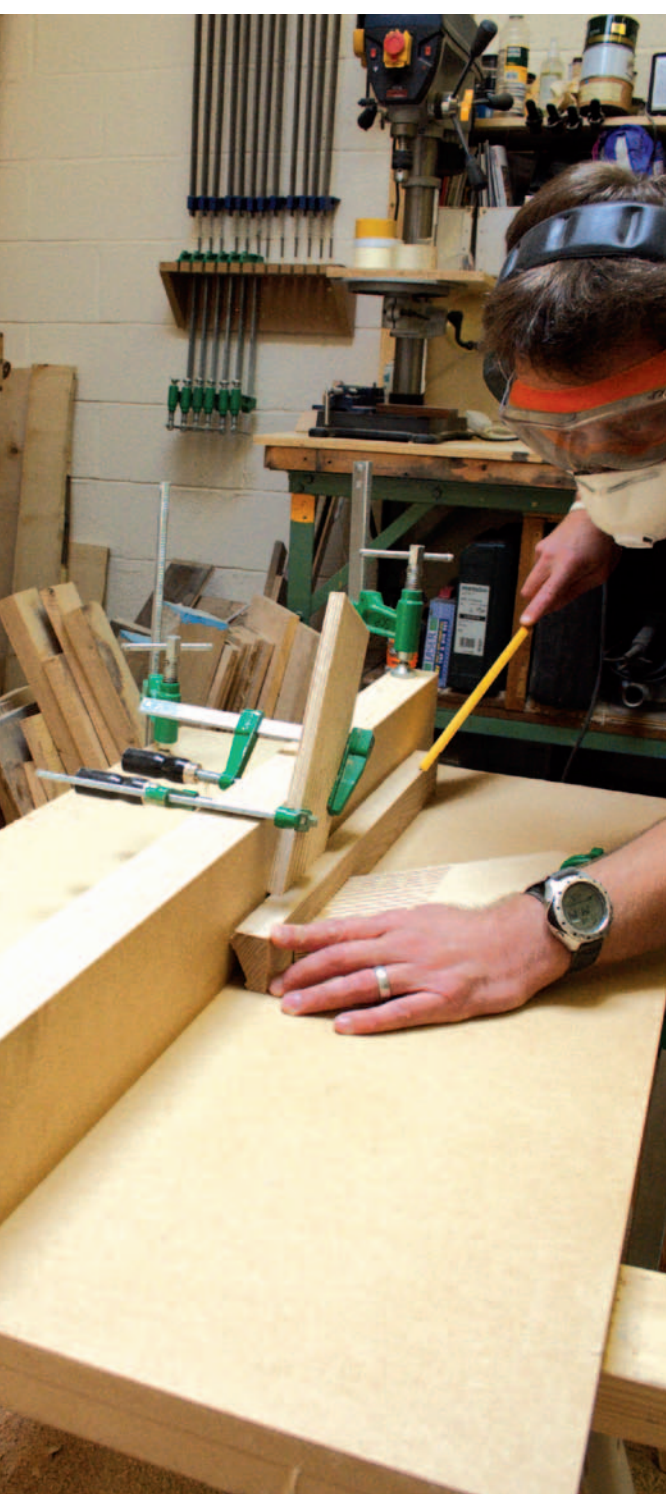




5 Ways to Lock... Mitre Joints

Rather than rely on metal staples, Stephen Prescott explains how to reinforce a mitre joint for picture framing with wood



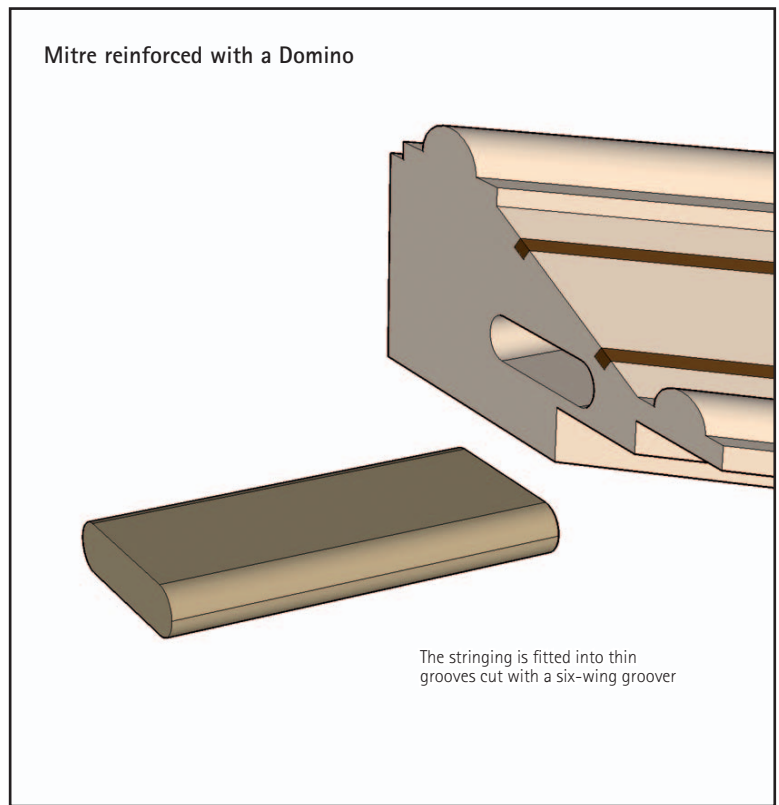
No.1 Festool Domino

Like it or not, one of the most obvious ways to strengthen a mitre is with a Festool Domino. All the mouldings in this article were formed with Wealden's new set of picture framing cutters, and the one for this first ash frame is T3707. It has quite a wide flat area in the centre, so I decided to break it up a bit with two pieces of walnut stringing, which are about 1.5mm wide.

Start by machining the moulding on a router table. Make sure you use featherboards (left) for this sort of aggressive cutting. Once that is done I put Wealden's T380 thin slitting

groover in the router. To support the moulding against the fence I stuck a sacrificial strip of 4mm MDF to the router table fence with double-sided tape (Pic.3). With this strip in place turn on the router and pierce the thin MDF with the thin cutter. Do this twice, with the cutter in the lower and higher position. This technique also helps to limit tearout. Now you can rout the tiny grooves (Pic.4) for the walnut stringing, insert the walnut and plane/sand back flush.

Now you can cut the mitre however you prefer and cut the slot for the Domino.



Pic.1 This moulding is created with Wealden's T3707 cutter



Pic.2 The slits for the stringing are formed with the six-wing T5380 groover, which is 1.5mm thick and 60mm diameter. It is fitted to the long T3030 1/2in arbor, which is popular for cutting tops off boxes



Pic.3 Stick a sacrificial fence to the router fence to run against the flats on the moulding. You pierce this with the groover



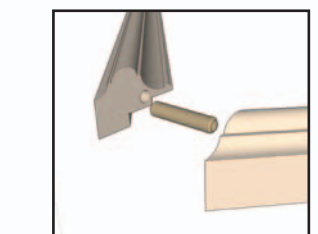
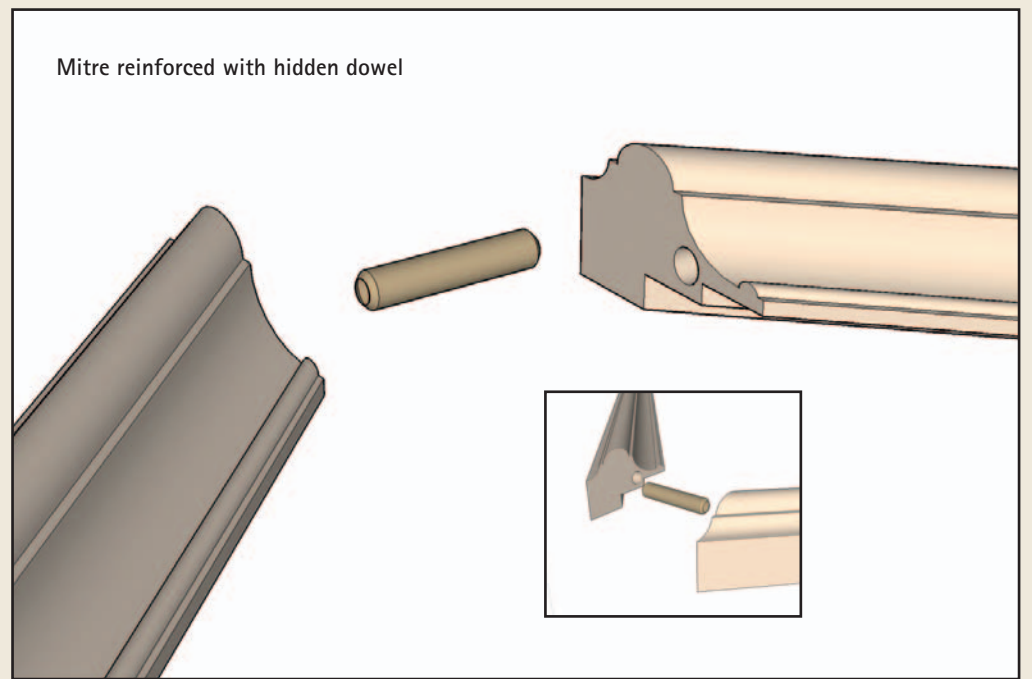
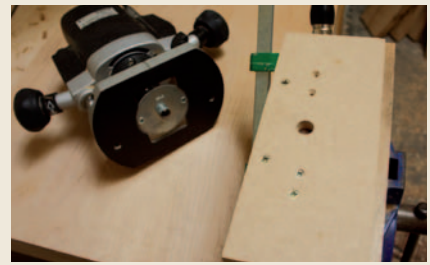
Pic.4 The sacrificial fence raises the moulding away from the main fence so that you can rest the bottom edge of the moulding on the table while slitting for the walnut stringing

No.2 Hidden Dowels

Hidden dowels are another obvious choice for strengthening a mitre joint, but ironically for such a simple concept they are the most difficult to line up. I made a guide bush jig for my router using an offcut of the walnut moulding I'd created with the T3705 moulding cutter. Having mitred the end of the offcut (right) I screwed it to an MDF plate, with a small fence underneath at the back screwed to the MDF. You then clamp the mitred moulding to be drilled to the offcut. I used the offcut because it was guaranteed to be exactly the same thickness as the moulding so the whole thing could be held in a vice. The really awkward bit is that the joints are handed, and you have to move the supporting offcut through 180° for the second half of each mitre. Obviously you rout all one side first, and then the other, making sure you've plenty of spare mitred moulding for setting up and potential mistakes. Not for beginners!



Pic.5 The jig for drilling hidden dowels is held in the vice (above) which is why Steve used an offcut of moulding as a support as it is the same thickness as the moulding. Notice the two sets of screw holes in the top of the jig for the two mitre positions (left)



No.3 Angled Dowels for Many Sides

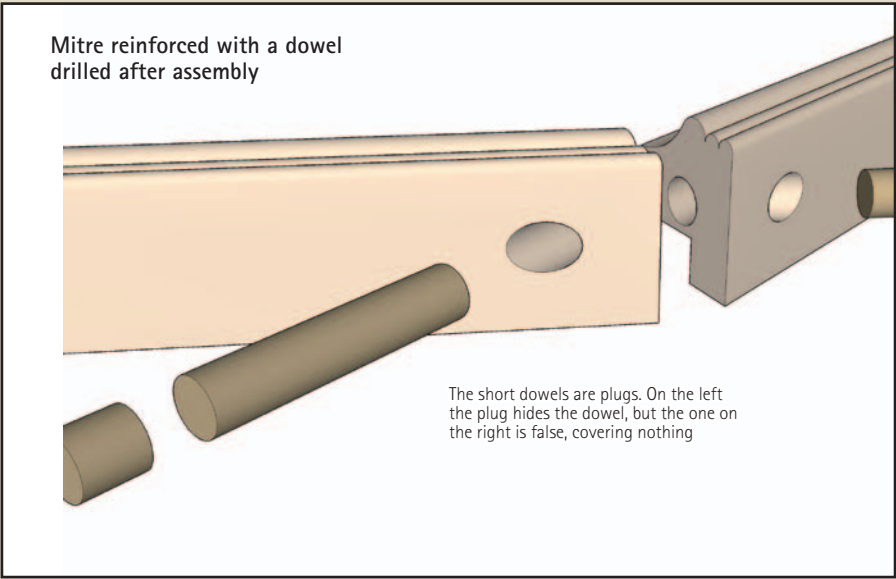
This joint is a bit of a fake. Drilled after the mitre has been assembled with PVA (glue of choice for all this mitring), the stopped dowel hole is drilled from one side using one of Wealden's dowel cutters, which is really designed for a router, but works well enough with the pillar drill at max. A beech dowel is inserted in the hole, then a plug covers it up. The plug on the other side of the same mitre (see photo below right) is in fact only a plug, with no dowel beneath. The plugs are pared back with a chisel, to produce the optical illusion, of sorts, that the dowel is continuous across the joint.



Pic.6 The assembled frame clamped against a fence on the pillar drill table, which has been twisted through 90°



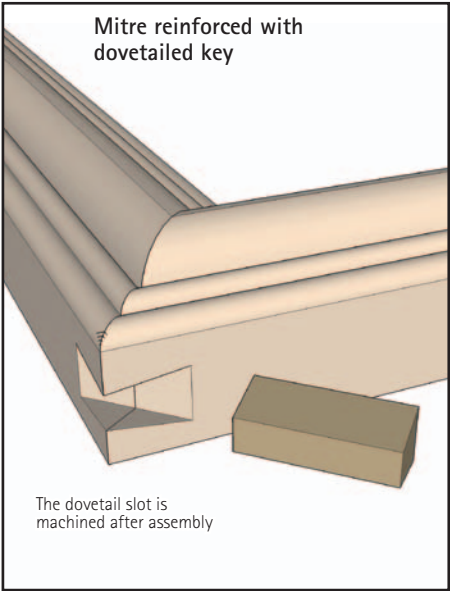
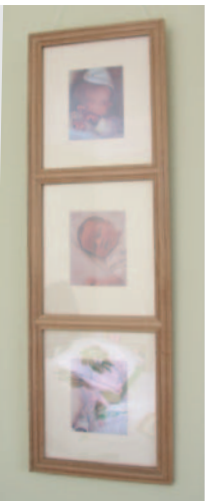
Pic.7 Cut with the T3709 cutter, this frame has eight sides, mitres cut at 22.5°



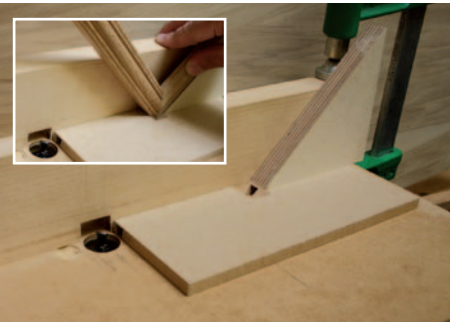
No.4 Dovetailed Keys and Visible Dowels

This long thin frame combines two reinforcements, both of which are done after the mitres are glued up. The T3711 is the only symmetrical moulding cutter of Wealden's picture framing range, which lent it to the bishop's mitre on the horizontal divisions. I cut the notches for these by hand and then cleaned up with a 45° paring jig (Pic.8). After assembly I drilled through at 90° and inserted a reinforcing dowel.

The mitres at the corners are strengthened with a dovetailed key, with the socket machined after assembly of the joint. I made a simple carriage for this for my router table, comprising a baseplate and a 45° support (Pic.9). It runs against the router table fence. Don't screw the support to the base or you might, I suppose, hit the screws with your cutter, and wreck it, possibly. With a dovetail cutter in the router you simply cut a notch across the mitre, having already machined up strips of dovetail section hardwood with the same cutter to fit in the notch.



Pic.8 Steve made a paring jig to tidy up the V-notch for the horizontal divisions on this frame. Cramp the jig to the bench holding the moulding down. The T3711 cutter is symmetrical (right)



Pic.9 The notching jig for the dovetailed spline comprises a baseplate and a 45° supporting arm. It runs against the fence on your router table. Make sure the support isn't screwed to the baseplate or you might knacker your cutter by routing into one of the screws



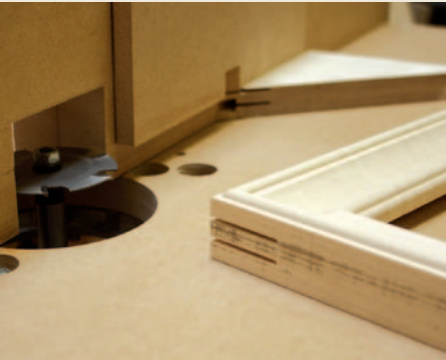
Pic.10 For the dowel to strengthen the horizontal division you can either make your own dowel and have that visible, or use beech or softwood dowel inside the joint and cover the hole with an oak plug. Steve 'drilled' the holes with a jig mounted on the completed frame, using a spiral drilling cutter

No.5 Visible Veneer Splines



Once again I've used the six-wing 1.5mm T5380 groover to cut the grooves across the mitre, having already cut and assembled the joint, gluing it with PVA. Reinforcing after assembly is easier from an accuracy point of view, but it means you can't use the spline or key or dowel to align the joint during cramp-up. I made another simple carriage jig for the router table to hold the mitred frame for grooving (right). The angled support reduces breakout behind the cut, and is fixed to a supporting board that runs against the router table fence. Notice how the board goes over the top of the grooving cutter. I normally have a horizontal piece of MDF fixed to the supporting board to cover the cutter, like a tunnel guard on a tablesaw. Take care when paring back the veneer inserts that you don't knick the tip of the veneer at the point of the mitre.

Pic.11 The sycamore frame was moulded with a bulbous T3713 cutter (above right)



Pic.12 You need a guard attached to the vertical part of the jig to cover the cutter. Thanks to Wealden Tool Co. for the supply of the cutters (wealdentool.com). Steve's written about these cutters on their site

