

Torsion Box Assembly Table

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A torsion box is an excellent system to use for this type of table because it is very stable and has excellent resistance to warping, sagging, or bending. In addition, it weighs and costs less than using solid lumber.

Engineers have employed this concept for decades using it to build everything from the structural steel I beam to airplane wings.

The construction method is fairly straightforward and well within the reach of a woodworker with a small shop. The components consist of two plywood or MDF (medium density fiberboard) skins for the top and bottom and an inner core grid. The dimensions of the grid and skins can vary depending upon the requirements of the project. I have a 4 foot by 8 foot by 4 inches thick assembly table that I made around 1985 and I needed a smaller one so I designed this to be 4 feet by 5 feet by 4 inches thick. I have built torsion boxes using solid wood milled up for the grid (usually poplar) and decided it was much easier

to rip plywood or MDF without any significant loss of strength.

For this project I used 1/2 inch thick MDF for the grid and skins, and 3/4 inch MDF for the outside frame. All of the grid pieces were ripped 3 inches wide on the table saw. After cutting, gluing, and pin nailing the frame together, I cut the long pieces so that they fit inside the frame. Making a full scale layout was necessary to determine the spacing which in this case turned out to be 6-7/8 inches by 7 3/8 inches. To ensure that the placement of the short grid pieces was consistent, I made a spacer 6-7/8 inches long from MDF. Once the grid is glued and pin nailed together, it is time to attach the skins. It is critical that you have a flat surface to reference off of because the grid will flex and take on the shape of the surface.

A vacuum press referenced to a flat surfaced is ideal but if you do not have one, this is an alternative. Set up 2 sawhorses and level them with shims. Lay four 2 by 4's on top of them that have been jointed flat and planed parallel. Next set two sheets of 1/2 inch or 3/4 inch thick MDF on top of them. The MDF will add weight and stability. Check the surface with winding sticks, string, or a level to make sure the plane is flat and level, adding more shims if necessary.

Apply paste wax to the MDF so glue won't stick to it and then set the grid work on it. Now apply glue to the grid work then set one of the skins on top and pin nail it. Clamps would probably distort the surface so they should not be used in this scenario. Once the glue has dried, flip it over and repeat the process to the other side. After flush trimming the edges I capped my assembly table with 8/4 mahogany. Finishing it off with several coats of oil and wax helps prevent glue from sticking to it.