

# THREAD WRAPPING ON THE LATHE PART 2 CROSS WRAPS

Contributed by: Tom Wilson

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By: Tom Wilson AKA Jolly Red

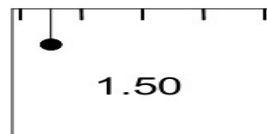


Pentel pencil in Walnut Orange background, with green, yellow and red cross wraps.  
There is a cross wrap and trim wraps of metallic silver thread

This is the Part 2 of a 2-part article on thread wrapping. You need to read Part 1 before reading this article. The techniques, materials and tools described in Part 1 are also used while doing the wraps described here. This article is again mainly about wrapping on a project with a turned wood barrel, such as the mechanical pencil pictured above.

Cross wraps are a method of creating a diamond shaped pattern with thread. This was originally developed to decorate fishing rods, and the techniques and patterns come directly from that craft. Modifications in the exact methods are required since we are not wrapping on long fishing rods, but the essentials are the same.

Most of the tools and materials are described in Part 1. All the tools in that article will be used in the making of cross wraps, with some additions, described below.



Typical story board for 3 spaces plus one extra space in a 1 1/2" long groove.

I use a story board to mark the points where the threads will cross to make the cross wraps. A story board is not necessarily essential for making cross wraps, but it will make for less measuring and easier marking of the blank. If only doing a few projects with a particular spacing, the story board can be made of stiff paper or thin card stock. If doing a particular wrap on a lot of projects (such as the wraps I do for sale), I paste the paper story board to a thin sheet of aluminum and cover it with clear packing tape.

To make a story board, mark the length of the groove on a piece of paper or thin card stock. Divide this length into as many parts as you will want to have the pattern repeat.

An extra space also needs to be marked at one end of the story board. I usually use 3 or 4 spaces, which I think makes for a good-looking pattern on the length of most pens. You may have other ideas, so do as you think best.

If the story board is for cross wraps, divide the first or last space of the story board in half; I mark this differently from the other marks. A different mark reminds me this is not a regular spacing. It will be used to offset alternate rows of the pattern points when the groove is marked, which is what will make the wraps spiral around the blank.

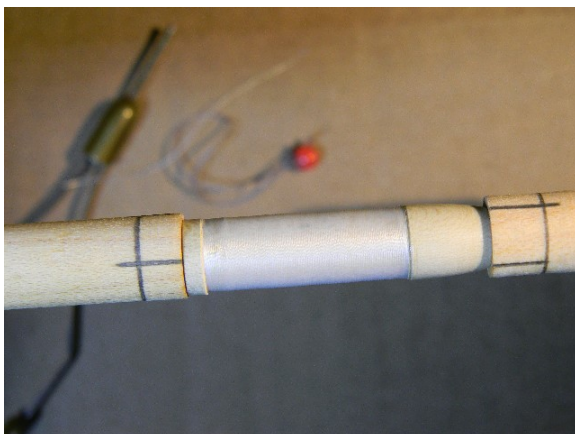
For more complicated story boards, such as for the military ribbons, I usually draw the spacing in a CAD program, print out the pattern at its actual size and paste it to aluminum flashing. These sometimes have such narrow bands that only three or four thread wraps are used to make the band. My measuring is not terribly consistent on these small spaces, so the CAD drawing keeps everything more accurate.

Double sided tape is used to hold the ends of the individual threads making up the cross wraps during the wrapping. This needs to be cloth backed carpet tape, which is quite sticky. This usually will not hold the threads for the entire wrapping process since oils from your fingers will cause it to lose its stickiness. Once this happens, use masking tape to hold the threads in place while you put on another layer of double stick tape. I often have to do these two or three times during the wrapping.

The blank for the project needs to be prepared in the same manner as described in Part 1. The blank for the project shown in this article is for the Mini Duchess Pen from Penn State Industries. I used Holly for this since it is white, and I thought it would go well with the gold plating on the pen. The colors of the wraps are just what I thought at the time would look good for the finished pen. If you do not like the finished pattern, it can be cut off and redone.

Once the blank is turned, it is mounted on the mandrel using the spacers described in the previous article. The narrow extensions on the ends of the spacers will be covered with double stick tape to hold the threads for the cross pattern. Once the blank is mounted on the mandrel for making the cross wraps, it cannot be removed from the mandrel till the wrapping is finished. If you want to remove the mandrel from the lathe while wrapping, make a mandrel from a length of 1/4" threaded rod, using nuts to provide pressure at the ends. The rod can be held with a Jacob's chuck in the headstock. A wood cap on the other end will allow the use of a live center in the tailstock.

My first step is to put a base wrap of white thread to cover the bottom of the groove. Base wraps are covered in Part 1. This will help hide the grain and color of the wood under the following wraps, and give a more uniform background to the pattern. If the base wrap is done in white thread, this will also brighten any following thread colors. This is given a coat or two of color preserver to maintain its color.



Blank with white base wrap

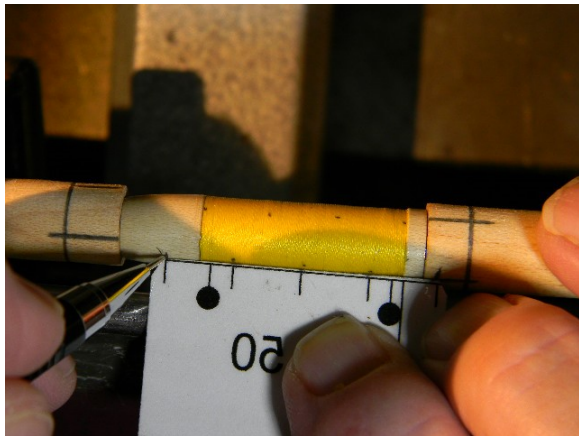


Blank with yellow background wrap being marked for wrapping



A background color for the cross wraps is then wrapped over the white base. Wrapping it over the white wrap will ensure a uniform color for the background. I usually wrap the background wrap in the opposite direction as the base wrap, which would otherwise "grab" the background wrap and make closing the gaps difficult. Reversing the direction of the wraps seems to make this less of an issue. Apply at least one, preferably two, coats of color preserver to the background wraps, and allow to dry before proceeding.

Now we need to mark the crossing points of the wrap on the blank. Using a story board placed against the wrap, with the index lines aligned with the ends of the groove and aligned with one of the quarter marks on the spacer, mark each point along the story board. I use the tool rest to help hold the story board in position. Rotate the blank 180 degrees and mark points in the same manner. Then turn the blank 90 degrees, and use the half space mark to align with the edge of the groove. Mark these spaces, the end marks will be outside of the groove and on the blank or the spacer. Rotate the blank 180 degrees and mark the last set of points using the half space mark again. This will leave alternating rows of points, which will define the spiral pattern for the cross wraps.

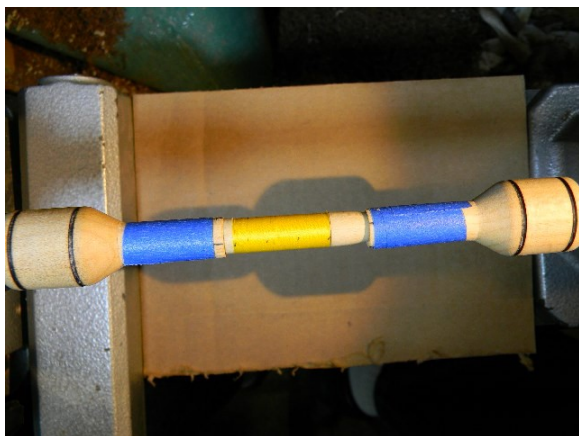


Marking the offset spaces

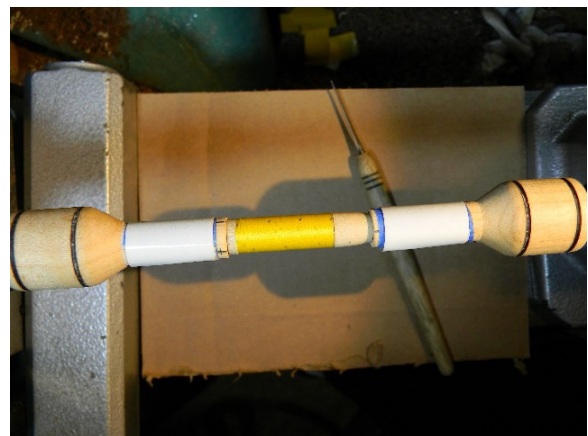


Spaces marked on the yellow background

While wrapping the cross wraps, the thread is held in place by the double stick tape on the narrow portion of the spacers next to the blank. A layer of masking tape is placed first so that the double stick tape can be removed easier once the wrapping is done. Then a layer of double stick tape is applied over the masking tape. You are now ready to start wrapping the crossing threads. If at any point in the wrapping the threads stop sticking to the double stick tape, hold the threads in place with a wrap of masking tape, then apply another layer of double sided tape. Do this as many times as necessary to complete the wrapping. Once the thread wrapping is completed, use masking tape over the thread ends to hold everything in place during the final steps.

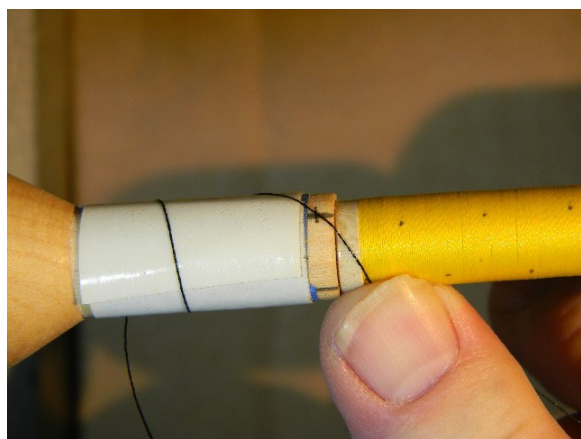


Masking tape on the spacers

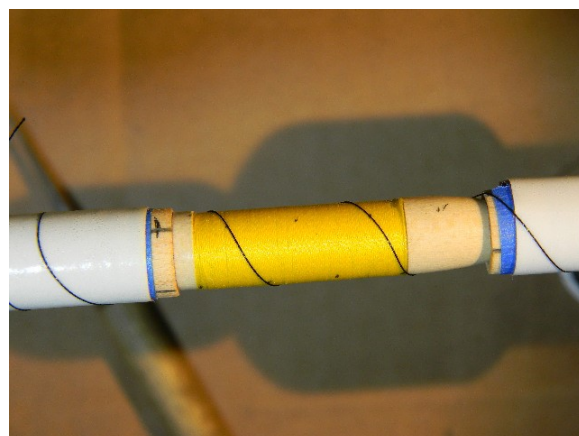


Double stick tape on the spacers

You are now ready to actually put some thread on the blank. The first thread wraps will be placed over the points marked previously. These wraps can be wrapped a bit tighter than the following wraps, as they will determine the rest of the pattern, and we do not want them to move. To start, hold the thread spool in your right hand and pull out 3 inches or so of thread with the other hand. I find holding the spool in the hand is the easiest way to do this type of wrap. Hold this in line with the last marks on alternate rows at the left end of the groove, with enough extended to wrap onto the double stick tape. Make sure the tape is holding the thread and it is still aligned with the first two points, then rotate the mandrel and place the thread over each cross point as you come to it. Once you reach the other end, continue to wrap over the double stick tape to hold that end of the thread, then cut off the thread. Do this again in the same direction, using the next set of points, so you have two spirals of thread going in the same direction. If all has gone well, the two spirals will be parallel and one space apart.

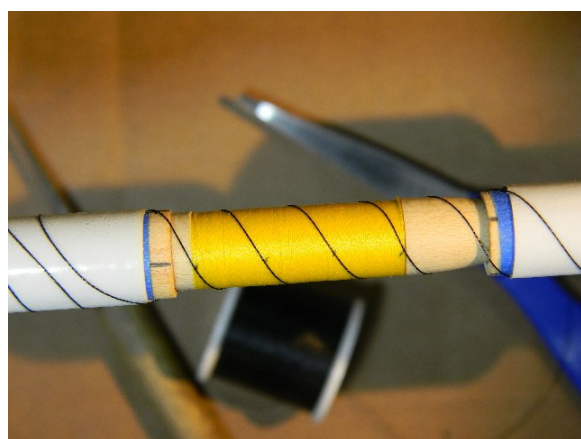


Starting the first thread



First thread wrapped to other end, going through the points

Reverse your grip on the thread and place two spirals going in the opposite direction, again crossing each of the marked points. You should now have two sets of spirals, going in opposite directions. The intersections of the spirals will cover all of the marked points in the groove. These provide the center lines on which the pattern is built. If these are evenly spaced, the rest of the pattern will be evenly spaced.



Second thread spiraled along blank

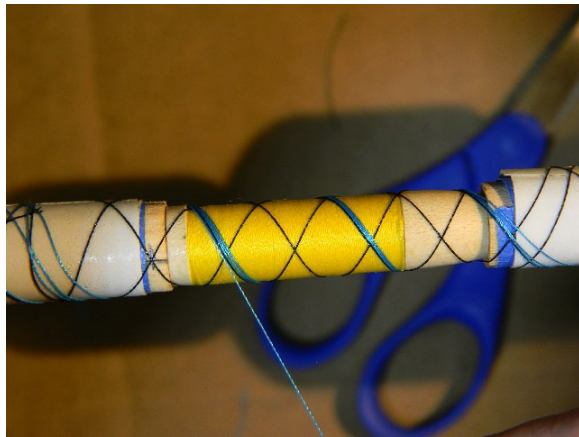


Base threads finished in both directions

The rest of the wrapping consists of wrapping thread along each side of these center lines. The pattern is determined by the color of the threads, how many you put on each side of the center line, and the order in which they are wrapped. The references below go into detail on many of the designs which can be done using cross wraps. The photo tutorial below shows a basic diamond pattern. This pattern will make a large number of design variations by varying the colors of the thread and how many are placed on each side of the center wraps. Metallic threads can be used to add "bling" to the pattern. I will often use a metallic thread wrapped through the middle of the open spaces to accent the pattern.



I will eyeball the location of the metallic thread, since looking good is more important for this than exact placement. I think this also gives a look reminiscent of a stained-glass window.

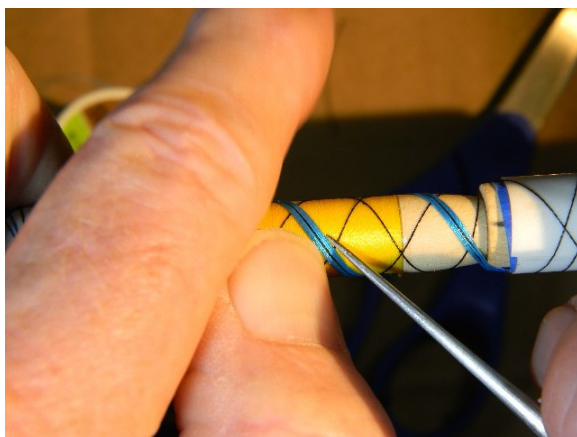


Three blue threads to the right and one blue to left of the center threads



Three blue threads on each side of the center threads

As you wrap the threads, make sure there are no gaps in the thread. Use the thread tool or your thumbnails to push the wraps up tight. Once the wrapping is complete, look everything over to get it right before applying the color preserver.



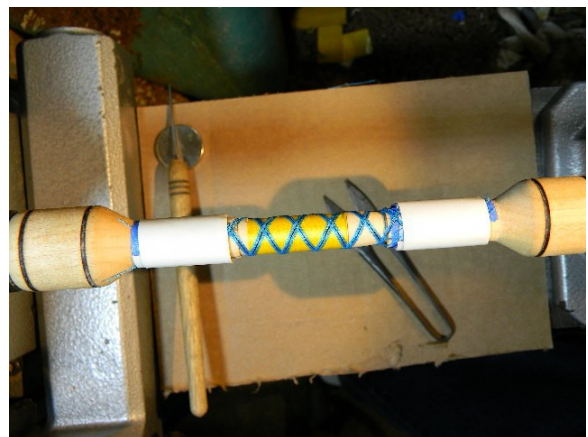
Tightening the threads



First blue wrap to right complete



Blue wraps to right and left completed

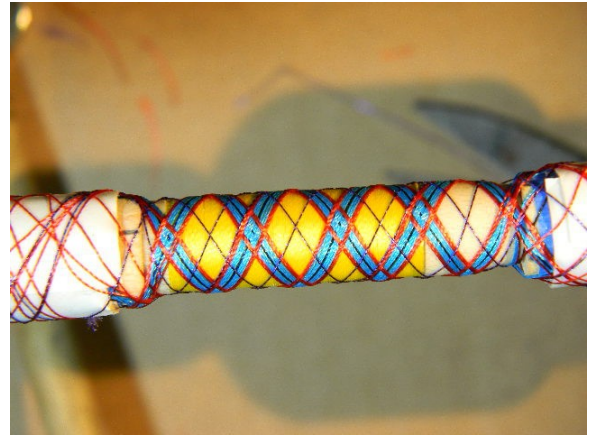


Re-taped the double stick tape

At this point, the double stick tape seemed to be losing its tackiness, so I put on another layer tape to be sure none of the threads would come loose.



Two red threads each side of blue threads



Metallic purple thread centered on open areas



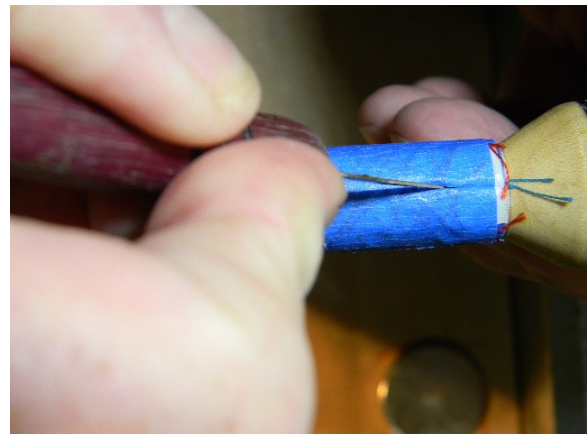
All the cross-wrap threads are now wrapped, so I put masking tape over the ends of the threads to be sure they stayed in place till I was ready for them to come off. I also put two coats of color preserver over the wraps, trying to keep the color preserver off the threads outside of the groove. Check the wraps before the first coat of color preserver hardens, and correct any gaps. Once the first coat hardens, adjustments are a lot more difficult.

Once both coats of color preserver are dry, the excess threads need to be removed. Do this with a very sharp knife, I prefer to use an Xacto knife that I hone as sharp as possible.

Cut the threads just inside the end of the groove, on an angle towards the end of the groove. The color preserver will hold the threads in the groove, and if no color preserver was applied outside the groove, the excess thread will come off easily. After cutting the ends of all the threads, slit the tape on the spacers so it can be peeled off. Proceed cautiously, to prevent loosening any threads in the actual pattern. Then trim the ends of the cross wraps down to the background on a taper, with no bumps. This will make the trim wrap look better and easier to wrap. This trimming requires an extremely sharp knife; the color preserver will hold all of the threads in place that are supposed to remain in place.

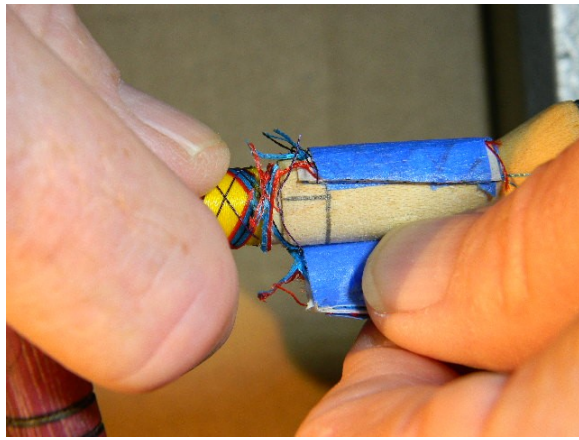


Cutting the excess thread



Cutting the tape for removal





Removing the tape



Tape and excess thread removed



Cutting the thread ends to a smooth taper

Once the ends of the cross wraps are trimmed and tapered, they are covered with a trim wrap. This is a short base wrap to hide the cut ends of the cross wraps. The trim wraps need to be the same width at both ends of the groove and tight against the ends of the grooves. I start the trim wraps against the end of the groove so I can wrap up the taper, which is much easier than wrapping down the taper. Once both trim wraps are done, a final coat of color preserver is applied, and the blank is almost ready for finishing. The points marked outside the groove still need to be removed; I usually start with a soft white eraser to rub them out. If that doesn't work, I carefully scrape them off with a sharp knife. Restore the surface of the scraped area with the finest grit sandpaper used during the sanding of the blank. Now the blank is ready for finishing and assembly.



Starting the trim wrap



Trim wraps completed



### Finished pen



The finish can be a film finish, such as polyurethane or lacquer. I prefer the polyurethane, as it seems to fill the grooves between the threads better.

Another finish for these is a coating of epoxy, which can be turned, sanded and polished the same as the acrylic blanks. Look in Part 1 for instructions on the application of an epoxy finish.

Of course, these could be done on a bare brass tube, and cast into a blank. If done this way, the pattern can go the full length of the tube, and examples of these can be found on the IAP forum.

Like a lot of things, once you understand the steps, this is simple to do. It does take some time and practice, but everything worth doing takes time and practice. This gives you another way to embellish your turning projects, and make a special project for a gift or selling. If you have friends or relatives who are military veterans, I can't think of a better gift than a pen with their service ribbon wrapped on it. Or a pen for someone special with a colorful cross wrap pattern. Or maybe just some red, white and blue stripes on your pens for the Freedom Pen Project.

#### A. References

These books contain more details on thread wrapping and present more advanced tools and wrapping techniques.

Advanced Custom Rod Building by Dale Clemens  
Decorative Wraps by Billy Vivona

#### B. Sources of materials and tools

Mud Hole Rod Building and Tackle Crafting  
Wrapping tools and supplies - they have all the tools and supplies listed in the article.  
[www.mudhole.com](http://www.mudhole.com)

Jo Ann Fabrics and other fabric and hobby stores

If you do one of these, please post it on the forums so others can enjoy it and be inspired by your work.

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