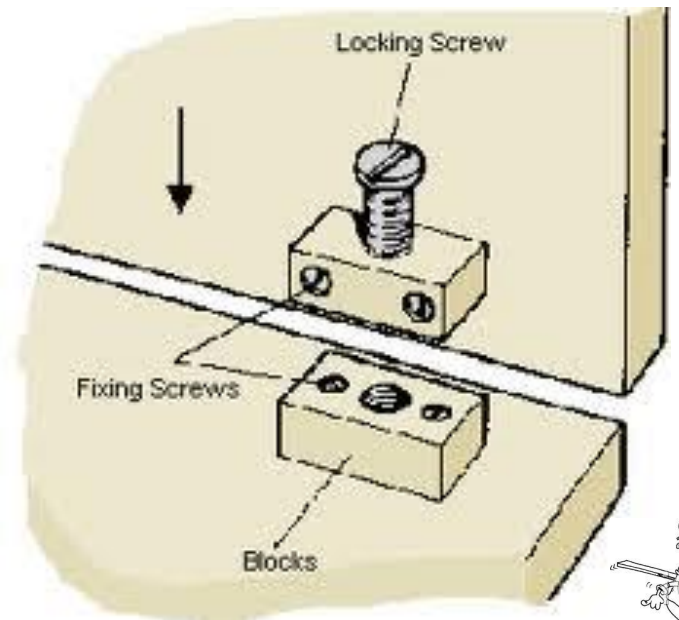
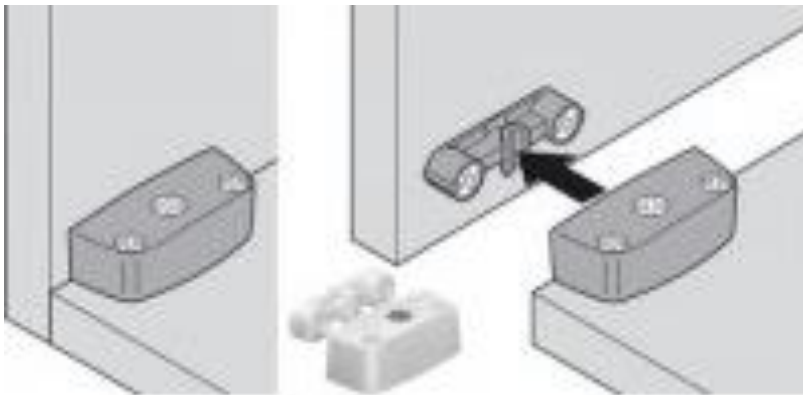
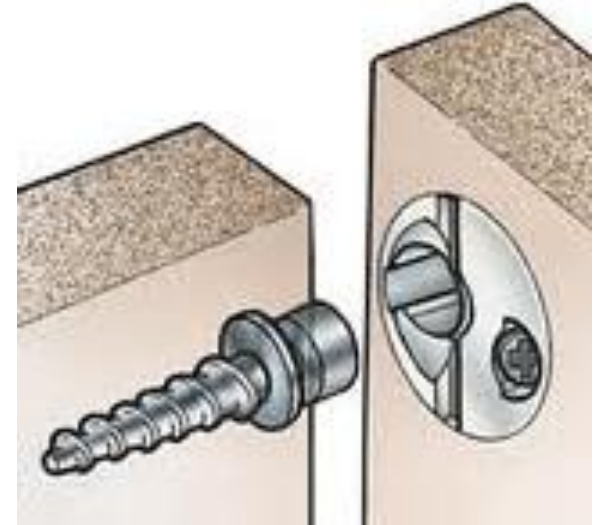
They can be capped for appearance



Knock down fittings (KDF)

K.D.Fs are basically alternative methods of attaching materials.

Their biggest asset is that they can be undone and materials will come apart



End of topic related to wood

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Joining Techniques



Plastic



Permanent

Temporary



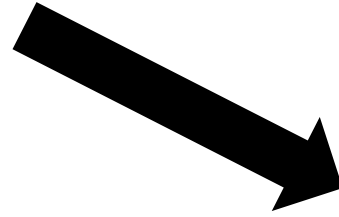
How many
types of
adhesives
can you
name



Permanent methods of joining



Contact adhesives



Epoxy resin



Liquid solvent cement



Tensol cement



Quick guide to adhesives

	Fabric	Plastics	Metals	Woods
Woods	PVA	Contact Adhesive	Contact Adhesive	PVA or Synthetic resin
Metals	Contact Adhesive	Contact Adhesive	Epoxy Resin	Contact Adhesive
Plastics	Contact Adhesive	Solvent Cement	Epoxy Resin	Contact Adhesive
Fabric	Latex Adhesive	Contact Adhesive	Contact Adhesive	PVA



How many temporary joining techniques can you name?

Nuts and bolts



Self tapping screws



End of topic related to plastic

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Joining Techniques



Metal





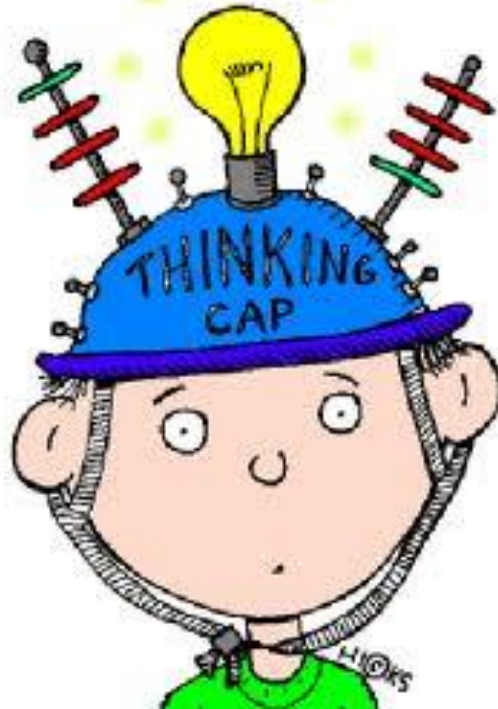
Permanent

Temporary



How many permanent methods of joining metal can you name?

- Pop Rivets
- Rivets
- Welding
- Brazing
- Silver solder
- Epoxy resin



Pop Rivets

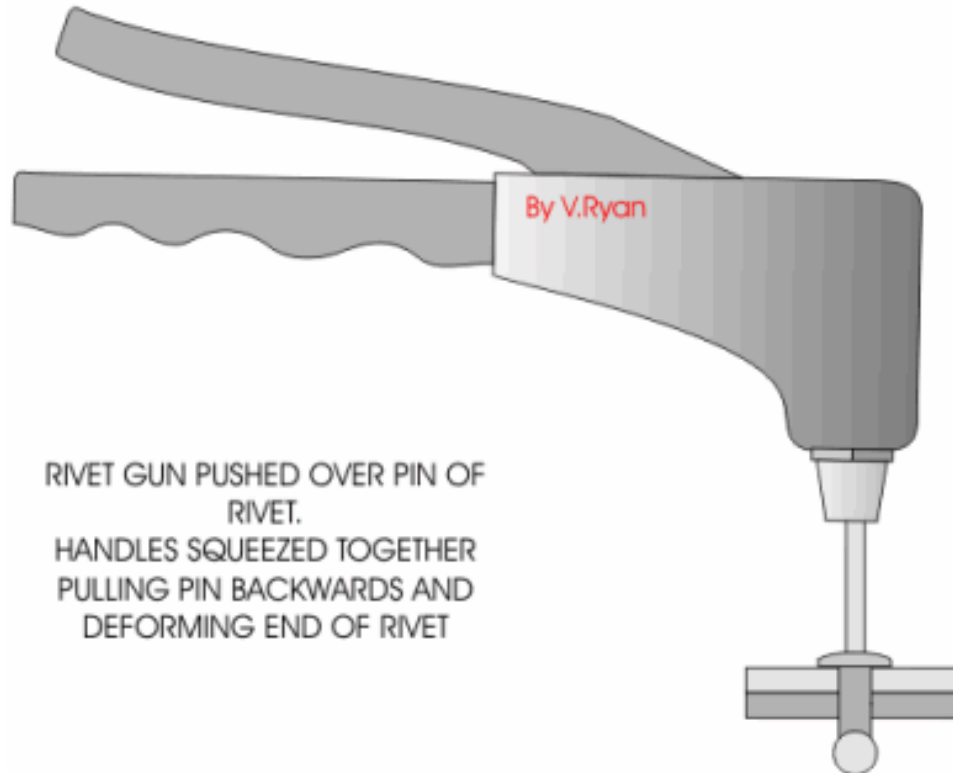
Pop riveting can be used to join sheet metal or Plastic.

Step 1: Drill a hole through the two materials

Step 2: The pop rivet is pushed through the hole

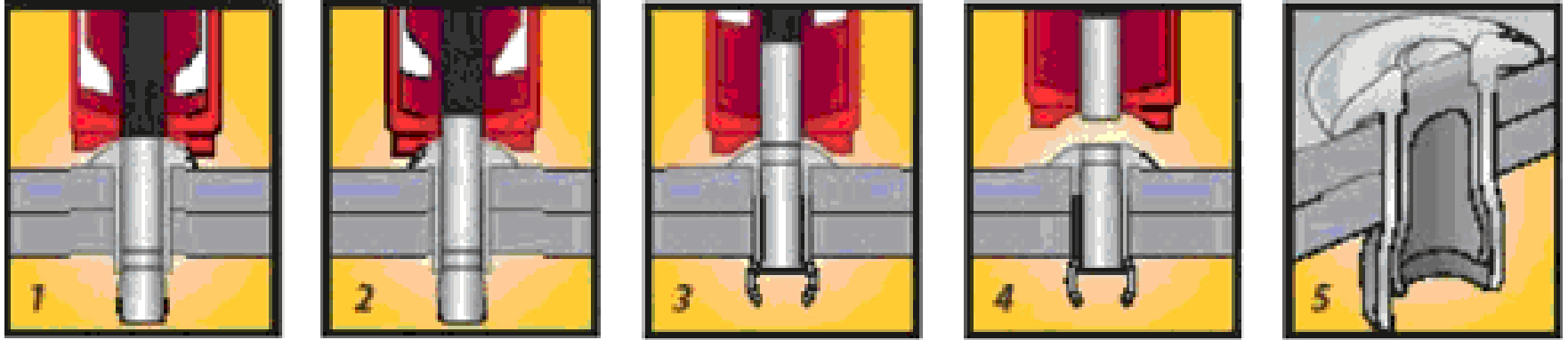
Step 3: Due to the squeezing of the handles on rivet gun the pin head is pulled into the rivet and the end of the rivet expands

Step 4: The motion breaks the pin and leaves the rivet



Rivets

Similar to pop riveting process, although it is a mechanical process and is used to attach two materials together.



Normal uses are on ships and



Welding

Thinking cap time:



What are the two common types of welding



ARC welding

Arc welding uses an electrical arc to melt the work materials as well as filler material called the welding rod for welding joints



ARC welding process

Step by step:

1. Attach a grounding wire to the welding material or other metal surface.
2. Attach another wire (known as an electrode lead) on to the material to be welded.
3. Once that lead is pulled away from the material, an electric arc is generated.
4. The arc then melts the work pieces along with the filler material that helps to join the pieces



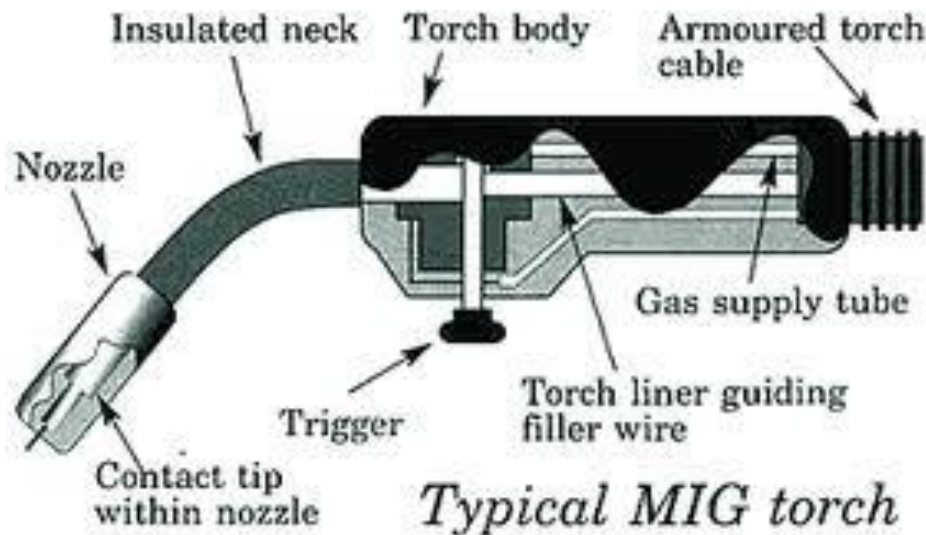
Quality control:

Feeding the filler into the welding joint takes steady hands and an eye for detail. As the rod melts, the welder must continuously feed the filler into the joint using small, steady, back-and-forth motions.

These motions are what gives welds their distinctive appearance. Going too fast or slow, or holding the arc too close or far away from the material can create poor welds.



MIG Welding (metal inert gas)



MIG Welding (metal inert gas)

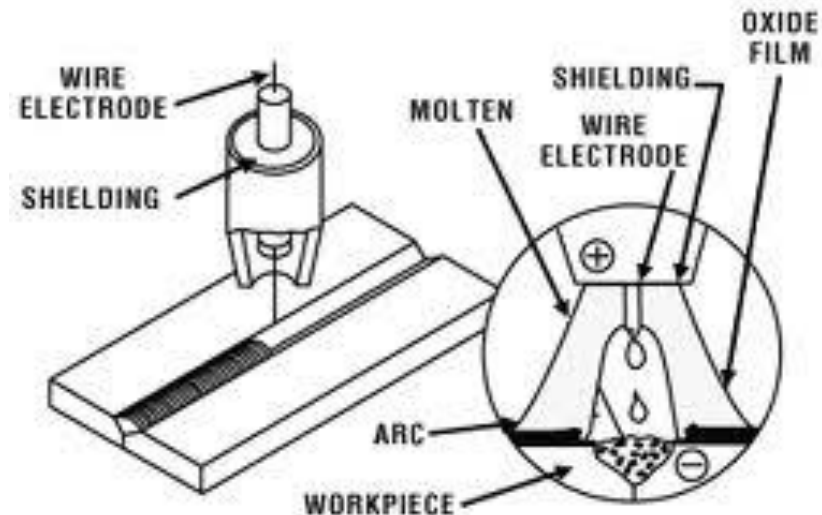
The process:

During MIG welding the electric arc is formed between an internal wire electrode and the work piece metals. which heats the work piece metal(s), causing them to melt, and join.

Along with the wire electrode, a shielding gas is fed through the welding gun, which shields the process from contaminants in the air

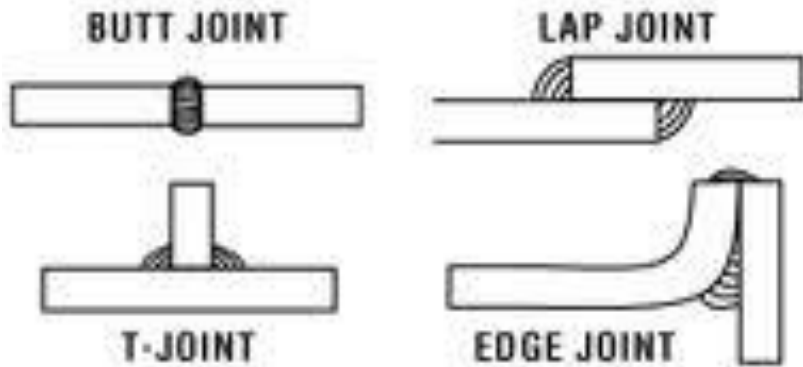
Quality control:

MIG welding is not normally completed Outdoors due to the gas being used and External factors like wind.



Welding

Types of welding joints



Quality control:



Excess material as a result of the welding can be removed via angle grinding or filing

Welding protective equipment



Brazing

Brazing is used to join steel together by melting brazing rods between the two pieces of metal which are to be joined.

The process:

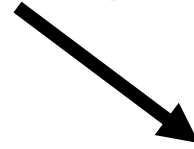
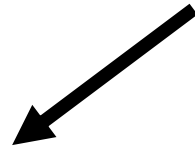
The steel is heated until red-hot and the brazing rod is placed against the join. The brazing rod melts and flows along the join.

Quality control:

Preparation of the two materials is vital. Both surfaces have to be clean to ensure a clean braze. Metal now Brazed is allowed to cool naturally and not quenched.



Soldering



Temperature range 90 to 450 ° C

Temperature range above 450 ° C



Soft soldering:
Electronic circuits
and plumbing



Hard soldering, silver soldering, brazing



Hard soldering is called this because the solder is an alloy of silver, copper and zinc. Several small pieces of the solder are cut and placed along the joint.

First the metal is heated to a dull red colour then a small hot flame is used to melt the solder. Like brazing the solder will flow along the joint.



Epoxy Resin:

An epoxy resin is an adhesive which forms as a result of a chemical reaction between two resins, one of which is a hardener.

A common brand of epoxy resin is Araldite.



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Fabric	Latex Adhesive	Contact Adhesive	Contact Adhesive	PVA



Temporary joining techniques for metal

Self tapping screws



Nuts and bolts



Scan fittings

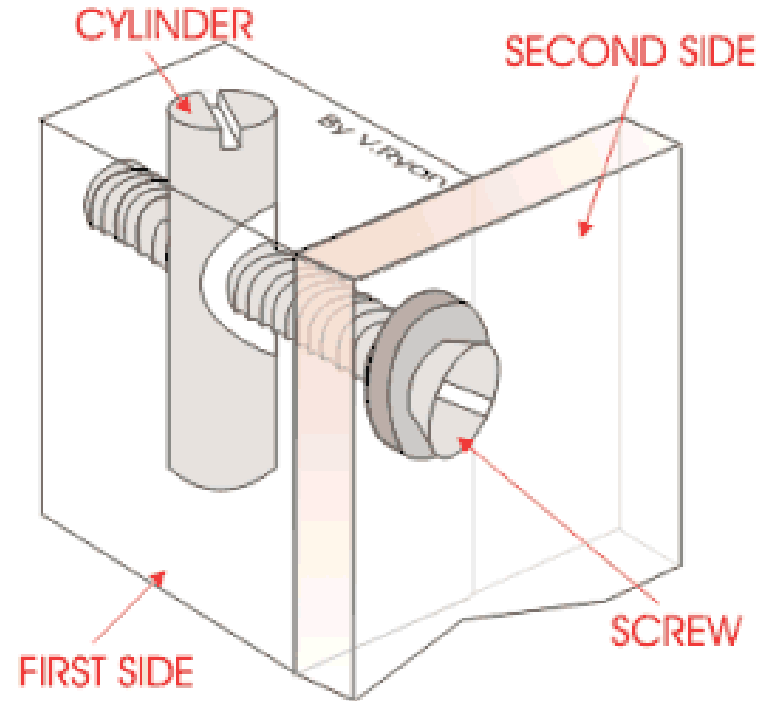
Scan fittings are used to joining frames or the sides of cabinets together.

These are strong enough to be either permanent or temporary joints.

The cylinder is inserted into the first side of a cabinet in a pre-drilled hole.

The screw is then pushed through the hole in the second side until it meets the cylinder.

It can then be tightened with a screw driver until both sides of the cabinet pull together



By V.Ryan

