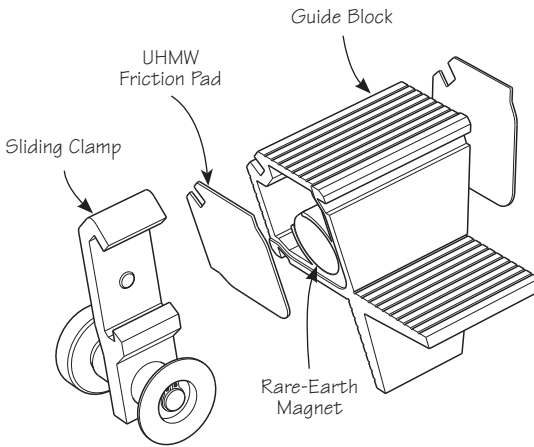


## Dovetail Saw Guides

U.S. Pat. No. 6,607,016

Dovetail joints have traditionally been the hallmark of a cabinetmaker who had acquired an expert level of skill. They are also a mark of quality and attention to detail that many people look for in high-end furniture. This perception remains despite the fact that modern glues and joinery techniques can create joints of equal or greater strength, often with less effort. Also, dovetail joints can now be relatively easily made with a router and dovetail jigs.

Still, traditional hand-cut dovetails remain desirable for aesthetic reasons, as well as for the challenge they represent. Veritas® has developed these dovetail saw guides to allow amateur woodworkers to achieve professional results. This system also allows the seasoned expert to produce dovetail joints more quickly and with less effort.



**Figure 1: Dovetail saw guide, exploded view.**

The dovetail saw guides are available in the traditional ratios of 1:6 for softwood (05T02.11), 1:8 for hardwood (05T02.12), and 14° for matching dovetails on antique furniture as well as those made with a router (05T02.05). The Right-Angle Saw Guide (05T04.01) ensures the shoulders have straight, accurate 90° cuts.

The guides come with a sliding clamp that is designed to fit in either side of the guide to allow cutting of both pins and tails. It can accommodate material from 1/4" to 1" thick. Each reference surface is embedded with a 3/4" diameter rare-earth magnet and covered with a low-friction UHMW pad. The magnets keep the saw aligned as you cut; the pads allow the saw to slide easily against the reference surface.

## Some Important Points about Saws

1. Because of the need for a large reference face to accurately guide the saw, it is important to use a saw that does not have a back (see below for information on our dovetail saw). Any back on the blade will interfere with the guide. Unfortunately, this precludes traditional dovetail cutting saws.
2. The teeth on the saw should be set no more than 0.005". The UHMW pads are 0.005" proud of the guide face, and this offset is necessary to create accurate cuts.
3. A fine-toothed saw will create a smooth cut and a high-quality joint.
4. While the guide is equipped with powerful magnets that will help hold a saw in line, ensure that your saw tracks straight without the guide. Tooth set should be equal on both sides of the saw.

The Veritas Dovetail Saw (05T02.03) has been designed specifically for use with the Veritas dovetail saw guides. The 8 1/2" blade length and 2" height offer good cutting action and complete registration against the guides. With 22 teeth per inch and 0.005" set on each side, it produces a fine cut on the pull stroke. The dozuki tooth form is effective in both crosscuts and rip cuts, leaving a smooth cut surface.

## Some Initial Thoughts about Dovetail Joints

Dovetail joints require a level of discipline and care that can only be acquired through patience and practice. The Veritas dovetail saw guides will reduce the amount of experience needed, but not eliminate it. We suggest that you spend some time with scraps to perfect your technique before starting on a project.

## Terminology

**Dovetail joint:** a woodworking joint that connects two parts generally at 90° to each other using a series of matched cuts, referred to as pins and tails (see **Figure 2**).

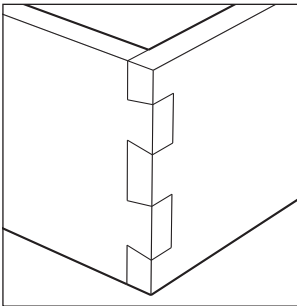
**Tail:** the part of the joint that looks like a dove's tail (see **Figure 3**).

**Tail Board:** the part that is cut to have a series of tails (see **Figure 3**).

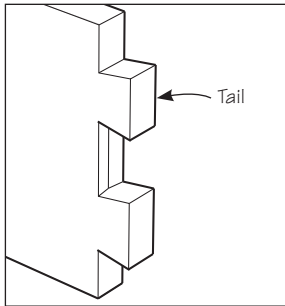
**Pin:** the part of the joint that is cut to fit between the tails (see **Figure 4**).

**Pin Board:** the part that is cut with a series of pins that will interlock with the tail board (see **Figure 4**).

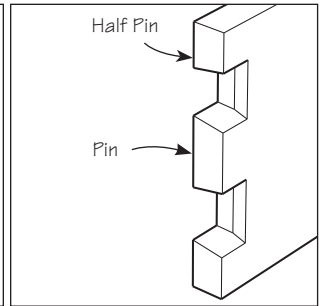
**Waste:** areas of wood to be removed.



**Figure 2: Typical full dovetail joint.**



**Figure 3: The tail board.**



**Figure 4: The pin board.**

## Tools Required

- Dovetail saw guide and right-angle saw guide
- Dovetail saw (backless)
- Pencil
- Chisels (should have a range of sizes and be sharp. Bevel-edge chisels work best, particularly for tail board waste removal.)
- Mallet (for striking chisels)
- Sharp knife (striking/marking knife is best)
- Square
- Bevel gauge
- Marking gauge
- Clamp/vise/bench hold-down
- Glue

## Through Dovetails

As with all activities of this nature, there are as many different ways of cutting dovetails as there are practitioners. After you have made a number of these joints, you will probably develop your own preferences. The following method is based on the “tails first” approach, since it not only yields good results fairly quickly, but also reduces the number of errors that could be made through measurements.

When you are just starting out, avoid the temptation to practice on extremely soft wood. Because there is less compression of wood fibers, it is easier to get good results using harder wood. Woods such as poplar, walnut or cherry are excellent dovetail friendly woods. Also, since small dovetails are difficult to clean out and can be delicate, these should be attempted only once the basic dovetail has been mastered.

**Tip:** To start, keep the number of dovetails on any one joint to a minimum. The more dovetails you have, the more likely one will be off, preventing the joint from fitting together properly.

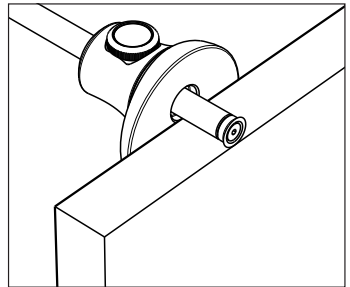
## Layout

1. Dress your boards to the desired thickness. Ensure that they are flat and consistent across the width. Also ensure that the ends are square.

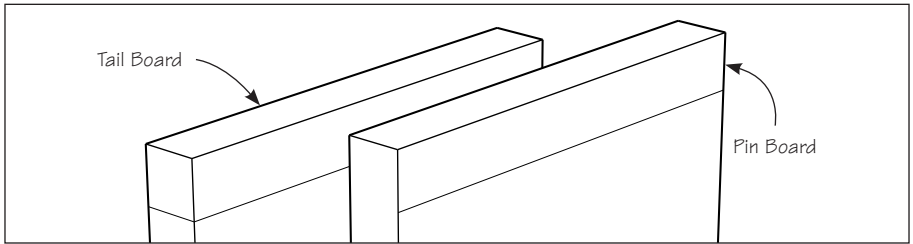
**Note:** It is assumed that all your boards are the same thickness.

2. Mark your tail boards and your pin boards to ensure there is no confusion as you work.
3. Pinch the width of the tail board between the cutter and fence of a marking gauge to obtain the socket depth of the dovetails, as shown in **Figure 5**.
4. Use the marking gauge to strike a line on all four surfaces of the tail board and on the two faces of the pin board (see **Figure 6**).

**Tip:** You can darken the lines with a pencil to make them more visible.

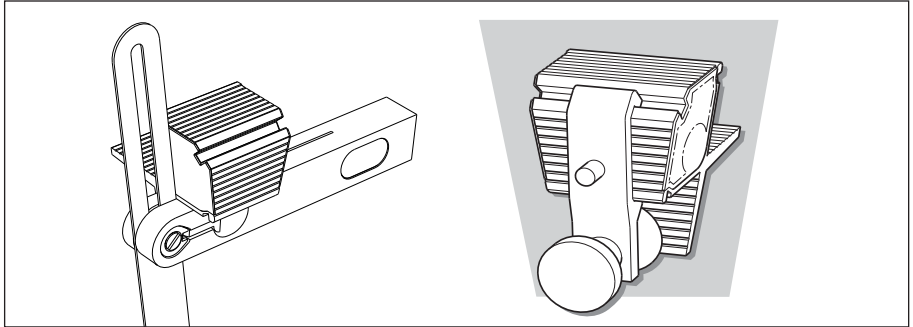


**Figure 5:** Using a marking gauge to determine the socket depth.



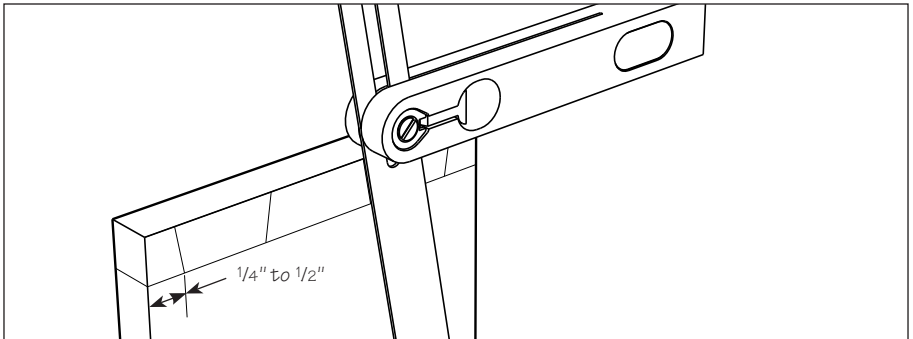
**Figure 6: Striking the base lines on tail and pin boards.**

5. Use the saw guide you have chosen to use (1:6, 1:8 or 14°) to set your bevel gauge, ensuring that the guide is configured to cut tails, as shown in **Figure 7**.



**Figure 7: Using the saw guide to set the bevel gauge. Note that taper is vertical.**

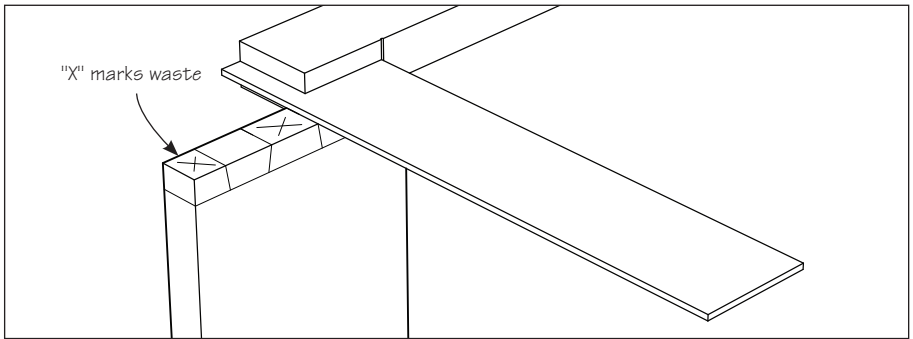
6. Clamp the tail board (outer face toward you) vertically in a vise.
7. Decide how many tails you would like across the tail board. For this example, there will be two tails centered across the board. Lay out the dovetails on the tail board using the bevel gauge and a pencil, leaving at least a 1/4" on each end for the half-pins to ensure your boards do not split during assembly (see **Figure 8**).



**Figure 8: Laying out the tails.**

**Tip:** You can adjust the tail width and the spacing between the tails as you wish; however, for your first few tries and to facilitate chiselling out the waste later, you might want to consider keeping these the same as the width of your chisel.

8. Carry the lines onto the end of the board with a square and mark your waste areas, as shown in **Figure 9**. These marks will provide helpful reminders for cutting in the waste areas and not in the save areas.



**Figure 9: Carrying lines onto end of board and marking the waste.**

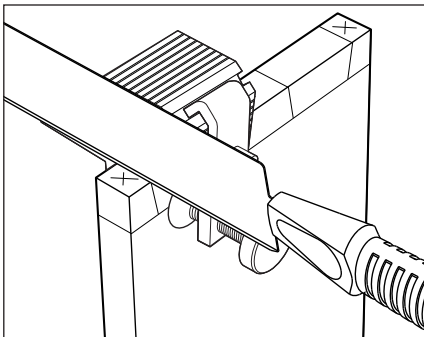
## Cutting the Tails

1. Align the left side of the saw guide with the outermost line at the left side of the board. Leave the clamp loose for the moment.

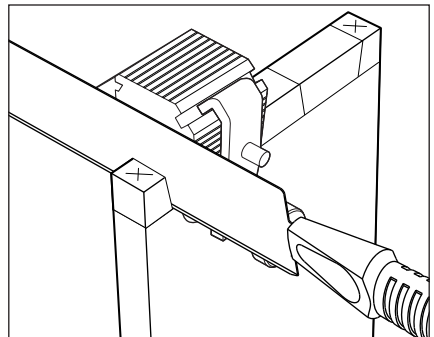
**Tip:** Position the saw guide such that the sliding clamp faces you. This will make it easier to move the saw guide across the board as you complete each cut. You can adjust the position of the sliding clamp left or right on the guide block as needed, so that it is out of the way as you cut with the saw.

2. Place the saw against the guide (the magnet will pull the blade into full contact) and adjust the position of the guide so the cut will be on the **waste side** of the line (see **Figure 10**). Tighten the clamp to hold the position.
3. With the saw fully registered against the guide (the magnet should take care of this), begin your cut (see **Figure 11**). Start with a few light strokes in order to start the cut. Once the blade has established a kerf, take long strokes that use the entire length of the blade.

**Tip:** The saw cuts on the pull stroke for smooth cuts and good control. You need not use force to make the cut. Let the saw do the work.



**Figure 10: Placing saw and guide to cut on the waste side of the line.**

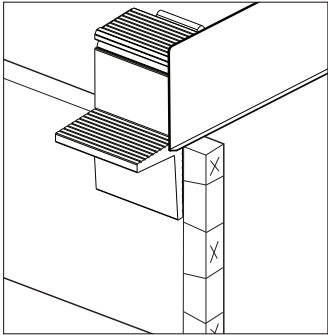


**Figure 11: The first cut.**

**Note:** The saw may scratch the sides of the guide legs; however, this will not affect the performance of the guide. If the saw begins to take a large gouge, it may indicate that your saw has unequal tooth set and needs to be properly tuned.

4. Cut to the socket depth line, ensuring that the saw remains level as the cut nears completion.
5. Move the guide to the next mark, ensuring the **waste area is exposed**, and make the next cut. Repeat this procedure until all the tails are cut.
6. Remove the tail board from the vise and reposition it horizontally. Clamp the right-angle saw guide on the end of the board and cut the waste area, being careful not to cut into the tails (see **Figure 12**). Repeat for the other side. Clean up the saw cuts with a sharp chisel if necessary.

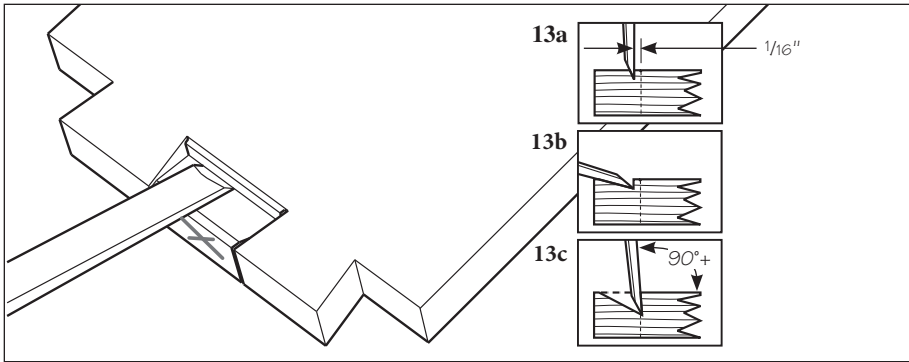
**Tip:** The right-angle saw guide can also be used for making finger joints, cutting tenons, or on-the-spot trimming of small items. It is also ideal for beginners or children learning to make perfectly square perpendicular cuts on board ends.



**Figure 12:** Using the right-angle saw guide to remove end waste.

### Removing the Waste from the Tails

1. Clamp the tail board flat on the workbench.
2. Keeping approximately  $1/16''$  ahead of the socket depth line, pare out the waste (in small increments) with a sharp chisel until you get to about half the thickness of the tail board. (**Figures 13a and 13b**).



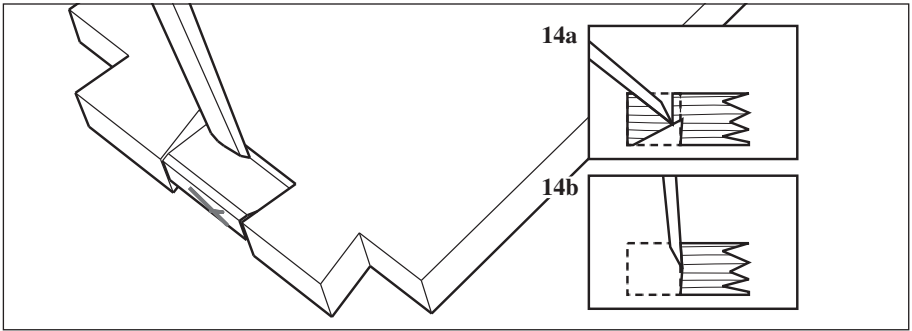
**Figure 13:** Chiselling out the waste. Note the angle of the chisel ensures clearance in the middle of the joint.

**Tip:** When removing the waste, never start at the socket depth line; otherwise, you risk nicking the edges of the joint at the surface of the wood, resulting in an unattractive joint.

**Tip:** Be careful that you do not nick the corner of the joints with the chisel, as this will leave marks on the finished work that cannot be removed.

3. Place the chisel into the socket depth line you made with the marking gauge to ensure accuracy, then angle the chisel so that the middle of the joint will be lower than the edges (**Figure 13c**).

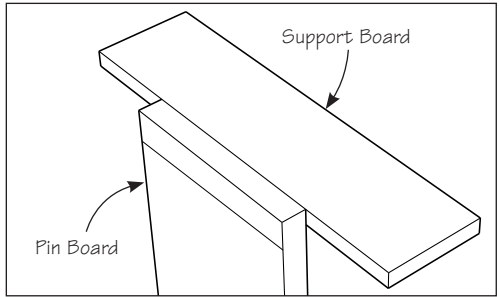
4. Flip the board over and pare the remaining waste, as shown in **Figures 14a** and **14b**.



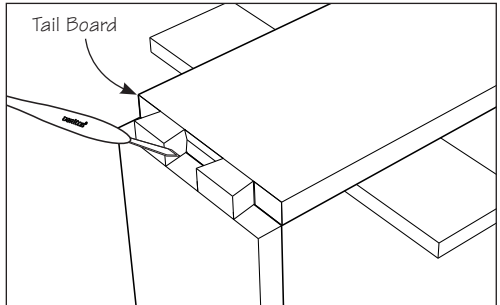
**Figure 14: Cutting the final depth of the dovetail.**

### Marking the Pins by Transferring the Pattern

1. Place the pin board (outer face toward you) in a vise. Use a scrap of wood or a hand plane on its side as a prop to ensure that the board protrudes from the vise equally and clamp firmly in place.
2. Move the prop a few inches away from the pin board and place the tail board over both, taking care to line up the edges of the tail board with the edges of the pin board, as shown in **Figure 16**.
3. Using hand pressure to hold the tail board in place, trace the shape of the tails onto the pin board with a knife (preferably a striking knife) with multiple light cuts to ensure a consistent line.
4. **Immediately** mark your waste so that you do not inadvertently saw on the wrong side of the line at this stage; otherwise, the dovetail will have a loose (and undesirable) fit.



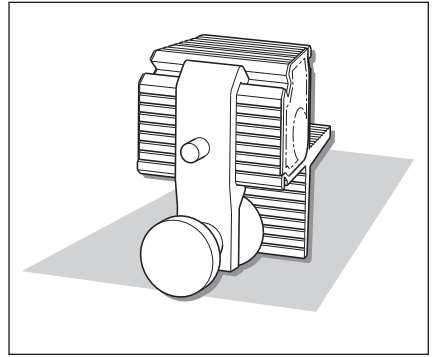
**Figure 15: Clamp pin board with support board.**



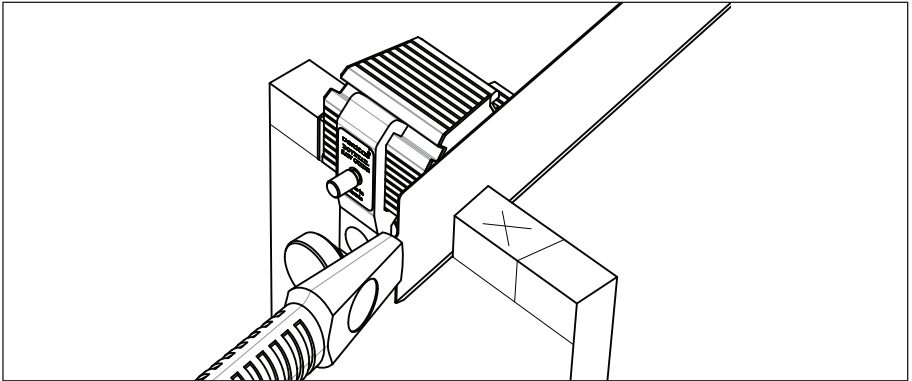
**Figure 16: Transferring tail layout to pin board.**

## Cutting the Pins

1. Switch the sliding clamp such that the guide is configured to cut pins (see **Figure 17**).
2. Reposition the pin board (outer face away from you) so it seats a little higher in a vise and cut the pins in much the same way as the tails. Ensure that the guide is placed so **the sawing occurs in the waste**.
3. Cut all the way to the depth line, ensuring that the saw remains level as the cut nears completion. See **Figure 18**.



**Figure 17: Dovetail saw guide set to cut pins. Note that taper is horizontal.**



**Figure 18: Cutting the pins.**

4. Move the guide to the next mark, ensuring the **waste area is exposed**, and make the next cut. Repeat this procedure until all the pins are cut.

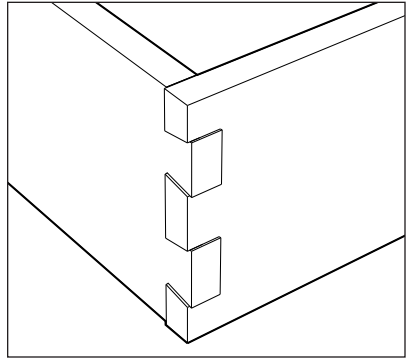
## Removing the Waste from the Pins

1. Clamp the board flat on the workbench.
2. Pare out the waste (in small increments) with a sharp chisel, the same way as with the tail board, being careful not to chisel into the (angled) pins, as this would ruin the aesthetics of the joint.



## Final Fitting and Gluing

1. Clean out the cuts completely so that the corners are as crisp as possible.
2. Ensure that the socket bases are clean and lightly undercut.
3. The joint should now fit together with very little effort. Notice that the pins and tails extend slightly beyond the width of the boards; this is intentional.
4. Glue the joint using PVA glue. Apply the glue onto all the pin sockets, then slide the tail board into place. You may require some gentle hammer taps to draw the tails and pins together.



**Figure 19: Overlap on pin and tail boards.**

**Tip:** *If you do use a hammer to draw the parts together, be sure to use a scrap piece of wood between the hammer blows and the work so as not to damage the wood or the joint.*

5. Once the glue is dry, plane or sand the ends of the pins and tails flush with the faces of the parts.

**Note:** *Your first attempt will probably not yield perfect dovetails; it takes practice to create fine dovetail joinery.*

## Accessories

- 05T02.11** 1:6 Dovetail Saw Guide
- 05T02.12** 1:8 Dovetail Saw Guide
- 05T02.05** 14° Dovetail Saw Guide
- 05T04.01** Right-Angle Saw Guide
- 05T02.04** Replacement UHMW Pads, 1 pair
- 05T02.03** Veritas® Dovetail Saw