

PLANKED SHIELD CONSTRUCTION

For Beginners

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This is a guide to building a planked shield, which while constructed using modern materials and techniques it will create an authentic impression once completed, while it won't be a hundred percent authentic it will be a vast improvement on a plywood shield. The same techniques will work for any flat shield, round or oval.

The Shield Board (double layered plank)

The board of the shield is formed from two layers of thin planks running transversely. The material of choice for this is V profile tongue and groove cladding: these are thin (around 7mm) softwood boards with pre cut joints, they can be bought in most DIY stores or timber merchants in a variety of lengths. The tongues and grooves slot together and allow you to get a tight join between the planks without the need for clamps. It will be necessary to buy sufficient wood for the two layers.



Cut enough cladding sufficient to construct two rectangular or square boards a few centimetres larger than the required dimensions of the completed shield (in case of any mistakes when cutting out). For example the standard DIY store planks I have bought are 9cm wide (don't measure the tongues) and I am constructing oval shield 115cm X 95cm, I will need 11 planks 120cm long for the back of the shield (where the planks run vertically) and 13 planks 100 cm in length for the front of the shield (where the planks run horizontally).

Construct the back of the shield first, the planks for back run vertically as this area of the timber will be exposed to view (on the majority of surviving shields the planks run vertically) and carefully select planks which have a good straight grain free from any knots. Slot the tongue and groove together to form the back panel, there isn't any need to glue these together (it won't do any harm if you do but it's messy and fiddly). Assemble the front panel in the same way it doesn't matter about the grain structure for the front as it will be covered and painted.

Once the two panels are assembled they can be glued together. Place the front panel (with the horizontal planks) on a flat hard surface with the v grooved side uppermost. Use a paint brush to spread a layer of PVA across the entire surface of the panel, now take the piece of cloth and place it over the glue, smooth out any air bubbles and then apply another layer of PVA over the cloth, ensuring that the cloth is completely saturated with PVA.

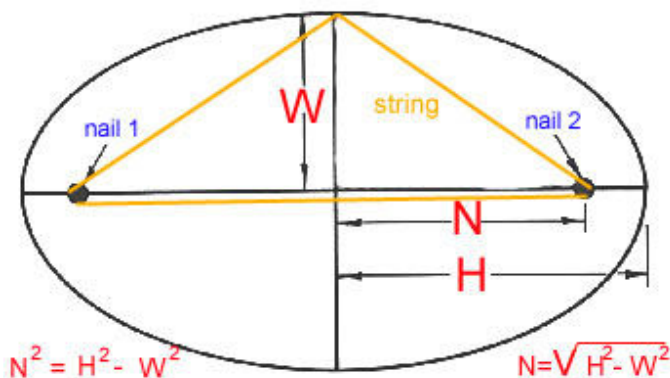
Place the second panel on top with the v groves facing down, to ensure that the boards don't slide put a wood screw in each corner, weigh the board down with something heavy (cover it with newspaper if you are going to use something that could stain or mark the timber) To glue the boards together successfully you will need a firm surface to work on, a wood or concrete floor is best to give a the compression necessary for a good glue bond. Now leave the glue to dry for at least 24 hours before you move it again.

Cutting Out

Once the glue is dry remove the wood screws from the corners and on the side which will become the front mark while the board is a square/rectangle you can find the centre of the board by drawing two diagonal lines from the opposite corners, where the lines meet is the centre point of the shield.

To mark out the shape of the shield on a round this is comparatively simple put a screw or nail in the centre point of the board, get a piece of string and tie a loop in each end. Put one loop over the nail and put the other end round a pencil and draw a circle keeping the string taunt and the pencil vertical. An oval shield is more difficult but the Fecto web article provides excellent instructions:

"Most shields of our period measured between 1.07 and 1.18m in length and 0.92 and 0.97 in width. Mine is 1.18 x 0.97m. This is the formula: If H is half the height of the shield, W is half the width and N is half the distance between the two nails. $N^2 = H^2 - W^2$ square. Or, N is the root of (H square - W square). See the image below:



So, to determine the length of your string, you need to determine the distance between the two nails. In my case, the sum was: $N^2 = 58^2 - 48.5^2$, or the root of $(3364 - 2352.25) = 1011.75 = 31.8\text{cm}$. Easy, isn't it? My nails needed to be that far from the middle to draw a nice oval. That was the hard part, which is why I save those cut-out remains! "

Cut out the shield using a jigsaw with a very fine cut blade to reduce splintering of the wood. To cut out the grip drill large (10mm) holes through the shield at any corners so you can introduce the saw and turn it through and tight corners. When the hole has been cut for the handgrip, round over the edges of the hole on the back (vertically planked side) of the shield with a router using a round-over bit or a knife/rasp if you don't have access to a router. This is so you don't have the full weight of the shield pressing a sharp edge into the back of your hand when you are carrying it. Sand all of sawn edges smooth inside the grip and around the edge of the shield.

Covering and edging the shield

To cover the front of the shield with cloth cut a circle or oval of cloth larger than the shield. Use your shield as the initial template and draw round it with a marking pen, then mark and cut out the cloth at 3-4cm (Use a formula of thickness of the shield + 1.5 cm) larger than the shield outline. To glue this to the face of the shield water down the PVA glue in a ratio of one part glue to one part water. Paint a liberal coat of watered down PVA onto the face of the shield.

Place the cloth on the glue with the marked outline upright and line the marks up with the rim of the shield to leave an equal overhang of cloth all around the shield. Paint the remaining PVA onto the cloth until it is saturated in glue; however take care no to get to much glue mix on the overhang, this needs to remain flexible. Smooth out any air bubbles that appear as the glue is added then leave the glue to dry, it may take a day or two to dry fully.

Once the glue impregnated cloth has dried the hole for the boss will be covered with cloth, simply cut it out using a Stanley knife. Turn the shield over so the back is facing up and return to the cloth overhang around the edge. Every 3cms or so cut strait from the edge of the cloth to the edge of the shield. One at a time cover each of these in PVA (neat or slightly diluted) and fold them over the edge and onto the back of the shield. Glue down each tab of cloth in the same way overlapping them as you go. Once they are all done, again leave this to dry for at least a day. This has a twofold purpose it seals the end grain of the wood (which is exposed all around the rim of the shield) and reinforces the area that will have lots of holes drilled in it.

More layers of cloth can be added in the same way to add more strength to the shield if necessary.



Once everything is dry the shield can be painted. All areas that are cloth covered should be painted. The back of the shield can be left unpainted or painted with watered down emulsion (if the paint is too thick the definition of the planks can be lost). When the paint is dry the rawhide rim can be added to the shield.

Prepare the rawhide by soaking the dog chews in cold water, after a few hours you will be able to straighten them out. Take a length of rawhide and nail it to a plank of wood use a strait edge to cut an even strip of rawhide as wide as it is possible but an absolute minimum of 5cm. cut as many of these strips as necessary to cover the circumference of the shield with some overlap.

There are two methods of attaching the rim to the shield:

- In the first method, mark out the position of the holes approximately a 1-3cms from the edge and about 1-2cms apart. Drill the holes using a 3mm wood/metal drill bit. Take the rawhide and tack it in place with as few carpet tacks as you can get away with. The holes drilled in the shield will be seen through the rawhide, punch a hole through each side of the rawhide with a leatherworking awl and sew with linen thread as you go Utilizing a saddle or double back stitch. Before the rawhide dries remove the tacks and the holes they caused will close and disappear as the hide dries.

- The second method, tack on the rawhide in its entirety and allow it to dry then drill the holes through the dry rawhide and the shield together then sew it in place and remove the tacks. A smaller drill bit (you can buy them as small as 1mm) can be used as the sewing is less fiddly.

When the rim is in place the front and rim of the shield should be sealed by painting it with more watered down PVA (a fifty/fifty mix should suffice), this will protect the paint and the thread used on the edging from the elements and some protection from blows. Don't put PVA on the back of the shield use an oil or wax finish instead as it gives a better impression on bare wood, alternately paint the back of the shield with a watered paint.

Metal fittings

With everything dry and sealed the final step is to add the Ironwork. Drill the holes in the boss first then site it on the shield mark the holes or just use the boss as a template. To attach the boss you can use a variety of fixings to attach the boss: Coach bolts or large nails cut down with a hacksaw to the required length are most common and cheap. I favour large copper saddlers rivets as they add some decoration to the boss, come with their own washers and copper is easy to peen over. If you are using nails or coach bolts cut square washers from some sheet metal and drill a hole in them. Push the rivets through the boss into the wood and out of the back place the washer over the shank. Place the head of the rivet on an anvil (if you don't have an anvil a big hammer head works) and using very gentle blows peen the end of the rivets over with a ball or cross peen hammer.

A metal grip is not necessary on a double layered board but it adds to the look of the shield, as it isn't integral to the structure of the shield it can be quite thin (3mm). Cut the metal bar you are using for the grip to the correct length, make it long enough to cover all the planks. Mark enough holes so that each plank will have one rivet going through it and drill the holes, a 3mm hole will allow standard round wire nails to go through.

Once the holes are drilled place the grip on the shield back of the shield in its desired place and mark and drill the corresponding holes through the shield. Push the nails through from the front of the shield through the wood then the grip and then cut the nails to length.

Before you attach the grip bar antique it by hitting it with a ball peen hammer to put some marks in the steel and make it look a little less perfectly milled. Line up the grip bar holes with the holes in the board and replace the cut off nails peen the end over to hold the grip in place.

Tools

Ball or Cross peen hammer
Drill and bits
Hacksaw
Needle & linen thread
Paintbrushes
Pencil and permanent marker
Saw (jigsaw)
Scissors
Tape measure

Materials

V profile tongue and groove cladding sufficient for the size of shield you are constructing

PVA glue

Cloth: a natural fibre with a tight weave such as cotton or linen sufficient to cover the shield board.

Rawhide edging (found in pet shops as dog chews)

Linen thread

Nails, coach bolts or rivets

Shield boss

Mild steel bar for handle
