

Jointing Edges

In search of the perfect glueline, John Lloyd asks why planing a board concave along its length might be an advantage

Unless you have totally embraced the world of man-made boards and veneering, when wide surfaces are required for a furniture-making project, or you possess an inordinately wide planer and have access to an endless supply of equally wide lumps of tree, it's a simple truth that you'll be doing some edge-to-edge jointing!

Well respected woodworking tomes such as Joyce's *Furniture Making* and Collins' *Complete Woodworker's Manual* seem to agree that when butt jointing the edges of boards, it is a good thing if the edges are slightly hollow, or concave, along their length; convex edges, on the other hand, are deemed to be quite unacceptable.

If you happen to be a purist, or don't possess any cramps; concave edge jointing obviously can't be an option. The only thing that will work in this situation is to plane two edges that are as close as possible to perfectly flat, and stick them together with a drop of hot animal glue. This is the 'rub-joint'! It is a real test of planing skill and is the perfect joint for the minimalist woodworker.

The reasoning behind the 'concave' thing, it is suggested, is that cramps force the ends of the boards into compression, the benefit of this is that if there is

any subsequent shrinkage of the jointed boards, the pressure that had been introduced into the ends would just be released, leaving everything in a state that is closer to equilibrium. This suggests that if this were not done, there would be a tendency for any shrinkage to encourage tension to develop at the ends of the boards, which could result in the joints opening, or splits developing at the ends.

The presumption here is that the boards will only shrink, not expand, and the ends will shrink more than the middles. This certainly makes sense, moisture can definitely get out of the ends of boards more quickly and



Authority Books like Collins and Joyce encourage us to plane edges concave for edge jointing, but the reasons aren't very clear

easily than anywhere else, although this can of course be controlled by adding a few coats of polish, effectively encasing the jointed boards in something that water vapour finds it difficult to permeate. The converse of this, though, is that

if the boards were to take on moisture, and expand more at the ends than in the middle, of course, the tension would be increased at the middle of the boards, which could ultimately induce splitting. This is unlikely in the dry, centrally heated, world that we all seem to live in, but don't take your furniture with you when you decide to emigrate to the heat and humidity of Caracas!

Convex edges

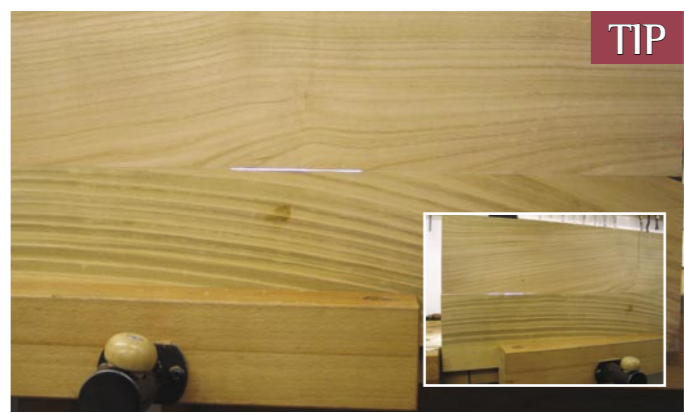
It has already been suggested that jointing convex edges is not a great plan. Collins and Joyce imply the main reason for this is that the tension that would be induced into the ends of the boards would be exacerbated by any shrinkage

Machining John uses the fence on his planer to check an edge for straightness, but rarely joints edges straight from the planer



after gluing, ultimately, perhaps, resulting in splits in the ends. On a more practical note, a pair of convex edges will tend to pivot around the mid point, being the only place where the two edges are touching, which makes getting the two adjacent surfaces accurately in register a bit of a challenge, especially when slippery glue is introduced into the equation!

Joyce mentions that when going for the concave option, the edges should be planed 'fractionally hollow' and illustrates this as having a gap between a pair of boards 'the thickness of a piece of thin blotting paper'. It's an analogy that might only be understood by woodworkers 'of a certain age', but suffice it to say that Joyce certainly isn't looking for very much of a gap between the boards. But all of this seems very vague. Surely the gap on a longer joint shouldn't be the same as that of a shorter one; and what about the type



TIP

Illuminations Shine a light and you'll be able to see whether the edges of a board are concave, convex or just wiggly

and stiffness of wood being used, could moisture content be an issue? It's all so imprecise that I suspect it doesn't make a huge difference, as long as the boards being used have been dried to a reasonable level, they are polished with something that slows the transmission of moisture and they are not destined to live in an excessively wet or dry location.

My take on this, then, is that a little bit of concavity between

boards makes the gluing and clamping process easier. It is also easier to plane an edge slightly concave than it is to achieve absolutely 'rub-joint flat'. When assembling a concave joint, the two ends will make contact first, and a little pressure from a single clamp positioned at the mid point is enough and will allow the adjacent surfaces to be persuaded into register. More pressure can be applied with this single clamp and a further

two cramps added near the ends of the boards, just to ensure good pressure along the full length of the joint. The cramping pressure required to close a concave joint is a great deal less than that needed for the same length of convex joint, and the resulting, relatively small amount of tension induced along a concave joint is easily restrained by the whole length of the glueline. All in all a much better option!

Questioning Joyce

The claim by Joyce and Collins that the effects of shrinkage can be balanced by jointing concave edges might actually have some substance to it, but using concave edges is, I'm beginning to think, more about being a convenient way of jointing boards, and less about shrinkage and stuff.

Assuming it's a good plan, how do we go about creating slightly concave edges? My starting point for edge jointing



Concave It is possible to plane a concave edge on a planer with a stopped pass, however awkward and dangerous it might feel, but the benefits are negligible as the surface will be bumpy

boards would be to use my planer for the initial preparation, followed by a little careful hand planing with a bench plane that is not too long. Bear in mind that a planer is designed to make surfaces flat, and in fact a planer (and a hand plane for that matter) will have a natural tendency to make any surface convex, removing more at the start and end of a cut, so on the face of it not terribly useful, but it's a start!

All about length

There are more variables to consider here too; board length and planer-table length. It is very difficult to engineer a concave edge on a relatively short board with a planer that has long tables, and conversely, I

find that it is just generally difficult to plane a consistent edge onto a very long board with a planer that has only very short tables. The best that can be done with a planer, I think, is to at least make sure that the pairs of edges being produced are square to their sides and they don't finish up convex. That's why it's important to plane a face first and to ensure your fence is square to the tables/cutterblock. I plane each edge as normal until the planer is removing material from the whole length and width of the edge.

If I wanted to use a planer to produce a concave edge, at this point I'd do just what I'd do if I were planing an edge with my bench plane: I 'plane out the



Handwork The initial reason for planing a machined edge by hand is to remove the ripples (left). Planing an edge by machine can at least get the edge straight and give you an edge square to a face

middle'. This involves just planing the middle part of the board's edge repeatedly until the blades (or blade in the case of a bench plane), on quite a fine setting, are no longer removing any material.

To achieve this, the front of the board must be lifted clear of the table and 'dropped-on' to the cutters a little way back from the front end of the board. The edge is then planed in the normal way, but not quite to the end, the front end of the board is then, once again, lifted away from the outfeed table, and whilst still holding the board against the fence, but clear of the cutters, it can be

Hollow Joyce recommended using blotting paper to check the concavity of an edge. In the absence of such stuff, use a feeler gauge instead

slid back to the start position, 'dropped-on' to the cutters again, and the process repeated. When the cutters stop removing material, the edge of the board should have become a little concave, but it will also be rather uneven. One or two full passes on the planer should sort out the unevenness of the edges, but it will also tend to remove any concavity!

Using a hand plane

It is possible to glue edges together straight off the planer like this, and you may be able to achieve a concave edge. The resulting joint line might even be quite good. But to be honest, I always finish edges that I am jointing with a bench plane, for several reasons. A machined edge is covered in tiny ripples and will never be as crisp or as strong a joint as a very flat, accurately hand planed edge, and a crisp edge hopefully means an invisible joint line. Blunt planer blades can compress or 'case-harden' the

fibres on the surface of the edges, which means that the glue will not penetrate the surface well, resulting in a weaker joint. Planers are likely to scoop a little extra wood from the end of the edge, something known as 'snipe', which can be quite deep if the planer tables/blades are not set up correctly, and would show as a visible glueline at the end of the joint.

No more ripples

Initially, hand planing a machined edge is just a case of removing the ripples produced by the planer blades. A long

Paired By cramping two pieces together, any discrepancy is nullified when the pieces meet

bench plane will not help to produce the desired concave edge, so a 5½, or less, is going to be the best bet, and 'planing out the middle' of the edge will produce a bit of a hollow, which if followed by one full length shaving should produce a nice crisp, slightly hollow edge.

The challenge when planing any edge freehand with a bench plane, is to keep the edge square to the side of the board. Regularly check that the edge is being planed square to the face side with an engineer's square and make adjustments by either skewing the plane to just take a narrow shaving off one side of the edge, or perhaps adjust the blade with the plane's lateral adjuster. Critical to success with any hand planing, but particularly when trying to make very fine adjustments to a relatively narrow edge is that the blade is razor sharp, and the shavings are very fine!

Two good ruses

One ruse that can be used to help this edge-planing challenge is to plane the two edges that are to be jointed as a pair. The two face sides are placed



together with the two edges level and the pair of boards held in a vice. This way, it doesn't matter if the pair of edges are at a slight angle to the sides because any inaccuracy will be cancelled out when the boards are removed from the vice and put together.

The other ruse is to use a shooting board, although this can only be used on relatively thin pieces of wood, anything that is much more than 20mm thick becomes rather hard work

for a thumb tucked behind the frog! If using a shooting board, check that the edge being produced is square to the face-side, minor adjustments can be made to this angle by using the lateral adjust lever to change the angle of the blade, or this slight discrepancy in the angle can once again be cancelled out by planing alternate boards, the first with the face up, the next with the face down. Now find out, overleaf, how to make a shooting board for edging.

Traditional straight edges



A traditional way that I was shown, to plane a square, straight edge on relatively thin pieces of wood involves a shooting board and a No.5, 5½ or 6 bench plane. The piece of wood that is to be 'shot' is placed on the shooting board, 'face-side' down, with what is to become its 'face-edge' hanging over the edge of the shooting board. The edge of the top part of the shooting board is not used to guide the plane, its only function is to lift the workpiece up enough to make contact with the plane's blade.

The edge of the board is planed until a full-length, full-width shaving is achieved, remembering to start the cut with pressure on the front end of the plane and transferring the pressure to the middle and finally the back of the plane as the shaving develops, and being careful to keep the plane flat on its side as it travels up and down the shooting board. As with many things, there's a bit of a knack to this, and practice makes perfect!

Having achieved a couple of nice full shavings it's time to take some stopped shavings to 'plane out the middle' of the edge. Start the shaving a little way along the edge and stop before reaching the far end, and with a fine blade setting keep repeating until the plane stops producing shavings. At this point the edge will be slightly concave. The final step is to take three, although two might be sufficient, full-length shavings to achieve a perfect straight edge. If you try this, check with a straightedge after two shavings to see what works for you.

Fundamentals Fact File

No.2 Edge Shooting Board

John Lloyd explains how to make a shooting board for planing edges

A shooting board is a rather mundane looking thing, but is a brilliantly simple and incredibly useful tool or 'jig' that is used to accurately 'shoot' the edge of a piece of wood at 90°. A shooting board is something that I consider to be a basic, essential piece of kit for any furniture maker. I made a couple of shooting boards when I was training, some 20 years ago, and I still use them today, although they are now beginning to look a little tired!

Making a long-grain shooting board is incredibly simple and can be a good way to use up offcuts of ply or MDF. In essence, all that is required is a base board, probably 18-25mm thick, and a top board that is the same length as the base board but narrower and thinner, and a couple of battens, again scraps of wood or ply offcuts can be used for these.

Whether you decide to make your shooting board a thing of great beauty is entirely up to you, but absolute accuracy of edges and squareness of battens is largely irrelevant, the only thing that's important is that the two boards are flat! To create the shooting board, the top board must be attached to the baseboard. This could be a good chance to have a play with a vacuum bag, if you own such a thing, but all that is actually required is some PVA and a few screws. One of the long edges of both boards are aligned, leaving a strip of baseboard exposed which is wide enough for a bench plane to sit on comfortably, on its side, with a little room to spare. A batten is added to the underside of the board, running lengthways, to drop into a vice and hold the shooting board in place when in use. A second batten is added across an

end, on top of the board, and is a 'stop'. Which end you attach the batten depends on whether you right- or left-handed; the shooting board in the photos is for right handers.

Added to the 'stop' is the vital 'secret weapon', which used to be a pin in my MkI version, but the MkII has a rather more sophisticated, and generally more satisfactory, screw, which has been 'tuned' to have a nice sharp point. The benefit of the screw is that it is rather more robust than a pin and can be easily adjusted for length and removed for sharpening, if necessary.

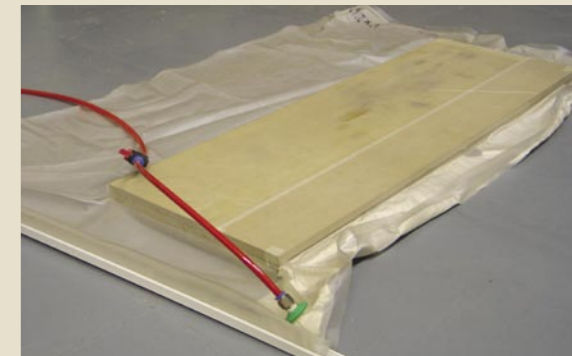
As a result of thinking about writing this article, and then coming across a shooting board belonging to Philly, of Philly Planes, at the recent Festival of the Tree, I have now moved on to the MkIII version of the shooting board which has a piece of Formica added to the planing strip, to make it more 'slippery'. Early tests suggest that this might be a nice tweak, although it certainly isn't essential, and a lurid mint green colour is definitely optional!



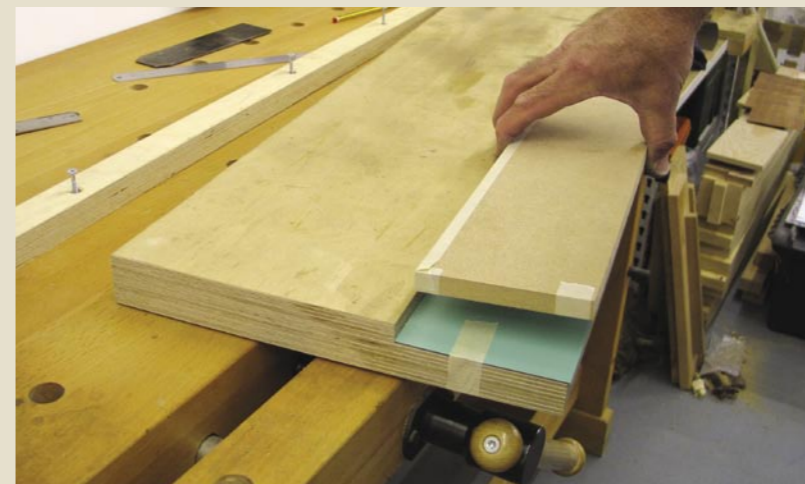
Comfort Many people automatically use a long-grain shooting board as if planing normally (below), but this means reaching over the bench and isn't as comfortable as working 'left-handed' (above)



Inspired The addition of a Formica surface to John's MkII shooting board was inspired by Phil Edwards' shooting board at the Festival of the Tree. The Formica is stuck down with PVA



Pin The screw stops the workpiece wandering around. It can be removed to be sharpened or replaced, and can be tuned if you need it longer or shorter



Caul Use a piece of MDF to hold down the Formica either in a vacuum press or with lots of G-cramps



Clifton A friend of John's has a Clifton plane with added knob on the side for use on a shooting board



Guide John doesn't use the shooting board to guide the plane, other than keeping it square to the edge. He will either plane to a gauged line or follow the traditional technique (see p51) of hollowing the edge first and then making two or three full passes

