Making moulds for use with the Curvomatic clamping system

Calculating Former Radius

To calculate springback. Laminate / bend a 4" strip of the intended material to a known radius. Measure the finished radius of the test piece. From these two radii you can calculate the springback co-efficient as follows.

Fig. 1.

$$\text{S.C. (springback co-efficient)} = \frac{\text{mold radius}}{\text{finished radius}}$$

The Springback Co-efficient S.C. is consistant for all radii and can be used to establish the radius of your mould.

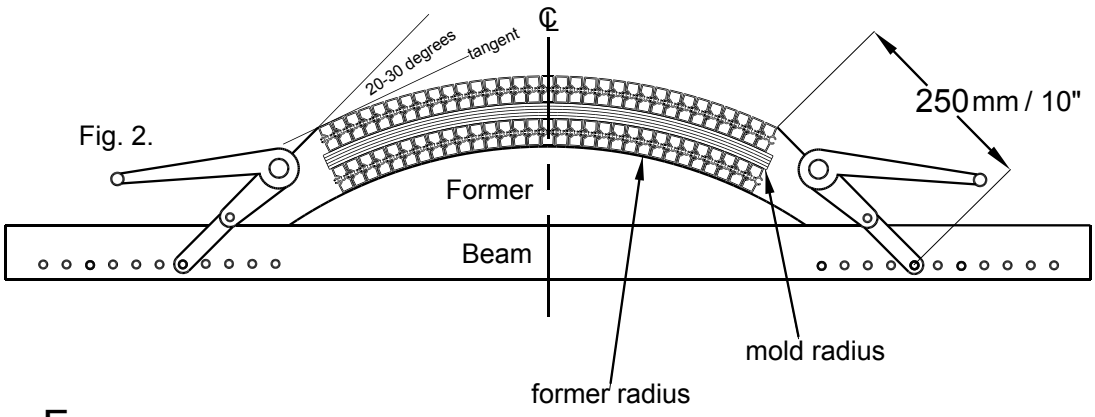
S.C. x desired radius = mold radius

The formers have a radius 1.378" / 35mm less than the required mold to adjust for the thickness of the extrusions.

Former design

First you need to adjust the width of the bottom cheek to the size of the required panel. Remove the screws and slide off the drilled outer sections. Remove an equal number of sections both sides. Replace the drilled sections. Draw a full size image of the desired mould to establish the size of the formers. The design must allow the straps to sit at 20 to 30 degrees from the tangent at the corner of the last extrusion and leave 10" for the free operation of the ratchet. The ratchet must not touch the extrusions or the edge will be deformed. Shown in Fig . 2

Fig. 2.



Making the Formers

Make your formers from an appropriate material. We recommend 3/4" MDF or Ply.
The mould will only be as good as the Formers, so take care to make them as well as you can.
Make the Formers from your full size design and drill pilot holes on the top and bottom along the centre line.

Beams

Make the beams from an appropriate timber. We recommend 3"x 2" hardwood. Drill a clearance hole for the centre former fixing screw and then similar additional holes equidistant from the centre. To attache the ratchetts mark and drill 7/16" / 10.5mm holes at a spacing of 1 1/2" / 38mm to make the beam re usable for different size formers.

Screw the Formers to the Beams

Insert the centre screw first and then pilot drill and insert the two outside screws.

Assembling the Mould

Lay the bottom cheek on a bench with the end overhanging to easily allow the centre screw to find it's pilot hole in the former. Insert the screw and lift the former onto the bench. Position and fix the other end of the mould.
Pilot drill and fix the outside screws into the formers making sure to first to stretch the cheek and take up the play between the extrusions.
Fix any extra formers in the same way at a maximum spacing of 2' 2" / 650mm.

How to use the Curvomatic clamping system

For all materials do a dry run to establish the correct number of extrusions for the top cheek.
Top and bottom cheeks should always have an odd number of widths of extrusions.
The top cheek must under no circumstances overhang the work, as this will deform the edge.

For wood laminates

Apply the glue to the laminates. We recomend Titebond Extend which is formulated to give more working time and does not creep. Use as little glue as you can to give an even wet coat. Mask off any areas of the mould that may get glue on them, as it is difficult to clean the dry glue off the extrusions. Water proof glues that cannot be removed by soaking in water are to be used with great caution, as they can only be chipped off.

Pin the laminates together 3/8" / 10mm from the center line so that the pins protrude 1/4" / 6mm.
As shown in Figure 3.

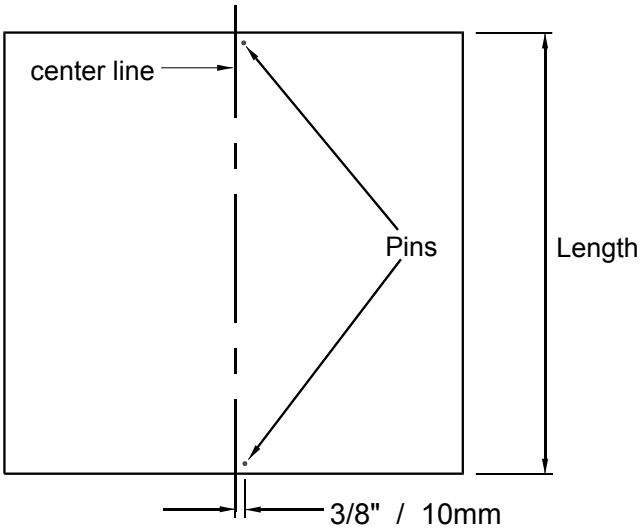


Figure 3.

Place the laminates onto the mold with the pins sitting into the gap on the one side of the center extrusion.

For thermoforming

Mark the center line for the panel and accurately position the work on the mold.

For all materials

Place the top cheek onto the work, making sure that the centre extrusions of the top and bottom cheeks are aligned. Then gently clamp across the centre extrusions to hold the whole pack in place as the straps are tensioned.
As shown in Fig. 4.

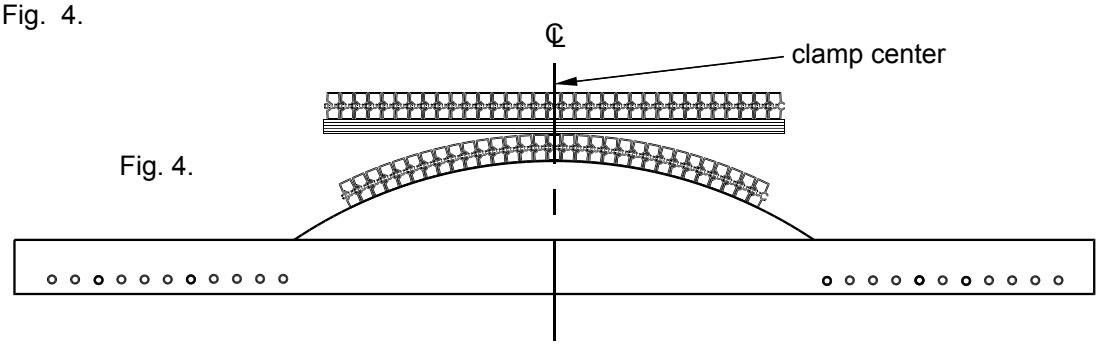


Fig. 4.

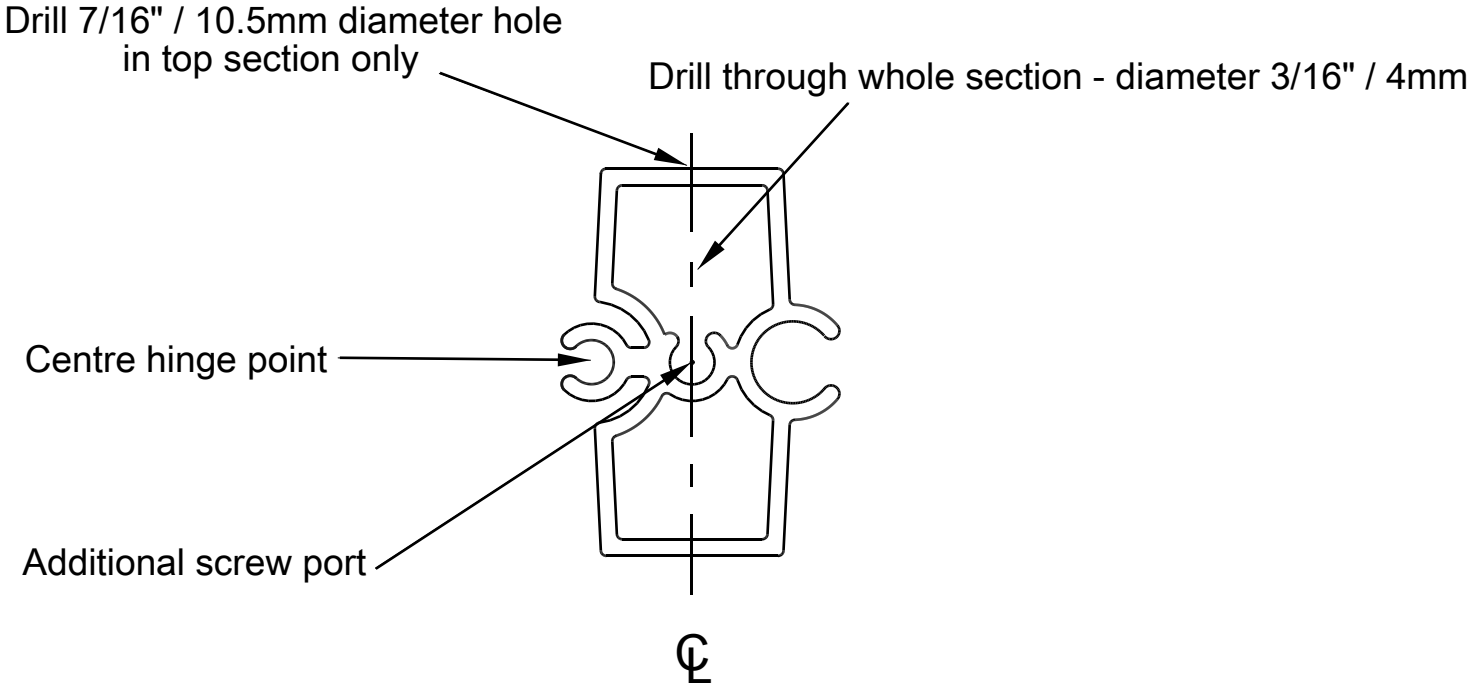
Start to evenly tighten the ratchett straps. Make sure that the straps are sitting correctly on the beams and that the top cheek is not overhanging the work. The play between the extrusions can now be removed by simply applying pressure to both sides at once. It is not absolutly necessary to remove the play in the top cheek but it can help to ensure that the cheek sits perfectly on the laminates.
Fully tighten the ratchet straps and remove center clamps to avoid deforming the laminate.

Drilling fixing holes

For all kits drill fixing holes in 3 of the full length extrusions.

Maximum former spacing - 650mm

There should be an odd number of extrusions in a bottom cheek with the centre and outside sections being drilled.



Kit assembly instructions

S / Solid Kits

Assemble the top and bottom cheeks in the same way as shown in the kit diagram except the centre long section on the bottom cheek is a drilled.
Insert screws into all the centre hinge points.

SH / Single Hollow Kits

Assemble the top and bottom cheeks in the same way as shown in the kit diagram except the centre long section on the bottom cheek is a drilled.
The 4” / 102mm sections are fixed on the ends
The 3” / 76mm sections are free to slide and need to be positioned during set up.
The top cheek has three long undrilled sections on each side.
The bottom cheek has two long sections on each side with outside most sections being drilled.
Insert screws into all the remaining centre hinge points to fix the ends.
Make sure to position the 3” / 76mm sliding sections over the formers evenly for best results.

DH / Double Hollow Kits

Assemble the 3” / 76mm sections in groups of two and insert the joining centre hinge point screws.
Assemble the 4” / 102mm sections also into groups of two and insert the joining centre hinge point screws.
Assemble the top and bottom cheeks in the same way as shown in the kit diagram except the centre long section on the bottom cheek is a drilled.
The 4” / 102mm sections are fixed on the ends
The 3” / 76mm sections are free to slide and need to be positioned during set up.
The top cheek has three long undrilled sections on each side.
The bottom cheek has two long sections on each side with outside most sections being drilled.
Insert screws into all the remaining centre hinge points to fix the ends.
Make sure to position the 3” / 76mm sliding sections over the formers evenly for best results.

TH / Triple Hollow Kits

Assemble the 3” / 76mm sections in groups of three and insert the joining centre hinge point screws.
Assemble the 4” / 102mm sections also into groups of three and insert the joining centre hinge point screws.
Assemble the top and bottom cheeks in the same way as shown in the kit diagram except the centre long section on the bottom cheek is a drilled.
The 4” / 102mm sections are fixed on the ends
The 3” / 76mm sections are free to slide and need to be positioned during set up.
The top cheek has three long undrilled sections on each side.
The bottom cheek has two long sections on each side with outside most sections being drilled.
Insert screws into all the remaining centre hinge points to fix the ends.
Make sure to position the 3” / 76mm sliding sections over the formers evenly for best results.

Modular Kits

Assemble the 6” / 152mm sections also into groups of two and insert the joining centre hinge point screws.
Assemble the top and bottom cheeks in the same way as shown in the kit diagram for the length you are working to.
Insert screws into all the remaining centre hinge points to fix the ends.

When using the modular kits at over 6' / 1830mm you will not have any full length sections.
To join the mould together you will need a double thickness former on the joint to allow fixing.
It is vital that clamping up is then done on a flat surface.

PLEASE NOTE:
When sliding the long sections into each other it is essential to de-bur and clean the joints. Make sure that there are no aluminium particles in the joint. Use lubricant such as furniture polish in the joint and DO NOT FORCE JOINTS TOGETHER as this can damage the extrusions.

When assembled file any sharp edges to avoid injury.