Build Your Own Smoker

An easy to build design and with only the very basic of carpentry skills required, anyone can make it!
Introduction

Congratulations on your purchase!

You are about to embark on a project to build your own hot smoker so that you can enjoy preparing your favorite BBQ recipes in your own back yard. The drawings and descriptions in the following chapters are easy to follow and hopefully will make the construction process fun too. All you need are some basic carpentry skills.

The design you will follow takes the component materials and constructs them into pre-formed panels or sub-assemblies. Once each panel is finished you will fix the sub-assemblies together to form the final unit. This book will take you through the fabrication of each panel chapter by chapter with pictures, diagrams and statements about the method.

The [http://www.barbecue-smoker-recipes.com/](http://www.barbecue-smoker-recipes.com/) website holds more content and pictures about the project so throughout the book you'll find links to guide you to all the relevant information that you might need. In addition there are also some short videos for you to watch and the links to those will be listed too.

Before you start please take some time to read the e-book in its entirety so that you can understand the reasons why certain materials have been used because this will help you plan the whole project. It's not a long project, if you are familiar with woodworking you may be able to finish the basic shell in a weekend and if not so familiar it will take two weekends. Don't worry if you've never attempted woodwork before, the wood working skills required are easy to learn and your finished product has been specially designed so that almost anyone can build it.

So don't rush, take time to plan and prepare – you'll recoup that time in the assembly process. The success of your project is dependent on you and the quality of your workmanship so at all points along the way it's best to spend the time and get it right first time.

Disclaimer

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In laymen's terms; this ebook and [www.barbecue-smoker-recipes.com](http://www.barbecue-smoker-recipes.com) provide information that you can either view or disregard. All reasonable effort has been, and will be, put forth to offer information in a clear manner and the interpretation and application of that information is your responsibility.
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1. About The Smoker Design

You'll find a whole load of detail about the design of this smoker on [my website](#) so here I'm just going to go through the basics in order that you get an understanding of how everything fits together. Just before we get going, you may find that some of the pictures and drawings look a little blurred on your screen, this is due to the magnification. All you have to do is resize your document for greater clarity and should you wish to print off the notes then everything will appear clear.

This is a design for a hot smoker so the basic principles are that we have a fuel source that provides heat and smoke and this resides in the lower chamber of the unit called the firebox. The fuel is propane which is delivered to a burner that sits in the firebox.

When lit, the burner provides the heat and sitting on top of the burner is a frying pan primed with wood chips – the source of the smoke.

The heat and smoke rise through the smoke spreader (to disperse heat and smoke evenly) into the food chamber above where there are a couple of food shelves and hooks for hanging.

Depending on the amount of food that you intend to smoke, you might want to add more shelves and this isn't a problem once I've shown you how the shelves are constructed. Normally I use the lower shelf for my water bath and the upper shelf for my meat. If I'm cooking fish, then I use the S hooks. All the information you need to buy these fixtures and fittings can be found in Chapter 17.

The final element of the design is the flow of air from the inlet in the firebox door to the variable aperture in the chimney of the food chamber.

To watch a video summary of the smoker [click here](#) 

That's a very basic introduction to how the smoker works and why the design is as it is but I guess that you're itching to get going right? OK, let's move on.
2. Construction Materials

The objective of the construction is to fabricate something that is practical (ie. it works), low cost, easy to build and as far as possible pleasing to the eye. In addition to create a design that anyone can build.

Other than the fundamental design of the smoker, practicality falls into three main areas:-

1. Structural – the unit is rigid and easy to man handle
2. Thermal – the food chamber maintains heat
3. Fire – the internal walls are fire retardant

The three requirements are fulfilled using a double skin design, the inner skin being made out of fire retardant material and the outer skin of plywood. For simplicity you could argue that the whole unit be made from the fire retardant material but I think that this would compromise the aesthetics.

The fire retardant material I used was a calcium silicate board because it is not only fire retardant but also moisture resistant which is ideal when thinking about the water bath and humidity in the food chamber.

You may be reading this anywhere around the globe so it's impossible for me to specify a brand of material to use because as far as I'm aware there isn't such a material available globally. If you can get calcium silicate board then great, if not you need to find a material that meets the criteria set out - fire retardant and moisture resistant.

In addition, I used 6mm (¼ inch) thick board. Anything between this and 12mm (½inch) thick will do the trick however the measurements in the plans are clearly going to vary dependent on the thickness of product you use. To help avoid confusion I've coded the measurements in drawings and referenced them to an adjacent table so that you can make the necessary adjustments to your design dependent on your choice of final materials. More detail on this point is covered in Chapter 5.

The outer skin is 9mm plywood (3/8 inch) and a minimum of 5 ply. Together with the fireproof board this is the minimum thickness to use in order to maintain structural rigidity and minimize heat loss.

The design is based on cutting from a sheet 8' x 4' (both the ply and fireproof board) but in the case of the ply you may prefer to work with 4’ x 2’ boards. These are easier to handle, you'll need 6 boards and you'll have little wastage however 6 boards will probably be more expensive than 2 sheets of 8' x 4'.

Pinning everything together are 21mm x 21mm (¾ x ¾ inch) planed square edge timber battens.

The full bill of materials is below

- 5 ply plywood 3/8'' thick 6 sheets of 4' x 2' or 2 sheets of 8' x 4'
- Fireproof board (calcium silicate) 6mm or ¼ inch thick - 2 sheets of 8' x 4'
- Softwood timber battens ¾" x ¾" - 9 lengths of 12' or 3.6m
- Softwood timber battens 1¼ x 1¼ – 2 lengths of 2' or 610mm(to mount the casters)
- 4 casters
- ¾" dowel – 2 lengths of 2' or 610mm
- 4 Solid brass hinges - brass doesn't rust.
• Velcro® loop - Don't buy the self adhesive stuff. Gluing with PVA is much better.
• 3-Inch Barrel Bolt
• 2 Snap catches
• ¾” Screws countersunk size 6 posidrive

For more information and pictures on these materials check out this page on my website.

Throughout the remainder of this book I'll refer to the fireproof board as “fire board”. This is for simplicity of typing and reading and is in no way intended to indicate or recommend any brand.

**Further Information**

Many of the folks who have bought this e-book in the USA recommend Hardie Backerboard as an alternative to calcium silicate for the fire board.
3. Woodworking Tools

Listed below are the tools that you will need in order to complete the build. I've listed four power tools in all and whilst they are not essential they sure make life easier and the build time that much faster.

- Electric drill
- Jigsaw
- Sander
- Electric screwdriver
- Bradawl – Use this to mark out screw points when not drilling holes eg. The snap catches on the food chamber door
- Tape measure
- Tri square – Invaluable for ensuring that you have square edges and also really useful for marking drill hole locations
- Drill attachments:-
  - Set of wood drill bits
  - Countersink – ensures that your screws finish flush. This will help the accuracy of measurements for cuts and gaps
  - Hole saw attachments for the drill – vital for cutting out the chimney and the smoke spreader
- Saw – fine toothed for making small cuts
- Stanley knife
- C-Clamps – for clamping a straight edge onto your board to make jigsaw cutting straight.
- Sand paper
- Tape Measure
- Scissors - For cutting Velcro®

A workbench is extremely useful and you will need to supplement this with another table of similar height if you plan to work with the 8’ x 4’ sheets of plywood otherwise cutting will become more or less impossible.

For descriptions, pictures and information on buying any of these items just use this link.
4. Tips 'n' Techniques

As I've gone through the build process I've noted down those little things that just make life easier and help you along the way. To the DIY experts out there this may be a little basic but I'm sure that there's plenty out there who (like me) shy away from DIY but still want to build their own smoker......this chapter is for you!

The Instructions

When reading the diagrams you'll find the dimensions of the panels and battens on the right and bottom, the drill hole spacing on the top and left.

The measurements for spacing of drill holes are not mandatory to follow but it does ensure that everything is symmetrical to look at and there's no conflict between the drill holes for the plywood panel and the fireproof board.

Read the instructions carefully to ensure that you countersink drill holes on the correct side.

General Carpentry

Whenever cutting anything with a jigsaw, always wear a dust mask.

To cut a straight line you will need a piece of square edge batten that you can clamp to the plywood or fire board, then use the edge as a guide as demonstrated in the picture below.

Sand down at every opportunity to ensure a smooth finish to all your work.

General process for fixing battens to the plywood is to drill holes in the plywood and countersink. The batten is then positioned on the plywood and secured using the C-clamps before the screws are inserted.

Don't glue everything, screws are enough

Some fire boards have a front and reverse side ie. they are only sanded on one side. It's important to ensure when countersinking the drill holes that you get the correct side. At all points through the
book I will note if there is something different to the norm. Clearly if your fire board is sanded on both sides then you don't need to worry about this point.

When using the drill hole cutter, clamp some waste wood to the reverse side of where you are making the hole. That way you prevent damage to the reverse side. The drill hole cutter is set at 2½ inches or 63mm.
5. Measurements & Calculations

There are a number of alternative materials that you could use to make your smoker and also different thicknesses of said materials. The dimensions of plywood and timber batten are standard globally so there shouldn't be any need to change these but the fire board thickness may vary from country to country. Some countries measure in inches, others in millimetres and the two options for the fire board thickness are ¼ inch (6mm) or ½ inch (12mm).

The tables below demonstrate the differences dependent on the materials you choose and your preferred unit of measure.

**Imperial**

<table>
<thead>
<tr>
<th></th>
<th>Inches</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plywood</td>
<td>3/8</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Battens</td>
<td>¼</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Fire Board</td>
<td>¼</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Fire Board</td>
<td>½</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Total</td>
<td>1 1/8</td>
<td>1</td>
<td>1 3/8</td>
</tr>
</tbody>
</table>

**Metric**

<table>
<thead>
<tr>
<th></th>
<th>mm</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plywood</td>
<td>9</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Battens</td>
<td>21</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Fire Board</td>
<td>6</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Fire Board</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>27</td>
<td>36</td>
</tr>
</tbody>
</table>

To make it easy for you to calculate measurements and gaps, all drawings are coded with letters and under each drawing is a table that will help you calculate the measurement from the letter code dependent on whether you are using ¼ inch or ½ inch fire board and whether you prefer to work in inches or millimetres.

All measurements in these tables are mathematically calculated whereas joinery (at this level) is a less than precise science. In other words if you screw a couple of pieces of wood together and then measure the combined piece, your result may be slightly different to mine or indeed anyone else's.

When fabricating our unit I found that not all measurements were exactly as calculated, an eighth or a sixteenth of an inch over or under was not uncommon so please take these measurements as a guide. You must re-measure everything and use the tables herein to sense check your calculations.

It's always handy to have a small piece of plywood, batten and fire board available so you can “build up” the equivalent of a panel thickness and again double check that everything is going to fit together before you get deep into the construction process.
6. The Base

The first panel to construct is the base. It's the foundation to everything else in more ways than one in that it will also get you familiar with the construction materials and process that's going to shape the rest of the build. It's also easy to do because both plywood and fire board panels are the same size.

This is how the completed panel should look:

On the top is a layer of fire board, the bottom is a plywood panel and the sandwich is 4 x ¾ inch battens.

In the picture the base is lifted onto small offcuts of batten. Don't worry about this at this stage, this is important during the assembly process only.

Step 1 – Plywood & Battens

Use Figure 1 (on the next page) for the dimensions of the plywood and battens for the next step.

Use a jigsaw to cut the plywood to size (see Chapter 4 for how to cut a straight edge) and use a pencil to mark the drill hole points.

Now double check the measurements for the battens and cut these. When all cuts are done, sand down any rough edges.

Once you have cut the plywood and battens to size, drill the holes in the plywood, countersink on the external side and fix the battens in position.

Remember when fixing the battens in position, to make sure that you get it accurate, secure a batten to the plywood with a couple of C-clamps and then insert the screws. Once fixed, removed the C-clamps and repeat for the next batten.
Step 2 – Fire Board

As I said at the top, the dimensions of the fire board are exactly the same as the dimensions of the plywood ie. A & B as marked on Figure 1. Sand down any rough edges.

Figure 2. (overleaf) shows the positioning of the drill holes in the fire board panel. There's not much to say other than the positioning is so that there's no conflict with the screws that secure the plywood and the holes are marked out symmetrically because this face will be visible.

If there is a front (sanded) side to your fire board then countersink the drill holes on the front side and using the C-clamps to secure, fix the fire board to the timber battens to complete the base panel.
Further Information

Use this link to find the corresponding web page for this panel on my website.

To watch the video click here
7. Rear Panel

The rear panel is constructed using one sheet of plywood and two pieces of fire board although the second piece of fire board (which lines the firebox) isn't fixed in position until later in the assembly process.

Just as with the base, the construction process starts with the fabrication of the plywood outer skin and to that are fixed four battens to be used as bearers for securing the inner fire board skin. The photo below shows the positioning of the battens.

![Positioning of the Battens](image)

**Step 1 – Plywood & Battens**

If you're starting with a sheet of 4' x 2' plywood then great because this plywood panel is exactly 4' x 2', otherwise the first job is to cut a piece this size from your 8' x 4' sheet. The horizontal battens and the upper vertical batten will act as bearers for the upper food chamber fire board panel and the lower vertical batten will act as a bearer for the firebox panel together with further securing battens on the side panels (fabricated in Chapter 8).

The horizontal battens butt up to the side panel so these lengths must be accurately measured whereas the vertical battens require less precision and you can use lengths slightly longer or shorter than I have. If you do change the lengths of these battens remember that this will affect the positioning of the drill holes in the plywood.

The positioning of the drill holes together with all the dimensions for this panel can be found in Figure 3 overleaf and all the drill holes are countersunk on the reverse side of the plywood as you see it in the photo above.

You will notice that in the firebox area there are four drill holes (one of them is adjacent to the letter H) that “double up” with the drill holes running along the vertical edge of the plywood. These will be used to secure the batten (mentioned above) that is attached to the fire board skin of the side panel thus providing the bearers for the rear fire board panel. The distance that these holes are from the edge have not been marked on the drawing for fear of confusion with the distance marked K, they are however listed in the table that accompanies Figure 3 as “not marked”.
So to complete this panel the method is:-

1. Cut a piece of plywood to 4' x 2'
2. Measure and cut the four battens to the specified lengths
3. Make all the drill holes
4. Countersink to the reverse side of the plywood (that which will be exposed)
5. Fix the battens in position with screws

Remember to use a straight edge to ensure you get a good jigsaw cut, sand all edges at every opportunity use the C clamps to position the battens accurately before fixing to the plywood sheet.

Fig 3.
Step 2 – Fire Board

For the rear there are two fire board panels and there's nothing particularly noteworthy of either other than the positioning of the drill holes. Make sure that the holes to fix the vertical battens are correct dependent on whether you've changed the length from what I used. All drill holes countersunk on the smooth front side.

Taking you step by step:

1. Cut the pieces to size as per figures 4 & 5.
2. Measure and mark out the drill holes
3. Drill and countersink

Figure 4 represents the rear fire board panel for the food chamber. Once this panel has been made, it can then be fixed to the plywood and battens.

Figure 5 is the drawing for the rear panel in the firebox. Do not fix this in position, this will be done during the assembly process.
### Table 1: Fireboard Specifications

<table>
<thead>
<tr>
<th>Upper Fireboard</th>
<th>Description</th>
<th>Imperial $\frac{1}{4}$ inch board</th>
<th>Imperial $\frac{1}{2}$ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Board Length</td>
<td>27 1/2</td>
<td>27 1/4</td>
<td>699</td>
<td>692</td>
</tr>
<tr>
<td>B</td>
<td>Board Width</td>
<td>21 1/4</td>
<td>20 3/4</td>
<td>540</td>
<td>527</td>
</tr>
<tr>
<td>C</td>
<td>Distance To Drill Hole From Top</td>
<td>10</td>
<td>9 3/4</td>
<td>254</td>
<td>248</td>
</tr>
<tr>
<td>D</td>
<td>Distance Between Drill Hole Centers</td>
<td>6</td>
<td>6</td>
<td>152</td>
<td>152</td>
</tr>
<tr>
<td>E</td>
<td>Distance To Drill Hole From Side</td>
<td>2</td>
<td>2</td>
<td>51</td>
<td>51</td>
</tr>
<tr>
<td>F</td>
<td>Distance Between Drill Hole Centers</td>
<td>8 5/8</td>
<td>8 3/8</td>
<td>219</td>
<td>213</td>
</tr>
</tbody>
</table>

**Fig. 4**

**Fig. 5**
<table>
<thead>
<tr>
<th>Lower Fireboard</th>
<th>Description</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Board Length</td>
<td>17 7/8</td>
<td>17 1/8</td>
<td>454</td>
<td>435</td>
</tr>
<tr>
<td>H</td>
<td>Board Width</td>
<td>21 1/4</td>
<td>20 3/4</td>
<td>540</td>
<td>527</td>
</tr>
<tr>
<td>J</td>
<td>Distance Between Drill Hole Centers</td>
<td>4</td>
<td>4</td>
<td>102</td>
<td>102</td>
</tr>
<tr>
<td>K</td>
<td>Distance To Drill Hole From Bottom</td>
<td>9</td>
<td>8 3/4</td>
<td>229</td>
<td>222</td>
</tr>
<tr>
<td>L</td>
<td>Distance To Drill Hole From Edge</td>
<td>2</td>
<td>2</td>
<td>51</td>
<td>51</td>
</tr>
<tr>
<td>M</td>
<td>Distance Between Drill Hole Centers</td>
<td>7</td>
<td>6 1/2</td>
<td>178</td>
<td>165</td>
</tr>
<tr>
<td>N</td>
<td>Distance To Drill Hole From Edge</td>
<td>10 5/8</td>
<td>10 3/8</td>
<td>270</td>
<td>264</td>
</tr>
</tbody>
</table>

**Further Information**

Use this link to find the corresponding web page for this panel on my website.

To watch the video [click here](#)
8. Side Panels

You need to make two side panels that are identical. The full sub-assembly (one side panel) consists of a sheet of plywood 48” x 20”, the batten bearers for the fire board and six discrete pieces of fire board.

As with the rear panel, all the fire board can be fixed to the plywood to form the complete panel except for the bottom piece that lines the firebox. This piece can only be assembled once the smoke spreader has been screwed into position and this can only be done once the rear and side panels are fixed together in final assembly.

Step 1 – Plywood & Battens

By now you've probably guessed that the first stage is to cut the plywood to size using a jigsaw and a straight edge and to cut the battens to size.

The vertical battens need to be measured and positioned precisely because these are the battens that “sit” on the base. If you get it wrong, there maybe overlap and or there won't be enough room at the other end for the top to sit on.
You can afford a little play in the horizontal battens but try and get them as close to flush as possible. With careful measurement, cutting and sanding you should be able to get them to friction fit pretty easily.

The full process:

1. Measure and cut 2 sheets of plywood – 1 for each side
2. Drill and countersink the plywood on the reverse external side
3. Cut the battens to length
4. Position and secure the vertical battens with C clamp and screws
5. Use friction to position the horizontal battens and fix in place with C clamp and screws

The measurements for the plywood, battens and their positioning are shown in Figure 6 overleaf.
### Table

<table>
<thead>
<tr>
<th>Plywood</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Length Of Plywood</td>
<td>48</td>
<td>48</td>
<td>1219</td>
</tr>
<tr>
<td>B</td>
<td>Width Of Plywood</td>
<td>20</td>
<td>20</td>
<td>508</td>
</tr>
<tr>
<td>C</td>
<td>Length Of Vertical Batten</td>
<td>45 1/2</td>
<td>45</td>
<td>1156</td>
</tr>
<tr>
<td>D</td>
<td>Width Of Horizontal Battens</td>
<td>18 3/8</td>
<td>18 3/8</td>
<td>467</td>
</tr>
<tr>
<td>E</td>
<td>Distance Drill Hole Centers From Top</td>
<td>16</td>
<td>16</td>
<td>406</td>
</tr>
<tr>
<td>F</td>
<td>Distance Between Drill Hole Centers</td>
<td>6</td>
<td>6</td>
<td>152</td>
</tr>
<tr>
<td>G</td>
<td>Distance Drill Hole Centers From Bottom</td>
<td>20</td>
<td>20</td>
<td>508</td>
</tr>
<tr>
<td>H</td>
<td>Edge To Drill Hole</td>
<td>2</td>
<td>2</td>
<td>51</td>
</tr>
<tr>
<td>J</td>
<td>Distance Between Drill Hole Centers</td>
<td>8</td>
<td>8</td>
<td>203</td>
</tr>
<tr>
<td>K</td>
<td>Distance Between Drill Hole Centers</td>
<td>11</td>
<td>11</td>
<td>279</td>
</tr>
<tr>
<td>L</td>
<td>Distance Drill Hole Centers From Top</td>
<td>1 1/4</td>
<td>1 1/4</td>
<td>25</td>
</tr>
<tr>
<td>M</td>
<td>Distance Drill Hole Centers From Bottom</td>
<td>1 3/8</td>
<td>1 5/8</td>
<td>35</td>
</tr>
</tbody>
</table>
Step 2 – Fire Board

The complete sub-assembly consists of six fire board panels adding up to 12 in total for the two side panels. Each side has:

- 2 shelf supports
- 3 lining the food chamber
- 1 firebox lining

The cutting, drilling and countersinking follow that same process as with the base and rear panels that you've already made with the exception of the firebox lining.

This panel has a batten attached to the front of the panel as shown in the picture below.

It's important to remember that when countersinking the drill holes for this fitting to countersink on the reverse side of the fire board. Remember also that these panels are not fixed to the plywood until later in the assembly process so you can make them up and put them to one side for later use.

Dimensions and drawing reference for this panel is Figure 9.

The first fire boards to be attached to the plywood are the shelf supports (4 in total)

Two for each side, these thin filets can be made out of fire board off-cuts. Note how the edge that's going to be exposed inside the food chamber has been well sanded and the corners rounded with countersinking to the front side.

The dimensions and drawing for making these panels is in Figure 7 overleaf.
Once four of these shelf supports have been made they can then be fixed to the horizontal battens on the side panels. The lower support is fitted to the middle batten and the upper support is fitted to the top batten as shown in the picture below. Take care to fit the supports in the order I've stated, if you fit the upper support first you won't be able to position your screwdriver to fit the lower shelf support.

The next 3 panels that you make will complete the lining for the inside of the food chamber. On all these three panels the countersinking is to the front side of the fire board and the positioning of the drill holes together with the cut outs for the shelf supports will determine how these panels are fixed.

The depth of the cut out is determined by the thickness of the fire board that you are using. So if you are using ½ inch thick fire board then the depth of cut out is ½ inch.

The upper panel on each side has two holes cut out near the top in order to position 2 lengths of ¾ inch dowel that will act as hanging rods in the food chamber. Drill these out to ¾ inch diameter (or a little tighter and sand until the dowel friction fits).

Drawings and dimensions are in Figure 8.
<table>
<thead>
<tr>
<th>Fireboard</th>
<th>Description</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Width Of Upper Panel</td>
<td>14 1/2</td>
<td>14 1/4</td>
<td>368</td>
<td>362</td>
</tr>
<tr>
<td>B</td>
<td>Length Of Every Panel</td>
<td>20</td>
<td>20</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td>C</td>
<td>Length Of Cut Out For Shelf Support</td>
<td>16</td>
<td>16</td>
<td>406</td>
<td>406</td>
</tr>
<tr>
<td>D</td>
<td>Edge To Start Of Cut Out</td>
<td>2</td>
<td>2</td>
<td>51</td>
<td>51</td>
</tr>
<tr>
<td>E</td>
<td>Edge To Drill Hole Center</td>
<td>1</td>
<td>1</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>F</td>
<td>Distance Between Drill Hole Centers</td>
<td>7</td>
<td>7</td>
<td>178</td>
<td>178</td>
</tr>
<tr>
<td>G</td>
<td>Edge To Drill Hole Centers For Dowel Rods</td>
<td>7</td>
<td>7</td>
<td>178</td>
<td>178</td>
</tr>
<tr>
<td>H</td>
<td>Width Of Middle Panel</td>
<td>6 1/8</td>
<td>6 1/8</td>
<td>156</td>
<td>156</td>
</tr>
<tr>
<td>J</td>
<td>Width Of Lower Panel</td>
<td>6 3/4</td>
<td>6 3/4</td>
<td>171</td>
<td>171</td>
</tr>
</tbody>
</table>
**Further Information**

The website has [more information and pictures about the fabrication of this panel](#).

To watch the video [click here](#).

<table>
<thead>
<tr>
<th>Fireboard</th>
<th>Width Of Fire Board</th>
<th>Imperial ⅛ inch board</th>
<th>Imperial ⅜ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>Width Of Fire Board</td>
<td>17 3/4</td>
<td>17 1/4</td>
<td>451</td>
<td>438</td>
</tr>
<tr>
<td>L</td>
<td>Length Of Fire Board</td>
<td>20</td>
<td>20</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td>M</td>
<td>Edge To Drill Hole</td>
<td>2</td>
<td>2</td>
<td>51</td>
<td>51</td>
</tr>
<tr>
<td>N</td>
<td>Distance Between Drill Hole Centers</td>
<td>7</td>
<td>7</td>
<td>178</td>
<td>178</td>
</tr>
</tbody>
</table>
9. The Top

This panel is shaped like an inverted top hat in that the plywood panel is slightly larger than the rest of the sub-assembly giving the appearance of the brim of a hat. This element of the design is because the top “sits” on top of the rear and side panels so that no gaps will be immediately exposed should it rain during the cookout and making it easier to secure in position.

To add further complication to the panel, the top includes the chimney vent and in order to make the vent variable in aperture our design has a slider. This is not difficult to do, it just requires a little more cutting and drilling.

The picture shows a close up of the slider mechanism. The plywood has been drilled using the hole cutter attachment in two points and cuts made between the drill holes to create the ovoid shape. The fire board has one single hole drilled in it and this is the chimney vent, sandwiched between the two sheets is the slider.

Unseen by us there are two battens, one either side of the slider that keep it in position and stop it moving laterally. Figure 10 shows this in cross section.

Fig. 10

Note that this drawing doesn't show the slider but in reality, the slider must be included before the plywood and fire board are fixed together.

Step 1 – Plywood & Battens

The first job is to cut out the plywood and battens as usual the pattern is shown in Figure 11.
The measurements are provided in the table below the drawing and the process is as follows:

- Cut plywood to size
- Mark center point
- Mark the drill hole points for the hole cutter (distance F from center).
- Form holes
- Use jigsaw to cut between the two holes
- Drill and countersink all other fixing points
- Cut battens to length
- Fix battens in position with screws

**Fig. 11**

Note that the battens forming the perimeter need to be measured accurately. The two inner battens that guide the slide need only be approximate in length however it is important to ensure that they are fixed parallel.
**Step 2 – Fire Board**

This panel is easy to fabricate and follows most other panels in that it is cut to dimensions, drilled and countersunk. At all points the countersinking is to the front side of the board.

On the reverse side of the board use a pencil to mark out the center point for drilling the chimney. You can also use this center line to measure the distance to the drill holes that will fix the battens that keep the slider in position.

---

**Fig. 12**

![Diagram of fire board dimensions]

### Table: Fireboard Dimensions

<table>
<thead>
<tr>
<th>Fireboard</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm</th>
<th>Metric 12mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>Top Width</td>
<td>20</td>
<td>20</td>
<td>508</td>
</tr>
<tr>
<td>M</td>
<td>Top Length</td>
<td>23 1/8</td>
<td>23 1/8</td>
<td>587</td>
</tr>
<tr>
<td>N</td>
<td>Edge To Drill Hole Center</td>
<td>2</td>
<td>2</td>
<td>51</td>
</tr>
<tr>
<td>P</td>
<td>Distance Between Drill Hole Centers</td>
<td>8</td>
<td>8</td>
<td>203</td>
</tr>
<tr>
<td>Q</td>
<td>Drill Hole Distance From Center Of Board</td>
<td>2 5/8</td>
<td>2 5/8</td>
<td>67</td>
</tr>
<tr>
<td>R</td>
<td>Distance Between Drill Hole Centers</td>
<td>9 1/2</td>
<td>9 1/2</td>
<td>241</td>
</tr>
</tbody>
</table>

---

**Step 3 - The Slider**

You can make the slider more or less out of off cuts. The only point to note is that if using 6mm (¼ inch) fire board you can make the slider out of a piece of plywood and fire board screwed together. If however you are using 12mm (½ inch fire board) the gap in the top between the plywood sheet and the fire board sheet will be insufficient so you must make the slider using fire board only.

The handle to move the slider is an off cut of timber batten and everything is held together with screws.

Figure 13 overleaf shows the slider dimensions.
### Further Information

More photos and descriptions about the top panel can be found on my website, just [click here](#).

To watch the video [click here](#).

<table>
<thead>
<tr>
<th>Slider</th>
<th>Imperial ⅛ inch board</th>
<th>Imperial ⅛ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Length</td>
<td>6</td>
<td>6</td>
<td>152</td>
</tr>
<tr>
<td>T</td>
<td>Width</td>
<td>4</td>
<td>4</td>
<td>102</td>
</tr>
<tr>
<td>U</td>
<td>Batten Length</td>
<td>3</td>
<td>3</td>
<td>76</td>
</tr>
</tbody>
</table>
10. Assembly Process – Part 1

It's time to start the assembly process once the base, rear, 2 side panels and top have been fabricated. The assembly process is broken down into 3 distinct phases but this one is the most exciting because the smoker really starts to take shape and that's a great motivator for finishing the job off in double quick time.

The Base

Set the base on off-cuts so that it is level and stable. The off-cuts serve to raise the base off the ground and make it easier to assemble the rear and side panels without scuffing knuckles on the ground.

Fit the panels in the order that they are listed to get the best fit. It's also helpful to have an extra pair of hands at this stage just to hold things in place whilst fixing everything into position.

The Rear Panel

Sit the rear panel on the base centrally and check by ensuring the space at each side is equal with an off-cut sandwich of plywood / batten / fire board. If it's not quite central give it a nudge with a hammer until perfect.

Insert a couple of screws (just enough to secure it in position) so that it's easy to move should there be a requirement for minor adjustment.

The lower fire board panel for inside the firebox should still not be attached, just keep it to one side for phase 2 of the assembly process.

The Side Panels

Offer up the side panels into position and insert the dowel rods. Make sure that the base and sides are flush and put a screw in the base and one into the rear panel from each side panel. This again is just to ensure that the thing holds together whilst minor adjustments are made.

It's important to remember that this is not an expertly crafted piece of furniture made by a skilled cabinet maker, it's a home made smoker made by a BBQ enthusiast so there will be some inaccuracies. Having said that it's still better built than your average piece of furniture from Ikea!
To make the unit look as good as possible it's important to get the bits right that matter which means making sure that everything is a good fit at eye level. So now that the rear and sides are vaguely attached start to work down from the top and use a piece of tape or string to keep the lower area in position whilst attending to the top.

Just as with the rear lower panel, do not attempt to fit these yet. The smoke spreader has to go in next so once we've completed this phase of the assembly then that will be the next piece to make.

**The Top**

Sit the top in position and move the rear and side panels so that everything fits snugly with the minimum of gaps. Hold it in this position and drive in the majority of the screws. At this point you may need to ease out some of the screws that have already been inserted so before doing this tie the smoker around the waist with some string or tape just so that everything stays approximately in position.
Now drive in some screws between the rear and side moving down from top to the base and when you've got a couple more in it's time to look again at the base.

**Completing Phase 1**

To get the best fit at the base may take a bit of brute force. If one person can squeeze the panel into near perfect position then this leaves two hands free to drive in more screws.

When all the screws are in position you should have something that's starting to resemble a smoker. Take time to admire your handy-work so far, give yourself a pat on the back and then move onto making the smoke spreader and the firebox panel.

**Further Information**

Watch the video to accompany this chapter by [clicking here](#).
11. The Smoke Spreader

Designed to ensure that the smoke that has been generated in the firebox disperses evenly in the food chamber, the smoke spreader separates the two compartments. In order to maintain the fire resistance of this whole design, the smoke spreader is made exclusively from fire board.

![Image of the smoke spreader]

Note how the fire board is front side up so that the smooth surface is on view.

It is effectively a rectangle with the corners nibbled out to house the vertical battens on the side panels.

The panel dimensions are in the table below:

<table>
<thead>
<tr>
<th>Plywood</th>
<th>Description</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Width Of Fire Board</td>
<td>20</td>
<td>20</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td>B</td>
<td>Length Of Fire Board</td>
<td>23 1/2</td>
<td>23 1/2</td>
<td>597</td>
<td>597</td>
</tr>
<tr>
<td>C</td>
<td>Distance Between Drill Hole Centers</td>
<td>5</td>
<td>5</td>
<td>127</td>
<td>127</td>
</tr>
<tr>
<td>D</td>
<td>Distance Between Drill Hole Centers</td>
<td>6 3/4</td>
<td>6 3/4</td>
<td>171</td>
<td>171</td>
</tr>
</tbody>
</table>

The first step is to cut out the fire board to the correct dimensions and then on the underside, mark out in pencil the pattern shown in Figure 14. This is easier to do with the corners intact so don't nibble out the corners just yet.

**The Pattern**

This is shown in Figure 14 overleaf.

Once you've got the center point marks for a symmetrical shape of drill holes, make the holes using the hole cutter attachment for the power drill. You can then also nibble out the corners.
The smoke spreader is fixed on three sides. To the underside of the lower batten on the rear and side panels, and to the top side of the horizontal batten of the firebox panel. Drill holes therefore need to be made along the perimeter approximately 3/8 inch (10mm) in from the edge. The holes are not marked on the diagram because they were drilled at intervals already marked out by the lines in Fig. 14 above.

Along the three sides (that will attach the smoke spreader to the rear and side panels) the countersinking is on the reverse of the smoke spreader whereas the countersinking for fixing to the firebox panel is on the front side.

When complete, inserting the smoke spreader into the smoker is the first step of the second phase of assembly but before that commences there's the Firebox front panel to be fabricated.

**Further Information**

More about the smoke spreader can be found at the following web pages:

http://www.barbecue-smoker-recipes.com/smoker-parts.html

http://www.barbecue-smoker-recipes.com/home-smoker-design.html

Use this link to watch the video that accompanies this chapter.
12. Firebox Panel

When the smoker unit has been assembled (base, sides, rear and top) and after the smoker spreader has been inserted this is the next panel to fit. It's important to have it fitted in position because it forms the surface upon which the smoke seal (on the doors) compacts against so getting this panel in position helps with the fitting of the door panels.

Whilst not the most challenging panel to build it probably is the most challenging to describe because both the fire board, the plywood and the battens overlap to different degrees. On two sides (bottom and right as you look at the unit) there is a plywood overlap to allow the panel to be secured to the side and base yet in other areas battens remain exposed because these will be the overlap for the door seals.

In the picture above there are two battens missing. One that runs across the top and one that remains exposed on the left side.
Both these battens are secured to the fire board panel and this is what fixes them in position. In addition the batten running across the top is also fixed to the smoke spreader (remember the holes in the smoker spreader that were countersunk to the front side?)

The finished panel looks like this.

![Finished panel image](image)

On the inside, the whole perimeter of the battens is clad with fire board to ensure that no wood is directly exposed to the firebox.

**Step 1 – Plywood & Battens**

Figure 15 below shows the dimensions and layout of the battens

**Fig. 15**

![Diagram of battens dimensions](image)
Looking at the unit in reverse (Fig. 16) the plywood covers the batten rectangle as shown (minus the two overlapping battens) and the shaded area represents the plywood overlap where the panel will be fixed to the side and base.

**Fig. 16**

<table>
<thead>
<tr>
<th>Battens</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>A  Long Horizontal Batten Length</td>
<td>21 1/8</td>
<td>20 5/8</td>
<td>537</td>
<td>523.88</td>
</tr>
<tr>
<td>B  Vertical Batten Length</td>
<td>16 1/4</td>
<td>15 3/4</td>
<td>413</td>
<td>400.05</td>
</tr>
<tr>
<td>C  Short Horizontal Batten Length</td>
<td>6 3/4</td>
<td>6 1/2</td>
<td>171</td>
<td>165.1</td>
</tr>
</tbody>
</table>

Imperial ¼ inch board

Imperial ½ inch board

Metric 6mm board

Metric 12mm board

Looking at the unit in reverse (Fig. 16) the plywood covers the batten rectangle as shown (minus the two overlapping battens) and the shaded area represents the plywood overlap where the panel will be fixed to the side and base.

Once the panel has been cut, offer it up to the semi assembled smoker to double check that it fits correctly.

On the panel itself note how there's a bank of two drill holes along the right and bottom edge. It's the inner set that fix the battens in place and the outer bank are on the overlap to screw into the side and base. All the countersinking is on the same external face.

Use the C clamps to position each batten and then screw to secure.

The dimensions for the plywood panel are in the table below and the drawing (Fig. 17) follows overleaf.

<table>
<thead>
<tr>
<th>Plywood</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>D  Length Of Plywood Panel</td>
<td>18 1/2</td>
<td>18 1/4</td>
<td>470</td>
<td>464</td>
</tr>
<tr>
<td>E  Width Of Plywood Panel</td>
<td>9 3/4</td>
<td>9 3/4</td>
<td>248</td>
<td>248</td>
</tr>
</tbody>
</table>
Step 2 – Fire Board

The diagram below (Figure 18) looks at the fire board from the reverse. In other words the side that is fixed to the battens. Note how there are double drill holes to the left and top.
The inner holes secure the fire board to the batten rectangle shown in Fig. 15 with the outer holes securing the outer horizontal and vertical battens that form the door seals. All drill holes are countersunk to the front side of the panel ie. that which is exposed to the firebox.

<table>
<thead>
<tr>
<th>Fireboard</th>
<th>Length Of Fire Board</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>17 7/8</td>
<td>17 3/8</td>
<td>454</td>
<td>441</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>9 1/4</td>
<td>9</td>
<td>235</td>
<td>229</td>
<td></td>
</tr>
</tbody>
</table>

Finally, a proportion of the two horizontal battens attached to the smoke spreader remain exposed to the interior so it's necessary to make a small filet of fire board to cover this.

Fig. 19

Once this panel is complete, fit it to the side, base and smoke spreader because this will aid the positioning of the firebox door and the food chamber door.

<table>
<thead>
<tr>
<th>Fireboard Filet</th>
<th>Width Of Fire Board</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>1 5/8</td>
<td>1 5/8</td>
<td>41</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>12</td>
<td>11 3/4</td>
<td>305</td>
<td>298</td>
<td></td>
</tr>
</tbody>
</table>

Further Information

More commentary and pictures about this panel can be found here. Click here to watch the video.
13. Assembly - Phase 2

The first piece in this second phase of the assembly process is the smoke spreader and to put this and the firebox front panel in position it's easier to work with the smoker upside down. Carefully turn it over and rest the top on the off-cuts (otherwise you'll damage the chimney slider).

Fit the smoke spreader in position so that the reverse side of the fire board is now pointing up and (keeping in mind that the smoker is upside down) it sits on what is now the upper horizontal batten indeed the only one remaining exposed on the rear and side panels.

Once the smoke spreader is in position it's time to fit the remaining side and rear panels that complete the lining of the firebox. Firstly fix the side panels in position with the exposed batten that's already fitted to the panel fixed to the rear of the firebox. This panel is fixed internally to the front side panel and externally from the rear panel.

Finally fix the rear internal fire board. Mount it on the battens that were fixed to the side panels and the central vertical batten on the rear plywood panel. You should now have the inside completely covered in fire board with the exception of the front.
The final panel to fit in phase 2 of the assembly process is the front firebox panel and to do this it's better to return the smoker to be right side up.

The firebox panel is first secured on the front right and bottom by driving screws through the plywood drill holes into the side and base.

The double batten structure at the top of the panel which is held together by the fire board can now be fixed by screws through the smoke spreader.

That concludes phase 2 and there's just 2 more panels to fabricate before the final assembly.
14. Firebox Door

In addition to the standard construction design, this sub assembly has a couple of features worthy of note.

To the outer face there is a batten running down the left side and this is to make for easy fastening of the hinges.

The door also features a cut out area (bottom right) and this is to house the neck of the gas burner, it also serves as a peep hole so that you can regulate the power of the flame during the cookout. There are no measurements in the drawings for the size of this gap because it's dependent on the burner that you buy.

In the same fashion as the food chamber door that we will make next, the smoke seal is achieved by fixing Velcro® loop, glued to the perimeter of the inside of the door. Velcro® is a textile hook and loop system used commonly to fasten clothing and when I talk about the “loop” I'm referring to the strip that is fluffy to handle. It can also be purchased in fire retardant form.

To fix the door in a closed position there is a bolt and you'll see when we come to the pattern of battens behind the plywood in Figure 21 there's a couple of short lengths to act a bearers.
Step 1 – Plywood & Battens

Figure 20 shows the front view of the firebox door.

Fig. 20

<table>
<thead>
<tr>
<th>Plywood</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Length Of Plywood</td>
<td>18 1/2</td>
<td>18 1/2</td>
<td>470</td>
<td>470</td>
</tr>
<tr>
<td>B Width Of Plywood</td>
<td>14 1/8</td>
<td>14 1/8</td>
<td>359</td>
<td>359</td>
</tr>
</tbody>
</table>

The outer dimensions are given but the size of the cut out will vary dependent on the make of burner that you have.

Note the length of the batten to the left. Drill holes and screw heads will be covered by Velcro® loop so exact measurement for positioning of the drill holes is not necessary just remember to countersink on the reverse side to that shown in Fig. 20.

Having cut the plywood to shape you can then cut the battens and once again the length can only be calculated for a couple of them. The easy way to make up this panel is to take the measurements from edge to drill hole centers (F, G, H & J in Fig. 21) and draw on the reverse and then take the measurements.

The final two pieces to the jigsaw are a couple of off-cuts sited half way down the panel and these will form the bearers for the bolt. The length of these off-cuts is determined by the length of bolt used and in this example that was a 3 inch (75mm) bolt.

Draw round these off-cuts and then you can easily mark four drill points (symmetrically) to secure the battens making sure that the interval between drill holes is not the same as on the bolt. There's no need to mark the position of the off-cuts on the front of the door – this will be evident from the
position of the four screw heads.

Once you have marked out the length of the battens, offer the pieces up to the semi assembled smoker so that you can check that the door will open and close. There is an allowance in the measurements for the swing of the door but it's worth double checking before drilling any holes in the plywood otherwise your finished door will look a mess.

**Fig. 21**

<table>
<thead>
<tr>
<th>Batten Structure</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Length Of Vertical Batten</td>
<td>16 1/8</td>
<td>15 5/8</td>
<td>410</td>
</tr>
<tr>
<td>D</td>
<td>Width Of Upper Horizontal Batten</td>
<td>9 3/4</td>
<td>9 1/2</td>
<td>248</td>
</tr>
<tr>
<td>E</td>
<td>Distance From Top To Center Of Bolt Bearers</td>
<td>9</td>
<td>9</td>
<td>229</td>
</tr>
<tr>
<td>F</td>
<td>Edge To Vertical Batten</td>
<td>1</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>G</td>
<td>Edge To Vertical Batten</td>
<td>1 5/8</td>
<td>1 3/8</td>
<td>41</td>
</tr>
<tr>
<td>H</td>
<td>Edge To Horizontal Batten (Top)</td>
<td>3/4</td>
<td>1/2</td>
<td>19</td>
</tr>
<tr>
<td>J</td>
<td>Edge To Horizontal Batten (Bottom)</td>
<td>1 1/2</td>
<td>1 1/4</td>
<td>38</td>
</tr>
</tbody>
</table>

**Step 2 – Fire Board**

The template for the fire board panel is best simply drawn following the outline of the battens. Just remember to shape it so that the front side (if there's only one sanded side to your fire board) faces into the firebox.

Position the drill holes so there's no conflict with the screws that secure the plywood.

<table>
<thead>
<tr>
<th>Fireproof Board</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>Length Of Fire Board</td>
<td>16</td>
<td>15 1/2</td>
<td>406</td>
</tr>
<tr>
<td>L</td>
<td>Width Of Fire Board</td>
<td>11 3/4</td>
<td>11 1/2</td>
<td>298</td>
</tr>
</tbody>
</table>
Further Information

More about this panel can be found on the internet and you can access it through this link.

You can find the video right here.
Key features of the food chamber door over and above the standard design of plywood, battens and fire board are driven by three factors:-

- How to fix and hinge the door
- How to lock the door
- How to create a satisfactory smoke seal

The hinge is formed (using standard brass door hinges) by fixing a batten to the length of the door on the outer plywood skin which acts as a bearer to secure the hinge.

A further batten has been positioned down the other length, this acts as the bearer for the snap catches to close the door and also as the handle to open the door.
As with the firebox door, the smoke seal is created with Velcro® loop, glued to the perimeter of the inside of the door.

**Step 1 – Plywood & Battens**

You can see from Figure 23 that the battens are positioned inside of the absolute perimeter of the plywood. This overlap will be used to glue the smoke seal and when fixed in position it will butt up against the edge of the side panels, the top panel and the upper batten on the firebox panel (that has been secured to the smoke spreader).
Fig. 23

![Diagram of plywood dimensions](image)

<table>
<thead>
<tr>
<th>Plywood</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Door Length (And Front Vertical Battens)</td>
<td>29 1/2</td>
<td>29 1/2</td>
<td>749</td>
</tr>
<tr>
<td>B</td>
<td>Door Width</td>
<td>24</td>
<td>24</td>
<td>610</td>
</tr>
<tr>
<td>C</td>
<td>Length Of Vertical Batten</td>
<td>27</td>
<td>26 3/4</td>
<td>686</td>
</tr>
<tr>
<td>D</td>
<td>Length Of Horizontal Batten</td>
<td>18 7/8</td>
<td>18 3/8</td>
<td>479</td>
</tr>
<tr>
<td>E</td>
<td>Distance From Top To Drill Hole Centers</td>
<td>1 1/4</td>
<td>1 1/2</td>
<td>32</td>
</tr>
<tr>
<td>F</td>
<td>Distance From Bottom To Drill Hole Centers</td>
<td>1 1/8</td>
<td>1 1/8</td>
<td>29</td>
</tr>
<tr>
<td>G</td>
<td>Distance From Side To Drill Hole Centers</td>
<td>1 5/8</td>
<td>1 7/8</td>
<td>41</td>
</tr>
<tr>
<td>H</td>
<td>Distance From Batten Edge To Drill Hole Centers</td>
<td>2</td>
<td>2</td>
<td>51</td>
</tr>
<tr>
<td>J</td>
<td>Distance Between Drill Hole Centers</td>
<td>7 1/2</td>
<td>7 1/2</td>
<td>191</td>
</tr>
</tbody>
</table>

Note that to the extreme perimeter of the plywood there are three drill holes down each vertical edge. These holes are to secure the battens to the front side for attaching the hinges and snap catches.

The holes will not be seen on the outside and will be covered by Velcro® on the inside so precision positioning of the holes is not essential. Figure 24 shows the front view of how the battens fix to the door. Note that these holes will be countersunk from the opposite side of the plywood to all the other holes.
Step 2 – Fire Board

The fire board panel is cut almost to fit the aperture of the food chamber door and if measured correctly should fit snugly at the top and bottom once assembled. It will however not fit completely snugly to the sides because we have to allow a fractional gap so that the door opens and closes.

In order to ensure that you get this measurement right it's important to double check by offering up the panel to the part assembled unit, drive in one screw (gently) and check the swing of the door.
**Further Information**

More commentary and pictures about the fabrication of this panel are available on the website, [just click here.](#)

[Use this link](#) to access the video.

<table>
<thead>
<tr>
<th>Fireboard</th>
<th>Imperial ¼ inch board</th>
<th>Imperial ½ inch board</th>
<th>Metric 6mm board</th>
<th>Metric 12mm board</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Fire Board Length</td>
<td>27</td>
<td>26 3/4</td>
<td>686</td>
<td>679</td>
</tr>
<tr>
<td>B Fire Board Width</td>
<td>20 1/2</td>
<td>20</td>
<td>521</td>
<td>508</td>
</tr>
<tr>
<td>C Distance Between Drill Hole Centers</td>
<td>6</td>
<td>6</td>
<td>152</td>
<td>152</td>
</tr>
</tbody>
</table>
16. Assembly - Phase 3

The two doors are best fitted with the smoker resting on the rear panel. In this way you can get a good fit and ensure that the doors are level and that they open and close without snagging.

Sit the doors in their respective openings and once you are happy with the positioning offer up the hinges. Using a bradawl mark the position of the required drill holes and make the hole with your drill. The hinge should be fixed to the batten on the exterior of the door and the side panel and each door requires two hinges, one at the top and one at the bottom.

When the hinges are in position apply the same process to fitting the snap catches on the other side of the food chamber door and fix the bolt to the front of the firebox door.

In essence, that's it! You now have the complete smoker. Final points are the fitting of casters if you want or need to move the smoker around and three coats of varnish to finish the job.

Watch the video!

Congratulations!
17. Fixtures And Fittings

At all points I've tried to keep the design simple and accessible no matter where you are on the globe and to that end I've tried to do the same with the internal fixtures and fittings.

**Burner**

I chose to use a propane paella burner for my smoker and it works fine. It cost me about $50 on Amazon. My main criteria for buying this burner were firstly that it had a long neck therefore ensuring that the burner was central in the firebox and secondly that the fuel pipe inlet was positioned either to the right or underside of the neck so that the door to the firebox can be opened without snagging. In addition, the paella burner is more gentle and allows for an even slow burn of your wood chips.

I recently checked the price of paella burners and they sadly appear to have risen quite dramatically.

This link below will take you through to Amazon.com where you can compare and contrast prices and product reviews.

Clearly if you have a burner that has the inlet pipe on the left then this is not a massive disaster, it just means that you need to fabricate the firebox panel and door as mirror images of my plan.

**Food Racks**

I bought food racks from a BBQ spares company quite simply because they weren't expensive and they fit almost perfectly to the dimensions of my design. Use this link to see where I got mine.

**Temperature Gauge**

Nothing special here. I found this to be more than adequate

Note that in order to fix it I had to remove the fire board panel from the door but this isn't a big deal.

**S Hooks**

Again, simple and cheap. I got mine from Amazon.com

**Water Bath**

I think that you've got the message by now. It's time to buy your partner a new turkey roasting tin and commandeer the old one for use as a water bath! Whatever you manage to lay your hands on the main feature to consider is that it's a deep tray (at least 2 inches). If too shallow the water will evaporate too quickly and then you'll lose control over your humidity in the food chamber.

If you need to buy new then this link below will take you to a pretty good example of what you need.
Gas

If you haven't already got one, you'll need to buy a propane tank from your local supplier. In addition you'll need a regulator, length of hose and a couple of jubilee clips. Please do make sure that you buy the correct regulator because it's the regulator that controls the flow of gas to the burner and if it's wrong you could have all sorts of problems.

Most folks that I speak to also recommend that you buy a new tank so that you know the faucet is working correctly and once you have it, don't go to a tank exchange, get it refilled and hold onto it.
18. Recipes And Recommendations

Have you been planning what your first cookout will be in your very own home made smoker? I can imagine how you feel at the moment, really satisfied with your handiwork and maybe breathing a sigh of relief that you've finally completed the project.

Don't worry, I've put together some of my favorite recipes to help you on your way. These are the ones that your smoker was destined to do! Just click on the text to shoot straight through to my recipe.

Smoked Mackerel

********************************************

Texas Smoked Brisket

********************************************
Honey Glazed Ribs

Of course there's loads more where they came from at barbecue-smoker-recipes.com. Maybe I need to collate them all into my next e-book?

Enjoy cooking on your smoker and if you have any further questions or want to tell me how to improve my homemade smoker plans then use this link to contact me.

Have fun!

Paul
Acknowledgements

This e-book is dedicated to my family:-

To my Father, Peter, for help with the design, the entire construction project and those little things like the camera work on the videos and the loan of the drawing board.

To my Mother, Hazel, for the catering service over many weekends and endless cups of tea.

To my wife Louise, and daughters Hannah and Lucy, for their support and positive attitude throughout many frustrations and redesigns. Without them I would never have had the patience and determination to finish the project.

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To Ken Evoy and everyone at Site Build It! for showing me the way to market this e-book successfully.