

JOINING TIMBER

Timber can be joined in different ways. Working in the Timber Product and Furniture Industry, it is important that you have a good understanding of a range of joints and be able to construct them. This is of particular importance when designing a furniture piece.

Joints are an important part of construction in almost any woodworking project and the ability to make sound well-fitting joints is the mark of a good craftsman.

Wood, by its very nature, is fragile to work, easily splits and breaks. Despite this when wood splits it is often not caused by the material itself but through inexperienced handling of the material or inexperienced or careless use of tools.

In joining, as in all woodwork, studying the grain direction and working with it are vitally necessary. It must become common practice to look at the grain in a piece of timber to see how best to work it. It is very important that sharp tools are always used as blunt edges require greater pressure and this can cause fracture or splitting, even when working with the grain.

Although there are many different types and styles of joining timber, performing many different functions, the following **THREE** points are highly important in the successful construction of any timber joint:

1. To ensure accurate assembly of joints, pay particular attention to keeping ends and edges of the timber square as well as keeping the faces and edges true.
2. All joints are secured by nails, screws or glue or by a combination of these. Always pre-drill holes for screws, and in timber that tends to split, e.g. cypress pine, do the same for nails.
3. Hardened glue will quickly dull the cutting edges of tools used in final cleaning off, so wipe surplus from joints with a wet cloth before the glue sets.

Joints are classified under three broad headings according to their application:

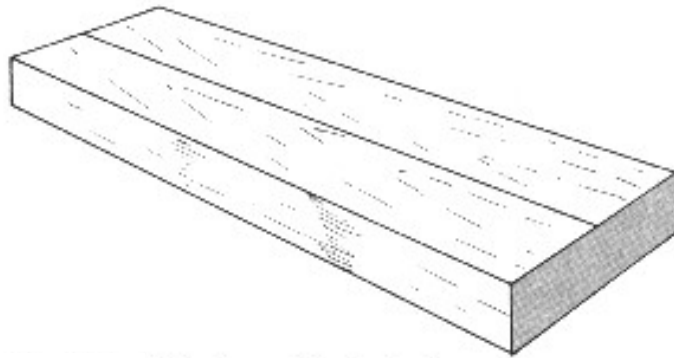
Widening Joints

Framing Joints

Carcase Joints

Widening Joints

Boards joined edge to edge are said to be joined by 'widening joints'. The most common form of widening joint is the plain butt and glued joint.

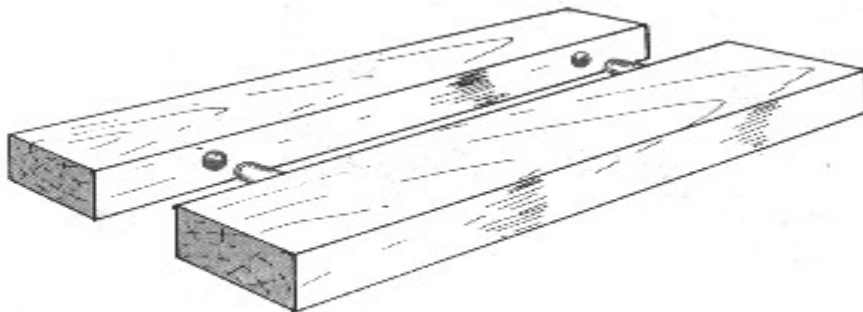


Plain butt widening joint.

Other types of widening joints include: dowelled butt joints, tongue and groove, rebate, groove and feather, and biscuit. In all of these shaped widening joints the aim is to increase the gluing area and accurately position the various pieces.

dowelled butt

Dowel jointing is a simple method of joining boards to form a solid timber top. Dowels are positioned at 150mm to 200mm intervals along the length of the boards.



The direction of the growth rings should be alternated when wide boards are

joined because if there is movement in the timber the growth rings will tend to straighten out causing the boards to cup. When the growth rings are alternated the movement of one board is generally counteracted by the movement of the next board.

Dowel holes should be drilled with a dowel bit.



Dowel Bit

A dowelling jig can be used with a portable power drill to ensure that dowel holes are accurate. In a furniture factory a horizontal boring machine would usually be used.

Using the knowledge obtained from this document answer the following questions (in full sentences).

1. From your experience constructing the dowelled butt joint, explain why it is important to ensure that the edges that are to be joined are true?

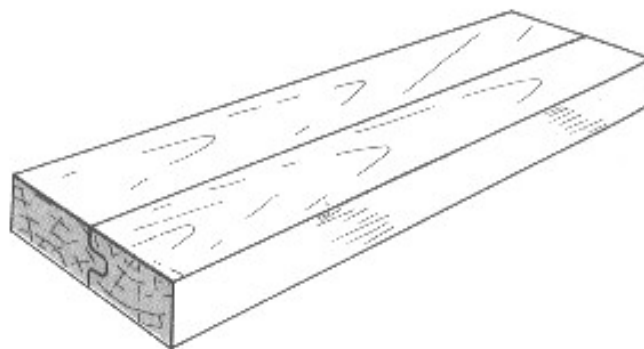
2. How do you prevent the joined timber from cupping?

3. Why is it so important to ensure that the dowel holes are drilled accurately?

4. In a timber furniture factory how would this joint be constructed?

Tongue And Groove joints

Tongue and groove widening joints can be constructed by hand but are often constructed with pre-milled timber. The 'tongue' is a protruding lip of timber that sticks out along the edge of the board. The tongue is designed to fit into a matching 'groove' cut into the corresponding edge of another board. Tongue and groove joints can be used without glue when constructing the backs of furniture but when being used as a widening joint should always be glued. The tongue and groove increases the gluing area and strength of the joint.



Tongued and grooved joint.



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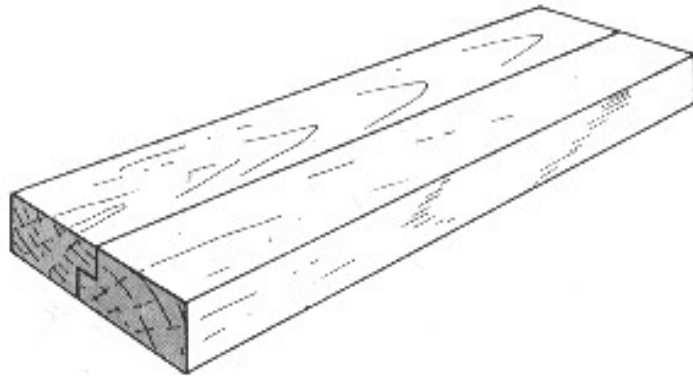
1. Explain why tongue and groove timber is often used in flooring.

2. What significance, if any, does the size of the 'tongue' have on the strength of the joint and what effect does it have on the size of the groove?

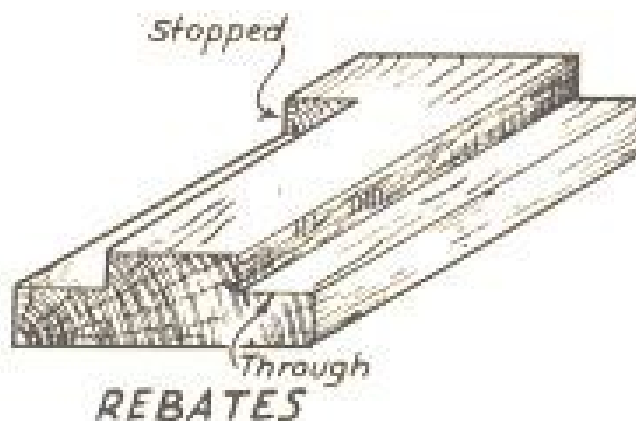
3. Pre-milled tongue and grooved boards can be expensive, what are the advantages of using them?

Rebate joints

Rebating is the cutting of a rectangular recess along the edge or across the end of timber, in the case of a rebated butt widening joint the recess will always be along the edge. Rebates are very versatile and relatively simple to construct, and as such are used not only as widening joints but also in framing and carcass construction. Used in timber panelling, rebated widening joints are stronger than regular butt joints. Rebated joints can be glued and nailed or glued and screwed, and with the two contact surfaces this can be done two ways if necessary.



Rebated joint can be used for widening.



Using the knowledge obtained from this document answer the following questions (in full sentences).

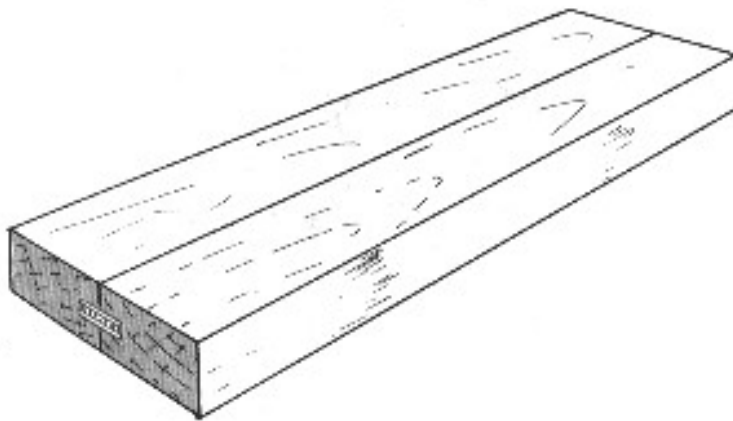
1. In the timber products and furniture industry how would the rebates be cut?

2. Explain what is meant by the phrase 'two contact surfaces' (using a diagram if necessary) and briefly describe why it creates a stronger joint?

3. Using a diagram, sketch where a rebated widening joint would be nailed?

Groove and Feather joint

Feather and groove widening joints are also sometimes referred to as slip tongue joints. Feathered joints are constructed by making a groove with a saw cut into the edges to be joined and gluing a thin piece of timber which is cut with the grain into the grooves. Feathered joints help to align the timber boards and increase strength. Feathers can be solid timber, plywood, or as in the case of particle board, plastic.



Slip tongue or feather may be ply or solid wood.

Using the knowledge obtained from this document answer the following questions (in full sentences) .

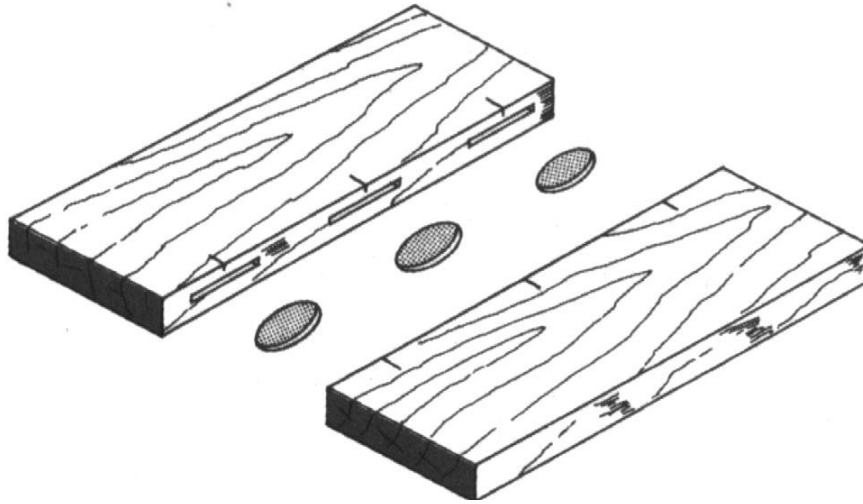
1. Describe the process undertaken to cut the groove into the edges of the boards?

2. What property of plywood makes it ideal for adding strength to a widening joint?

3. Explain why plastic feathers are used with particle board?

Biscuit joints

Biscuit jointing (sometimes also called plate jointing) is a quick and easy method of reinforcing butt joints. The biscuits are oval shaped discs of wood, usually 4mm thick (but come in three sizes), that fit into matching semicircular slots cut by a power tool called a biscuit joiner (or jointer). The slots for biscuits are easier to fit and more forgiving than dowel holes. The biscuits are made by pressing with a die so they are in a compressed form and should fit snugly into the slot (provided they are kept dry). When the glue is applied and the joint is cramped, the biscuits expand in the slots making a strong joint. The slots locate accurately parallel to the face of the biscuits but are 1 or 2 mm longer than the biscuits, allowing the joint to be shifted along its length before the glue sets.



Using the knowledge obtained from this document answer the following questions (in full sentences).

1. Why do biscuits come in three sizes?

2. Why are biscuit joints considered more forgiving than dowels?

3. What problems could arise if glue is applied to the biscuit before it is inserted into the slot?
