Downdraft Sanding Station Plans

Keep clean with this shop-built downdraft sanding table that connects to your existing dust collection.

Building the Torsion Box

Keeping dust at bay in the shop results in better quality finishes, less time spent cleaning, and a more pleasant and safe work environment. This downdraft table is easy and inexpensive to make and connects right to your existing dust collection with a 4” port.

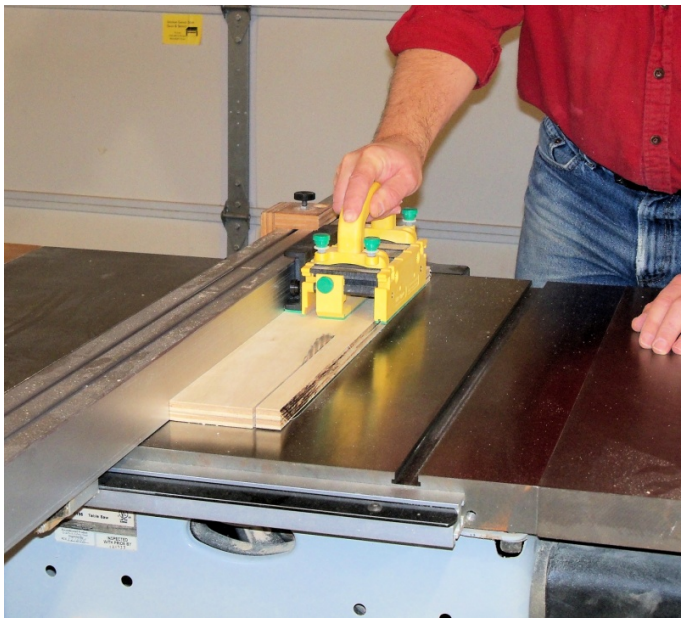
The top is a simple torsion box, essentially built like an airplane wing: Ribs provide the internal structure and the addition of relatively thin skins to the faces creates a very strong but lightweight box. The fact that the box is mostly air space makes it ideal as a downdraft sanding table with a simple modification to the ribs.

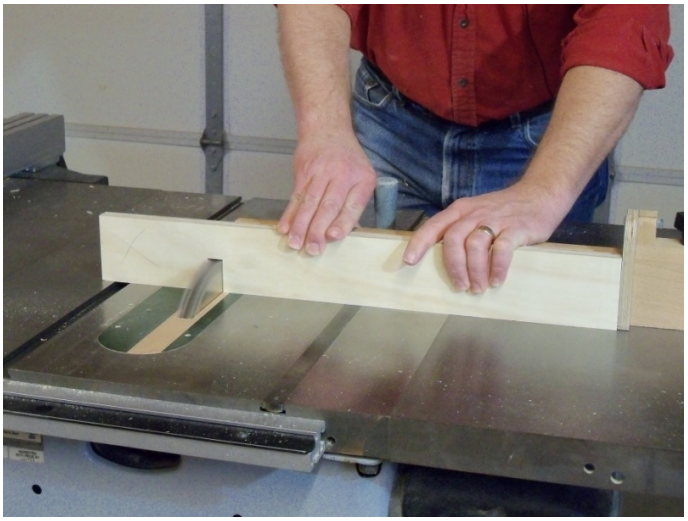
Begin with the base. I cut it from 3/4" ply, 24 inches wide and 36 inches long. You can build yours whatever size you need.

I then spent a bit of time laying out the rib locations on the face. This allowed me to space them correctly, and see how many ribs were needed. I laid the ribs out for approximately 6" spacing on center.

Keep in mind that because of the outside faces, the spacing won't be exactly 6", which is why I did the layout first.

I ripped several strips of the same ply 5" wide, and crosscut them to length. The long sides were 36", but the long internal ribs were about 1-1/2" shorter. I left the stop set at 36" and used two scraps of the same ply so the center ribs would be exactly right since the ply is not actually 3/4" thick.





The shorter cross ribs are all the same, but while the ends remained 5" wide, the rest were ripped down to 4" to create openings for air circulation in use. One end piece was drilled to accept a 4" flange for the dust collection.

I used the layout to mark the locations of half lap cuts and marked one end of each rib to keep them oriented in the same direction. The dado blade was set up in my saw and all the half laps cut.

When you dry fit the ribs you will see that air can pass under the short cross ribs, but the long ribs divide the box into three sections. I stacked the three long ribs together and cut 2” radius semi circles in the bottom edge between the half laps.

You can see now that the airflow will reach all sections, and dust can flow out.

With the ribs dry fit and the sides clamped in place to ensure proper fit, I marked where the long ribs sat on the base and drilled pilot holes through for screws. I glued and screwed the ribs in place, then glued and nailed the sides and ends in place as well. If your half laps are cut well, everything should be very flat across the top. If not, sand it all flat before adding the top.

The top is simply a piece of pegboard. The face is smooth and soft enough not to mar parts being worked on it, and the holes allow dust to be removed as you work.

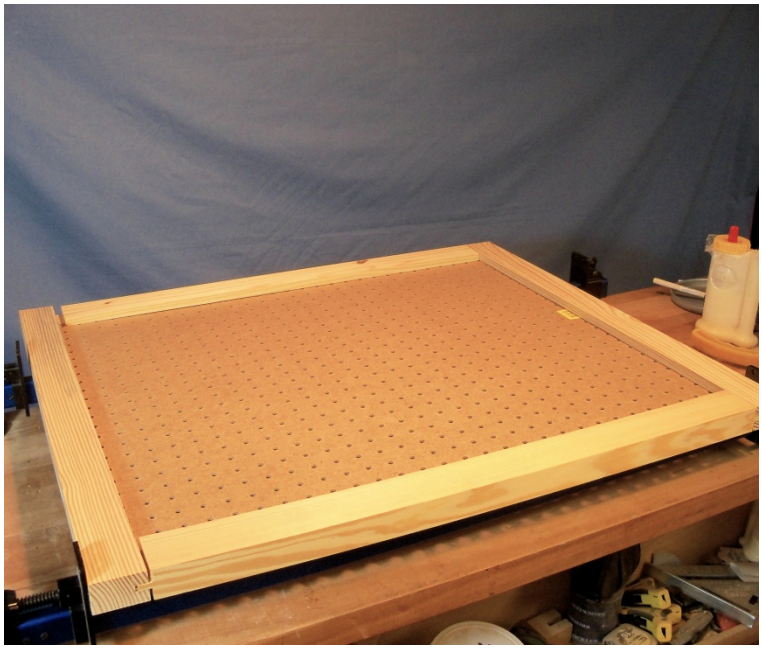
The top was cut to size and glued onto the assembled box. I used my vacuum bag to clamp it in place, but stacking weights on the top will work too. If you vacuum clamp your box, USE LIGHT PRESSURE; too much vacuum can force the top down between the ribs or even crush it entirely.

Finally, add a flange to the end for connecting the table to the dust collector. The downdraft top can be mounted to almost any stand, but this one was mounted to a cabinet so it could be used for storing sanders and sanding supplies.

Building the Cabinet

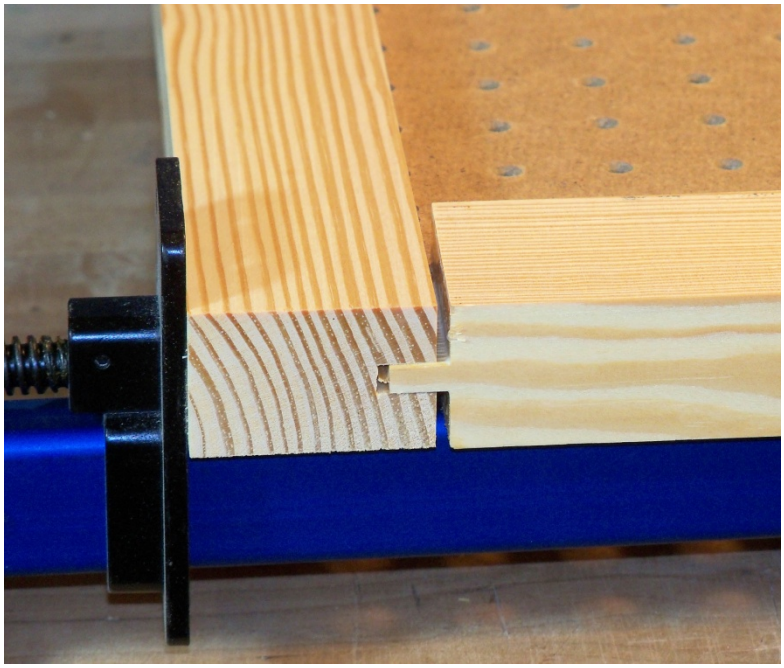
Any number of cabinet designs would work to hold the downdraft top, but this one features pegboard panels within wood frames. This feature allows for hanging sanding supplies all over the outside of the cabinet without losing any of the interior storage.

I created the sides and back panels as frames with the pegboard let into in them. "Two by" stock (not pressure treated) was planed to 1-1/4" thick and ripped into 2" wide strips. The cabinet needs to be sized to match the torsion box you built.



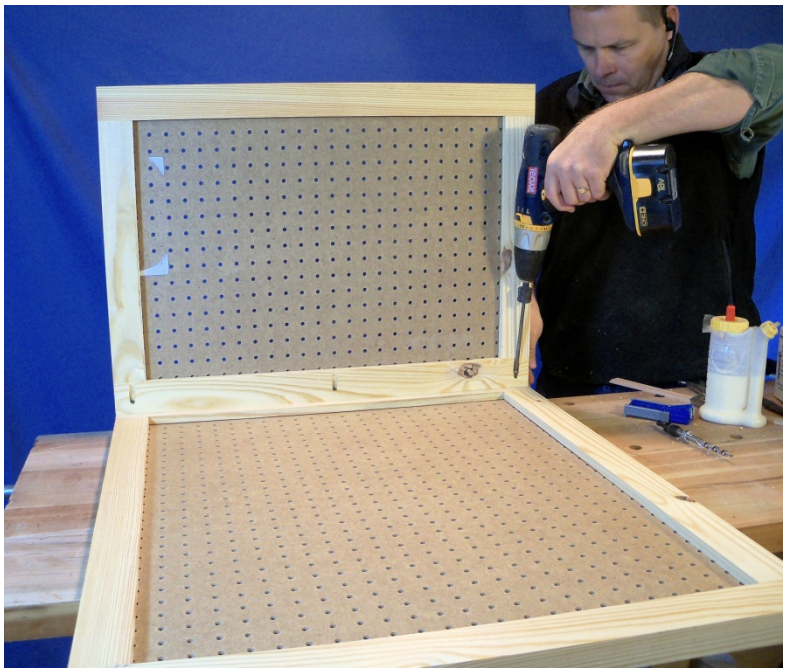
The top should overhang the cabinet by at least 2” to allow for clamping around the edges if needed.

The rails and stiles get a 1/4" wide by 1/2" deep groove centered along one of the 1-1/4" edges to accept the panels and for the tongue and groove joints. Now the ends of the rails get matching tongues cut in them.



This is the same stub tenon joint used on shaker and mission style cabinet doors. Once the parts have been cut and dry fit to ensure that everything is right, the frames can be glued up.

Assembling the panels is kept simple with pocket screws jointing them together, the side panels inside the back panel. This assembly is a bit flimsy, but we will be adding a top and bottom plywood deck to lock it all together.



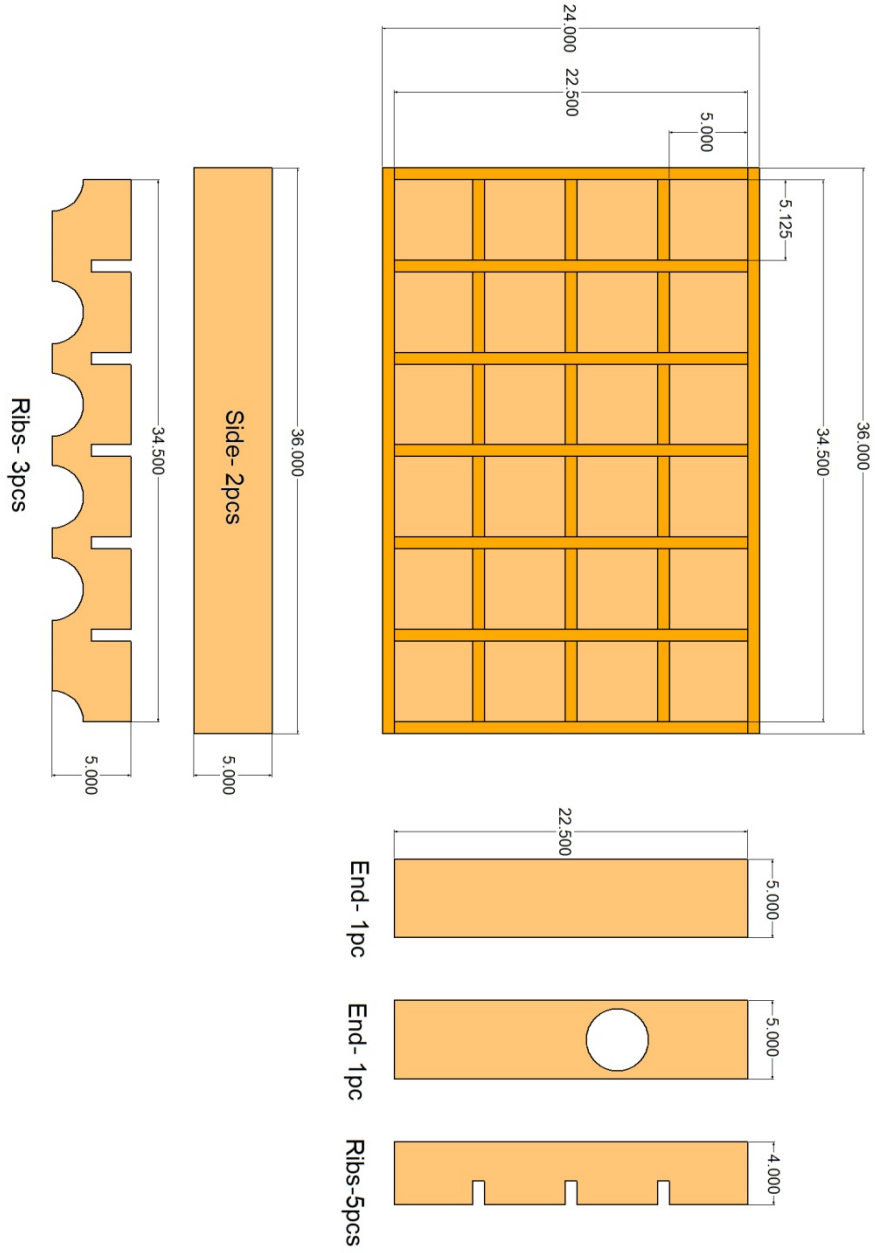
The doors are built the same way, just smaller.

Two 3/4" plywood panels are cut to become the top and bottom of the cabinet. The top will be attached through one panel and a framework to hold casters will be mounted at the bottom. Both are pocket screwed inside the sides and back.

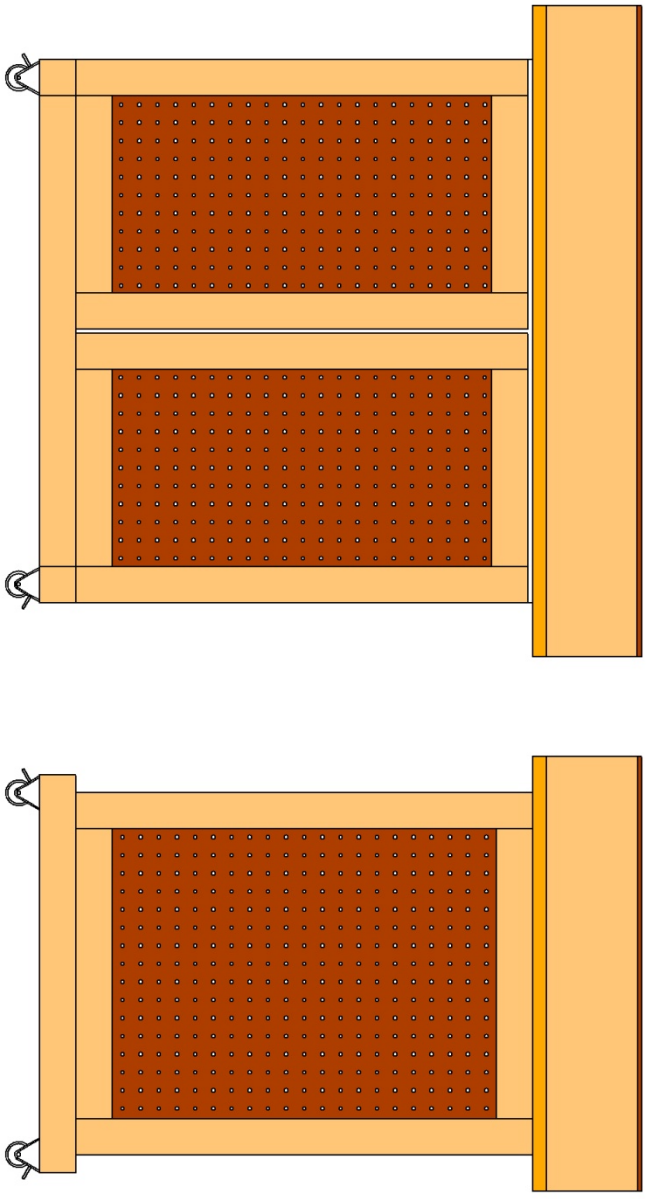
The casters are mounted to “two by” stock half lapped together and mounted to the bottom plywood. The frame allows the castors to extend beyond the cabinet, making the unit more stable and allowing easier access for locking the casters.

With a bit of careful planning, the cabinet and frame can be sized so that when the casters are added, the top ends up about 1/8” shorter than the saw table, allowing this unit to be used with the saw as needed.

The Downdraft Sanding Station in use as an outfeed table



The dimensions provided above are for a 36” by 24” Downdraft Table. They can be altered as needed for any size.



The cabinet parts are sized to the top allowing an overhang for clamping. The height of the cabinet, including the casters, will ideally set the top about 1/8” lower than the saw height as discussed in the text.