

### Safety

Never work on or around router bits unless the machine is unplugged from the power source.

Always use adequate push blocks or other safety devices that keep your hands a safe distance from the cutter at all times.

The Infinity Arched Panel Door Template set is best used with an Infinity Cabinet Bit Set. Follow the instructions for setting up and using the Infinity Rail and Stile bits for those portions of door building. See the "[Instructions](#)" section of [www.infinitytools.com](http://www.infinitytools.com) to view or download those instructions and other useful information.

### Prepare the Material

It is important that the wood used to build a door be consistent in thickness, have square edges and 90-degree end cuts. Irregular thicknesses amongst the pieces can cause the panel grooves to be machined out of line with each other and may also produce steps at the joint lines.

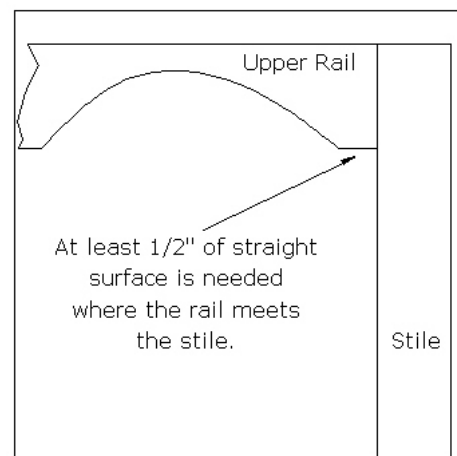
All of the door pieces are machined with the presentation face down on the router table. Lay the pieces out, choose sides you want facing out and mark them to avoid accidentally machining them incorrectly.

The only door piece that differs from a standard raised panel door is the upper rail. The width (top to bottom) of the upper rail must match the width of the template being used. Some like to increase the width of the lower rail somewhat as well.

### Choose the Template

The Infinity Arched Panel Door template set includes upper rail and panel templates ranging in size from 9" to 22" with each pair covering approximately a 2" range. While you can use smaller templates on larger doors if you like, it is important that the curved portion of the template ends at least 1/2" before the rail meets the stile. See the illustration at right. This is in addition to the straight length needed for the joinery that fits the rail to the stile.

If the curved portion of the template intersects the stile, the resulting joint can be angled, giving the piece an odd look or requiring handwork to fit properly. Having a small straight section between the arch and the stile eliminates extra work and produces joints that align properly with the corner of the raised panel for a more consistent appearance.



### Cope and Arch Cuts

For safety and accuracy, make the cope cuts in the rails before cutting the arch shape in the top rail. Because the cope bit cuts across the grain, using a backer strip following the rail through the cutter will prevent tearout as the cutter exits the rails.

Locate and mark the center of the upper rail. Apply double-sided carpet tape to the back of the template and then attach it to the upper rail, aligning the center mark on the template and the rail. Be sure that the upper edges of the rail and template are aligned also. Make sure the template is pressed firmly onto the rail to be sure it does not move during the routing operations.

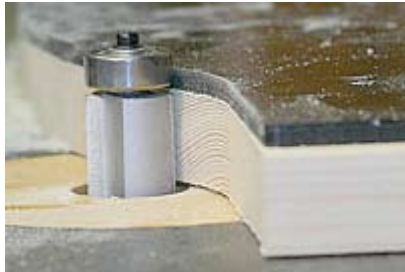
Using a band saw or jigsaw, cut the waste material away to begin forming the arch. Keep the cut 1/8 to 1/16" from the template. Be careful not to cut into the template! Cutting the waste away very close to the template lets the flush trim bit work easier and reduces the chances of splitting and chipping. Remember that this same edge will be machined with the stile bit. In that process, small chips along the edge of the rail will be eliminated.

Install the Infinity Flush Trim Bit (#06-690) in the router table, the bearing aligned with the template and the ends of the carbide cutters even with the top edge of the wood. Set the router to a maximum of 18,000 rpm.

Carefully route along the template, cutting the rail edge to its final shape. Routing the first half of the template (moving the material right to left) is usually with the grain and presents no problems. The last half of the template often forces the bit to cut against the grain as the bit moves along the wood. This may cause large chips or tear out that can ruin the piece.

The small amount of material that is being removed often makes using a "climb cut," routing with the direction of the bit rotation, the material moving from left to right, a viable option. Extreme caution must be used when making climb cuts as the bit wants to pull the material to it and you can lose control of the wood. Be sure to use a good pair of push blocks to maintain control of the piece and to keep your hands far from the cutter.

If you are unfamiliar with or uncomfortable making a climb cut, you can carefully finish trimming the edge to the template using a drum sander or rasp. Take your time and be sure you do not work into the template itself.



The flush-trim bit transfers the template shape to the wood very accurately.

If the rail extends beyond the ends of the template use a fine handsaw or rasp to make those sections flat and aligned with the edge cut with the template.

When the cuts are complete, use a putty knife to gently work the template free from the rail. Work the putty knife along the template to loosen it. Do not try to lift one edge and pull the template free as it could break.

Set up the stile bit and fence to cut the inside edges of the door frame parts.

The arch shape prevents using the fence to make this cut in the edge of the upper rail. Move the fence out of the way to cut the upper rail using the bearing on the stile bit as your

guide. Use a pair of good push blocks to help control the piece and to keep your hands a safe distance from the bit at all times.

### Size the Raised Panel

Dry fit the door frame assembly and clamp it with just enough pressure to draw the joints together. Measure the opening between the stiles and from the lower to the upper rail at the top of the arch to determine the size of the raised panel blank. Make sure to include the depth of the grooves into which the panel will fit.

Subtract 3/16" from the overall height and width measurements to insure there will be a minimum 1/16" free space on all four sides of the finished panel to allow for expansion and contraction.



Sawing the waste away very close to the template makes it easier for the flush-trim bit to clean the edge up.



Use plenty of double-sided tape to insure the template does not move during routing!

## Shape the Raised Panel

Locate and mark the center (width) at the top of the raised panel blank. Attach the raised panel template using double-sided tape as described earlier, aligning its center mark with the one on the blank. Use a long square to be sure the template is level on the blank.

Cut away the waste material with a band saw or jigsaw staying 1/8" to 1/16" from the template. Install the Infinity flush trim bit, adjusted as described for the top rail and finish shaping the top of the raised panel. Remember to watch the grain as a climb cut may be necessary on the first half of the template where the arch sweeps upward, very often against the grain.



The back cutter bit makes fitting the panel to the stile grooves easy without affecting the presentation face of the raised panel.

Install the panel-raising bit and set the initial height for a very light cut. Throughout the raising process, cut the end grain edges first, and then the long grain sides. Raise the bit 1/16" to 1/8" between passes until the full profile is cut.

At this point, the edge of the panel will probably be too thick to fit in the rail and stile grooves. Install the Infinity Back Cutter bit and set the height for a very light initial cut. As with the upper rail, the shape of the arch prevents using the fence. The amount of material being removed by the back cutter is small. Using a pair of push blocks, you can guide the panel across the bit to make the cuts.

Make a series of passes, gradually increasing the back cutter height until the panel fits the grooves. Because the panel floats, the panel should fit the grooves easily but not so loose that it rattles.

## Final Dry Fit and Door Assembly

Assemble all of the door parts and clamp with just enough pressure to close the joints to be sure they fit properly. If no corrections are necessary, disassemble and finish sand all surfaces. When permanently assembling the door it is important to apply glue only to the cope profile at the ends of the rails and the corresponding area of the stile profiles. The raised panel is not glued, remaining free-floating in the grooves.

Assemble the door and place in clamps, tightened just enough to draw the joints closed. Check to be sure that the door is flat in the clamps and square before allowing to dry thoroughly.

## Edge Treatment

When the glue has dried, sand the joints and edges smooth.

Install the ogee or cove bit from the Infinity set and make a series of light cuts, gradually increasing bit height between passes until the correct profile is cut.

**Tip:** Route the top and bottom edges first (end grain) and then the sides.

Finish sand the door and apply the finish of your choice.

## Design Options

The Infinity Arched Panel Door Template sets allow you to design a wide range of doors in addition to the popular top arch. An inverted arch can be cut in the bottom rail to mirror the one in the upper rail. You can also split the arch across two adjoining doors to define matched sets. You can also increase rail width to create whatever look is appealing to you.