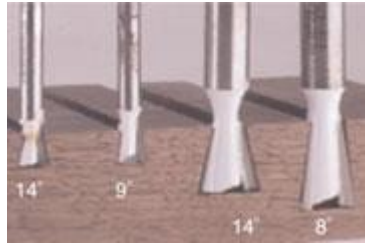


Woodworking tips

Tips & Techniques > Woodworking Techniques > Routing

Dovetail Bits

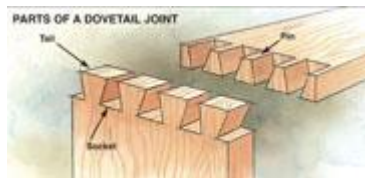
Think outside the box joint. For centuries, the hand-cut dovetail joint has stood as a testament to the quality of the case, box, or drawer that beheld it. These days, thanks to routers and dovetail bits, even a beginning woodworker can incorporate this joint to enhance the simplest projects.



Dovetail bits come in an array of cutting angles—usually 7-14°—and heights (see photo, *right*), on both 1/2" and 1/4" shanks. Generally speaking, the greater the cutting angle, the stronger the joint. But beware: The acute angles on the tails make them more fragile as the cutting angle increases, and they can break more easily along the grain.

Because of its opposing-wedge action, a properly fitted dovetail joint self-tightens. This means you can use it to eliminate fasteners, such as screws or nails. You should still glue the joint, but you won't need clamps.

How to tell your pins from your tails

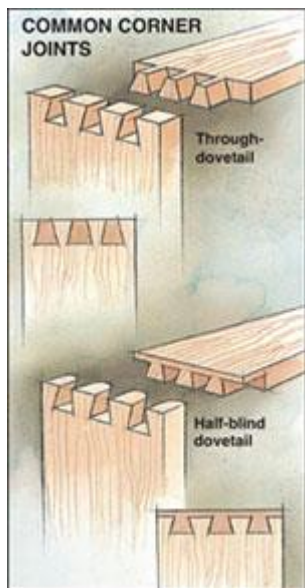


You'll see the three basic parts of every dovetail joint in the Parts of a Dovetail Joint drawing at *right*. The pin is the part that fits into the socket, which is formed by two tails. Pins and tails are often confused, but there's an easy way to remember which is which. If you look at the face of the workpiece and see birdtail-shaped protrusions, those are tails; if you see rectangles,

you're looking at pins.

The tails bear the brunt of the joint's stress, so when planning your project, point the tails in the direction of the stress. For example, opening and closing a drawer creates front-to-rear stress on the drawer.

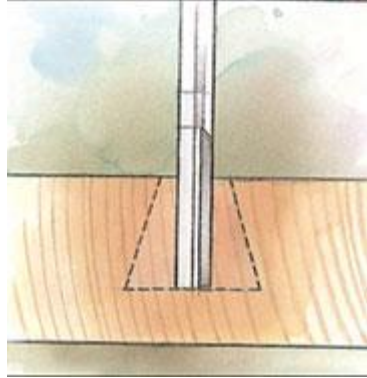
Therefore, point the tails front and rear, which means cutting the sockets in the drawer sides.



Here in the WOOD® magazine shop, we like to cut the sockets first, about 1/32" deeper than the thickness of the pins, using a dovetail bit in our router table. Then, using a straight bit, we form the pins, leaving them just a hair wider than the sockets. This lets us gradually remove more stock from the pins until we get a good fit. Once the joint is complete, we sand the tails flush with the pins.

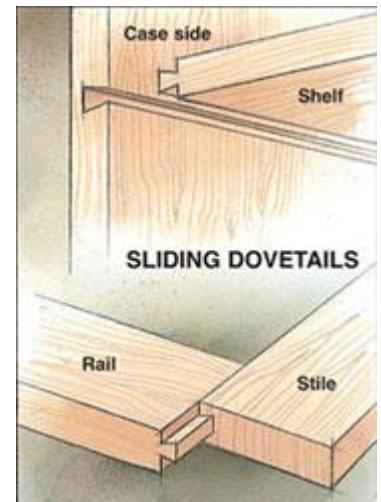
Making well-fitting dovetail joints in boxes or drawers requires a high degree of precision. That's why you'll find a covey of commercial jigs on the market today, each designed to simplify cutting the pins and sockets with bearing-guided bits. Less-expensive jigs make only half-blind joints, where the dovetails are visible only from one side of the joint. With pricier models, you can cut through-dovetails, where both sides show (see Common Corner Joints drawing, *right*).

1 Even without the use of expensive jigs, you can use dovetail bits to make other strong and attractive joints. For example, use a long dovetail slot (socket) inside a bookcase or entertainment center, then machine a long tail on each end of a shelf, as shown *right*. The resulting joint, besides adding beauty to the case, also keeps the case sides from bowing. And, if you don't glue the shelf in place, you can remove or replace it at any time.



Or, use a sliding dovetail joint instead of a stub tenon for making rail and stile panels, as shown *below right* you'll still want to glue the joint, but again, you won't need clamps for this assembly. Just be sure your panels are in place prior to gluing the frame.

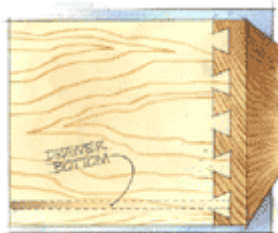
One tip for cutting sliding dovetails: The tapered sides of the dovetail slot tend to trap chips in the slot as you cut. So precut the slot with your tablesaw, or a router and a straight bit, as shown below, to remove as much material as you can before routing the dovetail. If pre-cutting proves impractical, proceed slowly with the dovetail bit, backing it completely out of the cut frequently to clear chips and



debris from the slot.

9 steps to great-looking Half-Blind Dovetails

Simple dovetail jigs, such as the one here, help you make tight-fitting half-blind dovetails quickly and easily. Follow these key steps and tricks for using your dovetail jig, and you're sure to enjoy success.

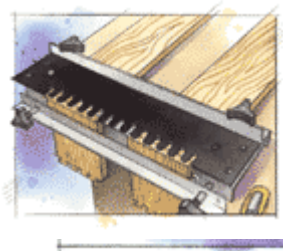
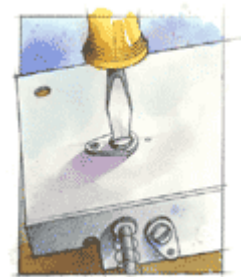


1. Dovetail jigs come with a template or "comb," with a series of "fingers" that you guide a router along to cut the dovetails. A standard 1/2" template works in conjunction with a 1/2" dovetail bit, and typically has fingers spaced 7/8" apart as shown at *left*. However, we've seen some templates with 1" spacing. And, manufacturers offer optional templates with smaller finger spacing. For example, with our Porter-Cable jig we occasionally use a 1/4" template that has fingers spaced 7/16" apart. Measure the spacing and make note of it.

2. Make the width of your workpieces an increment of the finger spacing. For example, a template with 7/8" spacing will work nicely with 3-1/2"-, 4-3/8"-, or 5-1/4"-wide pieces. That way, your workpiece will have equal half dovetails at the top and bottom of the joint as shown at *right*.

This also leaves a full tail correctly positioned for a drawer bottom. Plan to center a 1/4"-wide, 1/4"-deep bottom-holding groove on this tail *after* you machine the dovetails.

3. Most likely, your dovetail jig will have a set of stops on both ends that the edges of the workpieces butt against. Set these according to which template you are using as shown at *left*.



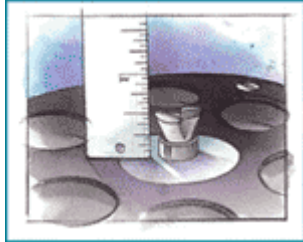
4. Now, select your stock and plane or resaw it if necessary. Drawers typically have 1/2"-thick fronts and 1/2"-thick sides and backs. With our Porter-Cable jig, the 1/2" template requires workpieces at least 1/2" thick. The 1/4" template works with drawer fronts at least 3/8" thick, and sides at least 5/16" thick. Cut your workpieces to size, making sure they are square, and arrange them as shown at *right*. Mark the top edges and number all of the matching inside corners.

5. Grab two workpieces with same-numbered corners. Place them into the jig with the numbered ends together, the drawer side positioned vertically, and the front or back sitting horizontally as shown at *left*.

The inside (numbered) surface of the drawer parts should be facing away from the jig, visible to you. The workpieces should be in contact with the stops, and tight against each other, with the face grain of the horizontal workpiece flush with the end grain of the vertical piece.



To speed things up, place workpieces on both ends of the jig as shown *right*. This only works if the width of your pieces is less than half of the jig's capacity



6. Mount the correct guide bushing into your router's base. Our jig requires a bushing with a 7/16" outside diameter (O.D.) when using a 1/2" template, and 5/16" O.D. bushing for its 1/4" template. Secure the necessary dovetail bit, and use a metal rule to adjust its height according to the instruction manual as shown at *left*.

Note: Perform the following steps in scrap stock that's of the same dimensions as your workpieces. After you're satisfied with the results, cut your actual workpieces

as described in Step 7.

7. Working from left to right, move the router in and out of each of the template fingers. Go slowly, especially near the ends of the cut, to ensure clean results.

Remove the two workpieces and check their fit with one another. The dovetailed ends should slide together with firm hand pressure or light tapping with a rubber mallet. If the joint requires more force than that, or won't go together at all, decrease the height of the bit and repeat your test cuts. If the dovetails fit together too sloppily, increase the bit height.



8. If you run into grain splintering near the end of the cut, add a scrap piece as shown at *right*. The scrap may splinter, but it will help keep the workpiece clean if the two are tightly butted together. 9. Now, check if the dovetails go together so that the face grain of the drawer sides aligns flush with the end grain of the front or back. If they won't align flush, you need to increase the length of the dovetail cuts by adjusting the templates in, away from the router. If the dovetail cuts are too long and the workpieces go more than a hair past flush, adjust the templates out, toward the router. With our Porter-Cable jig, we do this by loosening a holding screw and micro-adjusting a setscrew in or out with a hex key as shown at *left*.

Written by: Bill Krier with Chuck Hedlund **Illustrations:** Brian Jensen

Tips for Making Bread/Cutting Boards

Bread/cutting boards are quick and easy projects that make great gifts for birthdays, holidays, house-warmings, weddings, and more. Here are 11 great tips for doing a better job when making these boards.

1: Choosing the right wood. When making bread/cutting boards, choose close-grained hardwoods such as maple, cherry, walnut, birch, etc. for maximum durability. Using strips of contrasting woods enhances the appearance of these boards.

2: Grain direction. For stability, it's best to arrange your boards so the wood grain of each is going in the same direction. Vertical annual rings, where possible, are best.

3: Cutting your wood strips. Rip all wood strips to exactly the same width, making them about 1/16" wider than the thickness of the cutting board you're making. Once they're ripped, run each edge over the jointer, removing 1/32" in each pass.

4: For added strength...it's sometimes a good idea to run a 1/4" - 20 threaded steel rod through your cutting board from side-to-side. This is especially important to help avoid warpage and separation when making large, countertop boards that are over 15" wide. A rod every 6" to 8" is a good idea. Drill all your rod holes on a drill press, using stops to be sure each hole is in exactly the same location. On your two outside pieces of stock, do not drill a 1/4" through-hole for your rod ends. Instead, drill a 3/8" to 7/16" deep counterbore to conceal the tightening bolts on each end of each rod.

5: Choose the right glue. Always use a waterproof glue for bread/cutting boards. Titebond II® makes a good choice, as does two-part resorcinol epoxy glue. If you're using resorcinol, be sure to scrub all excess glue off your surfaces before it dries. If you leave hard glue on the surface, then run your assembled board through a thickness planer, it could nick your planer knives.

6: Smooth all board surfaces. If you have a thickness planer, run both surfaces of your board through the planer before proceeding. If you don't have a thickness planer, you can smooth your surfaces with a Hand Scraper, Belt Sander, Pad Sander or any combination of these tools.

7: Round all board corners for a softer appearance. Once you've glued your board together and allowed the glue to set-up thoroughly, it is recommended that you radius all board corners to help avoid chipping them or breaking the corners off your finished project. Do this on your bandsaw or Scrollsaw, then smooth them carefully on the disc sander.

8: Add a gutter to contain liquids. Use a "3-in-1" Router Bit or unpiloted core box bit to form a *gutter* around all sides of your board, about 3/4" in from its edges. This gutter will help contain blood from meats or any other liquids.

9: Round-over all board edges. Use a Round-Over Router Bit to "roll" all board edges for an improved appearance and better feel when handling the board.

10: Perform a final, light hand sanding...to remove any "fuzzy" surfaces or edges. Follow-up by using a tack cloth to remove any dust or residue before applying your finish.

11: Apply the correct finish. Always finish boards such as these (and all wooden utensils that are designed to come in contact with food products) with an appropriate finish such as Salad Bowl Finish or Preserve Oil

This Club/Guild aims to assist members to improve their working skills. Not all such activities occur in our Guild premises, and some activities or events are promoted through this Newsletter and others directly to members in some other ways, but are still Club/Guide activities, please support them. These activities may include personal and Group tuition of members by other members (we all try to help one another for the benefit of the Club/Guild in this way) sessions in members' workshops, wood-gathering, our activities to members of the public, and other such activities and events.



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