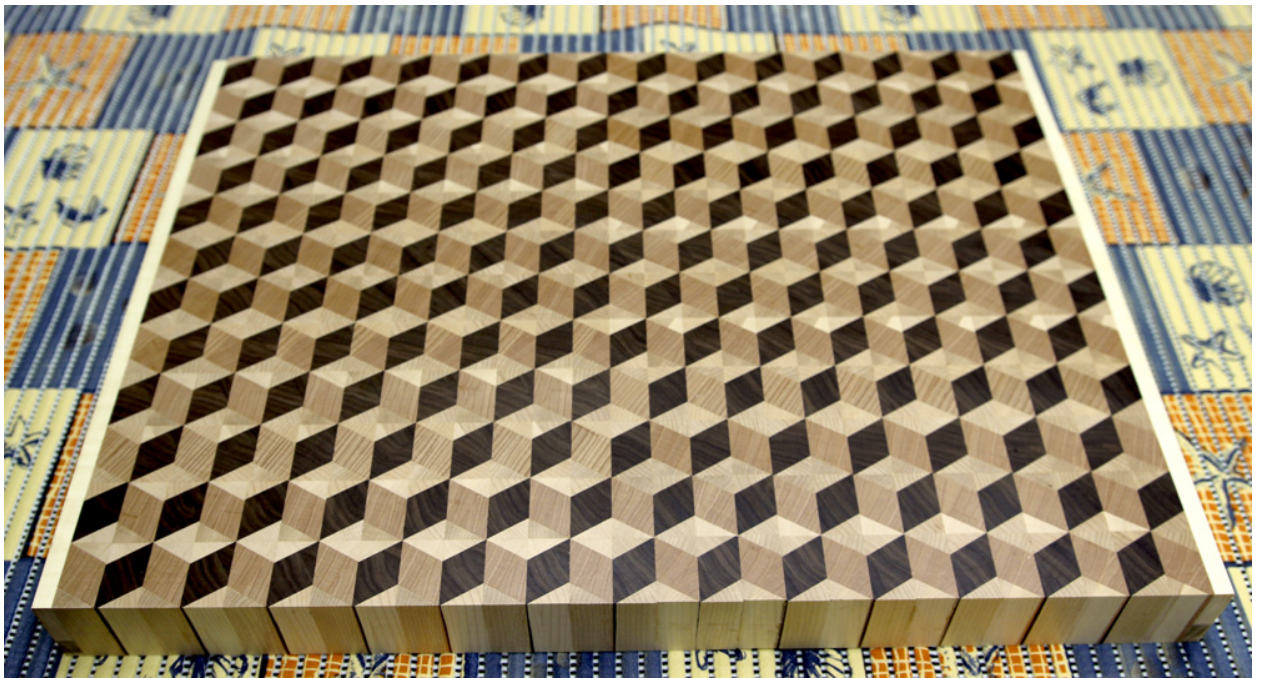


# Making A Blank For 3D End Grain Guitar Body

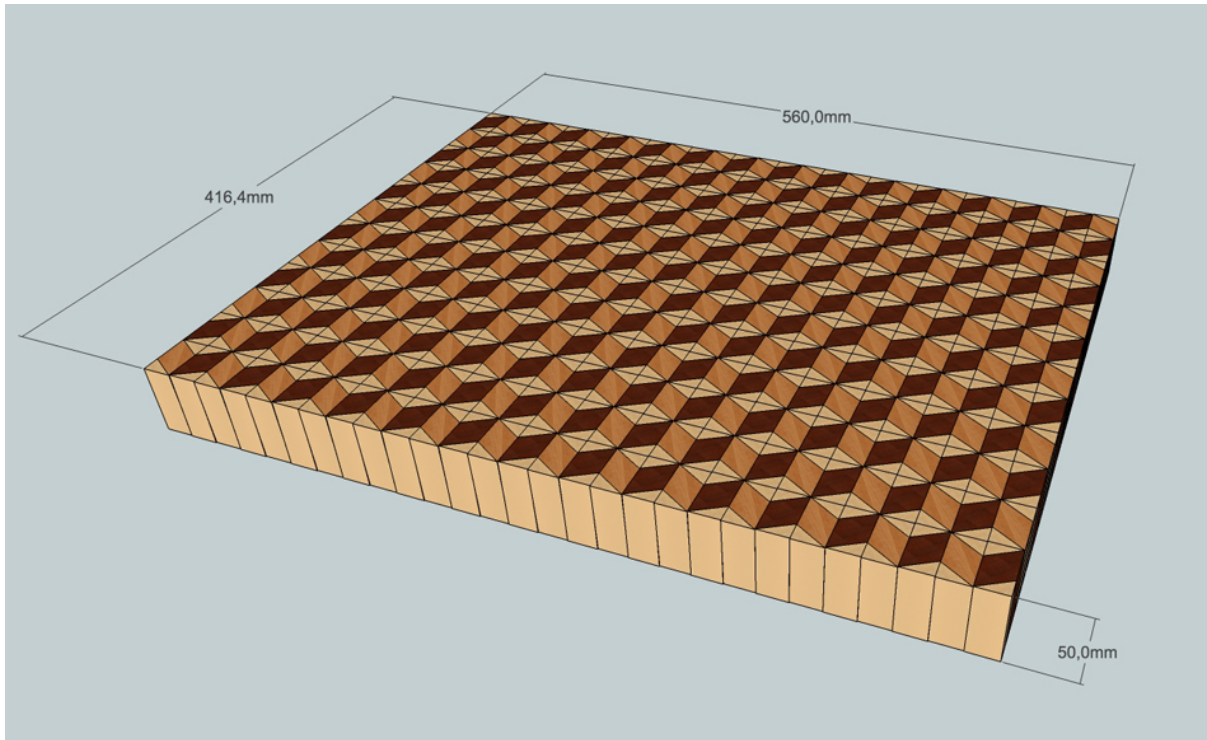


mtmwood  
2014

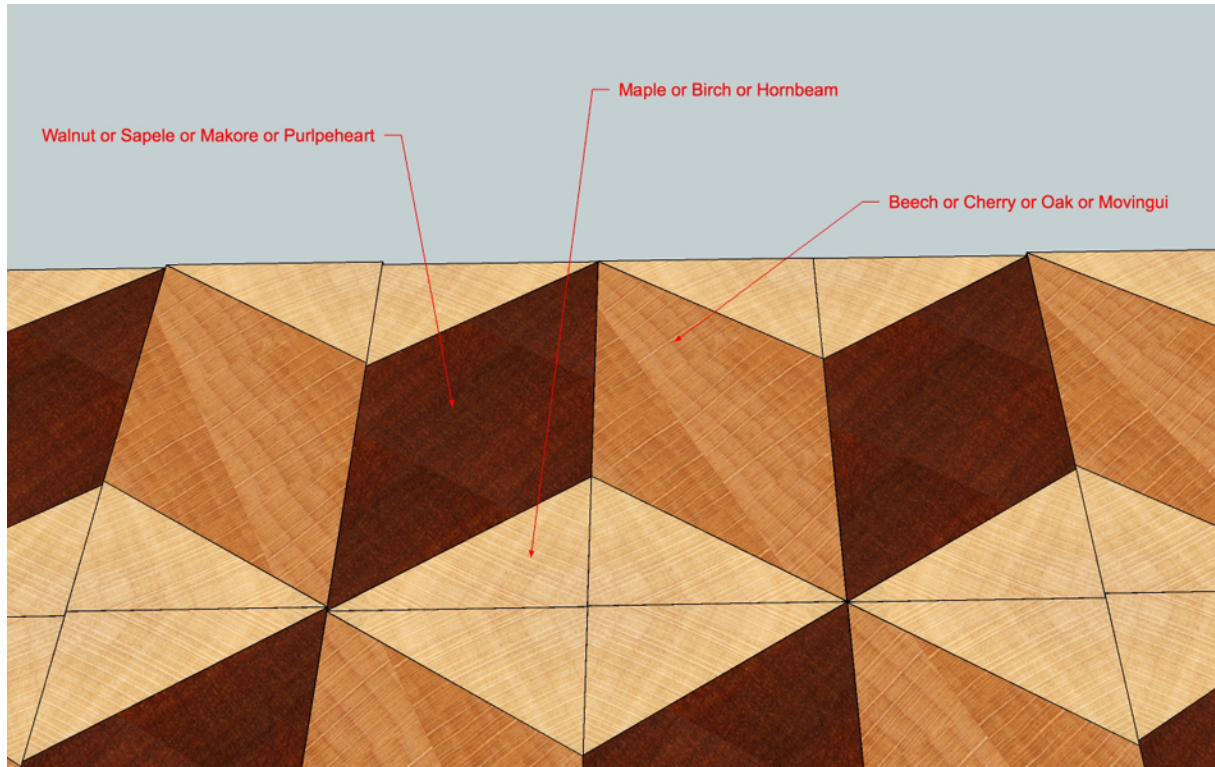


I got an order from the German guitar producer. He wants to make a guitar body from my 3D end grain cutting board. I made only a blank for the guitar body. It is large board and it is difficult to make. It is practically impossible to make the board of such dimensions using another method – gluing hexagons.

The board dimensions are 560x420x50 mm.



I used for this project hard maple, beech and black walnut. But it is possible to use other contrasting wood species. Usually I do not use the beech for cutting boards, because it is very hygroscopic. But the body of the guitar will be lacquered, so I used beech. Therefore it is better to use a cherry, if you make the cutting board.



First of all we should make calculations. Board consists of 14 cubes in length (28 rows) and 12 cubes in width. So we need 6 walnut elements and 6 beech elements.

The width of each element is 23,1 mm. We should add 2 mm as a reserve plus 3 mm as the width of table saw blade. So to get 12 slats we need a board with a minimum width of 340 mm.

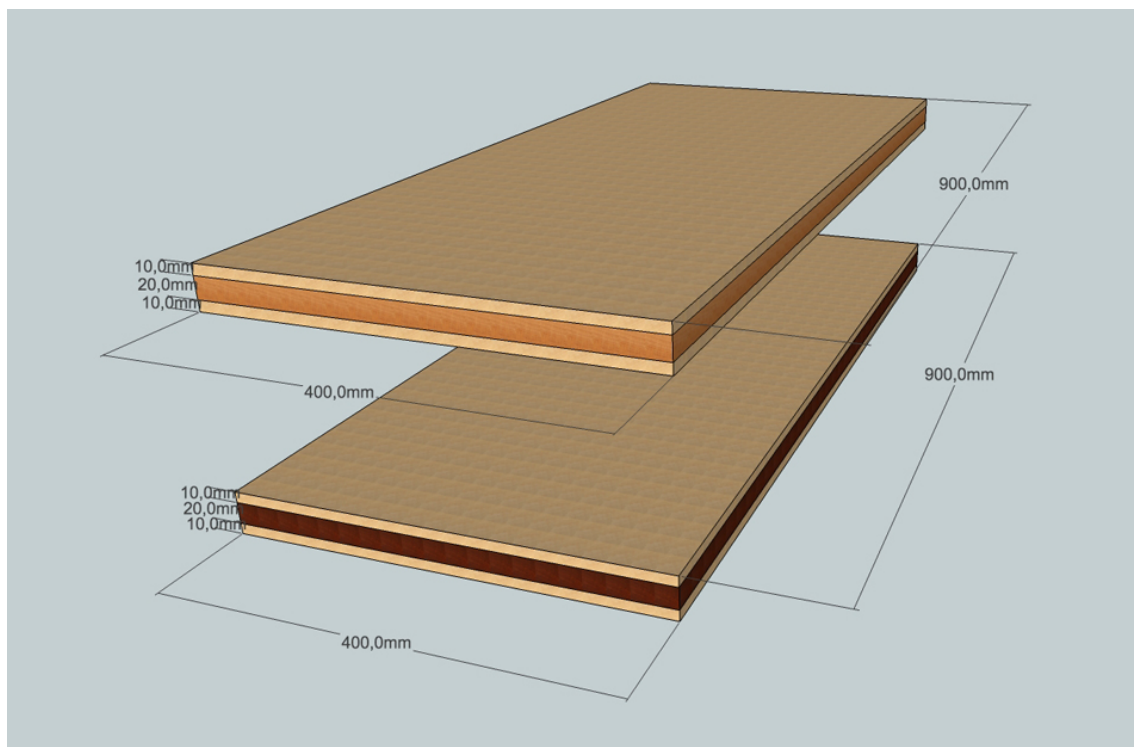
$$(23,1+2+3) \times 12 = 337,2 \text{ mm}$$

Let's add 60 mm and make 400 mm wide board.

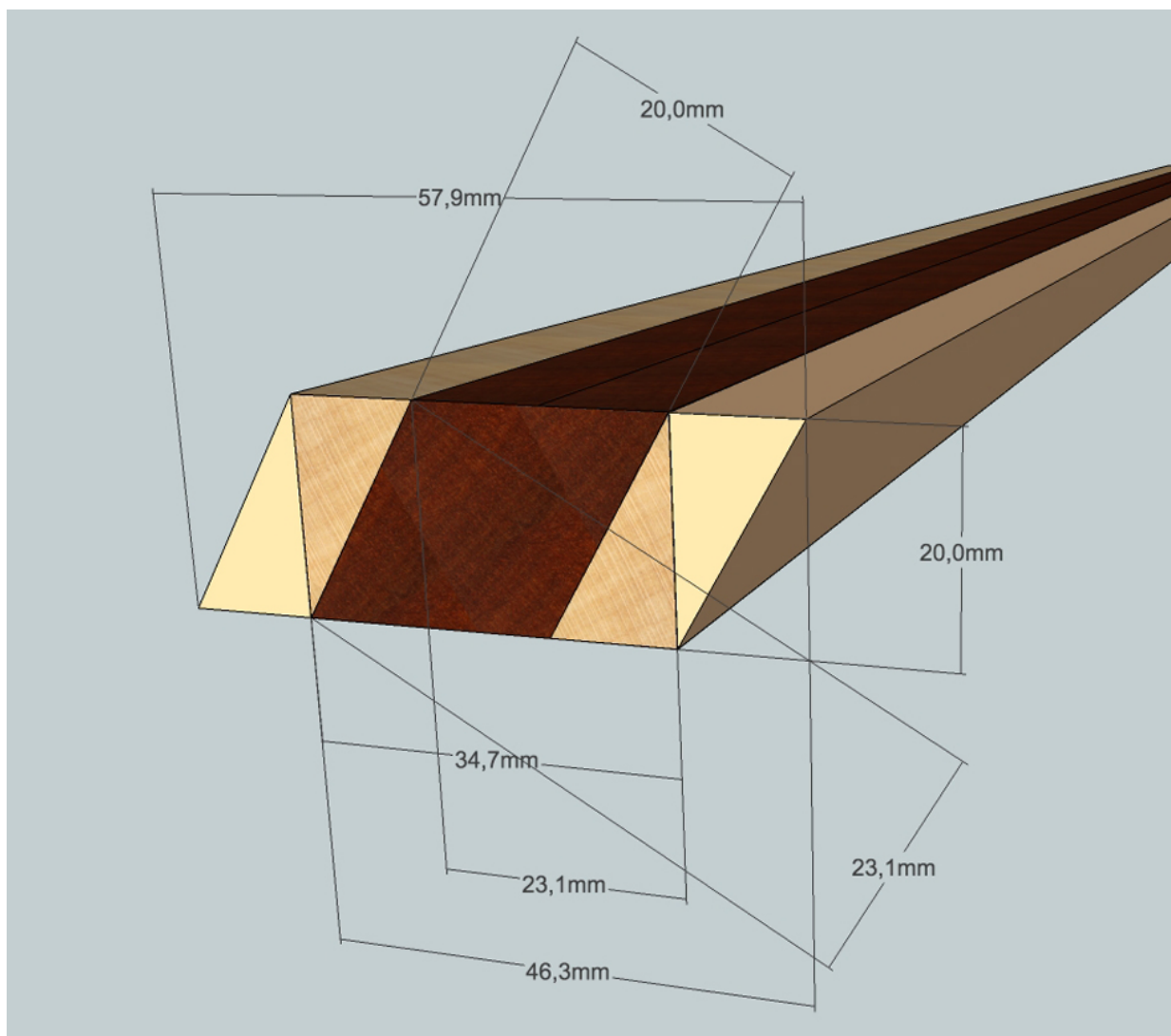
The board consists of 28 rows, the thickness of the row is 50 mm – the thickness of ready cutting board. Add 2 mm as a reserve plus 3 mm as the width of table saw blade. So we need two panels (walnut+maple and beech+maple) with a total length

$$(50+2+3) \times 28 = 1540 \text{ mm}$$

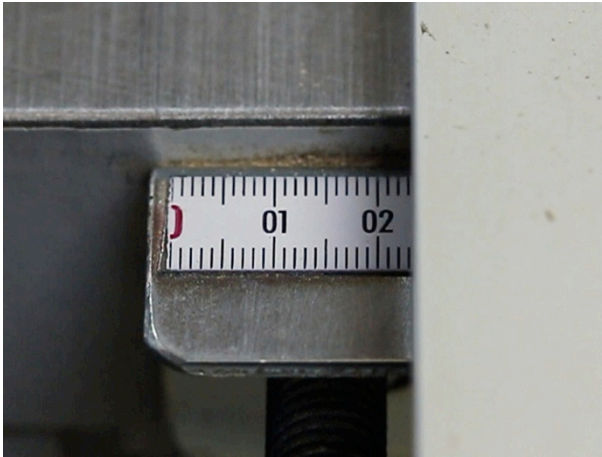
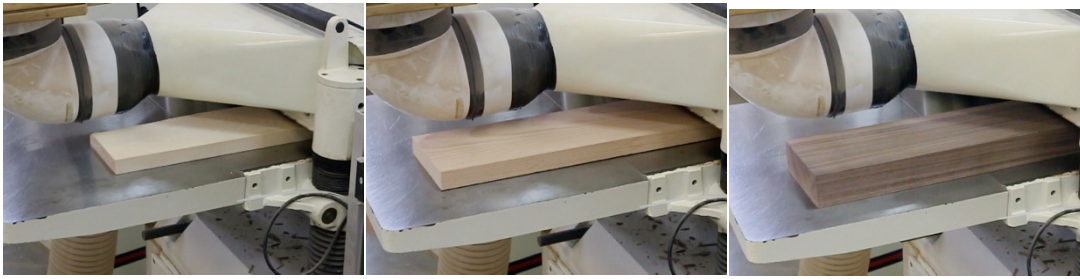
Add 200 mm as a reserve and get 1740 mm. We need two panels, respectively, the length of each panel shall be not less than 870 mm. Let's make 900 mm.



You must be very precise making this board. The main dimensions are at the drawing below. And we will come back many times to this drawing. When I make such board I hang this drawing on the wall so it is always before my eyes.



Prepare lumber using the jointer and the planer.



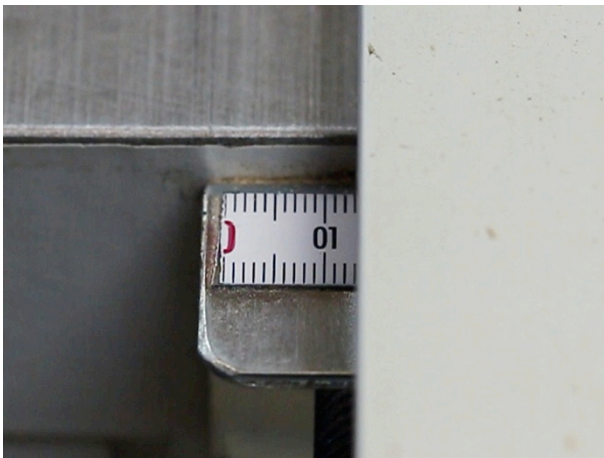
The final thickness of the walnut and beech panels must be 20 mm. So set the rip fence of the table saw on the level of 23 mm. 3 mm will be removed during planing. Usually 2 mm is enough. It is up to you.



Make one walnut panel 400 mm width.



Make one beech panel 400 mm widths.

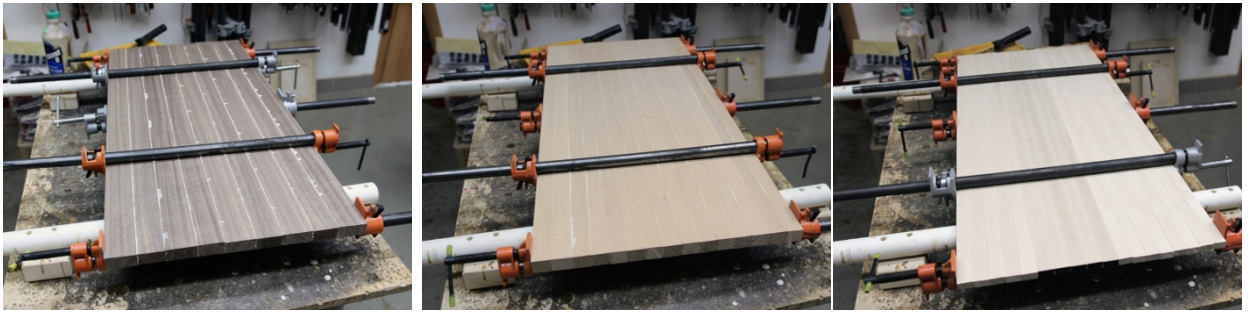


Then set the rip fence of the table saw on the level of 13 mm.



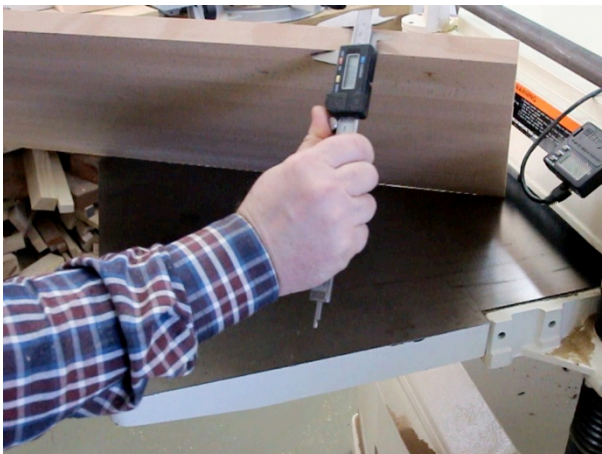
Make four maple panels 400 mm width.

Glue the panels. Use Titebond III glue. Wait at least 12 hours.



Next day.

Plane the panels. Finally you should get 20 mm thickness of walnut and beech panels.



Check the 20 mm thickness. It is very important to be precise at this stage.

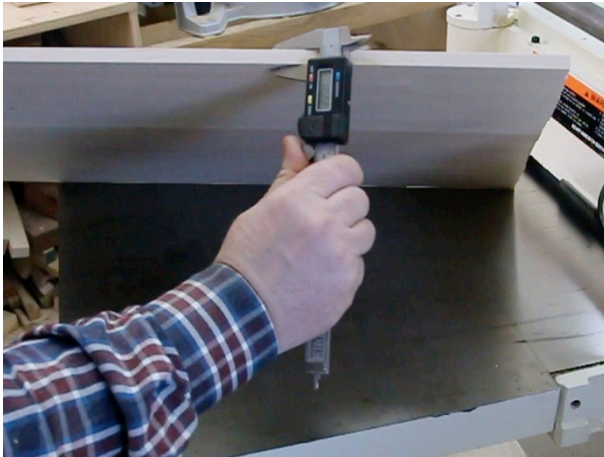


The same with the walnut panel.

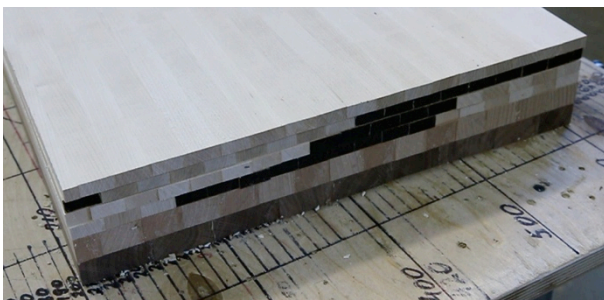


The final thickness of maple panels is 10 mm.





Check the 10 mm thickness.

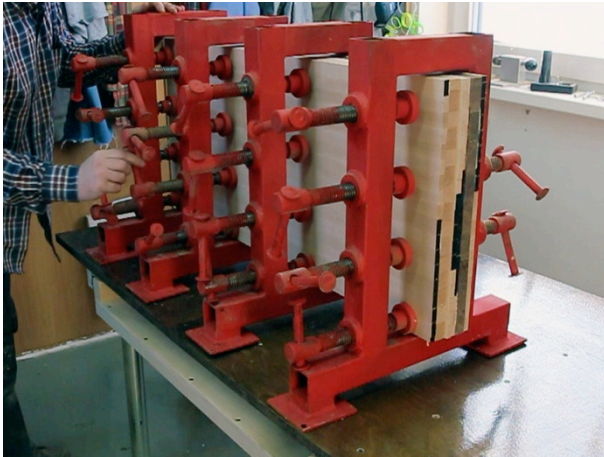


Make the width of all six panels the same for more convenient gluing.

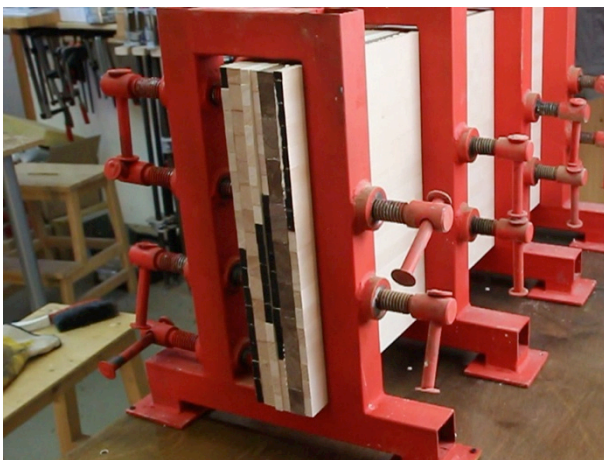


Glue two boards – walnut + maple and beech + maple. Do not use an excessive amount of glue - excess glue cannot be pushed out from the middle of the board.





Clamp the boards. It is extremely important to compress well in the middle. I use specially made clamps that allow me to compress the board width of 400 mm. Do not make the boards wider than 200-300 mm using ordinary clamps.



These clamps allow me to clamp the middle of the board from the other side.

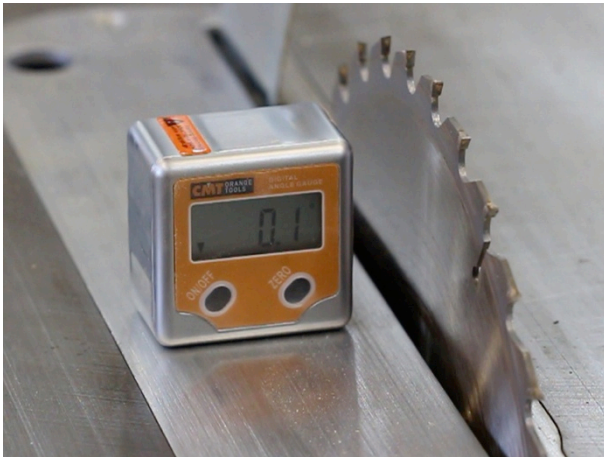


You can make 200-300 mm width board and use large F-clamps. They can clamp at the distance of 125 mm from the side of the board.

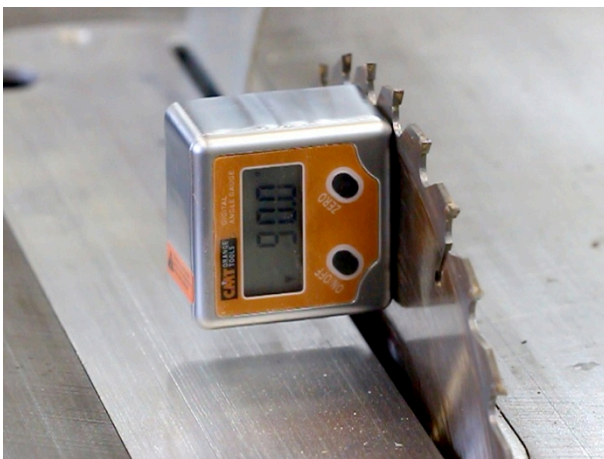
Glue the boards and wait at least 24 hours. Glue dries slowly in the middle of the board without access of air.



Align one edge of the boards on the jointer.



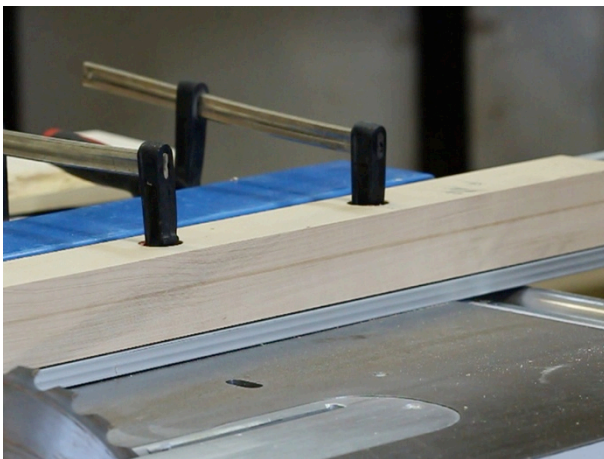
It is very important to set right angle of saw blade. Put the digital angle gauge at the table and press "ZERO".



Then attach it to the blade.



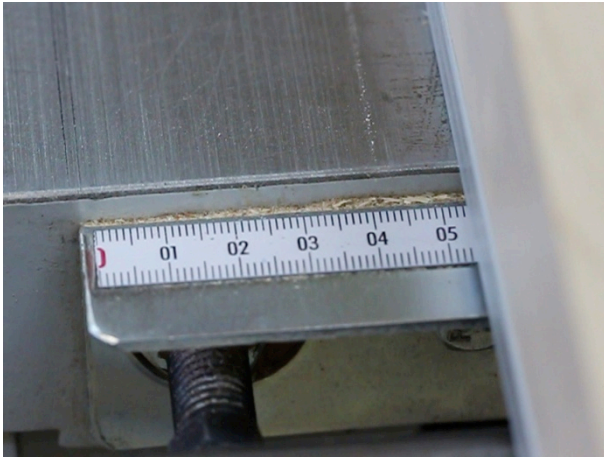
Tilt the saw blade and set the exact angle of 60 degrees.



I use a special overlay on the rip fence.



Make the first cut.



Set the rip fence of the table saw on the level of 53 mm.



Cut off 12 slats from each board.



Check the thickness - 23 mm. The final thickness should be 20 mm. 3 mm will be removed later.



You should get 12 walnut and 12 beech slats.



Cut off the corners. The cutting line must pass exactly at the corners of the internal rhombus.





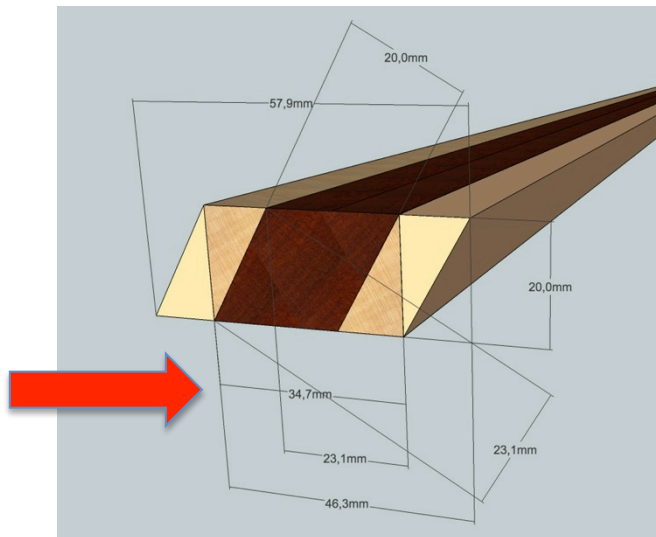
There is a lot of waste. So the light rhombus needs to be made of the cheapest wood.



Plane the slats.  
Try to remove equal amount of material from both sides.



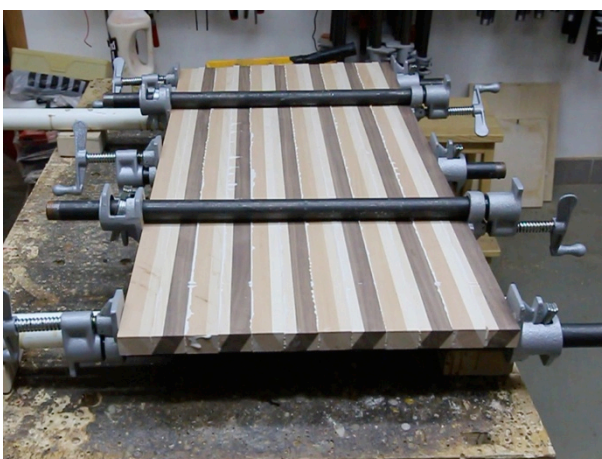
Important!  
The thickness must be exactly 34,7 mm.



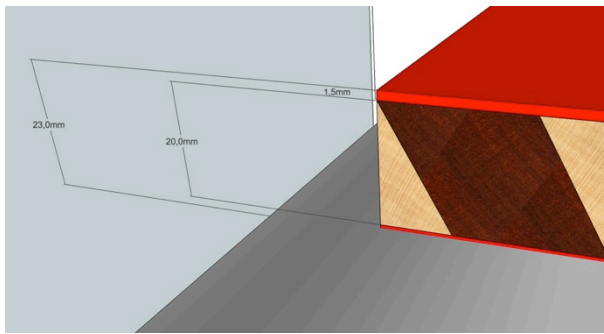
Check the dimensions.



Place the slats in the correct sequence as shown at the picture.  
NB! The width of this board is the **WIDTH (NOT LENGTH)** of the future cutting board.



Glue the boards. You need two boards.



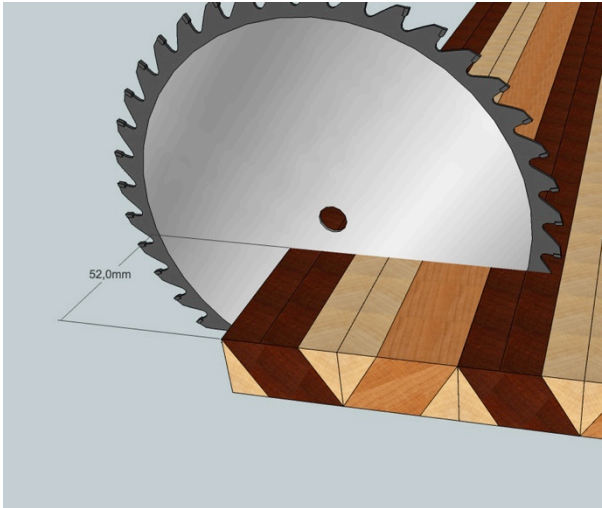
Plane the boards. You should remove 1,5 mm from each side.



Make sure that the strips of walnut and beech were serried and there was no a maple strip (or at least very narrow).



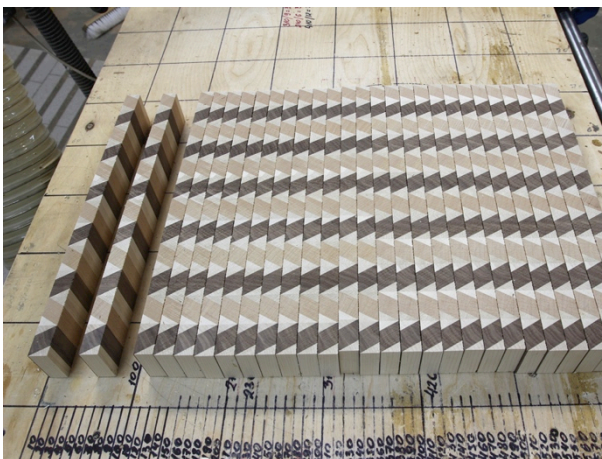
Check the thickness. Exactly 20 mm.



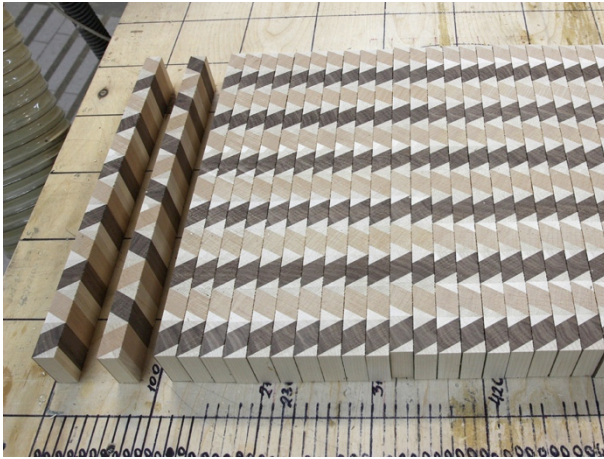
Set the table saw rip fence on the level of 52 mm.



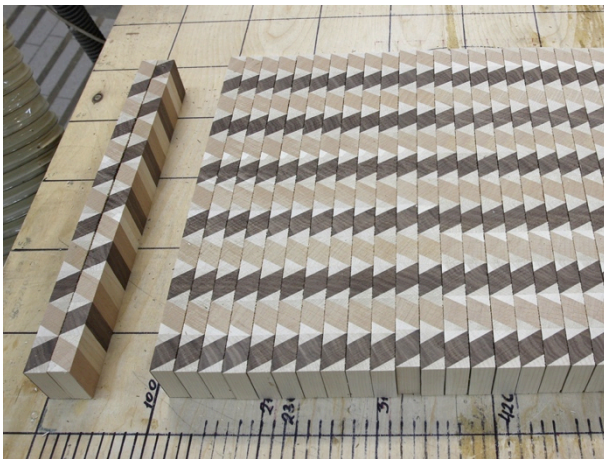
Cut 28 strips.



Make the pattern.

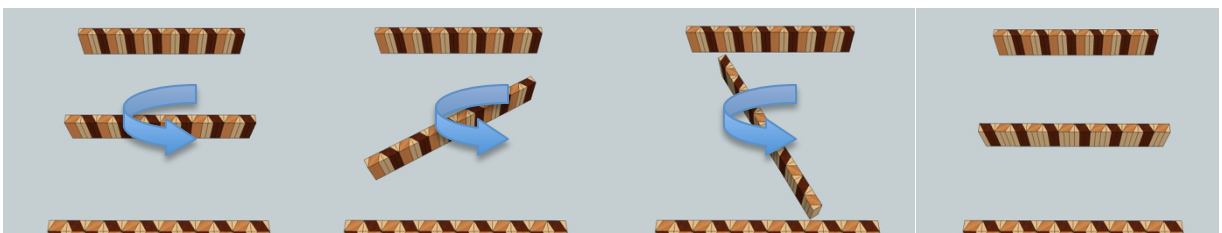


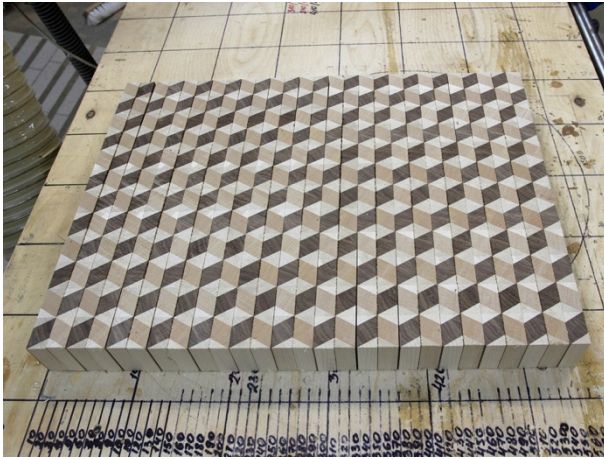
Rotate each second strip 180 degrees from left to right...



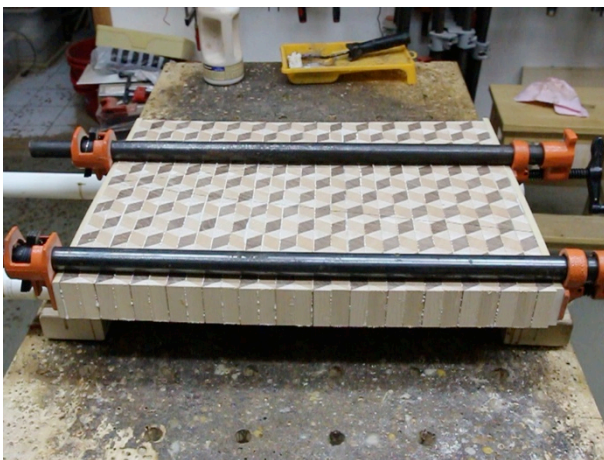
And then rotate it 180 degrees around the central horizontal axis.

Or another method: simply rotate each second strip 180 degrees around the central vertical axis.





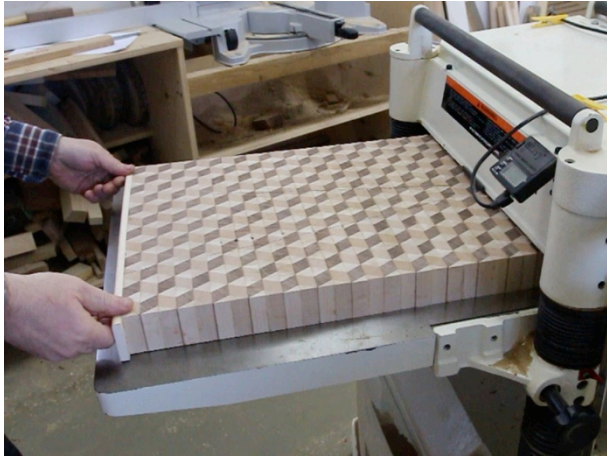
You made the pattern.  
When you see it for the first time - it's fantastic!



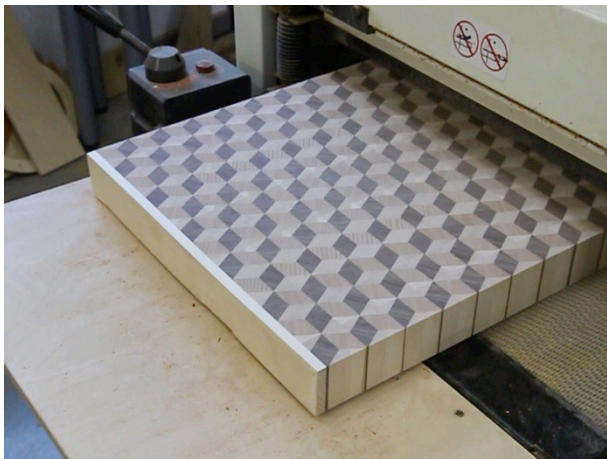
Glue the board.



Don't forget to glue sacrificial rails to save the pattern while planning.

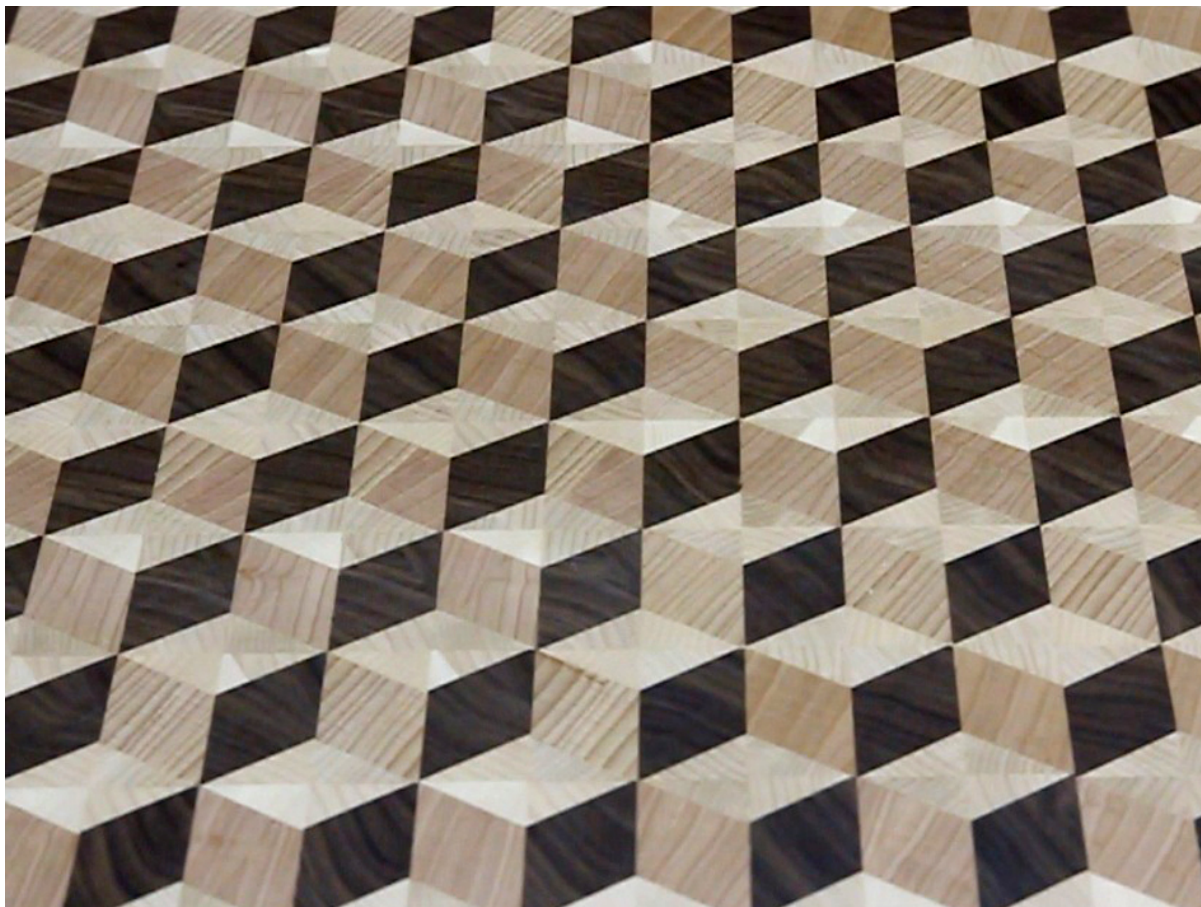


Plane the board.



Sand the board.  
Cut off the edges, sand them, make finger slots and so on (not shown).

If you did everything correctly, the corners of all three rhombuses must connect at one point up to 0,5-1 mm.



THANKS FOR YOUR ATTENTION!