PHOTOGRAPHS BY MARC FISH

How to... Laminate

This month Marc Fish gives professional advice on working with substrates, mould making with extruded polystyrene, MDF, laminate cutting and marking out

SHORTCUTS

Laminating is a portal to another dimension of furniture design and manufacture, although still in its infancy in the history of furniture making. Its origins date back only to the 1930s with designers such as Alvar Aalto whose designs must have shocked the largely Arts & Crafts-based woodworking fraternity.

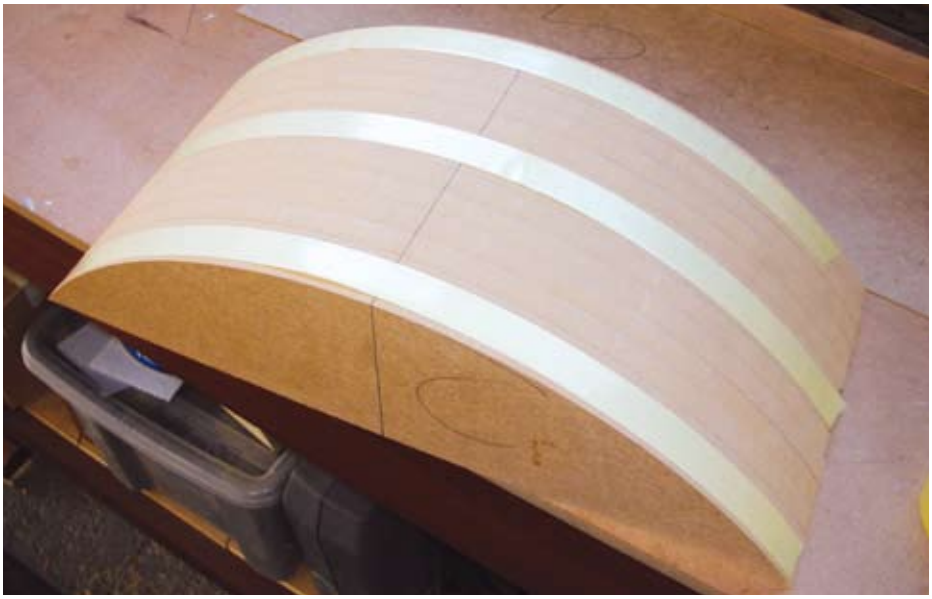
Laminating has come a long way since then and can now be done without huge expensive machinery since relatively cheap vacuum bag presses have opened up the technique to the small workshop and the serious amateur.

Here I am looking at a few techniques used in my own workshop that I hope you will find helpful.

Short Cuts series

- Dec 09 – Veneer jointing: including shooting edges by hand, planer, router
- Winter 09 – Wood edging: solid and veneered, trimming flush with chisel, block plane and router
- Jan 10 – Laminating: substrates, mould making with extruded polystyrene, MDF, laminate cutting and marking out
- Feb 10 – Making round lengths: turning, hand planing, spokeshaving and routing
- Mar 10 – Dovetails: top tips, marking out, batch cutting, alignment jig to ensure tight fitting
- Apr 10 – Tenons: cutting options, by hand, bandsaw, spindle moulder, milling machine, router
- May 10 – Hinge fitting: by hand and router jigs, hinge selection and prep, screw prep and fitting

Former making



Solid MDF former

A sturdy former is the first thing we will tackle. At my workshop we use two different types.

On smaller items a solid MDF former is constructed. This is ideal if weight is not an issue as it is very strong and will not deform around the edges.

On larger items where such a former would be heavy, we use blue extruded polystyrene. This should not be confused with expanded polystyrene which is white, much softer and is usually found in electrical appliance packing.

A full-size template is required to start making your former, and I make this out of 6mm MDF because it is quick to shape and wide enough to run a bearing-guided router cutter against.

This will become your master template and should only be used once to achieve the first section of the former after which each piece is machined from this and not the master template.

Rough-cut the MDF using a bandsaw if you have one or a jigsaw if you don't. The MDF can be glued together or double-sided tape can be used for a less permanent structure.

The blue polystyrene can be cut using machines or shaped by hand. Steps should be taken to control dust and debris as for any timber-based material. The polystyrene must be mounted on a base of 18mm MDF or ply but this is not necessary when using a solid MDF former.

A layer of 1.5mm 3-ply – also known as skin ply or Aeroply – goes onto the top of the former so remember to allow for this when calculating the dimension of the former. This can be stuck to the foam using double-sided tape. Parcel tape is used to pull it all together and to act as a non-stick surface.

Some spring-back on the laminated component is to be expected, depending on what substrate and glue are used. If required the former can be constructed to compensate for this, but trial and error prevails here.

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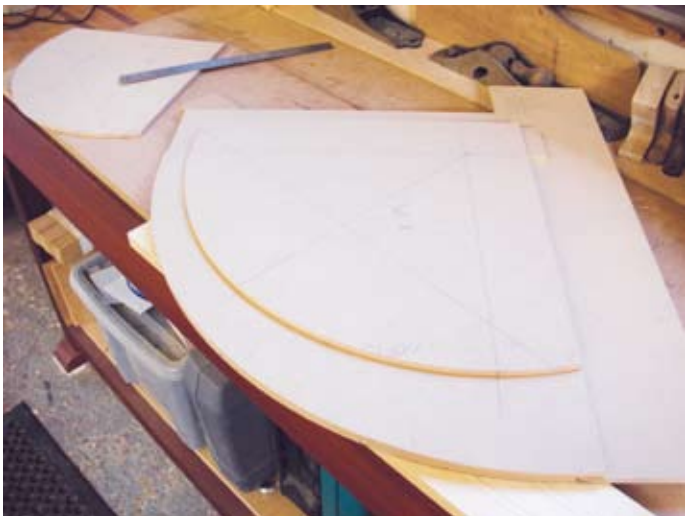
Blue high-density polystyrene former



6mm MDF templates

Spring-back is inevitable with some materials

Substrates and lamina

I have experimented with most options for substrates and they all have advantages and disadvantages. Flexi ply is available in many thicknesses, allowing almost infinite combinations that will achieve your desired thickness. I always use the 'rule of ply' and have an odd number of lamina – this means the outside laminates are in balance with an equal number of glue lines.

Flexi ply has a very open grain so be aware that this can telegraph through the veneered surface.

It is also quite susceptible to moisture and therefore can change shape after laminating.

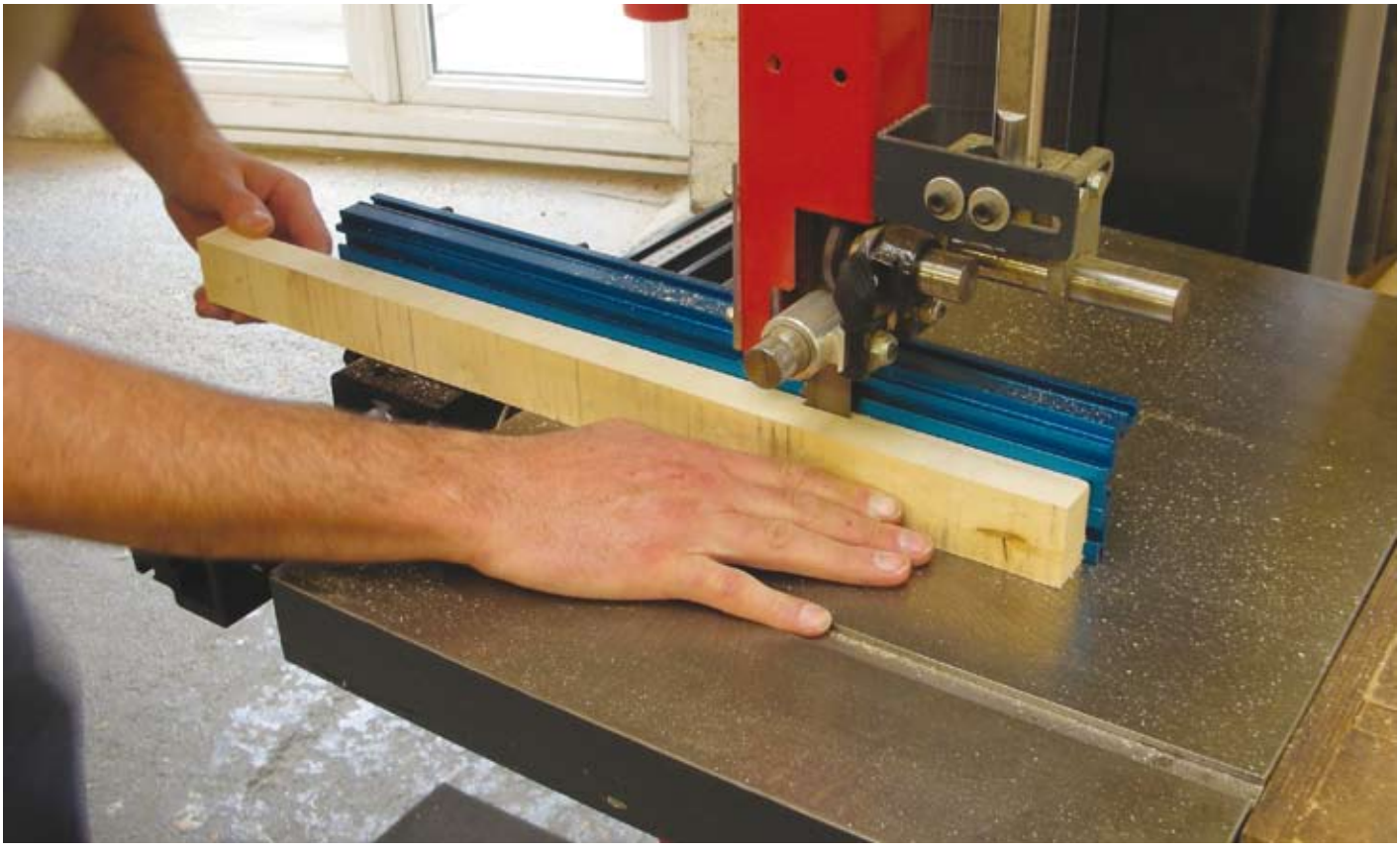
Layers of skin ply can be used as a substrate but this is expensive and the ply does not bend well when many layers are used.

MDF at 2mm thickness is very good but stiff when many layers are used. It is, however, very cheap, not susceptible to moisture after laminating and it is very stable.

Solid timber lamina are cut on the bandsaw and then planed by hand or through the planer/thicknesser; 2mm lamina are ideal but care must be taken with timber species and thickness of lamina as all species have different bend characteristics.

Curved panel made from 2mm MDF lamina

Knife-cut veneer is a great lamina. Use sequential packs if you wish to see the edge, but it is the most expensive. Take care with glue lines showing on the joins, choose your glue carefully and where possible match the colour of cured glue to the colour of your wood.



Solid lamina cut on the bandsaw

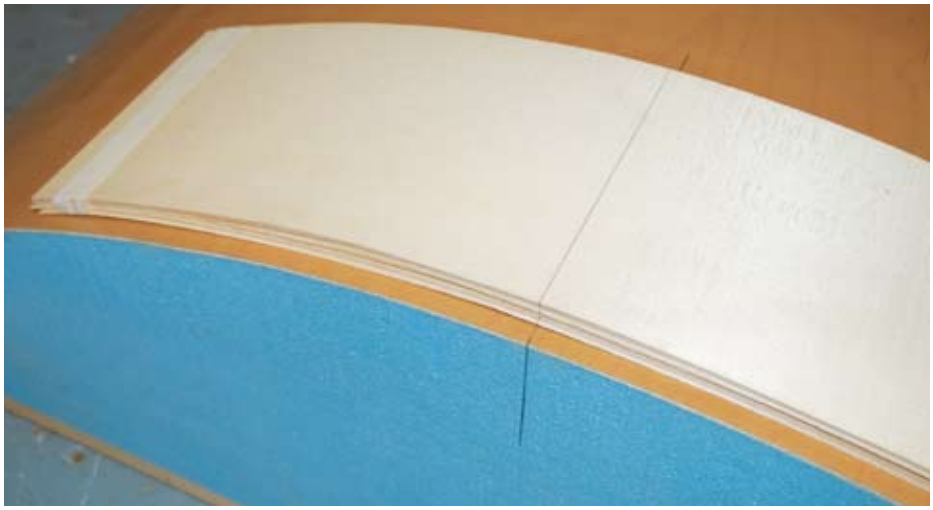
Marking out, former and substrates

With any curved work it is imperative that clear datum marks are drafted onto the former and the material being laminated. If neglected at this stage it is almost impossible to achieve any level of accuracy later on.

You need to mark a centre line across the former and over the lamination, and also across both ends with the angles these will be cut to.

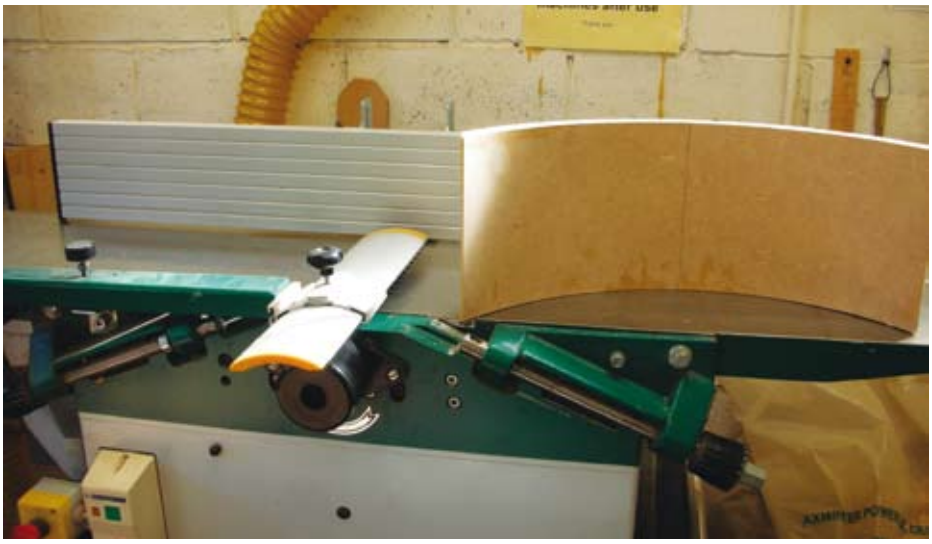
There are occasions when I use the former as a jig for machining processes later on and sometimes this will mean sacrificing the former.

The key to success really is correct marking out before it comes off the former.



Centre lines for alignment

Trimming up laminating shape



Passing a panel over the planer to achieve a straight edge

Trimming to size on the dimension saw

After the laminated shape has set hard it can be removed from the former, having first ensured that the datum marks are clearly visible on the shape. I use the surface planer on one side to flatten and square up to the face. You can do this with hand tools but cutting through a large glue area dulls the blade. You can equip your planer with TCT blades for this kind of work. While they do not give the best finish they do last a lot longer and are about the only thing that will plane teak without being eaten alive.

Ends can then be cut on the bandsaw, tablesaw or routed to the desired angle. The other side can be rough planed close to a parallel line marked to the dimension required. I usually hand plane the final part to ensure complete accuracy.

If you are veneering the surface, the component can be veneered and re-pressed in the vacuum bag on the existing former. First trim the shape to size and apply any lipping before veneering. Finally, using hand tools or a bearing-guided cutter in a router table, trim the veneer after the glue has cured. Job done. F&C