

Traditional Cabinetry From a Modern Material

Raised-panel assemblies made from MDF are dimensionally stable, cheaper than solid wood and easy to mill

by Jay Goldman



One-piece face frame cut from MDF. To create a decorative end panel, the author makes a face frame by cutting a rectangle from a piece of medium-density fiberboard.



Biscuits act as stops for raised panel. The raised panel will be supported by biscuits inserted in the edge of the face frame. The biscuits hold the field of the panel proud of the frame.



Cutout from the face frame becomes the raised panel. The author used a combination molder/planer to raise the panel. It will be held in place by moldings nailed into the face frame.

A year after I installed a fireplace surround that included large, solid-wood raised panels, I was called back to replace a frame that had blown apart when its panel expanded in summer humidity.

When I made the surround, I had left room for the poplar panels to expand. But there wasn't enough expansion space for the largest panel, measuring about 3 ft. by 6 ft. It was too late in the game to change the surround's design, so I made a replacement panel out of medium-density fiberboard (MDF), which is far more dimensionally stable than solid wood. Since then, the job has been problem-free.

After that callback, I decided to change my production methods to develop an efficient system for making paint-grade raised-panel cabinets from MDF that are less susceptible to changes in humidity and temperature than solid wood. I've now used the system on several cabinet jobs with fine results (top photo, p. 69).

By milling one-piece face frames and frame-and-panel components out of MDF, I can save the considerable labor required for traditional stile-and-rail joinery. In some cases, I use the same piece of MDF both for the frame and for the raised panel. The cutout, or offcut, from the frame becomes the blank for the panel.

As the price of solid wood increases and high-quality stock becomes scarce, man-made alternatives such as MDF are becoming more attractive. As long as the project is to be painted, MDF has several advantages over solid wood. MDF is generally cheaper, always available and perfectly flat.

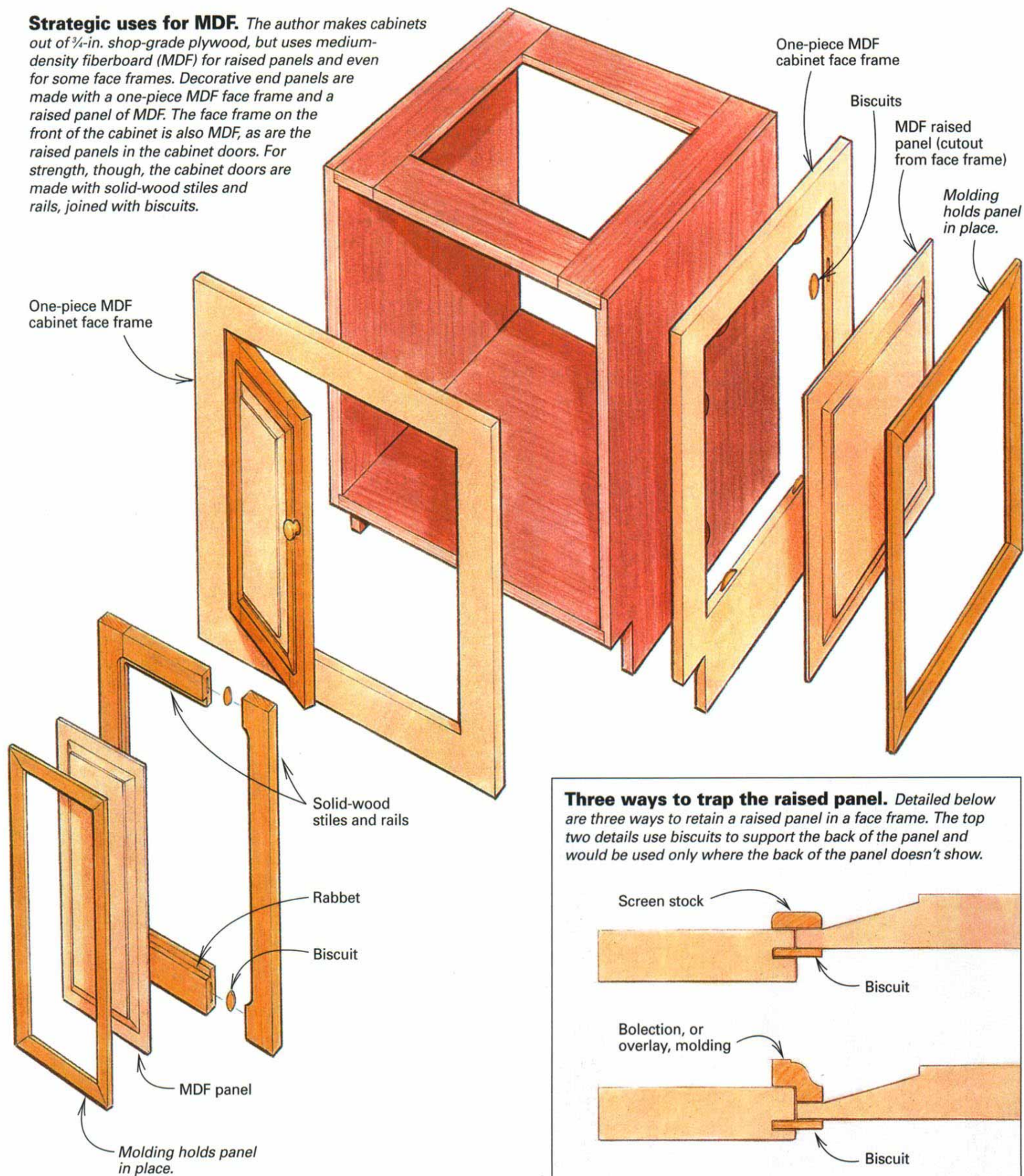
Dimensional stability is just one reason why MDF is ideal for raised panels. Because the material is manufactured in 4-ft. by 8-ft. sheets, it can be used to make large panels that don't have to be glued up from separate boards. It also mills cleanly. With no grain, there is little or no tearout.

Face frames from one sheet of MDF—The first step in making the cabinet face frames is cutting the MDF to the overall outside dimension of the frame. Then I mark the outline of the stiles and rails in pencil. I cut these lines with a small circular saw, finishing up the corners with a jigsaw.

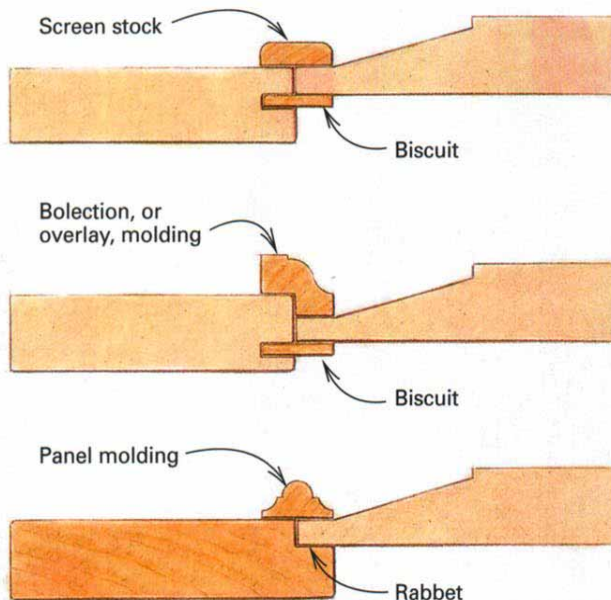
The edges of the face frames have to be clean and smooth because they will be clearly visible when the cabinet door is opened. I clean these edges up with a router and a bearing-guided, flush-cutting bit. The bearing on the bit rides against straightedges that I tack to the face of the face frame. The rounded inside corners produced by the router bit can be squared off with a file. Once the first face frame has been completed, it can be used as a template for other cabinets of the same size.

Two ways to make a frame and panel—I make frame-and-raised-panel assemblies in one of two ways, depending on how they will be used (drawing facing page). If the assembly is for the end panel, or return, on a

Strategic uses for MDF. The author makes cabinets out of $\frac{1}{4}$ -in. shop-grade plywood, but uses medium-density fiberboard (MDF) for raised panels and even for some face frames. Decorative end panels are made with a one-piece MDF face frame and a raised panel of MDF. The face frame on the front of the cabinet is also MDF, as are the raised panels in the cabinet doors. For strength, though, the cabinet doors are made with solid-wood stiles and rails, joined with biscuits.



Three ways to trap the raised panel. Detailed below are three ways to retain a raised panel in a face frame. The top two details use biscuits to support the back of the panel and would be used only where the back of the panel doesn't show.





Pine trim covers the gap between the frame and the panel. The cabinet's panel is trapped between the trim on the front and the biscuits on the back.



The back doesn't have to be pretty. This frame-and-panel assembly will be attached to the side of a cabinet, so its unfinished appearance on the back will be hidden.



Applied end panel is easier. Rather than integrate the MDF frame and panel into the cabinet construction, the author builds a plywood carcass and screws the MDF frame and panel to it.

run of cabinets, I make the raised panel and the surrounding stiles and rails all from MDF. If the frame-and-panel assembly will be used as a door, then I make the raised panel from MDF and the stiles and rails from solid wood.

It's possible and cost-effective to make one-piece doors by routing details into a solid sheet of MDF (sidebar facing page). But if I'm going to the trouble of making a true frame-and-panel door, I make the stiles and rails out of solid wood, which is stronger.

When the plans call for a frame-and-panel return on the side of a cabinet, I build the cabinet box first and then overlay the sides with the panel detailing. This may sound like extra work, but I find it much easier than building a raised panel into the side of the cabinet itself.

I make a stile and rail to go around a raised panel the same way I make a cabinet face frame. I cut the stiles and rails out of a solid sheet of MDF with a circular saw and a jigsaw (top photo, p. 66).

In the case of the side panels, these sawcuts do not have to be perfectly smooth because the edges will be covered by molding that will bridge the gap between the face frame and the panel. Also, the frame-and-panel assembly will not be visible from the back. The assembly can be nailed, screwed or biscuited and glued to the side of the cabinet carcass.

Raised panels are trapped between biscuits and molding—To mill raised panels for cabinet sides or for doors, I use a Williams & Hussey molder/planer, which is like a thickness planer and a shaper combined in one machine (Williams & Hussey Machine Co. Inc., P. O. Box 1149, Wilton, N. H. 03086; 800-258-1380). The panels also could be milled with an ordinary shaper or router table.

Remember that it's safer to run large-diameter panel-raising bits at a lower rpm than smaller bits. On a large umbrella-shaped bit, the outside edges spin faster than the edges closer to the shaft. If your router does not have built-in speed control, you can buy a variable-speed switch from a woodworking-supply house. Also, make sure you have bulletproof dust collection because the dust produced from milling MDF is not to be believed.

On the sides of cabinets, raised panels are held proud of the face frame by biscuits glued into slots along the inside edge of the frame (bottom photos, p. 66). The panel is trapped in the frame by the biscuits at the back and by bolelection, or overlay, molding at the front (top photo). If the edge of the panel and the face of the face frame are in different planes, then bolelection molding, which is rabbeted in the back, will have to be used (drawings, p. 67). Flat molding, such as screen stock, can be used if the edge of the panel and the face of the frame are in the same plane.

Because the raised side panels will be visible only from the outside, the backs of the panels do not have to be of finished quality. In fact, the panel looks quite rough from the back, with its visible biscuits and its jigsaw cuts (center photo).

The end result (bottom photo) is almost impossible to tell from a traditional solid-wood raised panel and frame. A painting trick can be used to enhance this look. If the cabinets are painted with a brush, the brush strokes can be placed on the face frame to mimic the grain of solid wood.

Cabinet doors combine solid wood and MDF—For the cabinet doors, I build solid-wood stiles and rails to accept a raised MDF panel. The frame is joined with biscuits, and then rabbeted to accept the panel. The panel is held in place with bolelection molding. The frame-and-panel method that I use for cabinet side panels is not suitable for doors because the doors have to be of finished quality on both inside and outside faces.

Because drawer-front frames are small, I usually make them from a solid piece of MDF. Like the door panels in the sidebar (facing page), the profiles for the drawer fronts are milled with a router. □

Jay Goldman is a designer and cabinetmaker in Roosevelt, N. J. Photos by Rich Ziegner, except where noted.



High-quality appearance from a man-made material. Most of the components that make up this cabinet, including the raised panels for the doors, drawers, countertop and cabinet sides, were made from MDF. Once painted, the material is difficult to distinguish from solid wood.

A solid-MDF door

Making raised-panel doors out of a solid piece of MDF can save labor and materials. Basically, a groove and then details such as beads, coves and shoulders are routed into the face of the MDF sheet. For the effect to be convincing, the milling operation has to leave the simulated raised panel and frame with square or nearly square inside corners. Also, the cuts in the face of the sheet have to be made with more than one routing operation. If only one pass is made, then the details to the left and right of the groove between frame and panel will be the same.

I've made solid-MDF doors by tacking straightedges on all four sides of a blank MDF panel and then performing three different routing operations on the panel.

The first operation, done with a $\frac{3}{4}$ -in. dia. straight bit, hogs out a $\frac{3}{8}$ -in. deep groove in the face of the panel (top photo). The next bit mills a cove on the inside

edge of the groove. Finally, a $\frac{1}{4}$ -in. dia. bit cleans up the outside edge of the main groove. This small bit nearly squares off the corners of the main groove (bottom photo).

For all three operations, straightedges are left in the same place around the frame. The path of the router bits is varied with different-size bases on separate routers.

I used to have trouble with sawdust collecting inside the straightedge frame. Part of the problem was that I was using square router bases. They are quicker to make than round ones, and also more likely to be thrown off course by accumulated sawdust. I also improved my dust-collection system. Now I use this method exclusively to make doors with a painted finish. The resulting door has a heavy feel to it, paints well and is stable.—J. G.



Routers turn MDF into cabinet door. Straightedge boards hold the panel in place and serve as guides for the routers.



Sandpaper smooths the routed profile. The groove in the door has nearly square corners made with a $\frac{1}{4}$ -in. dia. flush-cutting router bit.