

## MAKING A SOLID-CORE DOOR

*Building your own custom door is easier than you think*

The Oxford dictionary describes a door as “a hinged barrier, for closing or opening an entrance to a building or room.” To interior designers, architects and DIYers, interior doors are much more than simply “hinged barriers.” In fact, the design-savvy know that doors are one of the most prominent elements of a home’s overall interior design theme. The upgrade from run-of-the-mill builder’s doors to solid-core Colonial-style doors in this project made a dramatic improvement in the look of a house.



Before (ABOVE) and after

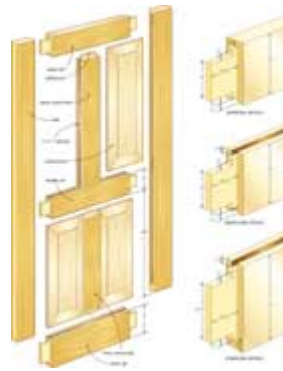


A 1/2" x 4" solid carbide spiral router bit (right) is specifically designed to plunge into stock without predrilling. The carbide bit produces a fast and clean mortise with very little effort compared with a straight-cutting bit (left)

Door-making is not as difficult to master as you might think, and this project will give you all you need to know to build a simple interior door.

### For Openers

Making your own doors is not as difficult as you might imagine, and the design possibilities are almost unlimited. I make a number of doors each year in different styles for clients whose homes range in age from brand-new to more than 80 years old.



[CLICK ABOVE TO ENLARGE](#)

### Material Matters

I chose knotty pine for this painted door project. Knotty pine is inexpensive, easy to work with and the knots can be sealed to prevent them from bleeding through the painted topcoat easily by applying two coats of shellac-based primer.

I cannot emphasize enough the importance of using dry, straight-grained lumber for a project such as this. When I began this project, the moisture content of this material was approximately seven per cent, which is just about the perfect level for making doors and means future dimensional changes of the frame should be minimal.

The materials list shows the material required to make one 30" x 80" door, a common size, but it can easily be adapted to suit doors of other dimensions.

### Finishing Up

Before the gluing and clamping operations are complete, check the door for square by measuring across its diagonal lengths, ensuring they are equal. Leave the door in the clamps for 24 hours to ensure a solid glue bond.

Once the glue has dried, remove the door from the clamps, sand thoroughly and fit into its opening. For fitting techniques, see the September 2002 issue of Canadian Home Workshop, "Hanging the Door," page 28.

### Trim it Out

Hang the door in the opening and trim it with new casing, plinth blocks and baseboard as desired. Be sure to prime the door with two coats of shellac-based primer to prevent the pine knots from bleeding through the paint. Finish with two coats of oil-based semi-gloss paint.

| You Will Need       |                           |      |
|---------------------|---------------------------|------|
| Part                | Size                      | Qty. |
| Stiles              | 1 3/8" x 5" x 80"         | 2    |
| Upper rail          | 1 3/8" x 5" x 25 1/2"     | 1    |
| Middle rail         | 1 3/8" x 5" x 25 1/2"     | 1    |
| Lower rail          | 1 3/8" x 7" x 25 1/2"     | 1    |
| Upper centre stile  | 1 3/8" x 5" x 36 1/2"     | 1    |
| Lower centre stile  | 1 3/8" x 5" x 26 1/2"     | 1    |
| Upper raised panels | 1 3/8" x 8 1/2" x 37 1/2" | 2    |
| Lower raised panels | 1 3/8" x 8 1/2" x 27 1/2" | 2    |



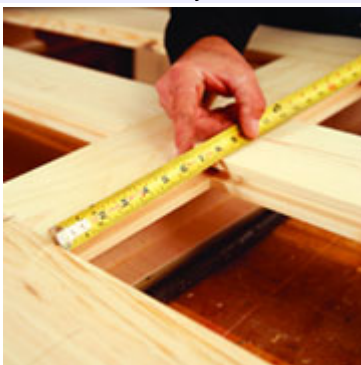
**1.** Once the material is cut to rough length and width ([see plans](#)), the next step is to cut a 1/2" x 1/2" groove in the centre of all the stiles and rails. I used a 3/8"-wide stacked dado blade on the tablesaw and raised the dado blade to 1/2" above the tablesaw surface. Centre the dado blade in the stock and cut a groove into one of the stiles. Turning the stock end for end and running the stile through again results in a 1/2"-wide groove that's 1/2" deep and centred in the stile. Test the cut on scrap material before committing to the actual door material. Clamp a featherboard to the tablesaw's surface to keep the stock tight against the fence during this operation. As you assemble the frame, insert four #20 biscuits at the intersection where the centre stiles meet the rails to help align the stiles with the rails.

**2.** Mortise the stiles with the aid of a simple platform for the router to sit on while plunging. Clamp this shopmade jig to the stile to support the router during the mortising operation, so the mortise is parallel to the face of the stock. Cut the mortises by plunging the router bit into the material and working to the layout lines and the prescribed depth of 2 1/4".



**3.** Forming tenons on the top, middle and lower rails of the door is the next step. There are many methods to choose from when it comes to making tenons, but this is one process that I have found to be both fast and accurate. Cut the tenons using a dado blade, stacked to a width of 3/4" and raised to remove just enough material to make for a snug fit of the tenon into the mortises. Set the fence of the tablesaw to act as a stop to prevent the tenon length from becoming longer than the depth of the mortise. Use a scrap piece of material of the same thickness as the rails as a test piece. The tenon should be sized so that it can be pressed into the mortise without having to force it into place with a hammer.

**4.** Refine the tenons by rounding off the square corners left by the tablesaw cutting operation so they fit snugly into the rounded corners of the mortise. Work a piece of cloth-backed sandpaper across the square edges of the tenon (similar to polishing shoes with a cloth) until the tenon has an evenly rounded profile that matches the mortise in the stile. The strength of this joint is due in part to the fit between the mortise and the tenon, and close attention to detail is a key contributor to a strong joint.



**5.** Measure between the stiles to set the dimensions of the interior panels. If the door will be painted, use medium-density fibreboard (MDF) for the interior panels. MDF is extremely stable, and using it will eliminate any concern about the interior panels expanding or

**6.** Once the mortise-and-tenons are fitting snugly, the door frame can be dry-fit and then clamped together to check that it's square. Measure the door diagonally from both corners: if the measurements are equal, the door is square; if they're not, adjust the parts as required. Make any necessary adjustments to the frame at this point, before gluing. Also, test to ensure the door will lie flat under the pressure of the clamps as it's glued.

