

# Model Ship World Plank Bending

*The following has been compiled from original posts on Model Ship World.*

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## Introduction

### **Example 1.**

Phrygian posts this information on 10 May 2007.

There is a detailed booklet on steam bending available free on the Lee Valley site: <http://www.leevalley.com/wood/page.aspx?c=1&p=31161&cat=1,45866,45867>

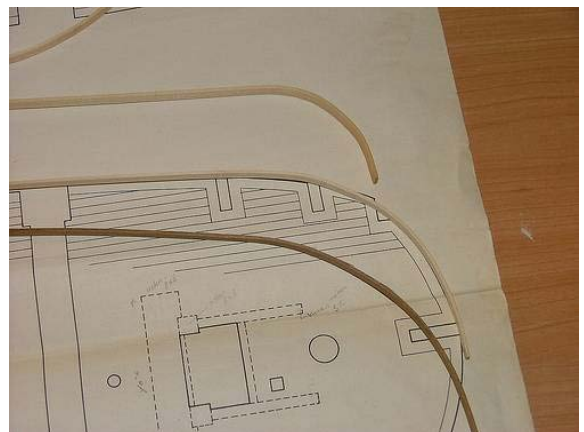
### **Example 2.**

This comes from johannesludo5 on 21 October 2010.

I use my wife's steam iron. As you can see in the picture, I take the drawing of the model, and take the top deck as a reference; or I make a template of the curve. Then I take a whole length of plank and put it on a flat surface. I take the hot iron and start on the plank approximately where the curve starts and work the iron to the end of the plank. I lift the plank a little with the left hand (or vice versa if you're right handed). Do this several times until you have the right curve.



**Figure 1. – Applying the Steam iron to a Strip.**



**Figure 2. – Completed Planks.**

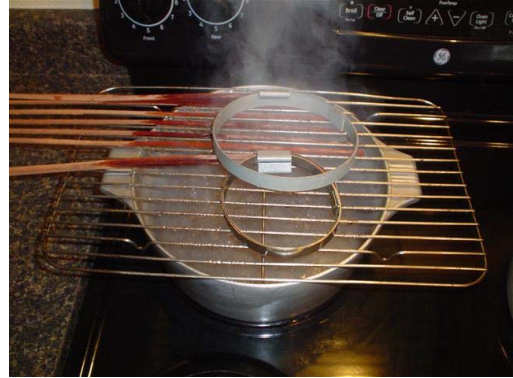
**Example 3.**

tjdarla2:

I use a steam pot method to bend the wood. What I have do is let the planks steam for 30 min. and then bend them in the hose clamps a little at a time with additional steam as needed.



**Figure 1. – Plank Steaming Set-up.**



**Figure 2. –Steaming the Plank.**



**Figure 3. – Plank Steaming Jig.**

**Example 4.**

This photo of plank-bending jigs comes from **God's Unicorn** posted 10 May 2008.



### **Example 5.**

This thread comes from a poll on Bending begun 12 August 2007:

#### **Don Lean:**

The best method I've found to bend wood is used by violin makers who use a 'bending iron' which is a heated oval shaped metal block. A damp cloth is sandwiched between the wood to be bent and a flexible metal strap and bent to the desired curve around the bending iron. This method allows bending with a twist which is what is often needed in planking. Temperature controlled bending irons are available from Luthier suppliers. I use a lash-up consisting of a length of copper pipe and a hot air paint stripper. Scorched fingers are common but we must suffer for our craft.

#### **Skuta:**

Here is a method (Figure 1) that I have used successfully over many years; this is by no means my own invention. Just soak the timber to be bent, warm up the copper tube (not too hot) and bend the timber over the tube.



### **Example 6.**

**Torchy** raises this question on April 28, 2008.

How long do you soak planks for before fitting? Can they be over soaked?

#### **Coater87:**

This is one of those things you will just have to experiment with. Just be sure to let the planks dry thoroughly before gluing or else they will shrink as they dry and leave gaps later.

#### **Philipgrae:**

There's definitely a time limit on soaking. I left some mahogany ones in to soak then forgot about them. After about a week they'd developed black stains which couldn't be removed. Also soaked some Lime ones for about four days and the ends started going black. So I would say the minimum is the time required to make them pliable and the maximum is not long after that.

### **WileyFromTexas:**

You are asking about soaking wood prior to bending. I thought this was a good opportunity to share a bit of furniture making industry knowledge about bending wood as it dispels many myths us modellers have to contend with.

Wood can be bent by simple soaking, bending and drying but the result is often unstable over time and tends to straighten as it soaks up and releases atmospheric moisture with humidity changes.

To properly bend wood the cell walls have to be heated to the point that some of the natural elements "plasticise" allowing it to flex and maintain its shape when cooled. Industry research has measured this point to be about 170C (338F) degrees! Adding the right amount of moisture can reduce this requirement.

The most popular ways to bend wood for models that stand up to scientific scrutiny are: dry heat bending; steam bending; immersing wood in boiling water; and microwaving soaked wood briefly (seconds). Any of these will elevate the temperature enough to plasticise.

Dry bending is typically done with a soldering iron with or without a special attachment for shaping the bend. Some folks even use mid-wattage light bulbs. A touch of the heat to the wood will contract it (and bend it). Repeated gentle application of heat will often do the trick as long as the wood does not scorch or burn.

The general steaming and boiling guidelines are 15 minutes per cm of wood (38 minutes per inch) thickness. If your wood is well seasoned or otherwise particularly dry, then more time (up to doubling) will be required.

Here is a key - when the wood is heated and ready for bending it must be done right out of the heat source before it cools too much. This cooling can sometimes just take seconds so get the wood on your work right away!

There are some myths that additives to the water or steam will make it more effective. Ammonia and Urea are most often mentioned. It is true these will work but they have to be induced under pressure into the wood before bending. Most hobbyists don't have the equipment to do this at home.

Finally some limits on bending expectations. Most woods can withstand about 25% to 30% compression when bending but can only withstand 1% to 2% stretching. Industry bending is sometimes done with a flexible metal strip with solid stops on it. The strip is put against the back of the wood bend and the stops adjusted snugly against the end of the wood piece. This way, when it bends the outside half does not stretch while the inside compresses. It is all compression.

### **Example 7.**

This suggestion comes from Dan Vad posted December 12, 2009

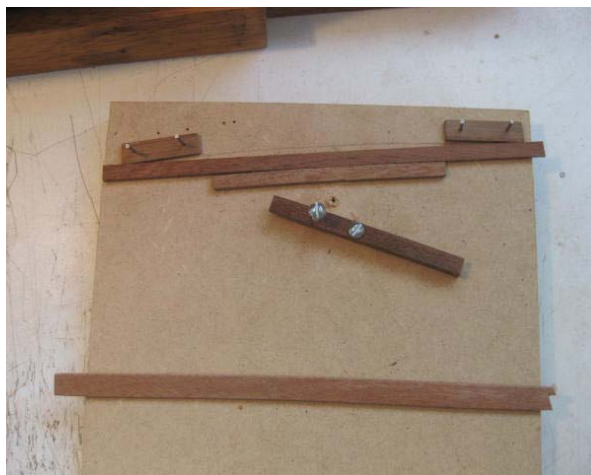
I needed to bend two pieces of 7mm x 2mm Sapelli laterally for the Cap Rails on the Quarterdeck of my "HMS Supply". I made up this jig in 10 minutes.

I used a piece of MDF board for the base. I placed the board across the Quarterdeck and drew a pencil line from below to get the shape I needed. Then I nailed two pieces of scrap on the line at the ends for "stops". I made the pivoting "pusher" out of a piece of scrap 5mm x 5mm and cut a 2mm deep x 10mm long slot in the end that would be doing the work. I drilled 2 holes in this for the screws - one is a "pivot" screw which remains fixed, the other is a "lock" screw that holds the pivot in the correct position and clamps it down onto the plank.

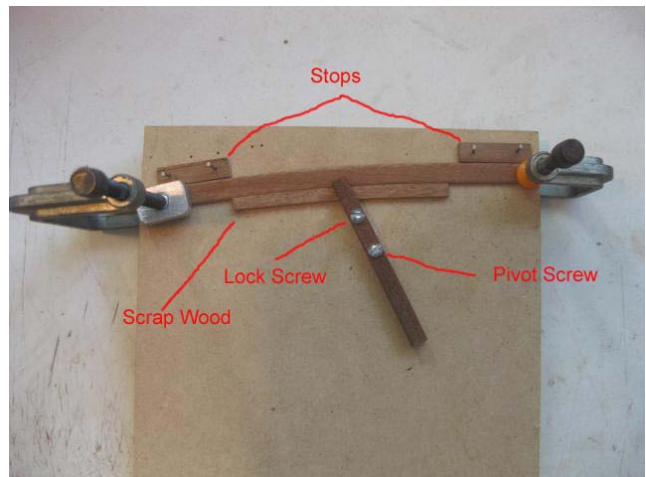
I soaked the Rail in water for 10 minutes and placed it in the Jig. I put a piece of 3mm scrap between the Rail and the Pusher to avoid damaging the Rail, and to help spread the load.

I then moved the Pusher clockwise against the Scrap until the Rail took the shape of the pencil line, and tightened the "Lock" screw.

I had to clamp both ends as the Rail wanted to twist up at the ends - in hindsight I should have made the "stops" with a step on the bottom similar to the slot in the "pusher". When the Rail was completely dry I removed it from the jig - it was a perfect fit, and didn't "spring back" at all .



**Figure 1. – Loaded and Ready to Go.**



**Figure 2. – Rail in Position, Waiting to Dry.**



### ***Example 8.***

#### **Lillee:**

On the subject of electric bender, I use a soldering iron with a modified turned brass head. The head is turned out of a solid 1 inch bar of brass with rounded corners. The head fits straight onto a generic 40W soldering iron. It gets really hot and can bend wet 4" pieces into a circle in about 20 seconds. It's been a very useful tool and I can't imagine life without one if ship modelling... no soaking, no jigs.

Here's a picture:

