



Setting Up and Using Infinity Tools Rail & Stile Sets

Safety First!

ALWAYS unplug the router from the power source when changing, adjusting or working with router bits. Eliminating the power source, except when actually making a cut, is the only positive way to prevent accidental startups.

Infinity Tool rail and stile bits are designed for use in a table-mounted router only.

Always use push blocks, push sticks or other applicable safety devices to maintain a safe distance between your hands and the router bit whenever the router is connected to a power source.

Test Cuts and Setup Blocks

Making test cuts in wood the same thickness as the project wood is the easiest way to insure the setup is correct. Making test joints in scrap wood is also a great way to familiarize yourself with the use of Infinity's rail and stile bit set.

When a setup is perfected, save examples of the rail and stile cuts to be used as "gauge blocks" to help speed setups every time you use them. Test joints in scrap wood should always be made before cutting the actual project wood as a final check that the setup is correct. Using the setup blocks will speed this process substantially.



Backer Boards

As a cutter exits a piece of wood, it can chip or splinter the edge. Using another piece of wood to back up the work piece prevents this tear-out. In most cases, a backer board with a square edge held flush against the trailing edge of the work piece is all that is needed. The exception is when cutting the tenon profile in the rail ends. See the section on cutting the rails below.

Adjusting the Bits

In most cases, Infinity rail and stile bits produce clean fitting joints as they come from the factory. If necessary, joint fit can be adjusted by adding or removing shims, preloaded during manufacturing. Make adjustments in

small steps, testing the fit between each adjustment. Once adjusted, the bits should not need further adjustment.

The stile bit has shims between the groove and profile cutter. The rail bit has shims between the back cutter and bearing. Both bits have extra shims located beneath the retaining nut.

If the tongue on the rails fits the groove in the stiles too tightly, remove one or two shims from between the back cutter and bearing on the rail bit. If the tongue is too loose in the stile groove, add one or two shims between the back cutter and bearing of the rail bit. If the profile sections (decorative cut along the inside edges of all pieces) do not match properly, the stile bit must be adjusted. If the profile area is too loose, add one or two shims between the groove and profile cutter on the stile bit. If the profiles are overly tight, remove one or two shims from between the groove and profile cutter on the stile bit.

The ideal joint fit is not so loose that it has play in it, nor so tight that anything more than light clamp pressure is needed to fully seat the joint.

Note: The adjustments to the rail and stile bits are to correct the fit between the rails and stiles only. The groove for the center panel remains constant. The center panel is formed to fit the groove produced by the stile bit.



Prepare the Wood

To build a square door assembly, the wood must be flat, straight, consistent in thickness and have perfectly square ends. When possible, using a surface planer to equalize the thickness of all project parts is best. If a planer is not available, choose the wood for each door assembly carefully, matching thickness, grain and color as closely as possible for the best fit and appearance.

Marking each piece with it's intended position in the door assembly, including inner and outer edges, and the side that will face outward will help prevent errors during machining.



Fence Alignment

The Infinity Tools rail and stile bits are equipped with depth limiting ball bearings that must be aligned with the edge of the fence to insure proper cut depth. A straightedge held against the fence should touch both sides of the fence and the bearing simultaneously when aligned correctly. Fences with moveable sides should be

adjusted as close to the bit as is safe to provide the maximum support of the work pieces during machining.

Sizing the Work Pieces

Infinity rail and stile bits are designed to work with wood thicknesses between $\frac{3}{4}$ " and $\frac{7}{8}$ ".

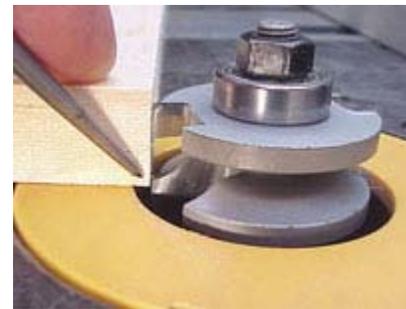
When cutting the rails for a door, allowance must be made for the overlap created by the $\frac{7}{16}$ " depth of the interlocking shape on each end.

For example, let's say we are building a door 18"-tall and 12"-wide. If the stiles (vertical pieces) are 3"-wide, the rails (horizontal pieces) would have to be $6\frac{7}{8}$ "-long. To determine the rail length, take the overall door width, subtract the combined width of the two stiles and then add $\frac{7}{8}$ " to that figure for the correct overall rail length.

The stiles, which run the full height of the door, are cut to the full height dimension desired.

Cut the Stile Profiles First

Install the Stile bit in the router and adjust the height so that the squared edge of the cutter is approximately $\frac{1}{16}$ " above the table surface. Using a piece of scrap placed **FACE DOWN** on the table, make a test cut and then adjust bit height and fence alignment if necessary to produce a clean edge on the profile.

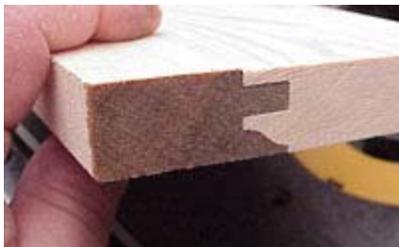


When satisfied with the bit and fence setting, run the inside edges of both stiles and both rails, (**All FACE DOWN**) across the Stile bit. Use a backer block held tightly against the end of each piece to prevent tear out as the cutter exits the wood.

Cut the Rails

Note: Because the rail cuts are on the narrow ends, use a miter guide or shop-built sled to fully support the work piece and keep it square to the fence while cutting.

Install the rail bit and adjust its height by holding the edge of a stile (face down) on the table next to it and matching the rail bit's cutter edges with the edges cut by the stile bit.



Make a test cut in scrap wood and check its fit into one of the stiles. Make adjustments as necessary and make another test cut. The profiles should be clean and the mating surfaces of the rails and stiles flush or very close to it. If more than minor sanding will be needed to bring the rails and stiles flush, the bit

height is not correct.

When satisfied with the set up, cut the rail profile down the side of a piece of scrap sufficiently sized for use as a backer block for cutting the rails.

When forming the tenons on the ends of the rails, the bit is cutting across the grain making tear out as the bit exits the wood a near certainty. Using a

backer board held tightly against the trailing edge of the rail piece during this cut is the only way to prevent this damage.

One end of each rail is cut with the square edge in the trailing position. A square-edged piece of scrap held tightly between the trailing edge of the rail piece and the miter guide during the cut will prevent tear out.

The other end of each rail must be cut with the profile edge in the trailing position. To prevent tear out, insert the piece of scrap prepared with the rail profile into the stile profile of the work piece and hold it tightly in place during the cut.

The Finished Product

If your bit settings were correct, the rails and stiles will fit together cleanly with little sanding necessary to bring the rails and stiles flush with each other. Because both the rails and stiles are machined face down, any variation in thickness between the work pieces is shifted to the rear where corrective sanding does not affect the profiles.

