

# HOW I BUILD A DOOR

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Some years ago, my wife and I bought a small wooded acreage in the bluffs above the Missouri River valley north of Omaha, Nebraska. My plan was to make use of the free time I had while teaching college courses at the University of Nebraska at Omaha to build a house. Four years of mostly solo work later, we moved in to a substantially complete contemporary passive solar house. One of the main things unfinished at move-in time was the interior trim and doors.

One winter during construction, I used a home-made chainsaw contraption to mill six large bur oak logs from trees sacrificed to build the house into two-inch thick flitches. After three years of air drying outdoors, the planks were brought inside for a few months, and finally resawn to make material for baseboards, door casing, and door trim. When finished with this, I'd enjoyed the experience so much that I decided to try my hand at making at least some of the doors, too. Following is a description of how I now make an interior paneled door, based on the experience of making about twenty of them.

Although I'd read many articles on traditional doormaking technique, what I wanted was slightly different. First of all, traditional raised panels were a bit too formal for my taste and our house, and I prefer a simple round-over contour on the rails and stiles to the more usual ogee. I also really love the look of bookmatched grain and the balance of pattern and color it affords. Lastly, since each room in our house is trimmed in a different wood, it only made sense to have doors with the appropriate wood on each side.

## White Oak and Walnut

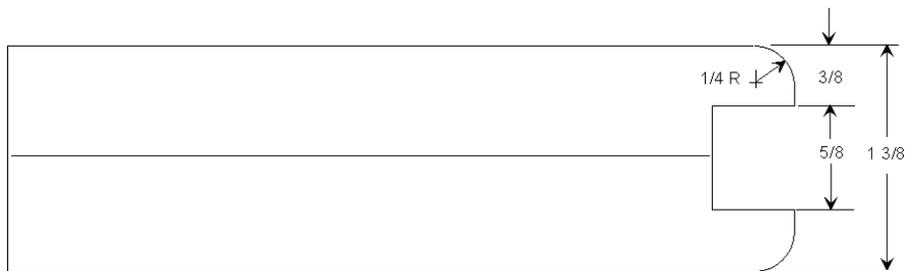
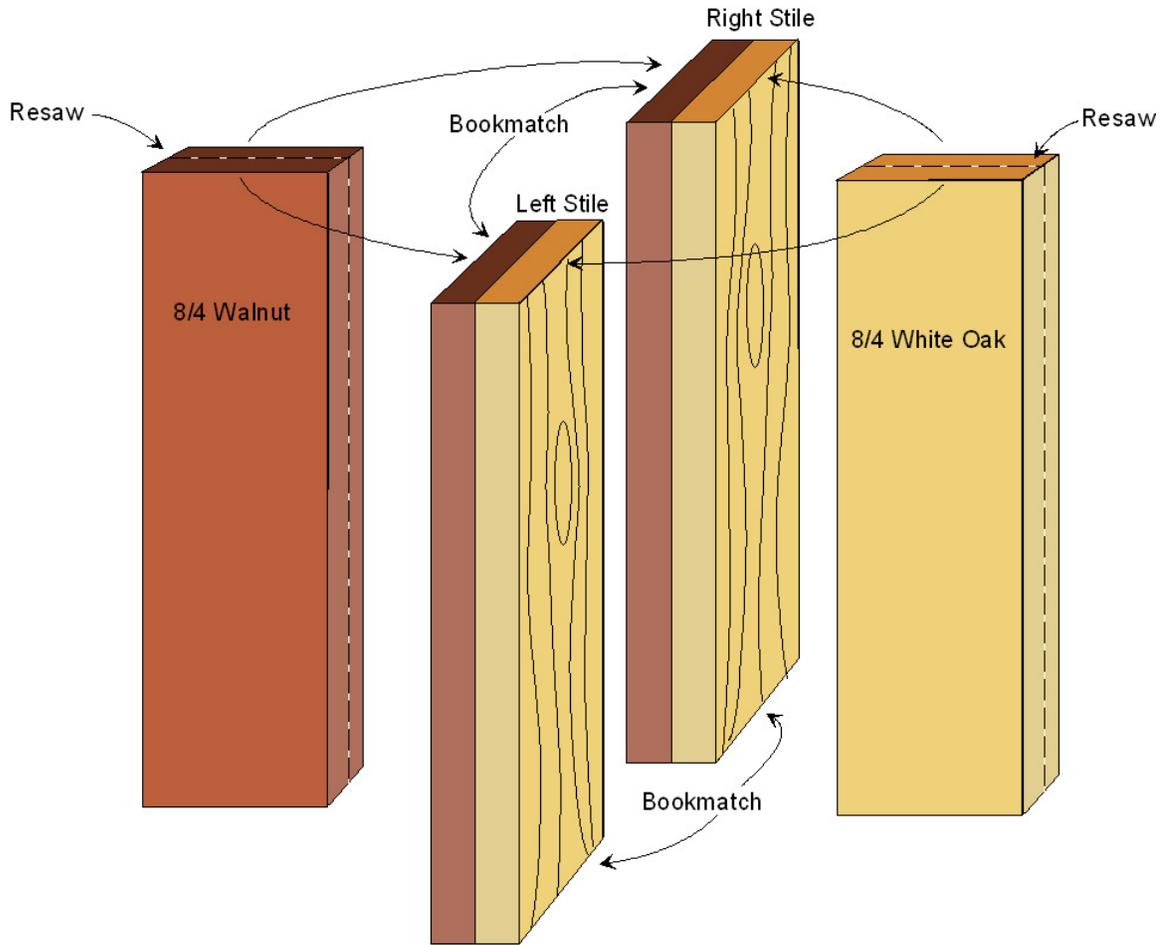
Our main hall is trimmed in bur oak, while our master bedroom has black walnut trim, so I'll describe how I made this door.

First, I selected pieces of straight 8/4 stock for the stiles—one oak and one walnut—and resawn each one on the bandsaw. I thickness planed them to just over half the final door thickness of 1 3/8 inches, taking only as much material off the bandsawn face as necessary to clean up the saw marks. This ensures the best bookmatching. I then glued up the pieces so that the stiles will show bookmatched walnut on one side and bookmatched oak on the other. The three rails can be glued up from 4/4 stock selected for similar color and grain. These five composite pieces are then dimensioned just as if they were solid lumber, including a light final thicknessing.

On a door at least 30 inches wide, I make my stiles 4-3/4 inches wide, which centers a lockset with 2-3/8 setback. On narrower doors, I use a proportionately narrower stile, but will sometimes flare the stile width out to the full dimension just in the area of the lockset and center rail. It is a nice looking detail, but a lot of trouble. I normally make the top rail the same dimension as the stiles, the bottom rail about 8" wide, and the center rail intermediate between the two. The center rail is located such that a lockset at standard height is centered on it.

One-half inch tenons are cut on the rails, and matching mortises on the stiles. The frame is then assembled dry, and when everything seems to be fitting correctly, I clamp it together, and round over the perimeter of the panel areas on both sides with a 1/4" router bit. A sharp chisel is used to bring the round-over detail all the way to each corner for a more crisp look.

The frame is then disassembled again, and I cut a  $\frac{1}{2}$ " deep  $\frac{5}{8}$ " dado centered on the edges of all of the pieces to receive the panels. I use a saddle-like jig for my router that rides on the edge of the pieces being cut. This keeps the dado centered and square to the edge.



**Figure 2. Profile of the stiles.**

## The Panels

I've used various techniques to build the panels, but they invariably use individual boards with bookmatched grain, and with the appropriate wood on each side. One way to do this is to decide on a pattern for the panels, select some 4/4 stock in each wood, resaw it, plane it, and layout each side separately, but to the same pattern. Glue up a composite for each board in the panel, dimension them, and cut dodoes in the edges for splines. Glue up a slightly oversized panel with the splines, let dry, and cut to size.

One other technique I've used for panels is to start with a sheet of 1/8" hardboard, and glue the individual pieces of each panel face to each side. This would technically allow a different pattern on each side, but this somehow bothers me.

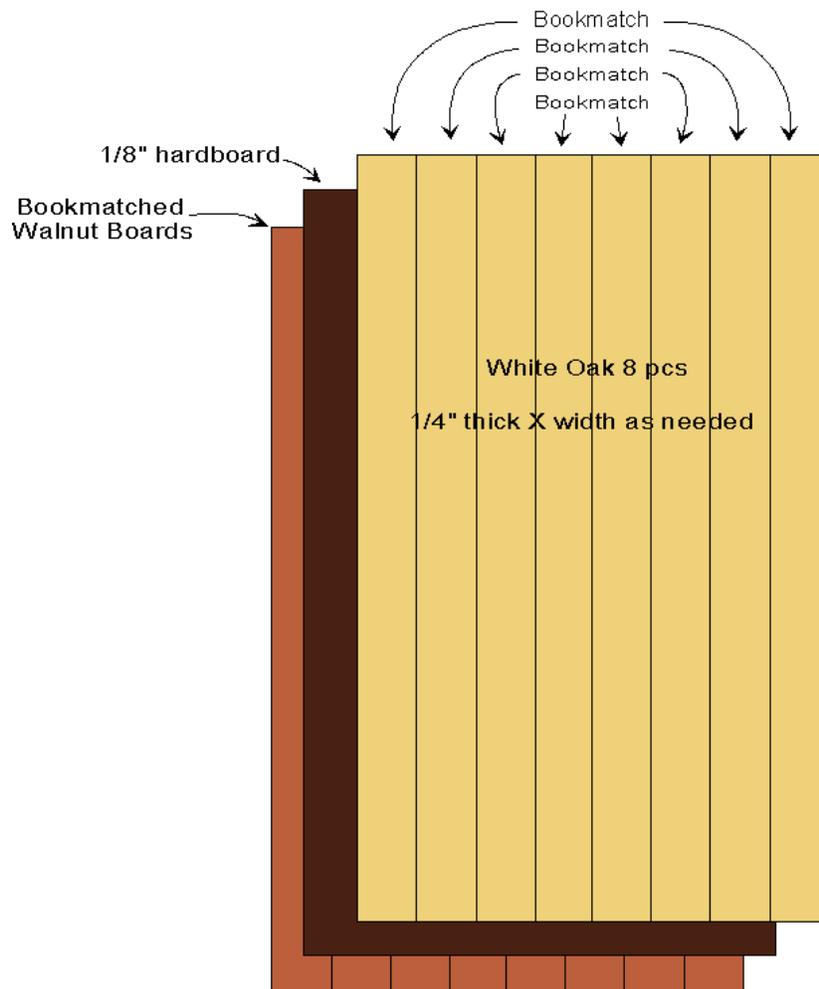


Figure 3. Panel Construction.

## Assembly

I usually do the final door glueup in two steps, first gluing the rails to one stile. I put the other stile on dry, and clamp, checking carefully for flatness and squareness. After the glue sets, the loose stile is removed, the panels are slid in, and the stile replaced and clamped. I sometimes prefinish the panels before assembly.

When the glue is set, all that is necessary is cleanup of the joints, installation of hardware, final sizing, and finishing.



Figure 4. Edge view of door.



**Figure 5. Roundover corner detail.**