

How to make thick, light tabletops

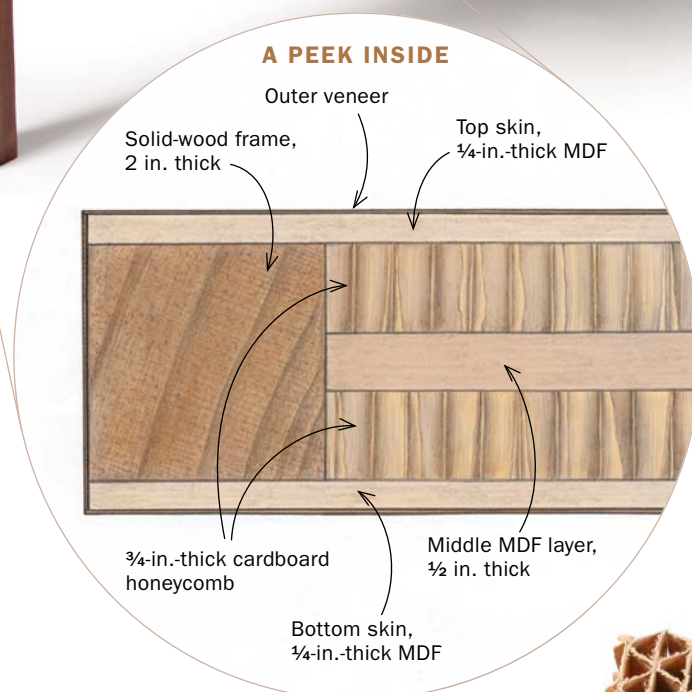
TORSION-BOX DESIGN WORKS FOR ANY SIZE TABLE

BY BRIAN L. SARGENT

From conference tables to coffee tables, many contemporary designs use thick tops—2 in., 3 in., even 4 in. thick. However, making these from solid wood presents problems. They are tremendously heavy, and they require a lot of expensive wood and labor to flatten them.

The solution is the torsion box. With it, you can make thick tops that are flat, stable, strong, and fairly lightweight. I'm not talking about the old way of making torsion boxes, where you build a solid wood frame and fill it with a latticework of crosspieces. I'm talking about a relatively modern take, with the labor-intensive latticework core replaced with resin-impregnated cardboard that resembles a honeycomb. The stuff is easy to cut, easy to use, and very lightweight, but you do need a vacuum bag.

The honeycomb helps create a perfect substrate for my favorite veneers. You often see it used in large pieces, like



Prep the parts

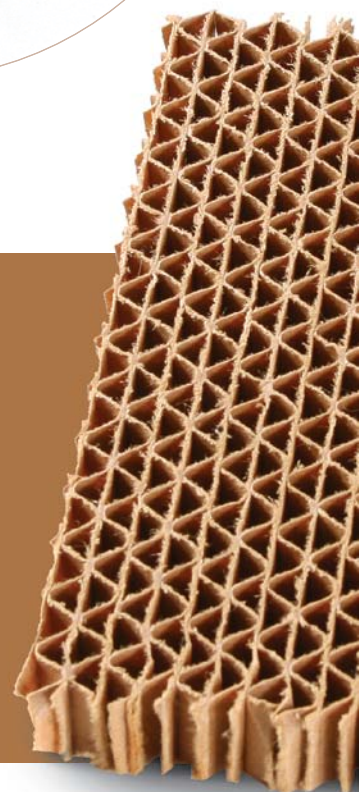
Cut all the interior pieces for a snug fit inside a mitered frame. The top and bottom MDF skins are cut a hair oversize and trimmed flush later.



Frame it. The honeycomb core requires a supporting frame made of solid wood.



Fill it. The cardboard honeycomb is easy to cut with a utility knife and straightedge.



Stack it and bag it

To reduce the stress of assembling the parts, Sargent mixes Unibond 800 to get an open time of at least 45 minutes.

1 **Get rolling.** Place the bottom MDF skin on a melamine caul, then apply Unibond 800 to the interior of the skin.

2 **Lay on the frame.** Place the frame on the bottom skin. The frame should sit about ¼ in. inside the skin edges. Both top and bottom skins will be trimmed flush later.

conference tables, but you can use it to make a top of any size or any thickness. Once you've used this honeycomb core, you'll never build a latticework torsion box again.

What is this stuff?

Resin-impregnated honeycomb sheets are available from Vacuum Pressing Systems (vacupress.com) in 2-ft. by 4-ft. sizes and in ½-in., ¾-in., and 1-in. thicknesses (\$12, \$17, and \$20, respectively).

The honeycomb is placed within a solid-wood frame and glued between two MDF skins. The honeycomb sheets can be glued using any woodworking glue, but I use Unibond 800 (vacupress.com), a two-part urea-formaldehyde resin. Unibond gives me plenty of open time, and it experiences very little creep and shrinkage, which makes for extremely stable tops. For this application, I use a 4-to-1 ratio of resin to powder,

which gives me an open time of about 35 to 45 minutes (with a shop temperature close to 70°F). The entire assembly is glued together in a vacuum bag.

The photos on these pages show you how to build a 2½-in.-thick top, but the process is the same no matter what thickness top you are making.

Make a cardboard sandwich, then put it in a bag

First, you need to build a solid-wood frame the same thickness as the core materials. Darryl Keil, owner of Vacuum Pressing Systems, says a good rule of thumb is to make the frame about as wide as it is thick. The frame should be made from a stable species, such as poplar or quartersawn mahogany (used here) to minimize wood movement. I miter the frame to avoid having to glue edge veneer over end grain.

Once the frame is glued up, cut the top and bottom skins



5 **Last layer of honeycomb.** Apply glue to the top of the middle MDF panel and then add the top layer of honeycomb. Press it down flush with the top of the frame.



6 **The topper.** After rolling the glue onto the bottom of the top skin, place it on top of the frame and core. Adjust it for an even overhang.



7 **Last caul.** Once the top skin is on, add the top melamine caul.



3 **First layer of honeycomb.** Place the first layer of honeycomb inside the frame. Press it firmly against the bottom skin and snug it into the corners.



4 **MDF is next.** After rolling glue onto the bottom of the middle MDF panel, lower it into the frame. Press it down so it sits flat.

about 1/4 in. larger than the frame. Making the skins oversize makes assembly less fussy. They'll be trimmed flush before the veneer is applied.

Now cut the layers of honeycomb and the middle panel of MDF to fit inside the frame. The honeycomb can be cut with a utility knife and a straightedge. I tend to cut it a bit oversize and compress the material to fit inside the frame. Once all the parts are cut, dry-assemble the top to make sure everything is fitting well. I use a 1/2-in.-thick melamine caul on the top and bottom to help spread clamping pressure and protect the assembly's top and edges from dings. For efficiency, assemble the parts on top of the bottom caul.

Start with the bottom panel, using a foam roller to apply an even coat. Put the frame in place and then the first layer of honeycomb. Next, roll glue onto one side of the middle MDF panel and put it inside the frame. Apply glue to the top of that

panel (making sure to get glue into the corners), add the next layer of honeycomb, and glue and install the top MDF skin. Now put on the top caul and use masking tape on all four corners to hold the sandwich together.

Slide the assembly into the vacuum bag, seal it up, and lower the vacuum pressure to 15 hg. If you have a pump that can't be adjusted, simply unscrew the filler jar in the line, releasing air until the gauge reads 15 hg. Leave the assembly in the bag, under pressure, for at least five hours. When you remove the assembly from the press, stand it up on edge or place it on stickers for 12 hours so that air can circulate around it. This way it will dry evenly and stay flat. After flush-trimming the top and bottom skins, you're ready to apply the veneer.

Have fun with your designs and this process. □

Brian L. Sargent makes furniture in New Hampshire.



8 **In the bag.** Use masking tape to hold the top and bottom cauls in position (inset), then slide the sandwich into the vacuum bag.



9 **Trim the edges.** After the assembly dries, trim the top and bottom skins flush with the wood frame. You now have a perfect substrate for veneer.