

Pat Hawley finishing up the ukulele

 woodgears.ca/ukulele/pat_finish_up.html

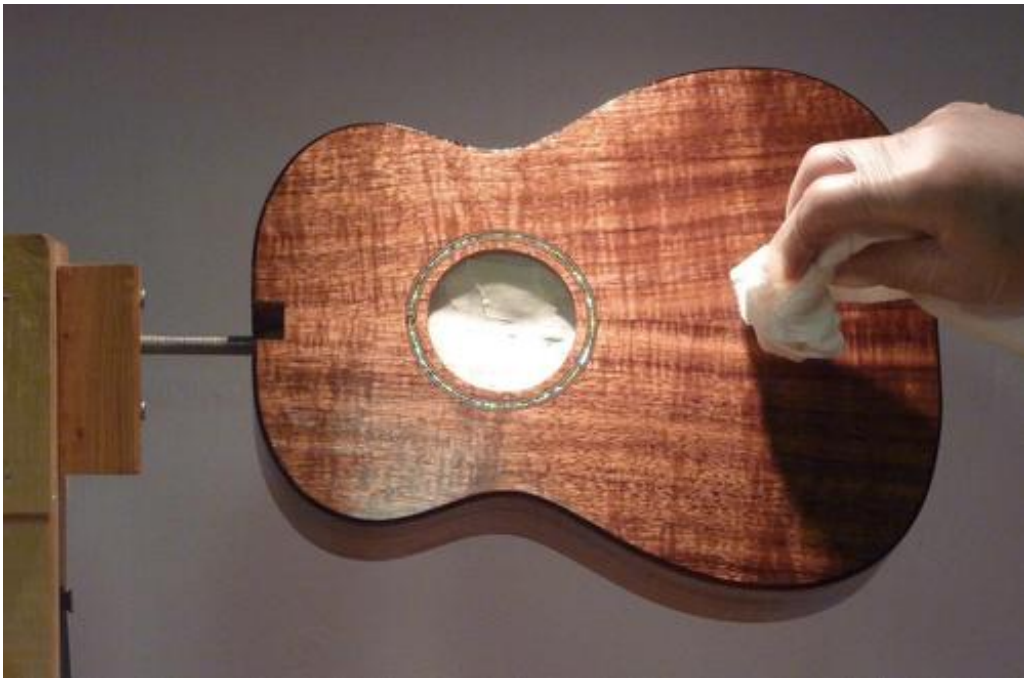
Pat Hawley writes:

"Finishing is the bane of guitar makers"

The ideal finish for a guitar would be ultra thin, flexible, perfectly clear, resistant to all chemicals, including body sweat, and able to stop bullets. In my quest to find such a finish I have tried nitrocellulose lacquer, various water based lacquers, varnish, shellac and, ultimately, UV cured polyester. I have found the finish that comes closest to ideal is the UV cured polyester and that's what I have been using for a couple of years, along with shellac for those that want a French polished finish. There's been quite a learning curve with the polyester finish and I have to say it's still a love/hate relationship I have with the stuff.



There are three steps to finishing with polyester: application of a "sealer" which insulates the top coats from the wood oils and helps it adhere, filling the pores and, finally the top coats. Although the odour from the finish I use isn't too bad (I use a finish that has zero VOCs) I apply them in a fume box that ventilates to the outside of my house. I apply three coats of the sealer, which dries quite quickly in air. I allow about 30 minutes between coats.



The pore filler comes as a gel which I wipe on with a paper towel. It is cured with the UV light. I put on two or three coats of the pore filler, scuffing in between with one of those green scouring pads.



With the finish I am using, it is very important not to expose unsealed wood pores to either the pore filler or the top coat so it is only after I am confident that I can sand things level without going through to the wood that I sand back prior to starting the top coats. I

apply six to eight thin top coats, curing each one with the UV light. Again to avoid going through to the wood, I scuff between coats but do not sand back level until the end when I am confident that I will not sand through.



After the last top coat has been applied I level it with 320 grit paper, sanding dry. From there I work my way up to 1500 grit paper, sanding wet.



After that I buff it out on my buffing machine first with a medium then a fine grit compound on the wheels.





I would not recommend finishing in polyester to people who do not intend to build many instruments. It's expensive to start up and, as I said, comes with a steep learning curve. What I would recommend is to try French polishing. Although a lot of arm work, there is something meditative about building up a shellac finish with a small pad. The results can be wonderful. The only downside is that the finish is somewhat fragile. However it is also very easy to repair and touch up from time to time.



Once the finish has been completed I am ready to attach the neck to the body. First I sand off the finish that will be under the fret board extension, i.e. the part of the fret board that goes over the body of the ukulele.



I apply glue in this area and clamp the fret board in place. It is also bolted in place with the hanger bolt that goes from the heel of the neck through the neck block inside the ukulele.



With the neck attached I now turn to making the bridge. I start with a piece of rosewood on which I mark out the main slots to be cut. I need a slot to hold a saddle and create the string tie block. I also want to put some decorative shell in the tie block so I need a slot for that as well.





The bridge at the point with the slots cut, test fitting the decoration over the tie block. The bridge is further shaped by hogging out the ends to make the "wings" and rounding off the back of the saddle slot wood to open up the area where the strings will be going through to the tie block.



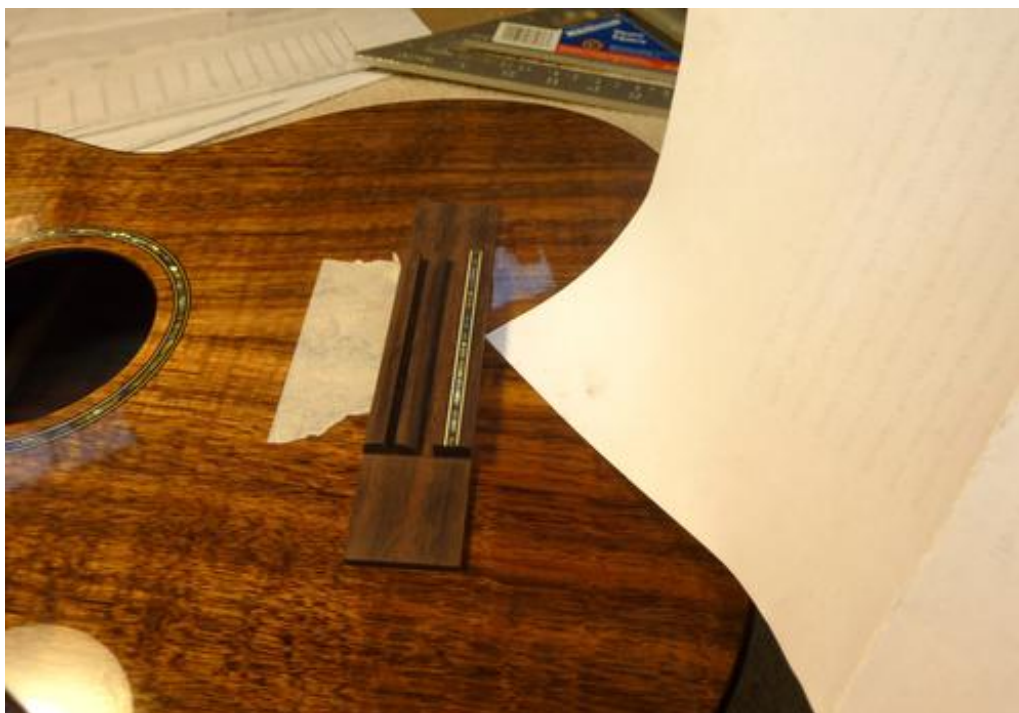
I drill the holes for the strings in the tie blocks on a simple jig I clamp to my drill press. The strings are spaced 15 mm apart at the bridge so, as can be seen in the picture, I made up 15 mm wide spacer blocks for the jig. I simply drill the first hole then remove one spacer block for each of the remaining three holes.



The almost completed bridge. Left to do is some final sanding and buffing to get it to a polished look.



Prior to gluing the bridge to the top I must ensure that its bottom sits perfectly on the surface. To do this I tape some sand paper to the top and sand the bridge against it.



I check for fit of the bridge against the ukulele surface with the corner of a piece of paper. If I can't slide the paper under, that's close enough.



I position the bridge by measuring the scale distance from the nut. To allow for increased tension in the strings when they are pulled down to the frets, one must include some "compensation" to the scale length. Therefore the actual alignment of the bridge I

use is to have the front edge (the edge closest to the sound hole) of the saddle slot at the scale length plus 1/16".



When I have the bridge at the right distance and square, I put down a piece of masking tape along its front edge. Then I align the bridge from side to side and put down masking tape at each end of the bridge. After this is done, I double up on the masking tape so that it makes a little barrier that I can use to bump up against to re-position the bridge as needed.

Readers may be surprised to learn that I glue the bridge right to the finish using medium CA glue. This was a tip I learned on a guitar forum from Rick Turner, a well respected builder in California. I must admit to a little trepidation the first time I tried this, but I have since done this on several guitars with no issues. I don't know if it would work with other finishes, but CA certainly sticks wood very well to polyester!



CA glue works fast so I use a "hand clamp" for about five minutes followed up by a "gravity clamp" for another 30 minutes.



Levelling the frets with a flat file.



I've learned not to be shy about this step and file enough to get a clearly visible flat on every fret as shown here.



I remove the scratches from the file and re-crown the frets with a special diamond grit file made for that purpose. After that I work my way up to 1000 grit paper to the point that

no visible scratches are left. Finally, I polish the frets with a small buffing wheel on my rotary tool, as shown in the last picture. By the time I am done, the frets are very shiny and smooth.



I was displaying a couple of guitars and a ukulele at Guitar Now 2013 in Ottawa when one of Canada's finest classical guitarists, Andrew Mah walked up and asked to try out the ukulele. While noodling around he played a little of the Bach Cello Suite and, later, when I noticed someone videoing with their phone, I asked Andrew if he would play a little more of it and could I upload it on YouTube. Despite that fact that this was completely unrehearsed, he said sure so this is the result.

I made the ukulele out of koa wood for Danielle Allard of the Ottawa group [Go Long\(!\)](#).

See also: [**Matthias finishing up his ukulele**](#)

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