How to make mortise & tenon joints with plywood board:

In this article I'd like to show you how to make mortise and tenon joints with plywood or other kinds of boards.

It's a very practical construction method whose greatest advantage is that it doesn't require nearly as many tools as solid wood, and the result is structurally very similar.

Besides, since plywood is made up of layers of wood glued and pressed together, rotating the grain for each layer, it's a highly stable material that isn't very susceptible to changing size due to moisture absorption, making it perfect for these kinds of jobs.

Examples of projects that use plywood with mortise and tenon joints



This was the first project where I decided to use this construction method. My high capacity multi-function woodworking workbench. Since it's a sizable design, I made the back and front frame pieces wider than usual, 100mm.

The frames are made out of hard birch plywood to make them more robust, and the cabinets that join the two frames together, completing the bench, are of lightweight poplar plywood, to make the total weight of the workbench a little lighter.

Of course, you can use other combinations to make this design, such as using different boards for the frames or top, or alter the original size. In this post you'll find other changes that the users of this site have implemented in their version of this workbench.



This was the second woodworking workbench in which I decided to use tenon and mortise joints for the boards, my modular workbench. As the modules are small, I decided to make the frames a little smaller too, about 80mm wide.

Aside from that, the construction method is nearly identical to that of the multifunction workbench. The main difference is that I also used hard plywood for the two cabinets.

I also changed the method to install drawers a little. This time I didn't use full extension drawer slides. Instead, I made some grooves on the sides of the modules where the drawers slide, making the bench a little lighter and saving some money.

Like in the previous ones, other materials and construction methods are also possible. In this forum post you'll find examples by other users of this site.

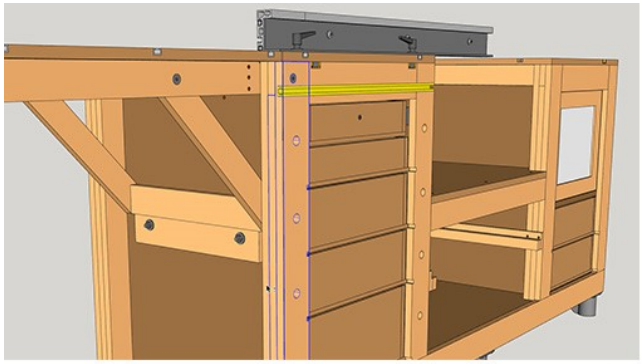
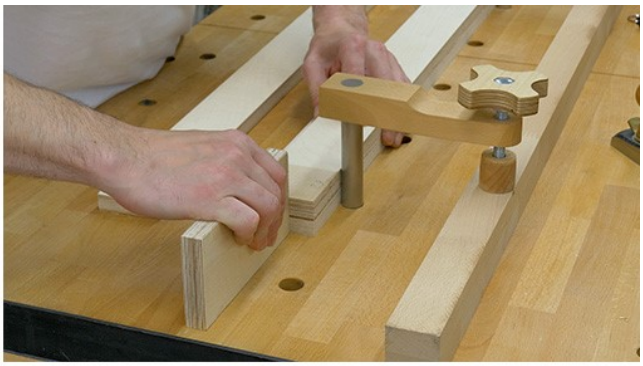
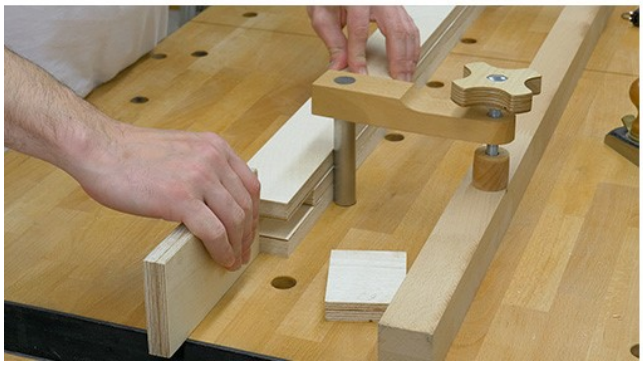


To this date, this is the last project where I used tenon and mortise joints with plywood. It's a robust woodworking workbench equipped with a table saw and a router table. Even though it's a little longer than the modular workbench, I used the exact same measurements for the frames.

This is definitely the most complex design of the three, especially due to having to leave a gap for the bench table saw. Besides, the sliding carriage and router table were also difficult to develop for such a compact bench, but in the end, I achieved an acceptable and quite versatile result.

Here you can also use more combinations to make this design, such as using different boards, alter the original size or even install a different bench table saw. In this post you'll find more changes that the users of this site have implemented in their version.

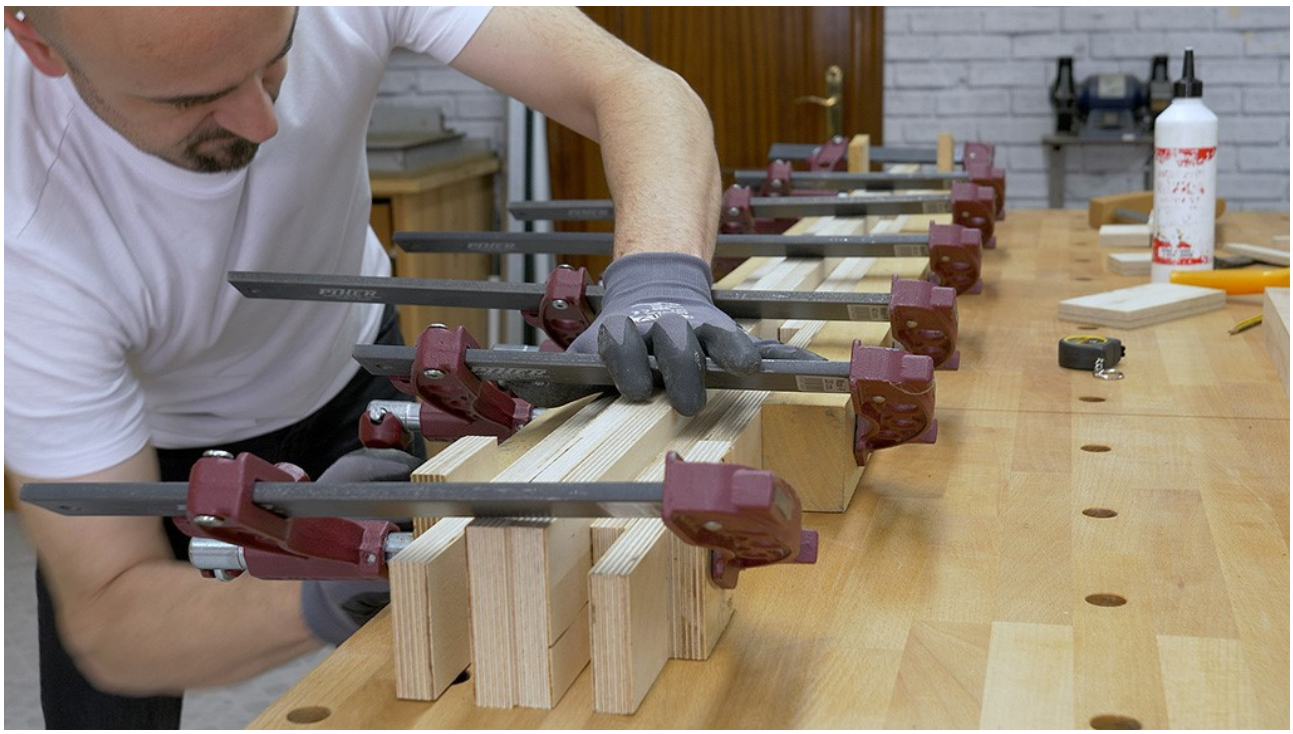
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Now I'll show you how to make this kind of mortise and tenon joints. First off, cut each of the pieces that will make up each leg or rail of the frames to size. To do this you should check the PDF called "Cutting List" that you will find inside the folder with the same name. It's a good idea to mark them with their reference number so that you can find them more easily when you need them. Once cut, we can start gluing them together.

In order to do that, we should use a block of wood as a jig to space the parts out. You can see what I mean in the second picture above. I've used the metal bars from some holdfast clamps as a stop and spacer to help me position the pieces correctly before using the nail gun.

The spacer must be the same size as the tenon, the part that's supposed to fit in the mortise. Instead of nails we can also use the old trick that consist of sprinkling salt to stop the pieces from moving when tightening the clamps.



As you can see in this photo, we can save time if we prepare several legs or frame parts and apply pressure on them at the same time. If you're going to use the salt trick, it's best to apply pressure to each part separately.







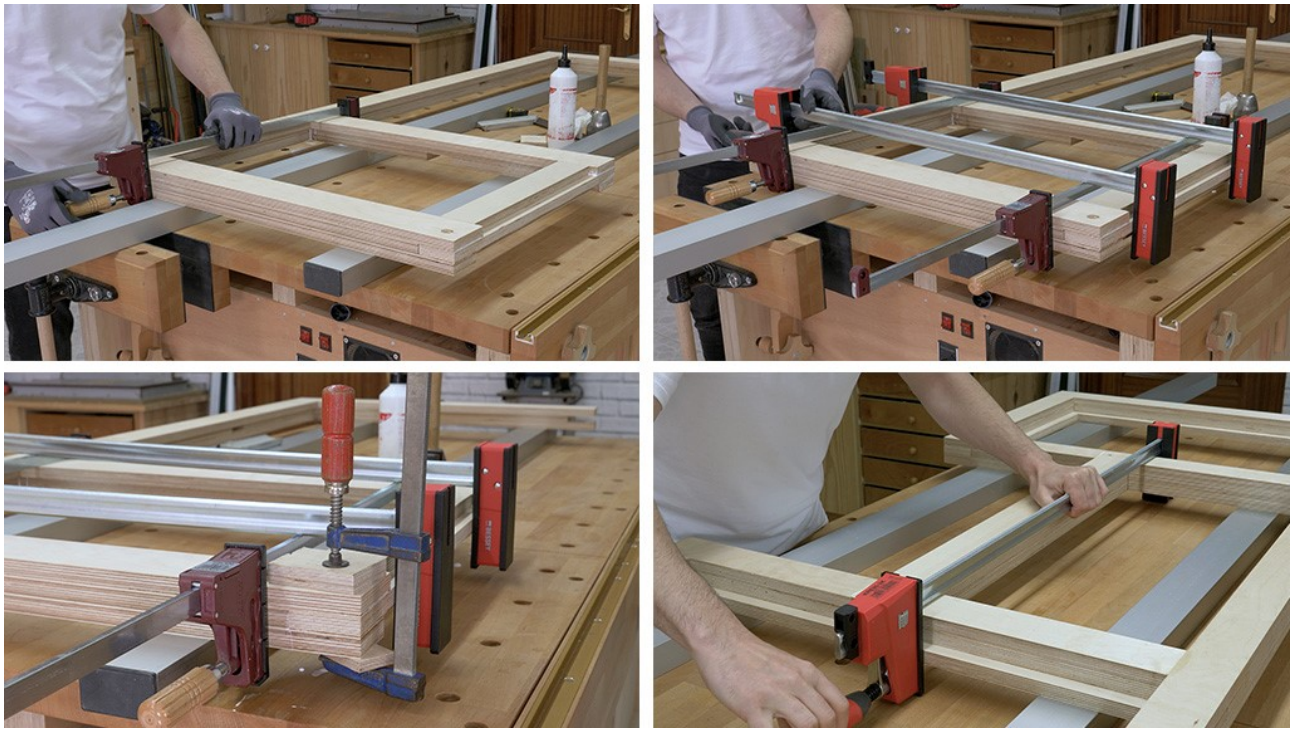


The next step is to remove the clamps and run a few tests to make sure everything is okay and the tenons fit into the mortises. It would also be a good time to see if the rabbet for the modules is correct.

As you can see in the first picture above, I'm shaping one of the rabbets with a hand plane.

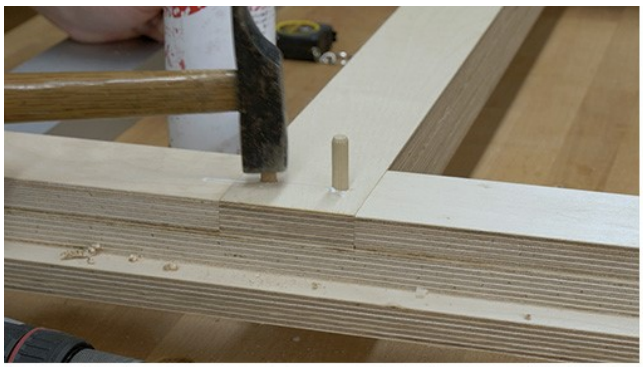
In the other pictures, you can see me drilling several holes before joining the frames together so that I can use, for example, holdfast clamps or a folding table.

How to glue mortise and tenon joints frames



Once the previous steps are done, we can join the pieces that make up the frames together. It's important to plan this out in advance and do it bit by bit.

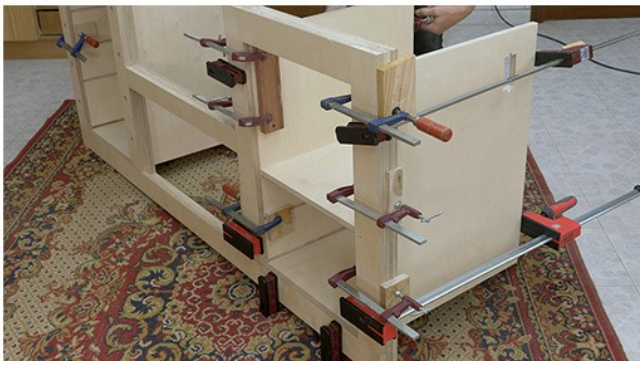
Keep in mind that wood glue dries off very quickly and you may not have enough time to place all of the clamps correctly and square the frame.






Here I'm reinforcing one of the joints with dowels. In the other photos you can see me making grooves for the drawers to slide on and machining the pieces that will make up the interior modules.



The final step is to put the interior frame together. Before doing so, it's important to make sure all the pieces have been cut to size by verifying whether they fit in the rabbets of the frames we made earlier for the cabinets. After that, we can put them together to join the two frames.

To join the frames and the cabinets together we can use wood glue and clamps. We can also use glue and screws, or even just screws if we are planning on disassembling any of these projects in the future, maybe to make them easier to transport during a move.