Hardwood Picture Frames with Decorative Splines and Hoffmann Dovetail Keys

Using splines in mitered frame corners is a proven way of increasing the joint strength with the added opportunity to incorporate a design element.

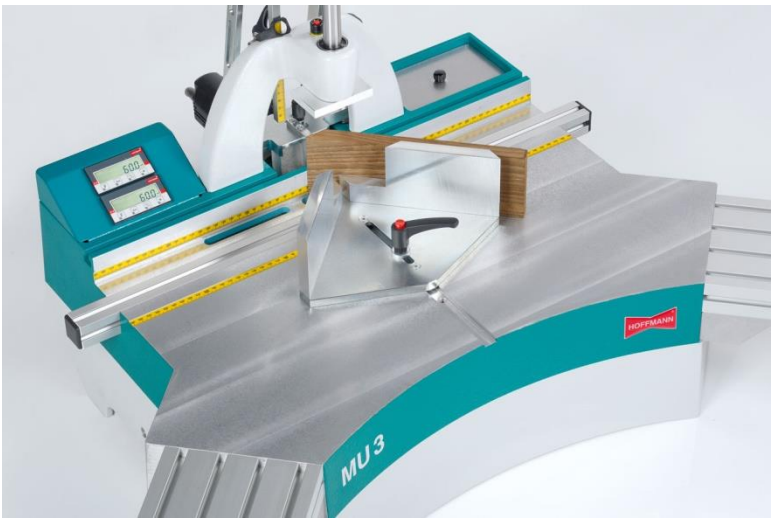
Process:
Frames are completely assembled and slots for the splines are machined into the assembled corners afterward.
If you pre-cut the slots into the individual frame members prior to assembly, you will struggle with trying to keep the slots perfectly aligned once you add a vice and you'll have clean-out glue from each slot as well. It is much easier and quicker to cut the slots after the frame is assembled and the glue has dried.

The frames should be assembled with glued corners and we always recommend the use of Hoffmann Dovetail Keys as well. **You should never use metal fasteners in corners that will be splined!**
Even if you try to place Vee-nails or staples in positions that, theoretically, won't be touched by the saw blade that is never guaranteed.
If you cut a steel fastener with a saw blade, you run the risk of injury due to flying metal from the fastener; damage to the saw blade with possible injury due to breaking saw blade tips and you also run the risk of a spark induced dust explosion if you have a dust collector attached to your saw.
Again, never use a metal fastener in a frame corner that is to be splined!

The following steps show how we have made splined corner frames with the use of Hoffmann Dovetail Keys and a table saw.
Before we go further we would like to quote Norm Abram of The New Yankee Workshop who started every episode with these very important safety rules:

Before we use any power tools let's talk about shop safety: Be sure to read, understand and follow all the safety rules that come with your power tools. Knowing how to use your power tools properly will greatly reduce the risk of personal injury. And remember this – there is no more important safety rule than to wear safety glasses.

As a first step we rout dovetail keyways and join the frames with Hoffmann Dovetail Keys and quality wood glue in each corner.
The Keys will align the frame members, pull them together for a tight joint and act as a “perpetual internal clamp”.



routing tall shadow box profile on MU3-D routing machine with optional Tall Center Fence Plate

We do not recommend glue-only joints for splined corners because you would have to rely solely on the glue joint while you move the completed frame over the saw blade. That may work out ok but the risk of a corner breaking and causing a dangerous situation near the spinning blade is high.
Dovetail Keys will hold even if the glue line should break.

Hoffmann Dovetail Keys are made of a special plastic compound that can easily be cut with woodworking tools without any damage to the blades.

Cross-section of maple picture frame moulding with W-1 plastic Key and walnut and bamboo splines

You can see how the three slots were cut through the Dovetail Key without any problems – the remaining Key sections continue to provide strength and hold the joint together.

The spline cradle:
The safest way to cut slots for splines is with a shop-made “cradle” because you need to set the frame on the tip of each corner while cutting the slot. There are different videos and instruction that can be found online on how to make such a sled, we have built ours out of cabinet plywood with recessed T-tracks to allow for quick setting of different spline positions.

An angle bracket made from 1.5” plywood holds the frame vertical to the blade; the bracket can be adjusted and locked in the T-track with the black knob.
As shown, our cradle is connected to the silver sliding table with front and rear clamps.
A sliding table saw is not necessary for this operation; you can make a cradle with a wooden strip beneath to fit your saw’s miter slot if you don’t have a sliding table saw.
In the end, the cradle must allow you to hold the frame securely in place, perfectly vertical to the saw table and it must allow you to slide the frame across the blade in a smooth and controlled manner.

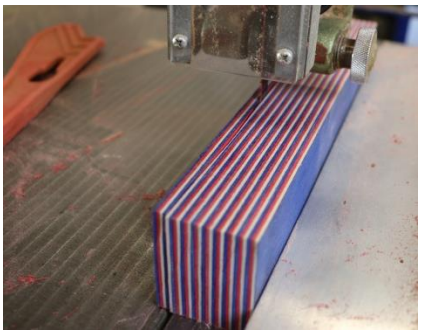
Making the splines:
The splines can be made from many different wood species; their width depends on how high you set your saw blade. You always want the splines to be plenty wide as you will cut and sand them flush after they have been glued in place.
The thickness of the splines depends on the width of your saw blade, the so called saw kerf. It is best to make some test cuts and then fine tune the splines to fit snuggly. They should not fall out by themselves but you should also not have to force them in with a large hammer. A snug fit required light hammer taps will create nice, tight lines and a proper glue bond.
You can cut the splines to the finished width on a table saw but we found it easier to cut them slightly wider and then take multiple passes through a sander to arrive at the final thickness.

Place the spline strip into the slot, mark the finished shape with a pencil and pre-cut them about 1/16” larger than the pencil line.

Apply glue to both sides and slide the spline in place, tapping it home it needed. If the spline feels loose, you can add a clamp to the joint to apply some pressure for a good glue bond.
Let the glue dry, ideally overnight, then trim and sand the splines flush.

Different spline designs with the same cradle:
You can create different splines and looks by varying the wood species of the splines and frames. Most framers choose contrasting wood, for example darker walnut or mahogany splines for maple frames, etc.

We went a step further and made a “patriotic spline” from a turning blank made from different colored plywood.



Equal sized splines are created by adjusting the saw blade height and pushing the cradle all the way through the blade.

You can add interest by stopping short of moving all the through; for consistency it is best to use stop blocks on the saw table to limit how far you move the cradle.

Maple frames – walnut splines

If your saw allows, you can tilt the saw blade carriage and create angled splines for an even different, modern look.

Maple frames – white oak splines

An important note at the end:
We want you to be safe and successful so if you are not sure about your woodworking skills or ability to build such a cradle and safely cut the slots please seek assistance from an expert or order frames pre-splined to avoid personal injury.
Hoffmann-USA and Hoffmann Machine Company provide these images and descriptions as ideas and the cradle and frames shown were built by a trained woodworker. We are not responsible for any damage or injury incurred by anyone following these descriptions.