

SPLINED CORNERS

By Rob Markoff, CPF

Splined frames are a hallmark of craftsmanship. They distinguish a frame as hand-crafted and truly custom. Splines are small pieces of wood that are inserted cross-grain in a miter to reinforce the joint. They can be made from the same species of wood as the moulding or from a contrasting species.

If you do not want to try this process yourself, there are many vendors who will produce a closed corner splined frame, including Vermont Hardwoods and several represented by Robert O'Donnel at The Frame Master. Splined corner frame samples make an excellent addition to what you already offer.

Originally, splined frames utilized only the glue holding the joint, with no mechanical means to join the frame. There are some who feel that a splined frame should only be made from 100 percent wood. For those purists, gluing up a frame, allowing it to dry, and then cutting the slots and inserting splines is the preferred method.

Today, using a plastic key in a routed slot (such as with a Hoffmann joiner) means that a strong, mechanically fastened joint can be augmented with splines. This increases productivity because the fastener will hold the miter closed while drying and makes a very strong joint. The Hoffmann key will not damage the blade used to cut a spline slot.

Using a mechanical fastener allows a joined frame to be hung vertically while drying and not tying up clamps and a joining table.

Frames that utilize mechanical fasteners are very strong. This is especially important for thin, tall-stem moulding, as the keys can be inserted almost to the top of the profile. The splines therefore function more as a decorative element, especially when a contrasting species of wood is used for the splines (such as a walnut spline in a maple frame.)

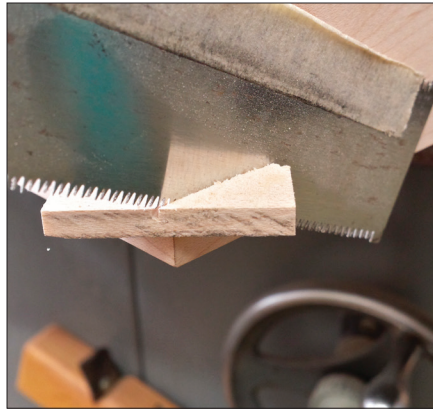
Splined corner frames are best created from raw hardwood moulding that is finished after the splining is complete. The frame is joined, allowed to dry, and then the spline slots are cut into the moulding. The splines are then glued into the slots, allowed to dry, and trimmed off. The ends of the splines are sanded flush and then the frame is finished using lacquer, wax, or paint.

The frame must start out with an accurate miter so there are no gaps in the joint. This is especially important if the joint is glued and does not use a mechanical fastener. The frame and splines are best joined with yellow aliphatic glue as white PVA glue tends to become gummy when sanded. Aliphatic glue should also be used when using Hoffmann keys.

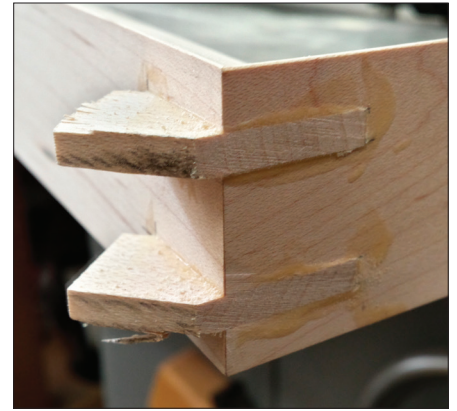
Once the frame is joined, there are several ways



● The frame must begin with an accurate miter so there are no gaps in the joint.



● I use a homemade jig on my table saw to cut the spline.



● Apply glue in the spline slot, not on the spline, to avoid it scraping off.

to cut the spline slots. I prefer using a homemade jig on my table saw. This also allows me to use blades of different widths to make splines of varying thicknesses. My preference is $\frac{3}{16}$ ", and I have a blade made specifically for this purpose. I also have custom blades for $\frac{1}{8}$ " and $\frac{1}{4}$ " wide splines. You can send an inexpensive, off-the-shelf $\frac{1}{8}$ " blade to a sharpening service and have the teeth reground to square tops.

The common aspect of all three blades (and for any cutter used to make a spline slot) is that it has squared teeth. This yields a smooth bottom slot. If you use an ATB blade, the bottom of the slot will be pyramid-shaped, leaving gaps between the spline and frame. On a painted frame, the gaps can be filled and will not be seen. On a hardwood frame (particularly with lighter woods like maple), they will fill with glue.

Another method of cutting spline slots is with a router table (straight router bits will leave a square bottom hole) with the appropriate sized bit. Router bits are available in a variety of widths and do not require custom fabrication. You will need to use a jig (most often shop-made) to hold the frame as it runs across the router bit.

A plate joiner (also called a biscuit joiner) can be used as well. The blade should have the tips squared off to leave a flat-bottomed slot. One advantage of using a plate joiner is that the frame remains stationary and does not have to be slid over a bit or blade. You do need to build a jig that will hold the frame and position the plate joiner. This can be done at a corner of a frame-joining table and it can be removed when not being used.

The quantity of spline slots, their position, and thickness is more of a

personal choice that a structural one, especially if only used as a decorative element. For tall, thin-stem moulding, the length of the spline approximately lines up with the interior lip of the moulding. A longer spline means the slot will have to go deeper into the frame and may penetrate the interior of the rabbet, making it difficult to fit without being trimmed flush. On a frame $1\frac{1}{2}$ " deep, I prefer two, $\frac{3}{16}$ "-wide splines that are equal distance from the top and bottom of the moulding. On a frame 2" tall, I prefer three splines with one in the exact center. For taller mouldings, additional splines can be added and positioned as desired.

Spline stock can be house-made or ordered in the approximate thickness from a vendor such as Vermont Hardwoods. It is better for the material to be a bit too thick and sanded to fit than to



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be too thin. An undersized spline will have a gap that fills with glue and appears black. I cut the material slightly oversized and test the fit before joining.

The glue is applied in the spline slot and not on the spline. If the glue is applied to the spline, it will be scraped off during insertion and will pool on the spline and outside the joint. I use an acid brush with the tip trimmed with scissors to apply the glue. These brushes are inexpensive and can be discarded (although they can also be washed and reused).

It is important to confirm that the spline stock is fully inserted into the slot. Hydraulic pressure from the glue being displaced in the joint can force the spline stock away from the back edge after insertion. This will leave a gap that will appear black or will need to be filled, and it never looks as good as a tight, flush joint. I use a small block of wood for extra leverage to push in the splines and go over the joints shortly after I have inserted the splines to ensure they are flush when they dry. No clamping is necessary. I like to insert my splines at the end of the day and allow them to dry overnight.

The glue should be completely dry before trimming the splines. The frame should be secured to the worktable either by clamping or in a framing vice that allows access to the back corner. I prefer to use a Japanese-type pull saw to trim the splines as close to the frame as possible without scratching the moulding. If the saw scratches the moulding, it can be sanded down, but it might make a slightly tapered end to the miter. Others have used a multi-master tool with a Japanese-style saw bit or even a band saw. In all cases, the splines need to be sanded flush to the frame.

I prefer to block-sand the ends of

the splines flush with 100-grit sandpaper, then use an orbital sander to smooth the frame starting with 150 grit and finishing with 220 grit. I fit thin-stem mouldings with a strainer, so I use the strainer inside the frame as I sand it to reinforce the corners.

Once the frame is sanded smooth, I clean it with a soft rag soaked in lacquer thinner. The thinner will cause any remaining glue to turn white and make it more visible so that it can be removed prior to applying the finish. The thinner also evaporates quickly. Do not use water, as it will raise the grain. A tack cloth will remove dust but will not reveal any remaining glue.

By combining two widths of splines cut concurrently, an even more decorative joint is achieved. Using a light-colored wood, a 1/4" wide spline made of a darker wood is glued into the slot, trimmed, and sanded. Then a

1/8" wide spline of a lighter wood (usually matching the moulding) is cut and inserted in the center and slightly less deep into the previous spline, trimmed, and sanded. This yields a light spline with 1/16" of dark wood surrounding the lighter spline. I prefer a wax finish on hardwood frames such as Liberon Staining Wax. The wax can be applied quickly and the frame fit the same day.

To learn more about this process, refer to my March 2017 PFM article, "The Perfect Wax Finish." **PFM**

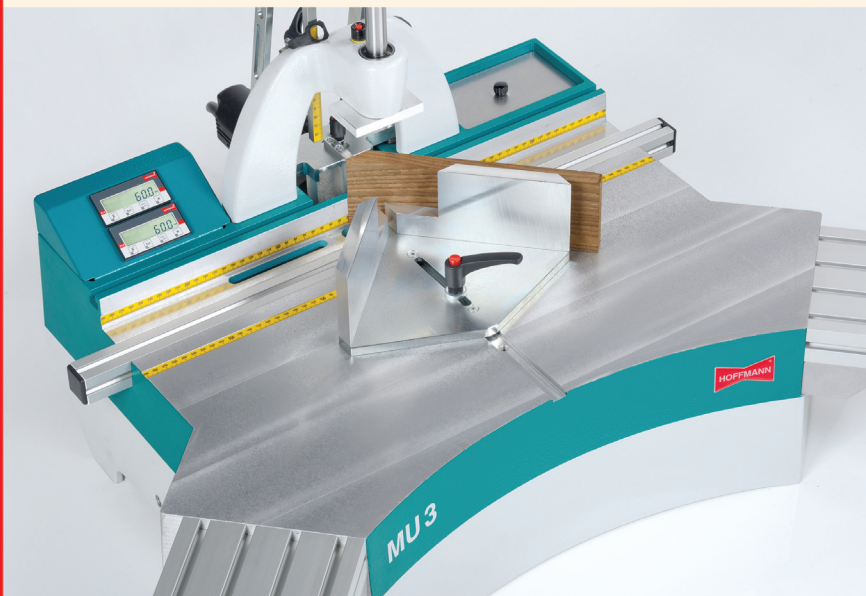
Photo credit: Cedar Owl (P. 36)



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Rob has been framing for over 40 years. With his wife, Barbara, he operates Gallery Services, a contract framing company, and Arttrageous!, an art and framing retail company in San Diego. He has written extensively for industry publications and is a featured speaker/educator at framing venues in the U.S., Canada, Russia, and Australia.

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