

Wood Joints

Take a comprehensive look at the most common wood joints.

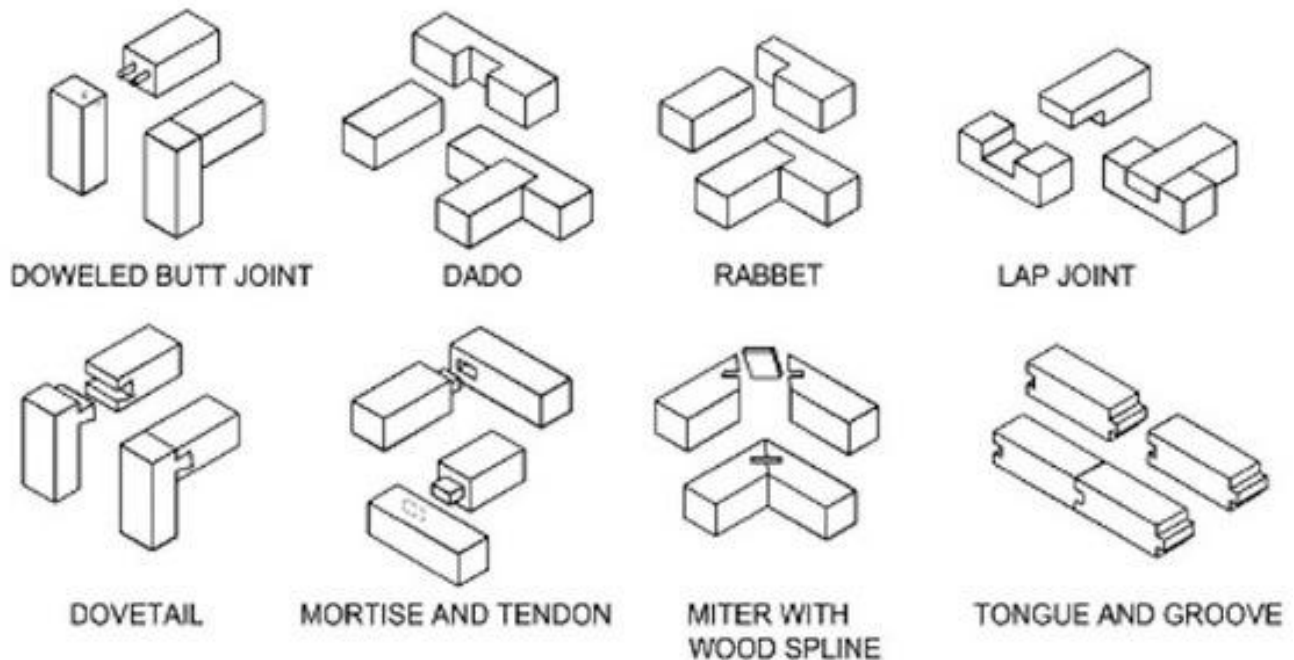


Photo: brightmix.co.uk

The language of the joiner is filled with words that we know well from ordinary usage but here have new and distinct meanings: Lap, edge, butt, and finger joints are technical terms to woodworkers. Joinery jargon gets still more complicated when you add in some other kinds of joints, like mortise-and-tenon, tongue-and-groove, dovetail, dowel, dado, spline, and rabbet. Not to mention such combination joints as cross laps, dado rabbets, dovetail laps, and keyed miters.

Yet this is, to say the least, a rather incomplete list of wood joints. With the introduction of the biscuit or plate joiner, any number of these joints are strengthened or varied thanks to the presence of the little, football-shaped wafers.

Don't be intimidated by all these possibilities. Try thinking of them as an embarrassment of riches. Pretty soon you will find that it's fun to figure out which will work best for a given project or a particular application.

If you are just making your first foray into the land of the joiners, you'd probably do best to start with a simple joint like a dado or a rabbet. (If you've ever made anything, you've almost certainly made a butt joint already.) A picture frame typically uses a miter joint, so perhaps you've done that, or would like to try.

So here they are, the basic kinds of wood joints, in something approaching simplest-to-hardest order.

Butt Joint. When you join two squared-off pieces of wood, you've made a butt joint, whether the workpieces are joined edge to edge, face to face, edge to face, or at a corner. A butt joint is the simplest to make, requiring little shaping beyond cuts made to trim the workpiece to size. As with all joints, however, the surfaces to be joined must fit together tightly; if they don't, a **block plane** may be used to smooth the end grain. Glues, nails, screws, dowels, and other fasteners may be used to secure a butt joint.

Miter Joint. As you know from the **miter box** and the miter gauge on your table saw, a miter cut is basically an angle cut (though if you consult your dictionary, you'll get told something like, "A miter is an oblique surface shaped on a piece of wood or other material so as to butt against an oblique surface on another piece to be joined with it.").

To put it another way, a miter joint is a butt joint that connects the angled ends of two pieces of stock. The classic example is a picture frame, with its four butt joints, one at each corner, with the ends of all the pieces cut at a forty-five-degree angle, typically in a miter box.

The miter joint has two signal advantages over a butt-corner joint: First, no end grain shows, making for a more regular and attractive joint; second, the surface for gluing is increased. Miter joints may also be fastened with nails, screws, dowels, or other mechanical fasteners.

Rabbet Joint. A rabbet (or rebate, as it is also known) is a lip or channel cut from the edge of a workpiece. A typical rabbet joint is one in which a second piece is joined to the first by setting its end grain into the rabbet. Rabbet joints are frequently used to recess cabinet backs into the sides, or to reduce the amount of end grain visible at a corner.

The rabbet joint is much stronger than a simple butt joint, and is easily made either with two table or radial-arm saw cuts (one into the face, the second into the edge or end grain) or with one pass through a saw equipped with a dado head. A router or any one of several traditional hand planes, including a plow plane, will also cut a rabbet. Glue and nails or screws are frequently used to fasten rabbet joints.

Dado Joint. When a channel or groove is cut in a piece away from the edge, it's called a dado; when a second piece set snugly into it is joined to the first with nails, glue, or other fasteners, a dado or groove joint is formed. Some cabinetmakers differentiate between groove and dado joints, insisting that grooves are cut with the grain, dados across. Whatever you want to call them, grooves or dados are cut easily with a dado head on a radial arm or table saw.

The dado joint is perfect for setting bookshelves into uprights, and can be fastened with glue and other fasteners.

Lap Joint. A lap joint is formed when two pieces have recesses cut into them, one recess in the top surface of one piece, the second in the lower surface of the other. The waste material removed is usually half the thickness of the stock, so that when the shaped areas lap, the top and bottom of the joint are flush.

Lap joints are used to join ends (half-laps) or mitered corners (miter half-lap). Dovetail shaped laps are sometimes used to join the ends of pieces to the midsection of others (dovetail half-laps).

Lap joints can be cut with dado heads, as well as with standard circular sawblades on radial-arm or table saws. Gluing is usual, though other fasteners, including dowels or wooden pins, are also common with lap joints.

Spline Joint. A spline is a thin strip, usually of wood, that fits snugly into grooves on surfaces to be joined. Miter, edge-to-edge butt, and other joints may incorporate splines. Once the surfaces to be joined have been cut to fit, a table saw can be used to cut matching kerfs.

The spline itself adds rigidity to the joint, and also increases the gluing area. As most splines are thin, they are usually made of hardwood or plywood.

Tongue-and-Groove Joint. Flooring, bead-board, and a variety of other milled, off-the-shelf stock are sold with ready-made tongues and grooves on opposite edges. The edges can also be shaped with table or radial-arm saws; in the past, matching hand planes did the job.

For finish work, nails are driven through the tongues of the boards, and the groove of the next piece is slid over them ("blind-nailing"). For rougher work, as with certain kinds of novelty siding and subroof or sheathing boards, the stock is face-nailed. Glue is used only infrequently, as one of the chief advantages of a tongue-and-groove joint is that it allows for expansion and contraction caused by changes in temperature and moisture content.

Mortise-and-Tenon Joint. The mortise is the hole or slot (or mouth) into which a projecting tenon (or tongue) is inserted. Most often, the mortise and tenon are both rectilinear in shape, but round tenons and matching mortises are to be found. The mortise-and-tenon joint is harder to shape than other, simpler joints (both pieces require considerable shaping), but the result is also a great deal stronger.

Finger Joint. Also known as a drawer or box joint, this one is most often seen in drawer joinery. Interlocking rectangular "fingers" are cut into the end grain of drawer sides and ends.

Though precise cutting of the fingers is essential, finger joints require only relatively simple ninety-degree cuts that can be made by hand or using a router, radial-arm, or table saw.

Finger joints, like dovetail joints, are sometimes used as a decoration, adding a contrasting touch as well as strength to the joined pieces.

Dovetail Joint. Occasionally, there's a bit of poetry even in the workshop. As early as the sixteenth century, this joint was identified by its resemblance to bird anatomy. A thesaurus of the period termed the joint "A swallows

taile or dooue taile in carpenters works, which is a fastning of two piece of timber or bourdes together that they can not away.”

The dovetail is one of the strongest of all wood joints. It’s also one of the most challenging to make, requiring careful layout and the investment of considerable cutting and fitting time. Its shape is a reversed wedge, cut into the end grain of one piece, that fits into a corresponding mortise on a second workpiece. Dovetails are traditionally used to join drawer sides and ends and, in the past, for many kinds of casework furniture.

The good news is that there are some jigs on the market (though they’re hardly inexpensive) that make layout and cutting dovetails a snap. The jig is generally used along with a router with a dovetail bit.

Wood Joinery Types

- [Joinery](#)

Wood joinery is one of the most basic concepts in woodworking. If one didn't have the ability to joint two pieces of wood together in a solid fashion, all woodworking pieces would be sculptures, [carved](#) out of a single piece of wood. However, with the many varied types of wood joinery, a woodworker has a number of different joints in his arsenal from which to choose, based upon the project. If you master these wood joinery concepts, you'll be well on your way to becoming a very accomplished woodworker.



Butt Joint. (c) 2009 Chris Baylor licensed to About.com, Inc.

1. Basic Butt Joint

There is no more basic wood joinery than the butt joint. A butt joint is nothing more than when one piece of wood butts into another (most often at a right angle, or [square](#) to the other board) and is fastened using mechanical fasteners. This type of joint is often used in wall framing on construction sites. Learn tips for using a butt joint, as well as when to choose another wood joinery type.



Mitered Butt Joint. (c) 2009 Chris Baylor licensed to About.com, Inc.

[2. Mitered Butt Joint](#)

A mitered butt joint is nearly 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. However, the mitered butt joint isn't all that strong. Here, you can learn how to create a clean [mitered](#) butt joint, and when to use this type of wood joinery. [More »](#)



Half-Lap Joint. (c) 2009 Chris Baylor licensed to About.com, Inc.

[3. Half-Lap Joint](#)

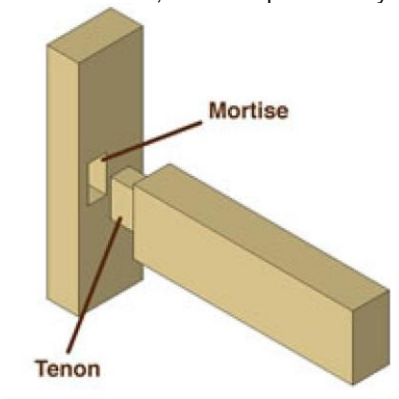
The half-lap joint is where half of each of the two boards being joined is removed, so that the two boards join together flush with one another. This type of wood joinery can obviously weaken the strength of the two adjoining boards, but also is a stronger joint than butt joints. There are a number of projects where this type of wood joint is quite desirable, in spite of its drawbacks.



Tongue and Groove Joint. (c) 2009 Chris Baylor licensed to About.com, Inc.

[4. Tongue and Groove Joint](#)

When [joining](#) two boards [square](#) to one another along a long edge, one can simply butt the joint together and hold it with fasteners. However, the [tongue and groove](#) joint is much stronger and provides more adjoining surface areas, which is particularly useful if you're going to [glue](#) the joint. [More »](#)



Mortise and Tenon Joint. (c) 2009 Chris Baylor licensed to About.com, Inc.

[5. Mortise and Tenon Joint](#)

The mortise and tenon is a classic wood joinery method. 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. [More »](#)

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Cutting a Biscuit Joint. (c) 2009 Chris Baylor licensed to About.com, Inc.

6. Biscuit Joint

Another method for joining boards along the edges (like the [tongue and groove joint](#)) is to cut slots and use beechwood wafers (known as [biscuits](#)) to hold the boards in place. This is a very useful modern woodworking joint, particularly for creating table tops, 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](#). [More »](#)



Pocket Joint. (c) 2009 Chris Baylor licensed to About.com, Inc.

7. Pocket Joint

The Pocket Joint is a [type of wood joinery](#) that involves [cutting a slot](#) and pre-drilling [a pilot hole](#) at an angle between two boards before connecting the two with a [screw](#). This pre-[drilling](#) needs to be very accurate, so it is typically accomplished by use of a commercial jig. Pocket joints work great for [cabinet](#) face frames and other similar applications where a lot of strength is not needed. Learn the steps to creating pocket joints in your woodworking projects. [More »](#)

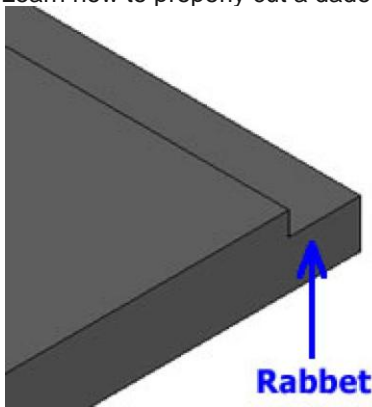


Dado in Plywood. (c) 2009 Chris Baylor licensed to About.com, Inc.

8. Dado

A dado is nothing more than a [square](#)-grooved slot in one board where another board will fit. Similar to tongue and groove joinery, this is a commonly-used wood joint for connecting [plywood](#), such as building cabinetry.

Learn how to properly cut a dado, and when to use one. [More »](#)



Rabbet. (c) 2009 Chris Baylor licensed to About.com, Inc.

9. Rabbet

Another common wood joint used in cabinetry is the rabbet. A rabbet is essentially 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. [More »](#)



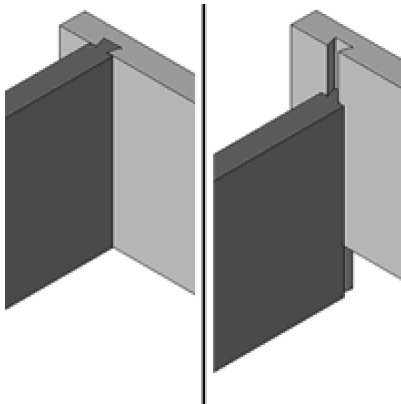
Dovetail Joint. (c) 2009 Chris Baylor licensed to About.com, Inc.

10. Through Dovetail Joint

Of all wood joinery methods, 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](#), from hand cutting to machining with a jig. Learn the keys to a quality through dovetail joint and how to create them.

11. Half-Blind Dovetail Joint

There are situations where a dovetail joint is the connection of choice, but both edges of the dovetails should not be visible. A perfect example is a [drawerfront](#), where you don't want to see the end of the through dovetail on the face of the drawer. For this type of joint, the best choice is a [half-blind dovetail](#). Learn how to build a clean, strong and beautiful half-blind dovetail joint and when to use this type of wood joinery. [More »](#)



Sliding Dovetail Joint. (c) 2009 Chris Baylor licensed to About.com, Inc.

12. Sliding Dovetail

A [sliding dovetail](#) is a versatile joint with a lot of possible uses. A good way to think of it is as a locking dado. Learn the keys to building a clean sliding dovetail joint, and when to use one. [More »](#)



Box Joint. (c) 2009 Chris Baylor licensed to About.com, Inc.

13. 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 projects. [More »](#)