

### Safety Precautions:

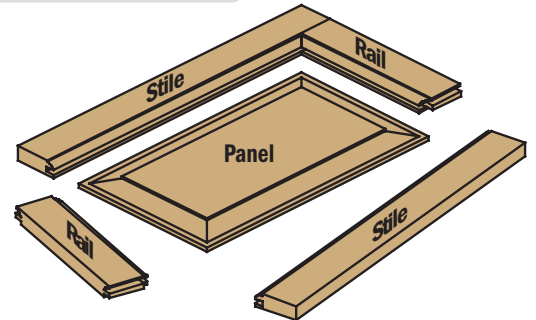
- ◆ The Raised Panel bit is capable of removing large amounts of stock. To safely and effectively produce the profile you want, we suggest making several shallow passes. It is dangerous to try to mill the entire profile in one single pass.
- ◆ Thoroughly check all tools for damage and flaws before using.
- ◆ Wear safety glasses and ear protection when using power tools.
- ◆ Be sure that at least 75% of the shank is securely inserted into the collet of the router.
- ◆ Use a router table and fence.
- ◆ Keep your tools sharpened, clean and stored in a safe place.
- ◆ Reduce the router speed when working with larger diameter bits. The raised panel bit should be used at speed of 12,000 RPM or less. If your router does not have a built in speed control, a number of speed controls are commercially available.
- ◆ Take care to remove large quantities of stock (cross section 3/8" (10mm) in more than one cut.
- ◆ NEVER use dull or defective router bits.
- ◆ NEVER force the shank entirely into the collet (bottoming out). Leave about a 1/8" space between the end of the bit's shank and the bottom of the collet.
- ◆ NEVER force the cut or overload the router.

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In our step by step example of panel door construction, we used the following:

- pre-cut stiles - 19mm thick x 62mm wide
- pre-cut rails - 19mm thick x 62mm wide
- panel - 19mm thick
- scrap stock

The CMT Rail & Stile set was designed ideally for the construction of panel doors from 19mm thick stock, however any variation of size up to 22mm thick can be used. Remember to adjust your measurements and cutting depths according to the wood thickness you use.



### MILLING THE RAILS AND STILES

First make trial cuts of the cope profile (rail) and the stick profile (stile) in scrap stock and check the accuracy of the joint. This is extremely important when working at maximum thickness (22mm). Make sure your stock is flat and cut straight with square edges. Using the CMT Stile Bit shown in Illustration 1, place the stock front face side down on the router table and mill the stick profile in the stile and rail pieces. To mill the cope cuts, use the CMT Cope Bit shown in Illustration 2, position the rails face side down on the router table and mill the cope profile in the ends. If you are milling cope and stick profiles before cutting the rails and stiles to length, make sure to make the proper calculations before cutting the rails.

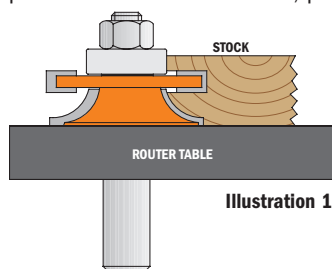


Illustration 1

The stiles are the same length as the door. The length of the rails must be calculated by the following equation:

**Width of the door, minus the width of the two stiles, plus the length of the two tenons, equals rail length.**

In our example, the door is 305mm wide, and the stiles are both 62mm wide.

The tenons produced by CMT rail and stile bits are 11mm long. Therefore, the equation for our examples is: **305mm - 124mm + 22mm = 203mm rail length**

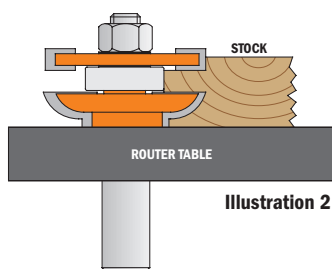


Illustration 2

Place the second panel front face up and repeat the milling process. This assures you will have the best side of your stock as a front face. If a third panel is required, mill one cut edge of the piece as instructed above, turn the piece over and run the other edge. Assemble the reverse cut pairs together for beautiful, strong joints that match up perfectly.

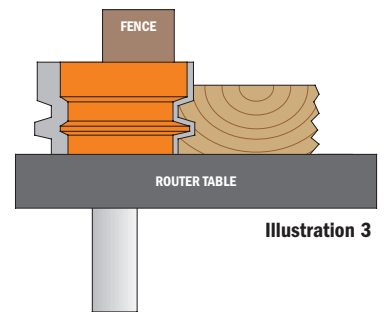


Illustration 3

### MILLING THE FLOATING PANEL

Make trial cuts in scrap stock so the top of the panel is flush with the top of the rail and stile pieces. The panel size can be calculated using this method: the width of the panel is 6mm less than the length of the rail. If the rail length is 203mm, the panel width is 197mm. This allows the panel to expand and contract between high and low humidity seasons. It is also advisable to insert Panalign strips which keep the panels centered. The length of the panel is 102mm less than the overall door length. A 610mm long cabinet door - 102mm = 508mm long raised panel.

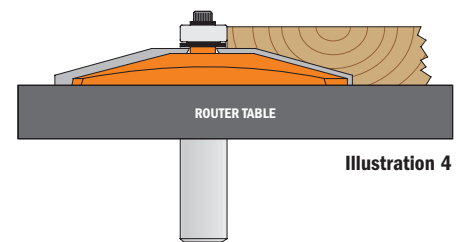


Illustration 4

This 102mm method only works when you make your rails and stiles 62mm wide since our tenons are cut 11mm long. If you plan on using the Panalign strips on the top and the bottom of the panels, you should subtract another 6mm on the length of the panel. It is not required to use Panalign strips on the top and bottom, but some cabinetmakers use them to expose more of the raised panel cut.

### GLUEING UP PANELS

If the panel requires a width greater than the width of your stock, you will need to edge-glue stock for the central floating panel. This is simply accomplished using the CMT Reverse Glue Joint bit. Place the first panel front-face down on the router table and accurately center the wood to the bit. Adjust the bit according to the thickness of the wood you are cutting by lining up the cut edge of the wood to the center point of the bit as illustrated in Illustration 3 and mill the cut edge of the wood.

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**BE CAREFUL!  
 USE GLOVES.**