



Woodworking

making joints



Using Joints





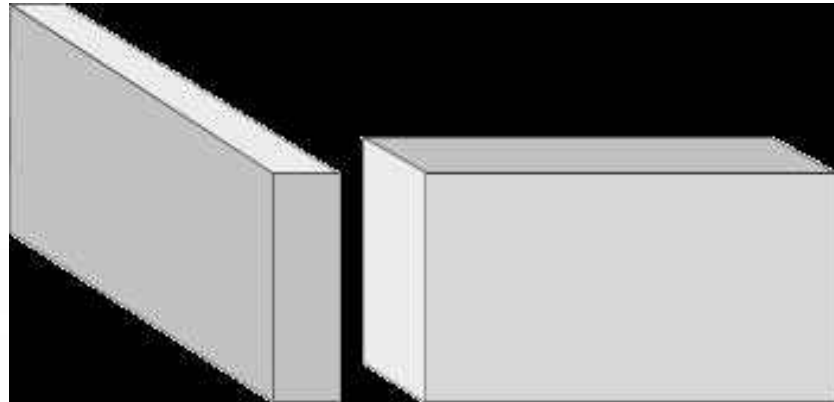
Basic Butt Joint



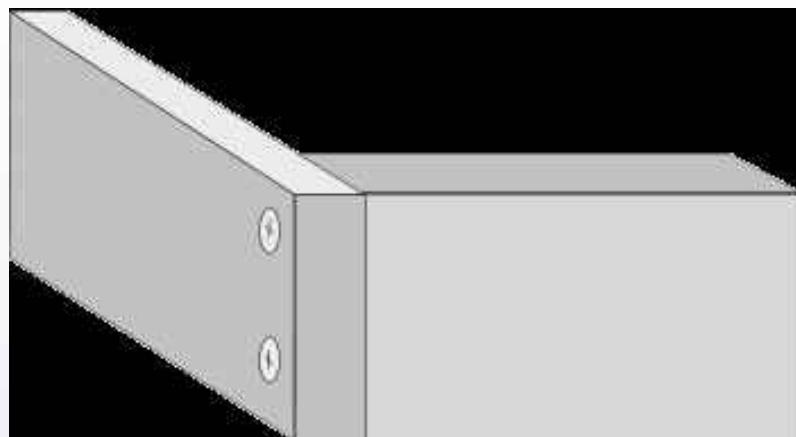
The butt joint is the most basic woodworking joint. Commonly used when framing walls in conventional, stick-framed homes, this joint relies on mechanical fasteners to hold the two pieces of stock in place. Learn how to build a proper butt joint, and when to use it on your woodworking projects.



Basic Butt Joint



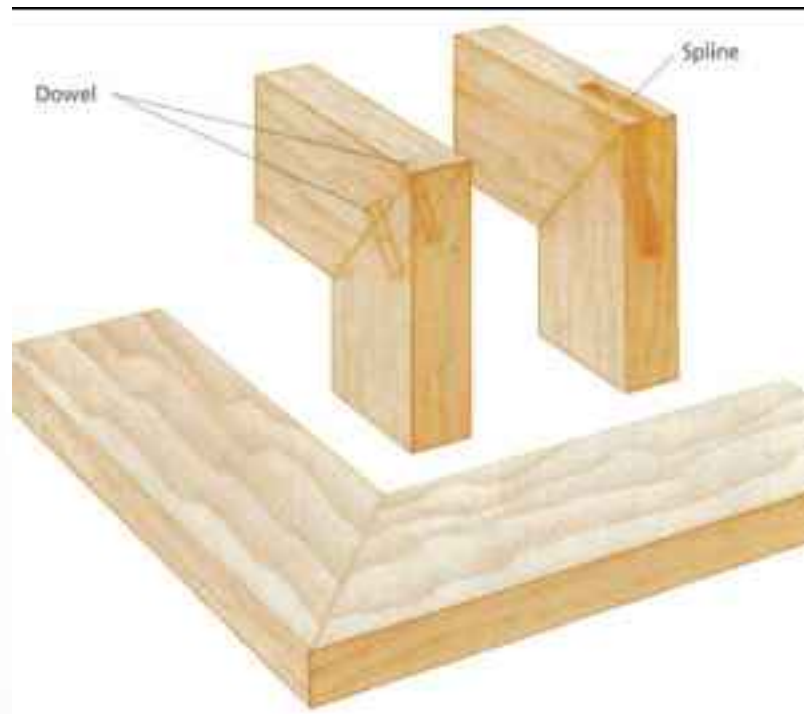
The simplest of joints is a butt joint - so called because one piece of stock is butted up against another, then fixed in place, most commonly with nails or screws. The addition of glue will add some strength, but the joint relies primarily upon its mechanical fixings.



These joints can be used in making simple boxes or frames, providing that there will not be too much stress on the joint, or that the materials used will take nails or screws reliably. Butt joints are probably strongest when fixed using glued dowels.



Mitered Butt Joint

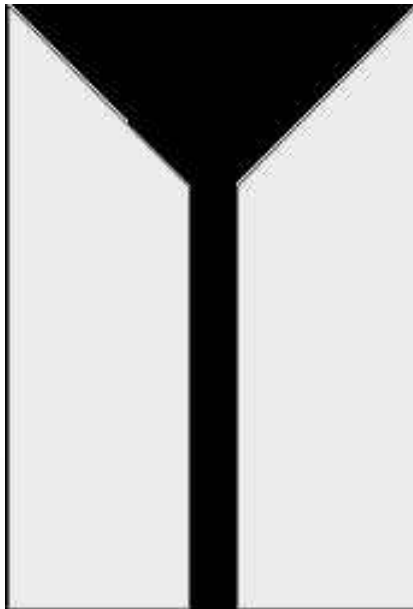


A mitered butt joint is basically the same as a basic butt joint, except that the two boards are joined at an angle (instead of square to one another). The advantage is that the mitered butt joint will not show any end grain, and as such is a bit more aesthetically pleasing. Learn how to create a clean mitered butt joint.

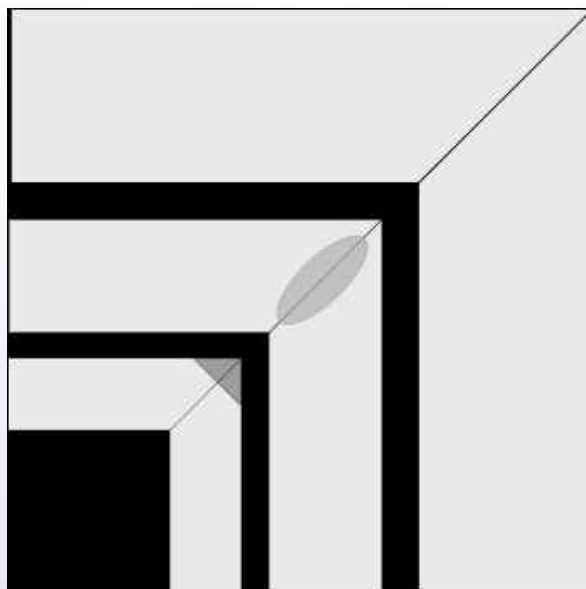




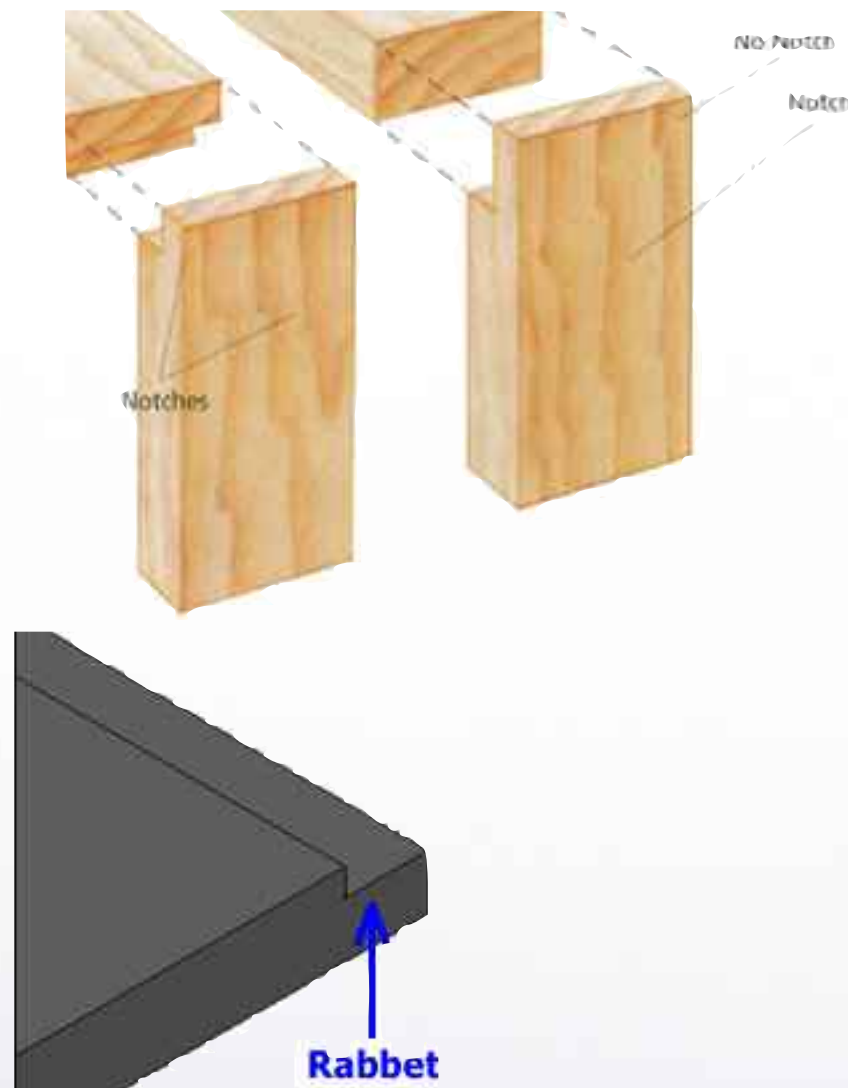
Mitered Butt Joint



The simplest joint that requires any form of cutting is a miter joint - in effect this is an angled butt joint, usually relying on glue alone to construct it. It requires accurate 45° cutting, however, if the perfect 90° corner is to result.



To reinforce the plain joint, biscuits or splines are often used (the spline being trimmed after the glue has cured).



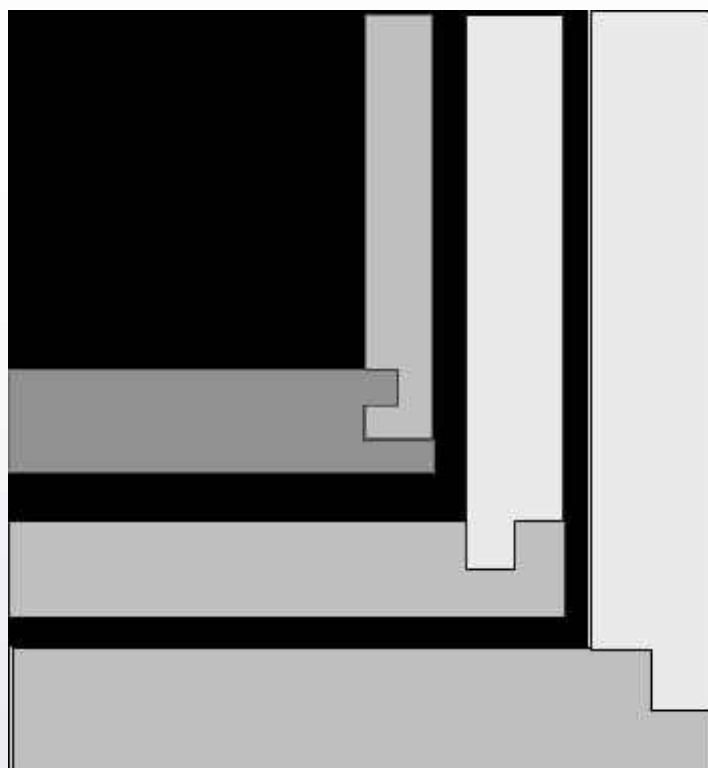
Another common cabinetry joint is the rabbet. A rabbet is basically a dado cut along the edge of a board. Rabbets are often used at the back of cabinets and other similar assemblies for attaching the back to the sides of the box, adding a considerable amount of strength to the assembly. Learn how to cut clean rabbets and when to use them.

<http://www.technologystudent.com/joints/lapt1.htm>



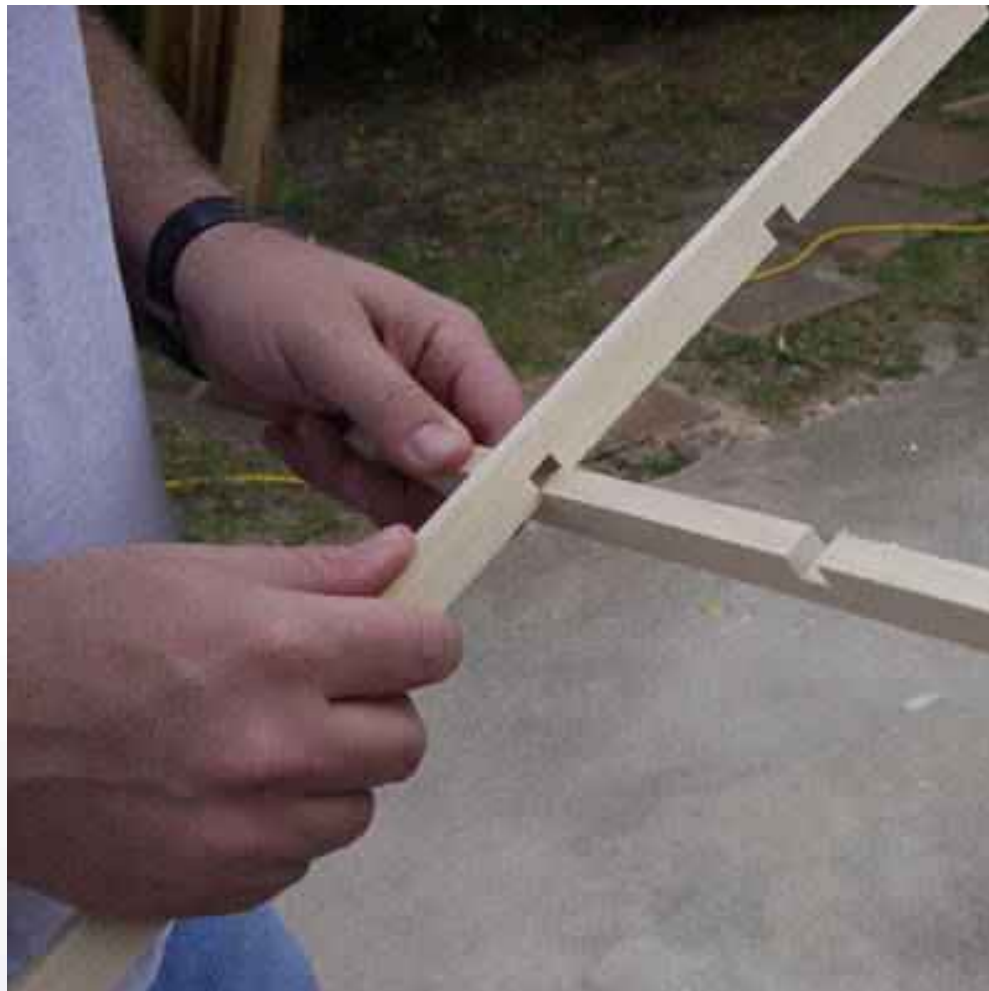
A rebate (or rabbet) cut in a piece of stock is also a joint. The purpose is to make assembly easier and to increase glue surface area. It is also possible to screw or pin through the rebate from underneath, or through the side.

Rebates can be simple or complex, but are effective joints and much stronger and easier to assemble than butt joints.

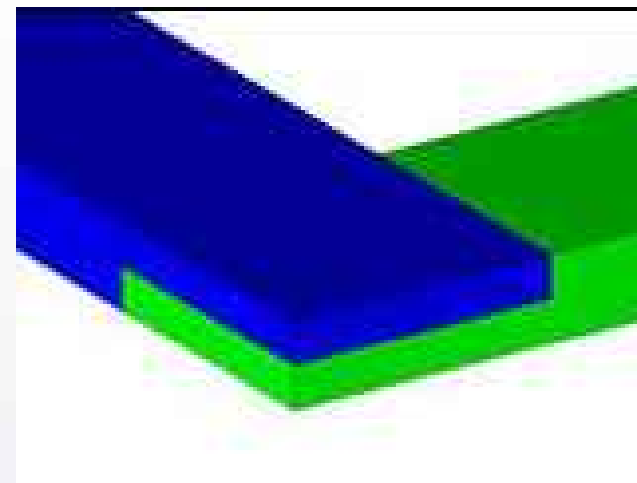




Half-Lap Joint

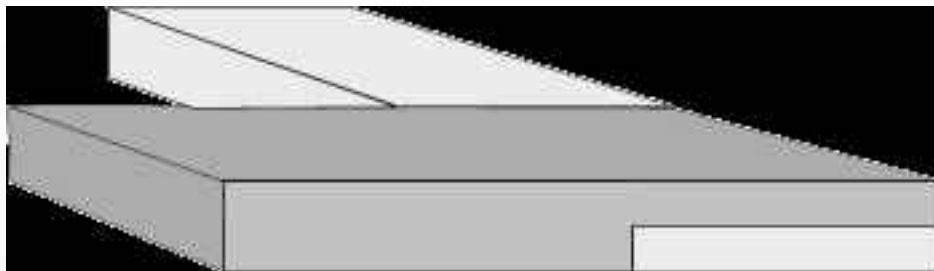
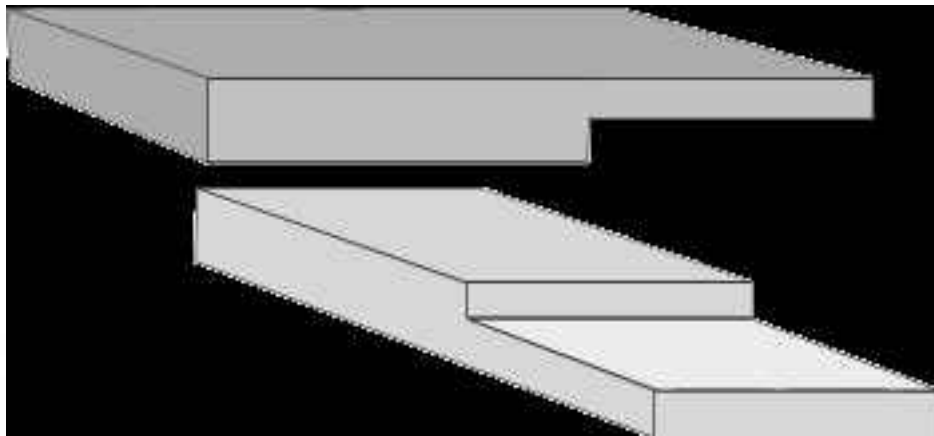


The half-lap joint is where half of each of the two boards being joined is removed, so that the two boards join together flush with one another. This type of joint can obviously weaken the strength of the two adjoining boards, but also is a stronger joint than butt joints.





Half-Lap Joint

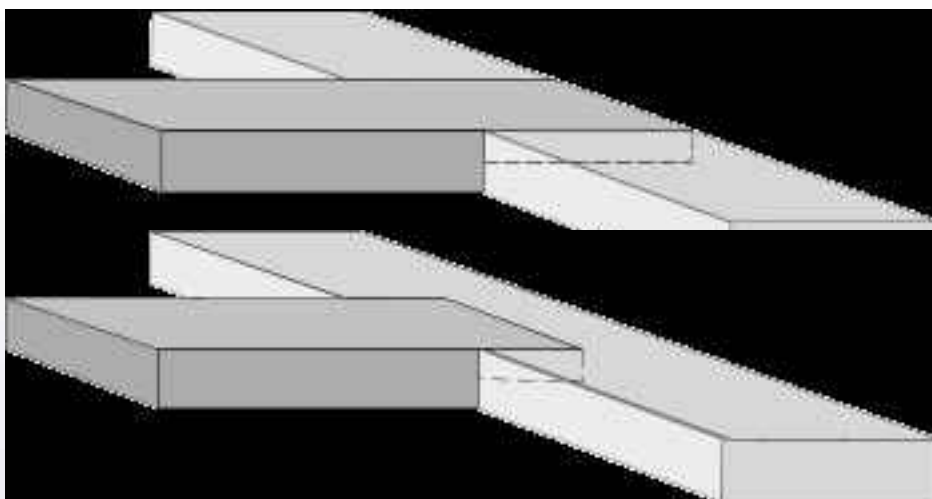
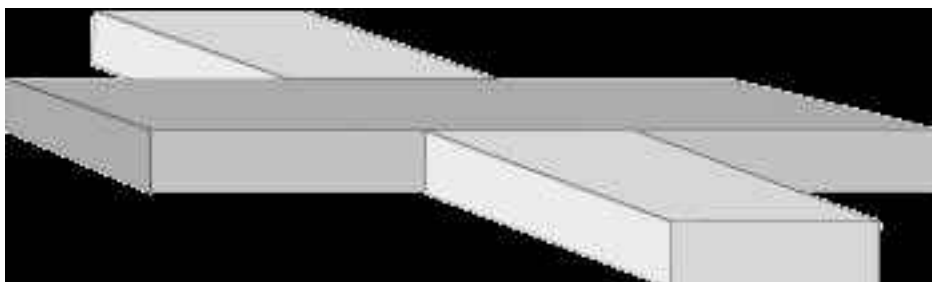
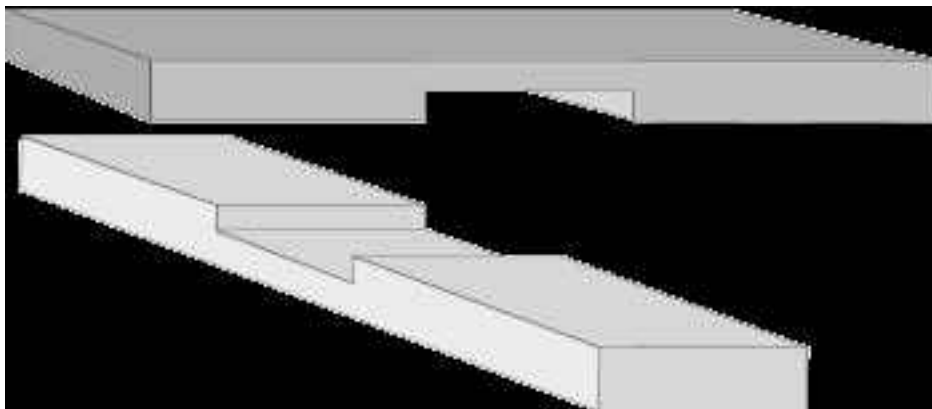


Another simple joint is the half-lap joint. This requires the removal of stock to exactly half of the overall thickness of the piece, in order that a similar piece can mate with it. This technique is also used in the cross-halving joint (see later).

The main uses for this joint are to allow two pieces of stock to meet - usually at a right angle - so that the joint is contained within the overall thickness of the material. Used for face frames, other simple frames and frequently in garden projects. Glue alone can be used as a fixing method, or combined with screws or nails.



Cross Half-Lap Joint



The cross-halving joint is another form of half-lap, but used where one piece of stock crosses another, in order to retain the same dimension. These joints are often used in braces, especially where stretchers cross over. If accurately constructed, this is an extremely strong joint.

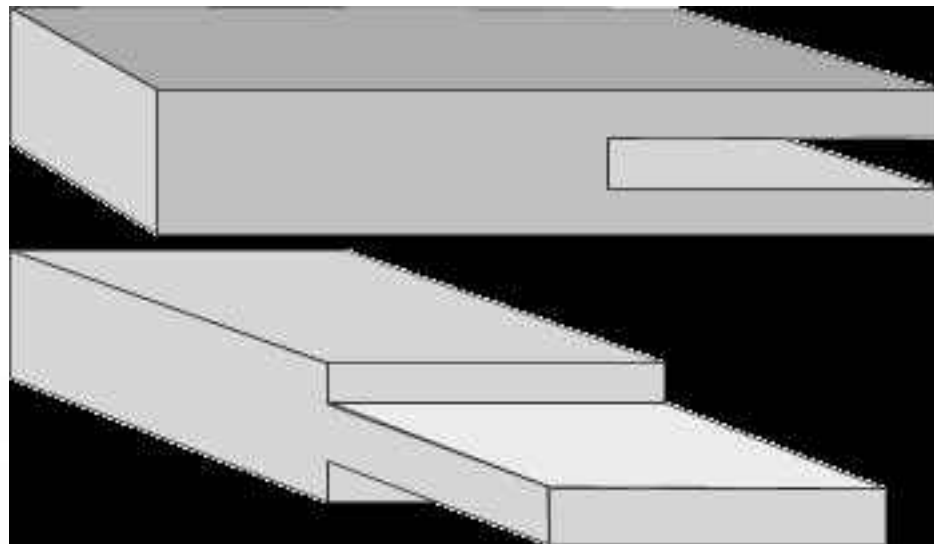
Cross-halving joints can also be used in trellis construction, making box compartment dividers and as the bracing ribs of a torsion box.

The halving joint has good glue surface area and will resist side forces if accurately made with tight tolerances.

<http://www.technologystudent.com/joints/crsh1.htm>



Corner Bridle Joint - finger joint



A development of the halving-type joints is a corner bridle joint. This uses an open mortise with a through open tenon.

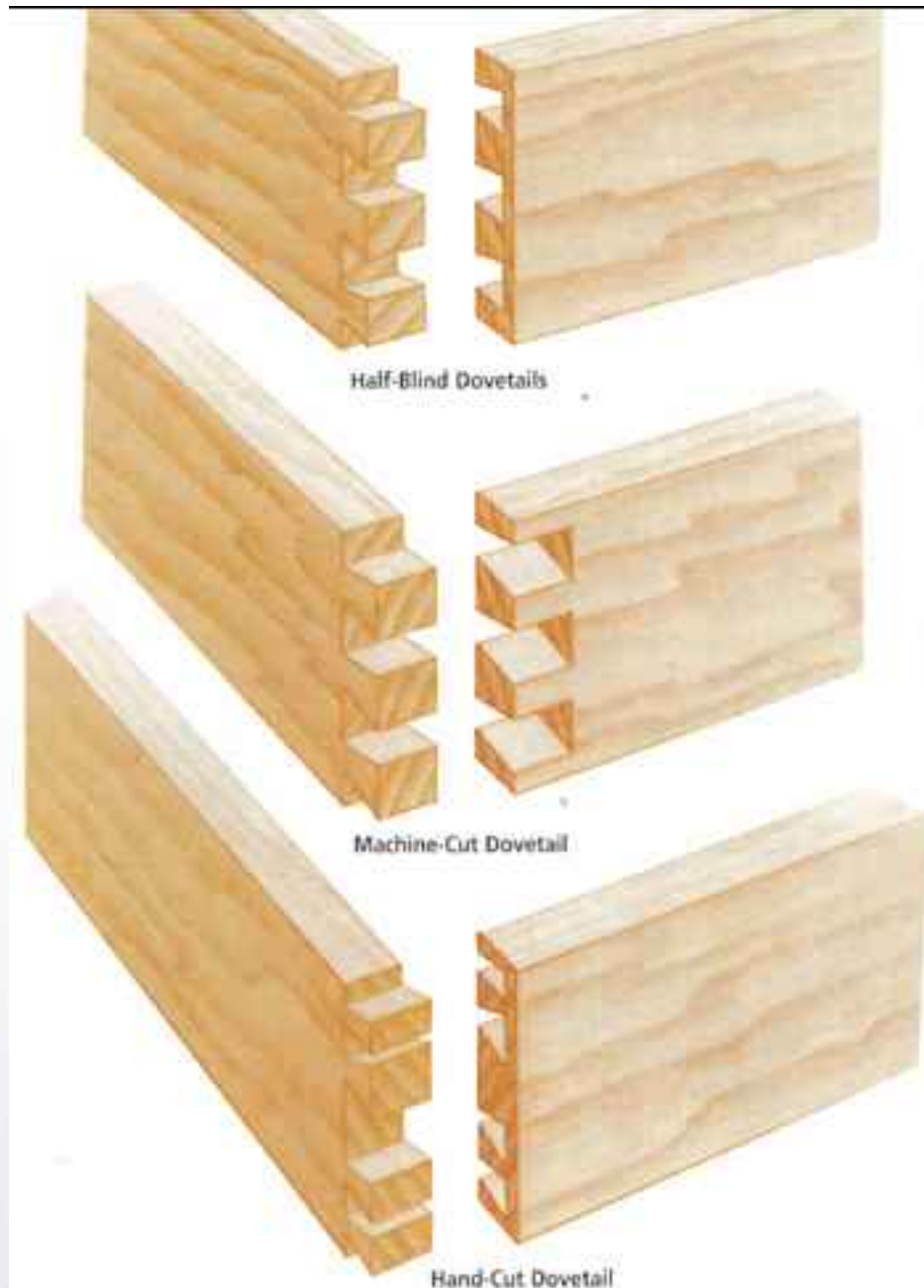
There is plenty of glue surface area and the joint will be strong, but screws or dowels as reinforcement will help the joint to resist side forces. Another useful joint in frame construction. The visible end grain can be also be utilised as a decorative feature.

<http://www.technologystudent.com/joints/fingjt1.htm>

<http://www.technologystudent.com/joints/brid1.htm>



Dovetail and Box Joints

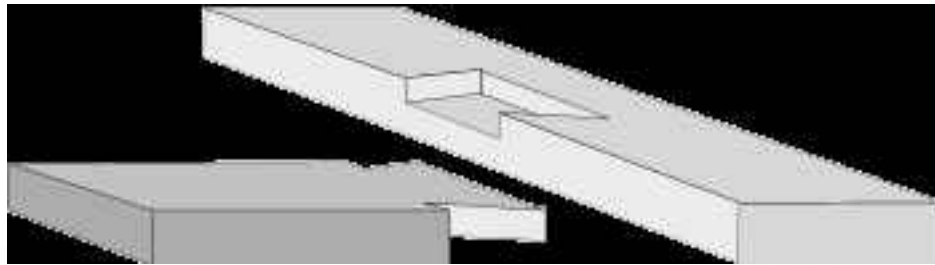


Of all woodworking joints, the through dovetail may be the most revered. A classic through dovetail is beautiful and very strong, and adds a touch of class to any piece. There are a few methods for creating through dovetails. Learn the keys to a quality through dovetail joint.

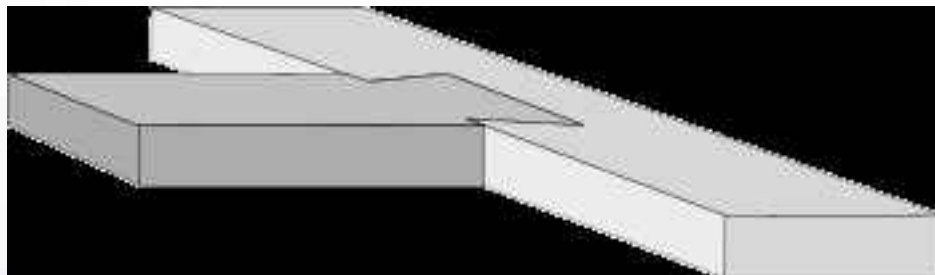




Dovetail Joint



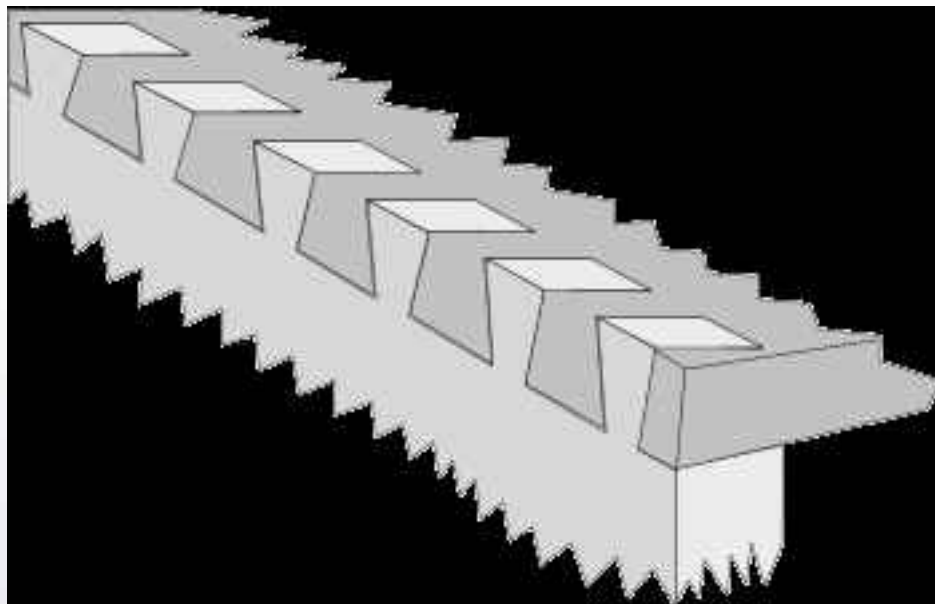
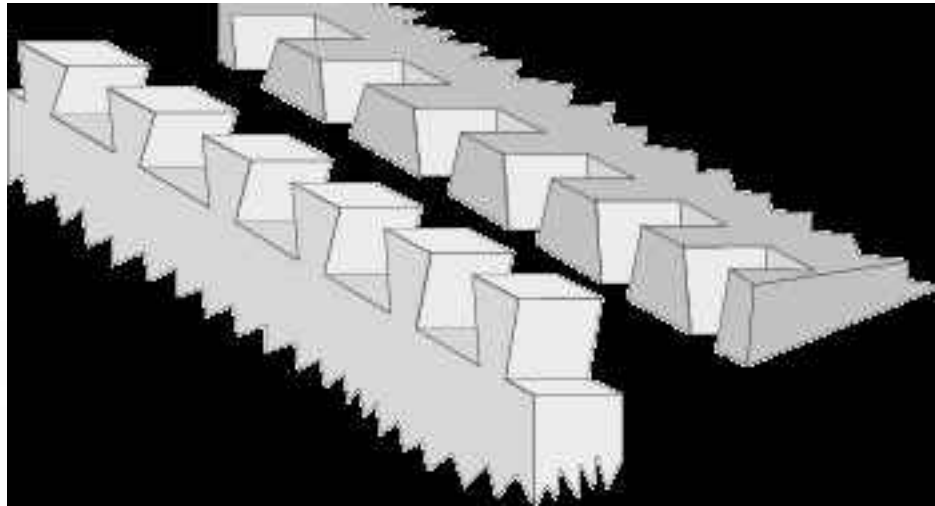
Natural enhancement to this joint is the inclusion of the dovetail.



The dovetail will prevent the joint separating laterally through side forces.



Through Dovetail Joint

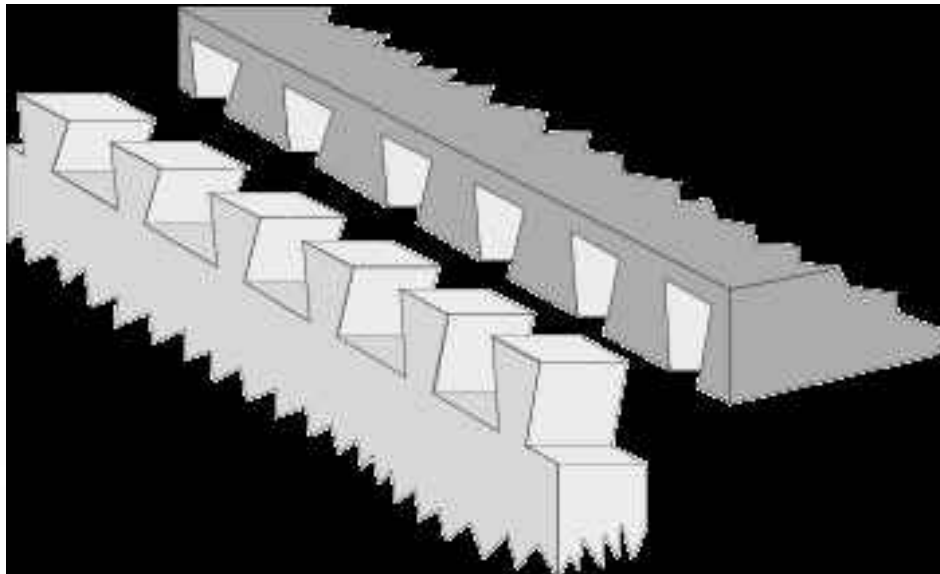


Through dovetail joints are also extremely strong - again due to the vast amount of glue surface area they contain.

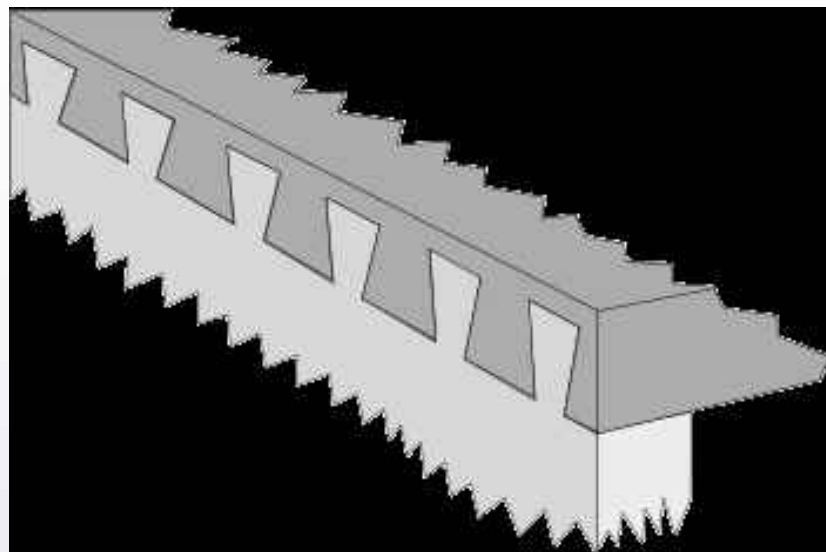
Although more time-consuming to make, they have a major advantage over box joints as the shape of the tails and pins mean that the joint cannot be pulled apart. For this reason, they are much used for drawer fronts, where they resist the pulling forces well.



Half-Blind Dovetail Joint



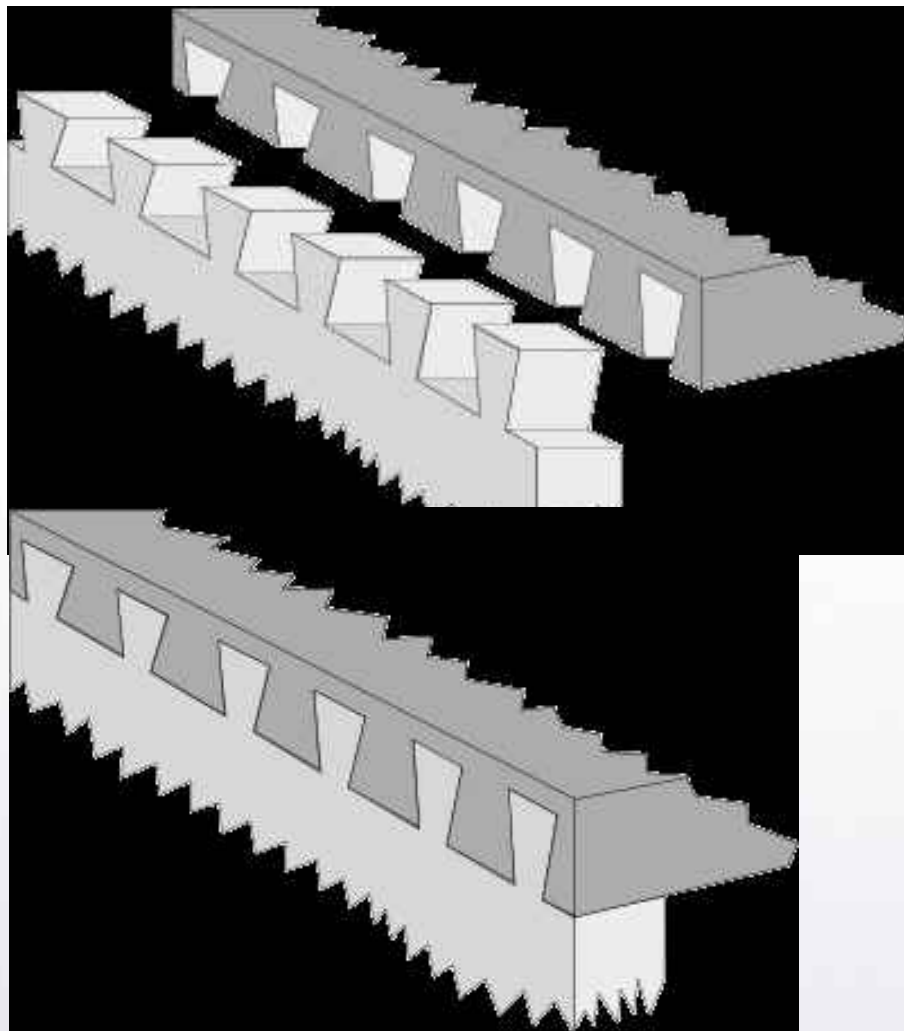
Half-blind dovetail joints are also very strong and resist pulling forces well.



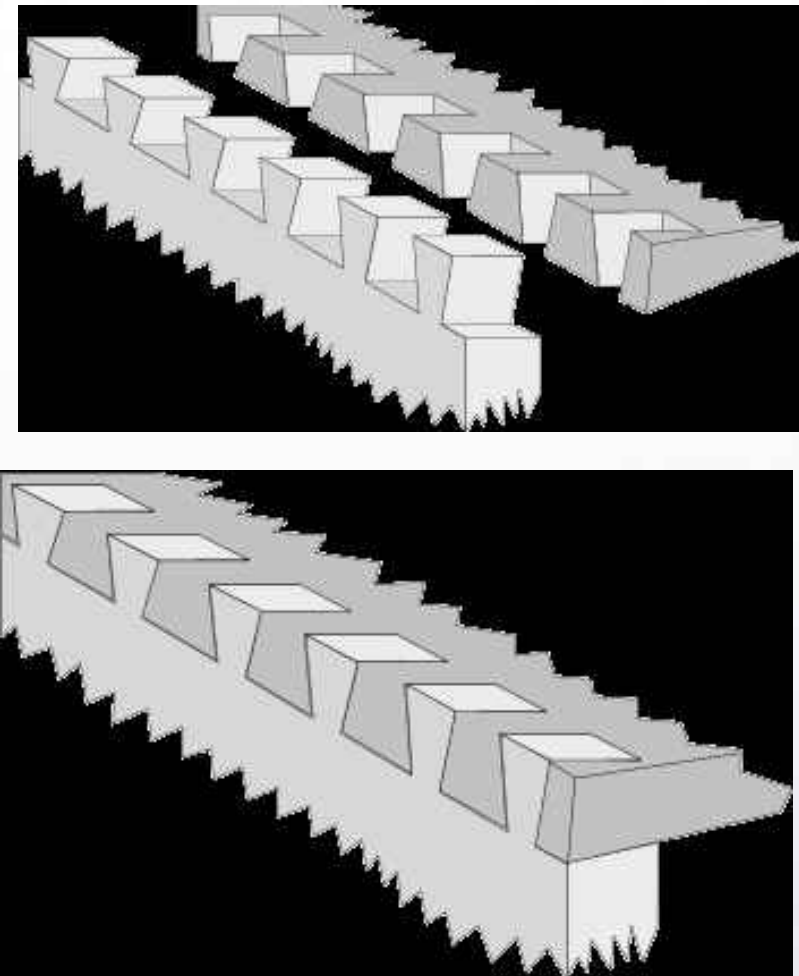
The advantage with this joint is that it allows a plain drawer front, whilst retaining all the strength qualities of the through version.



Half-Blind Dovetail Joint

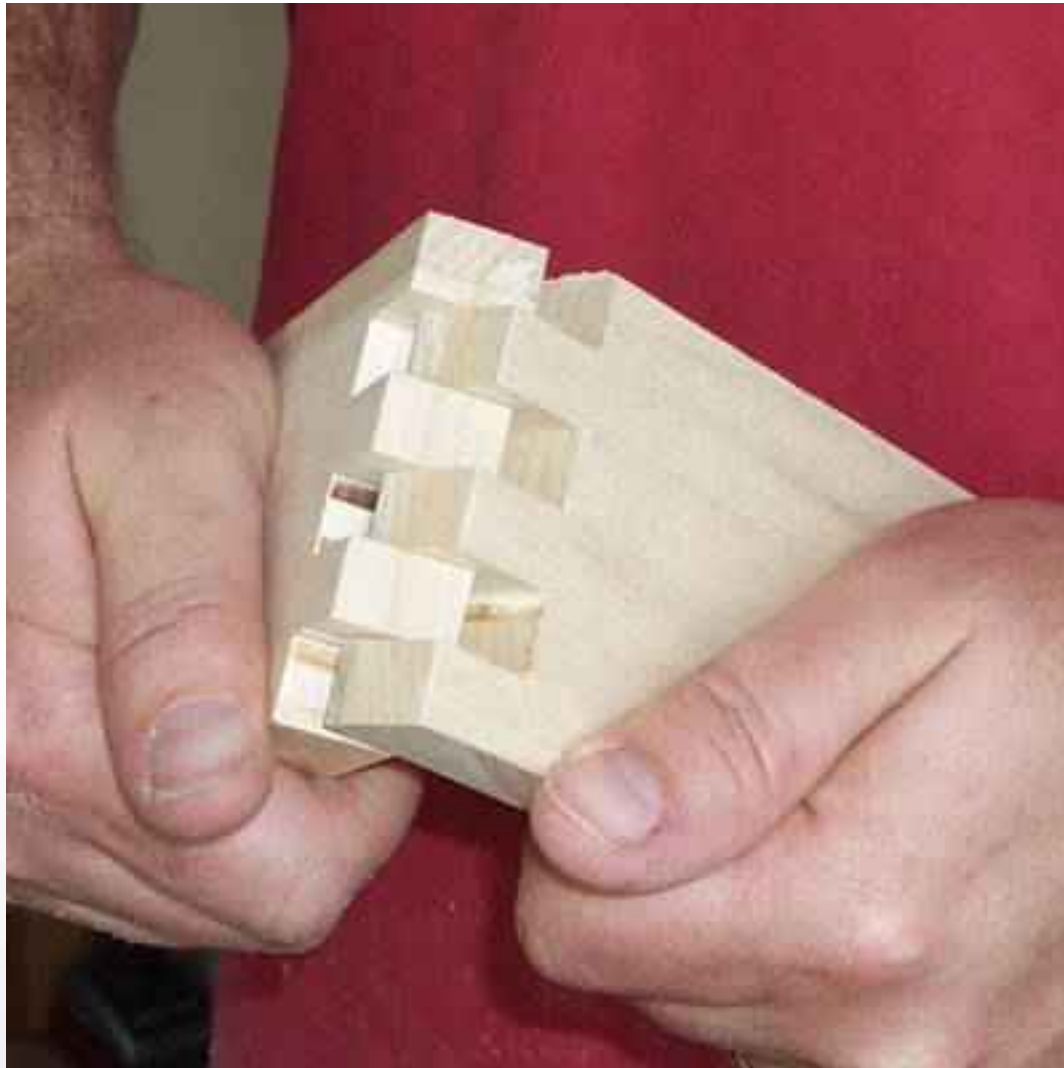


Through Dovetail Joint





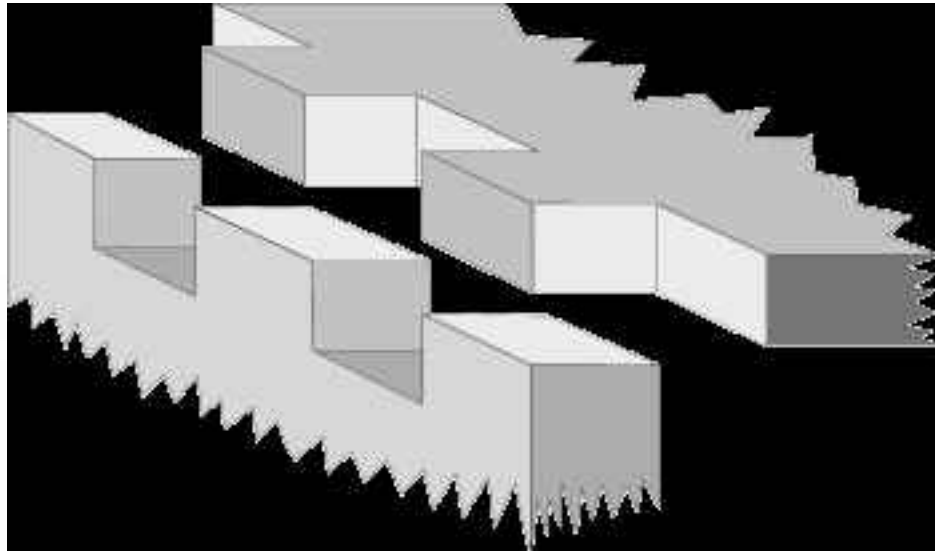
Box Joint



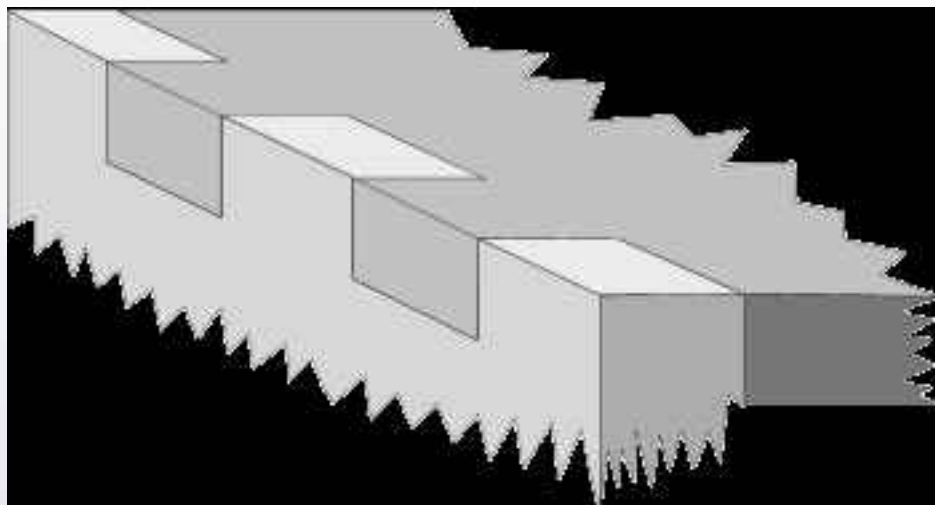
Dovetail joints are beautiful and strong, but not always practical. A box joint is a simpler alternative to the dovetail joint. Learn how to build consistent and strong box joints in your woodworking project



Box Joint



A straightforward joint (which in a way is a development of the bridle joint) is the box joint, also known as the finger joint - because of the similarity to interlaced fingers. This is a very strong joint due to the vast amount of glue surface area.



The end grain of the fingers can be a problem, as it will inevitably stain or finish darker than the remainder of the piece, but this is often used as a feature or decorative element.



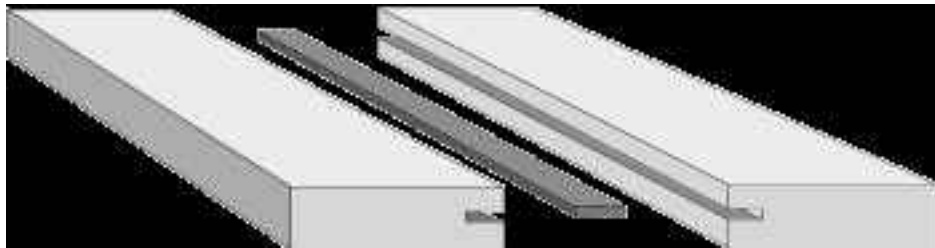
Tongue and Groove Joint



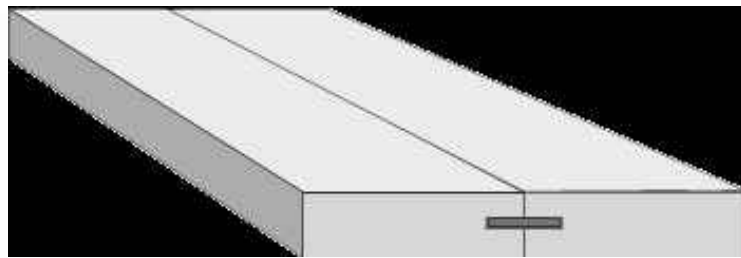
When joining two boards along a long edge, one can simply butt the joint together and hold it with glue. However, the tongue and groove joint is stronger and provides more glue surface. Learn how to create consistent tongue and groove joints.



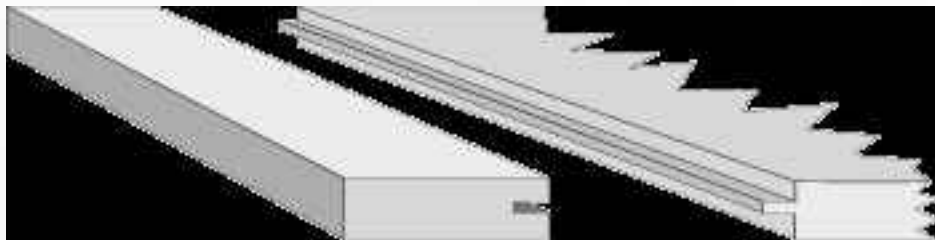
Tongue and Groove Joint



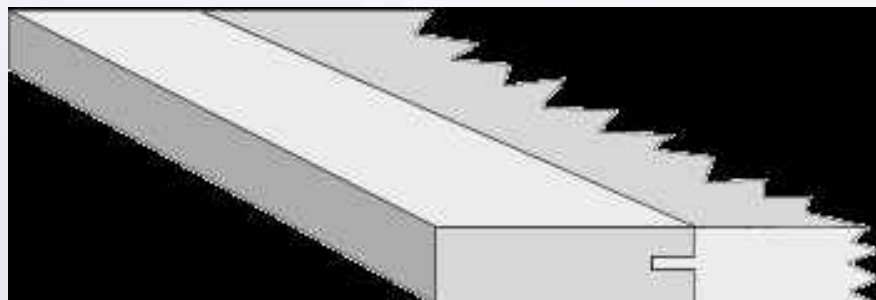
The natural development of a rebate is a groove, as shown here in a spline joint, which uses a separate strip of wood (the loose spline) to join two pieces of stock via a groove in each.



The advantage of this method over simply butting and gluing, or using flat plate dowel technology (biscuits) is that the glue surface area is at least doubled and the spline helps to prevent bowing or cupping.



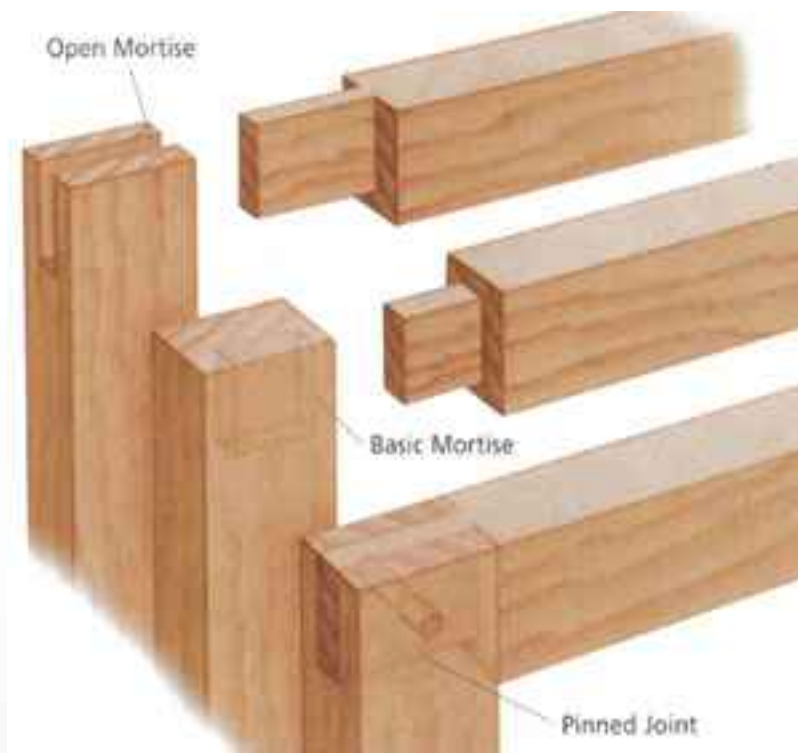
A more common development is in the tongue and groove joint, which uses a milled tongue in place of a separate loose spline to achieve the same result.



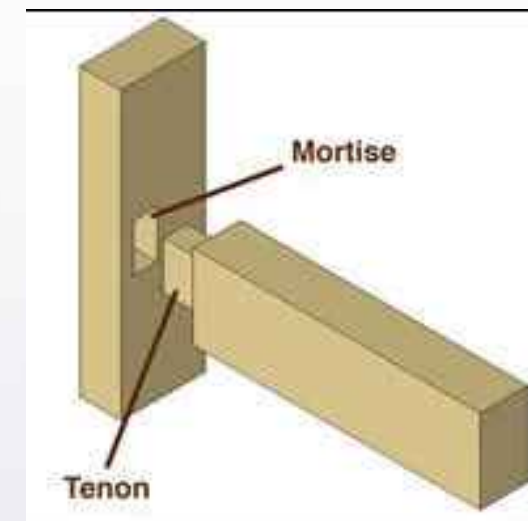
Quite a strong joint, the glue surface area is good and ease of assembly is a main feature.



Mortise and Tenon Joint

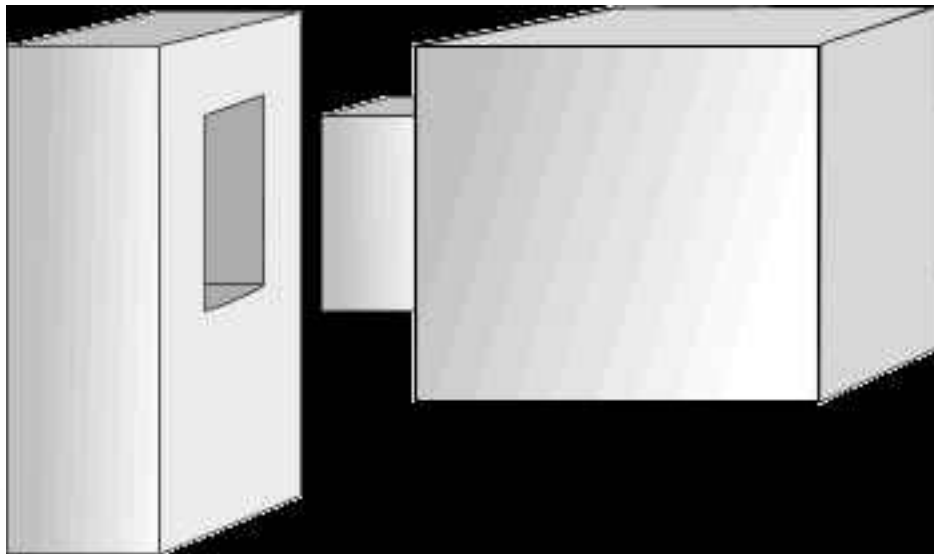


The mortise and tenon is a classic woodworking joint. These joints have been used since the early times of woodworking, and are still among the strongest and most elegant methods for joining wood. Learn methods for creating tight, beautiful mortise and tenon joints

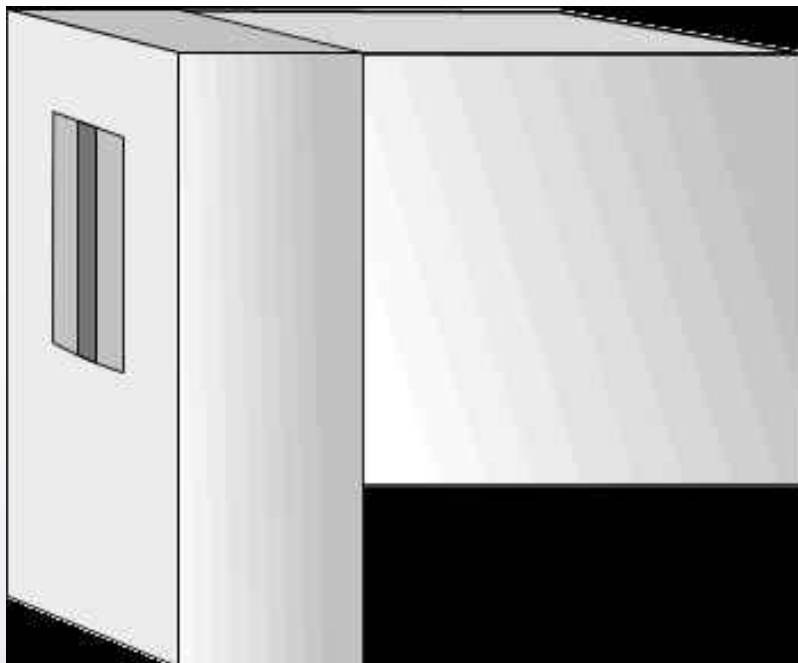




Mortise and Tenon Joint



The mortise and tenon joint is a very popular, strong and frequently-used joint for assembling a variety of projects where strength and reliability are required. The mortise can either be a through mortise - passing all the way through the stock - or a blind mortise that only partly pierces the stock.

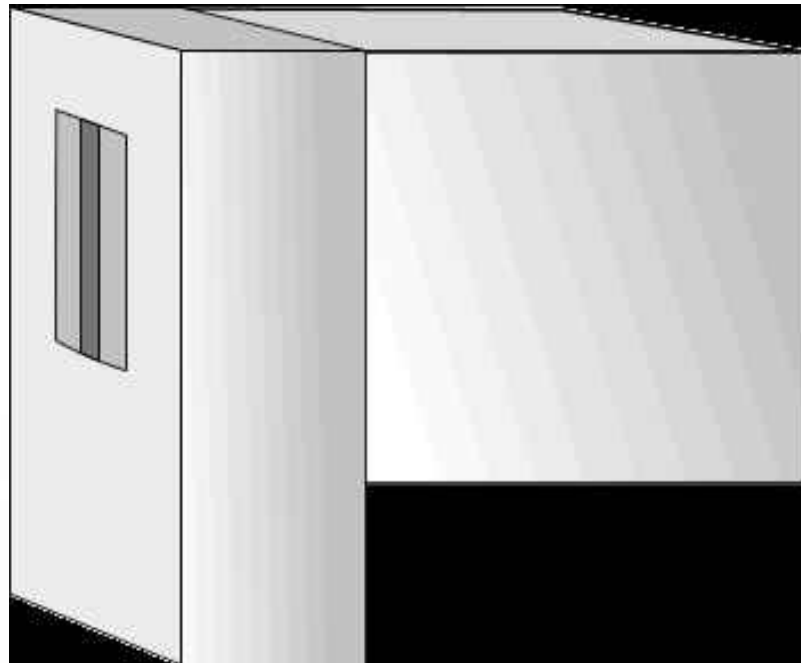


Mortise and tenon joints have several advantages, including a lot of glue surface area, shoulders to resist side forces acting on the finished project, neatness and virtual invisibility if required, plus the option to be used as a decorative feature if constructed as a through mortise, using a contrasting wood wedge, as shown here.

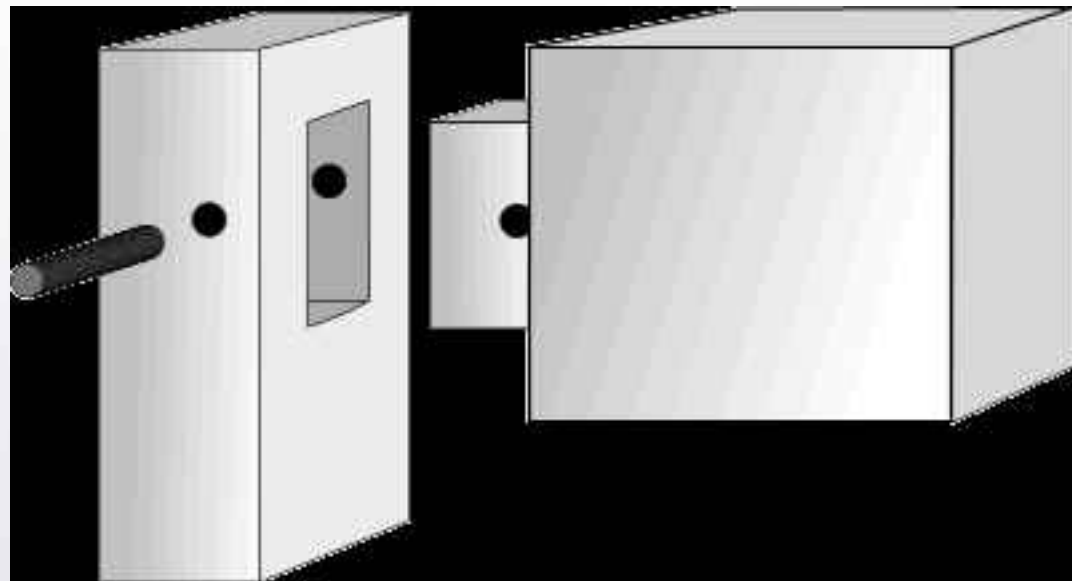
<http://www.technologystudent.com/equip1/mortga1.htm>



Mortise and Tenon Joint

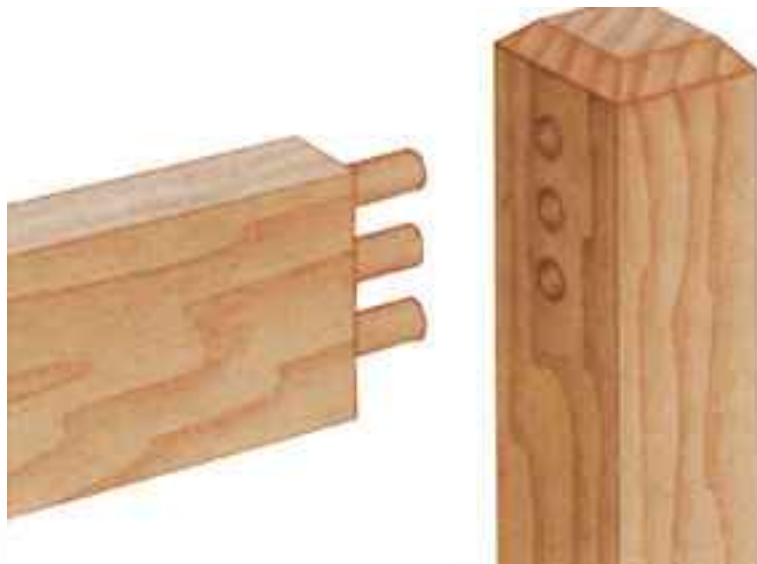


In addition to gluing, dowel pins can also be used to secure the joint - this can be an advantage if the joint may need dismantling later.

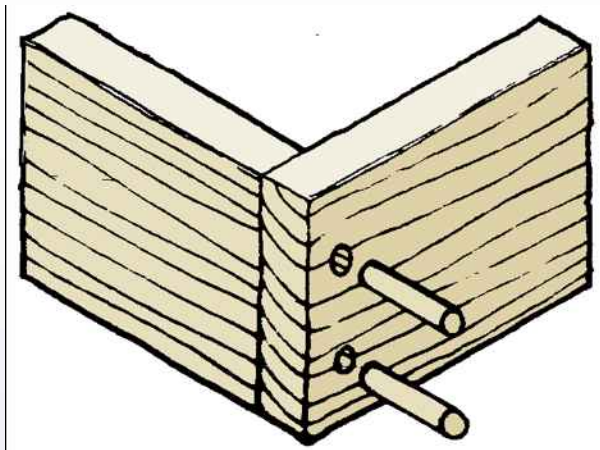




Dowel Joint



Dowel joints are basically substitutes for mortise and tenon joints. A dowel joint is made by fitting a butt joint and then drilling corresponding holes in the two pieces of wood to be joined and inserting the dowel pin or pins before joining the pieces. Glue is used in this type of joint, and the dowel pins serve as round tenons, holding the two pieces together.





Biscuit Joint



Another method for joining boards along the edges (like the tongue and groove joint) is to cut slots and use beechwood biscuits to hold the boards in place. This is a very common modern woodworking joint, relying on glue and the swelling of the beechwood biscuit to hold the boards in place. Learn how to cut consistent slots and get reliable results from biscuit joinery.



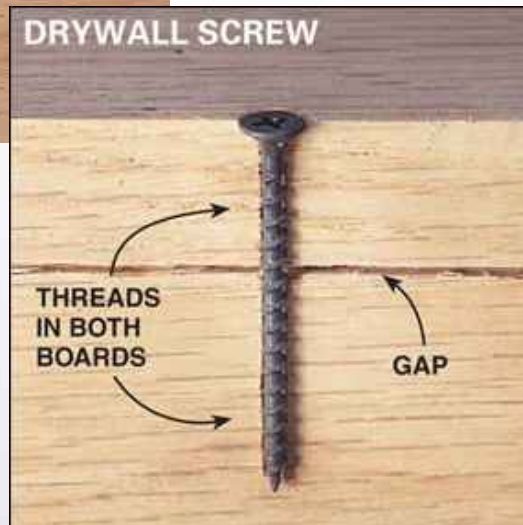
Making strong wood connection

- screws
- nails
- wood glue
- pegs
- biscuits



Using screws :

1. clamp and secure both pieces before connecting with screws.
2. pre drill holes for screws to prevent splitting of your wood.
3. sink the head of the screw by drilling larger hole just bit under the surface.
4. dont force it!! Forcing screws may strip the head groove and brake the screw.
5. using drywall screws may split your wood piece.





Using nails :

- clamp and secure both pieces before connecting with nails.
- if the nails are too large, pre-drill small hole to guide your nail
- sink the head of the screw by drilling larger hole just bit under the surface
- dont force it!! Forcing nails to your piece will bend the nail and damage your wood.





Using wood glue :

- sand smooth and clean both surfaces before gluing together.
- apply even thin layer of glue to both surfaces. Do not put too much! it may weaken your connection
- clamp and secure both pieces and let the glue completely dry.





Resources

Furniture Joints

<http://www.efi-costarica.com/antique-furniture-joints.html>

How to make joints

<http://woodworking.about.com/od/joinery/tp/JoineryHub.htm>

Common woodworking joints

<http://www.raygirling.com/wwjoints.htm>

Exotic wood

<http://www.macbeath.com>



Resources

Overview of wood working tools

<http://www.technologystudent.com/equip1/equipex1.htm>

Overview of wood working joints

<http://www.technologystudent.com/joints/joindex.htm>