

The CKW Wrap

by Dave Hauser

CKW stands for 'Comedie Kaleidoscope Wrap'. This name is what eventually took hold on a rod building website after going through a few other names. 'Kaleidoscope' is a pretty decent descriptor of how this wrap looks.

The CKW builds upon the base of Scott Throop's Tiger Wrap. The Tiger Wrap uses two layers of threadwork, and sets up a moiré interference pattern between those two layers. The moiré optical effect is what creates the stripe patterns. The basic CKW, however, uses just one layer of threadwork for the base, and then instead of using another layer of threadwork over the top, mono line is wrapped over the first layer of threadwork.

While part of the CKW optical effect is a moiré, as powers the Tiger Wrap, another effect that can be even more pronounced is the lensing created by the round cross section of the mono. The lensing effect is quite different than the epoxy padding done between Tiger wrap layers. In the CKW the mono truly is a spiral magnifying glass. Because of this magnification, the real time effect of the CKW is very different than a Tiger. The pattern and colors in a CKW will vary greatly with just a slight difference in viewing angle. For example, pattern sections that appeared to be one color will flip to another color, and areas that at one angle seemed flat will sprout bulls-eyes from another angle. This optical effect makes the CKW a much more lively wrap, compared to the Tiger.

I know that various folks have experimented with, or hypothesized upon, using mono over a Tiger base the last few years. But, I haven't actually seen it implemented in a robust way that you could depend upon. The first time I remember considering the CKW possibility was in brainstorming with Scott back in May '08 at the WCCRS.

The problem is that if you immerse the mono fully in epoxy, finish or adhesive, the lensing effect largely disappears. The technical reason for that is that monos have a much larger refractive index difference relative to air than they do compared to epoxy. But even though a fully immersed CKW is elusive, it turns out that by covering either the top or bottom surface (but not both) with epoxy that the optical effect is fairly well preserved, and is more durable and stable than using nothing at all with the mono.

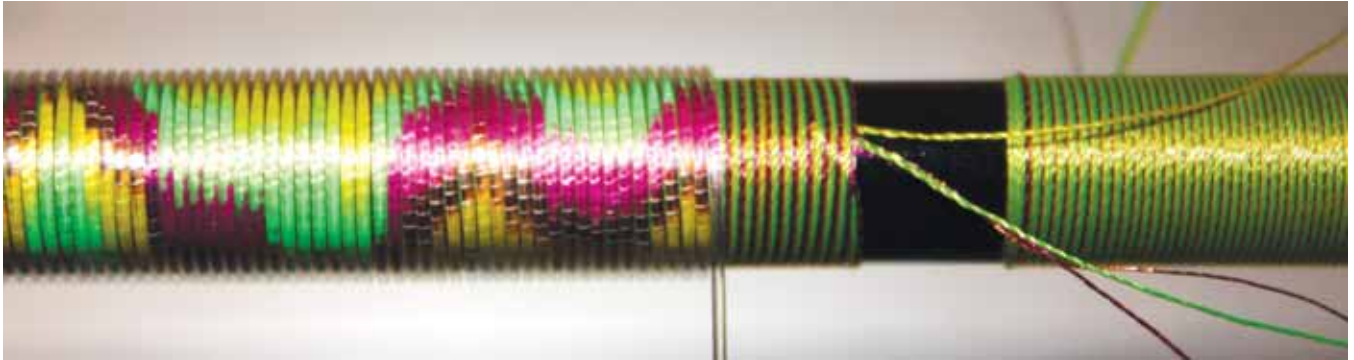
By far the easier way to do the CKW is with the epoxy underneath the mono. I credit Greg Vella (aka CaptG), proprietor of Fisherman's Warehouse in Osaka Japan, with proposing the under-epoxy route as a workable solution.

The Basic CKW

Choose Thread Colors/Sizes

This part of the CKW largely follows the same choices you would make in doing a Tiger Wrap. A difference being that you will not be able to add another color in a second over wrap later (at least not in a basic CKW). So all the colors you want to show should be chosen now for the bottom wrap. While I've been primarily using 40 wt embroidery thread, other thread sizes will also work fine.

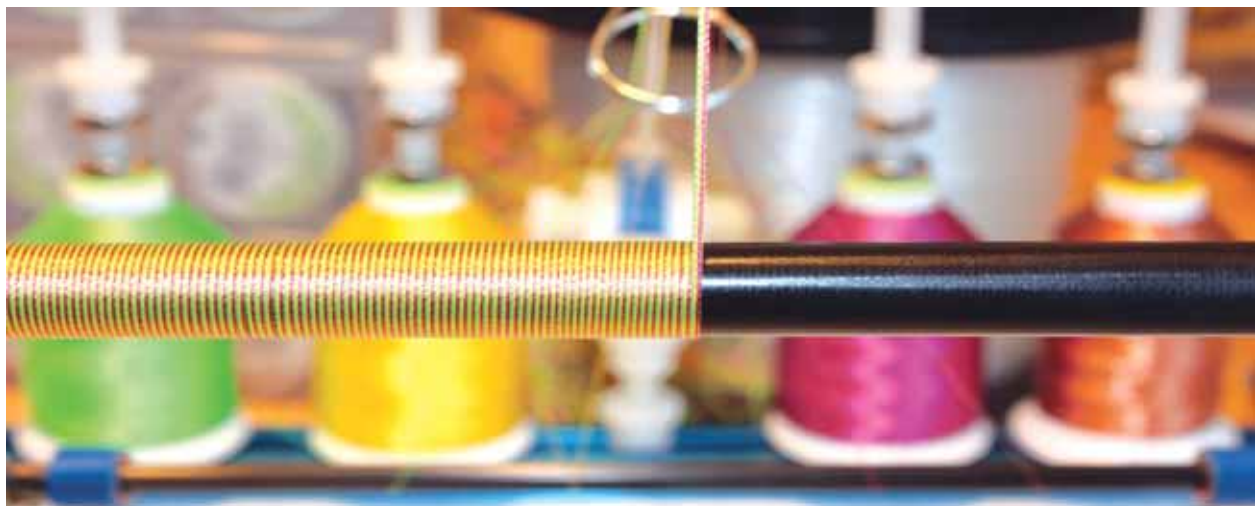
You are not tethered to using any particular thread size, can intermix sizes, and even variegated threads are game. Metallics tend to really shine in the CKW.



Test Wrap a Section

This is setting up for the trial and error fitting. The CKW effect will vary depending upon the threads chosen, the diameter of the area wrapped, and the diameter of the mono used. If you are unsure on the thread diameter, color mix, or number of threads, then make several small test wraps on the section you want to wrap.

For this example I knew I wanted neon green in the mix, and decided to add yellow, fuschia, and metallic copper - all Coats & Clark 40 wt polyester embroidery thread. After wrapping the test thread, burnish just enough to even out the bands for consistency. Pattern burnishing can come later, but for now you are testing for compatibility with the diameter of what you are wrapping, and to determine the size of mono to match.



Find Mono That Pairs Best

The choice of mono is up to you. The clearer monos will obviously lens better, although tinted monos can be used to add/modify the color mix. Harder surfaced monos will also hold up to any abuse better. Fluorocarbons will be more UV stable and harder, while nylons are easier to adhere to and will lens better due to its higher refractive index.

I have largely been using Yo-Zuri Hybrid line, because it is tough stuff, pretty UV resistant, has a nylon core, and I have quite a bit of it on hand. A downside of the Hybrid is that because it is fluorocarbon on the outside, adhesives do not stick to it as well as they do to nylons. (Monos)

Trying several different mono diameters, overwrap the test threadwork. Usually (but not always), the best pattern will result in wrapping the mono in the direction opposite that of the threadwork – just like the over wrap on a Tiger. I have used mono weights from 15# thru 100#, although 40# thru 60# have been my favorites. The mono weight largely depends upon the sum width of the threads used, and the diameter of what you are wrapping. A good starting point is to try monos having a diameter similar to the sum width of the threads you chose. The patterns resulting from different mono diameters can vary from tight stripes, to loose stripes, to waves, to a salt and pepper look.

In this example, I overwrapped with 30, 40, 50, 60, and 80 pound test Yo-Zuri Hybrid line. It was a toss-up to me between 40# and 50#, so I chose 50#. Notice how the stripes change not only from fine to open patterns, but also the slant change between 40# and 50#. If I had had a mono diameter between those, a very open pattern would result, or I could have wrapped/packed a little differently or even made a thread change. As it was, however, I was happy enough with the pattern I saw developing.



Wrap Bottom Thread

This time it is for real. Take off the test wraps, and now wrap the entire section you want to apply the CKW to, using the thread color/sequence mix you decided you liked best. In my example, during a 10" long CKW, I encountered a mid-spool knot in the copper metallic after about 9.5" of nice wrap. So, I had to tear it all off and start over. ☹



RodCrafters Journal

Final Fitting, Optionally Refine the Pattern

Similar to what you did in choosing a mono diameter, overwrap the CKW threadwork to assess the pattern. If you laid down the real threadwork with a different level of packing or tension than what you previously did in testing, then you might need to try a mono size up or down from what you had previously chosen to get the pattern you like.

Mostly at this stage, you are concerned with whether you want to modify the pattern at all with selective burnishing. This is basically the same as pattern burnishing a Tiger Wrap. A part of the friendliness of the CKW, however, is that you can go back and forth trying different things to refine the pattern without committing. In my example, I did no burnishing beyond just evening out the bands, so no overt pattern burnishing was done.

Hint: *When doing a normal Tiger Wrap, the mono overwrap can help you to determine what the final pattern will look like when finished.*

CP Thread (optional), Coat with Epoxy

CP the thread or not, depending upon your needs. In this example I did use CP because the neon green and yellow darkened quite badly against the black blank. You do not want to build up a surface, however, since the closer the contact between the mono and thread, the better the effect.

Once the CP has cured, you then coat the CKW threadwork with a layer of epoxy. You want to put on enough so that it fills in the voids between mono coils in the next step. In this case I used regular Threadmaster. I have also used other epoxies, both thin and thick, and even two-part automotive clearcoat. I think that I may slightly prefer the automotive clearcoat, but then it is not on everyone's shelf.

Wrap Into Wet Epoxy

Setup your spool of mono on a dowel, so that the line feeds off without twisting. Then thoroughly wet a towel (that will not shed lint) with denatured alcohol. Running the line through the towel and providing tension, wrap the mono right into the wet epoxy. The alcohol helps to clean the line, and there



appears to be some technical evidence that alcohol also alters the surface chemistry of some plastics so that they stick better to adhesives. Wrap slow and steady to maximize the cleaning action and the drying of the alcohol, packing the mono fairly tightly.

I have yet to tire of seeing the pattern form when wrapping on the mono!

Wipe off the excess

The lands and grooves of the mono are what create the lensing effect. Wait until the epoxy has had a little time to partially set up, then using an alcohol or acetone dosed towel, gently wipe off any epoxy that has ended up on the surface of the mono. Check a few times after for any additional seepage before it is fully set.



If using acetone, check first that it doesn't do bad things to your mono. Denatured Alcohol is probably the safest way to go.

Shrink Wrap the CKW (optional)

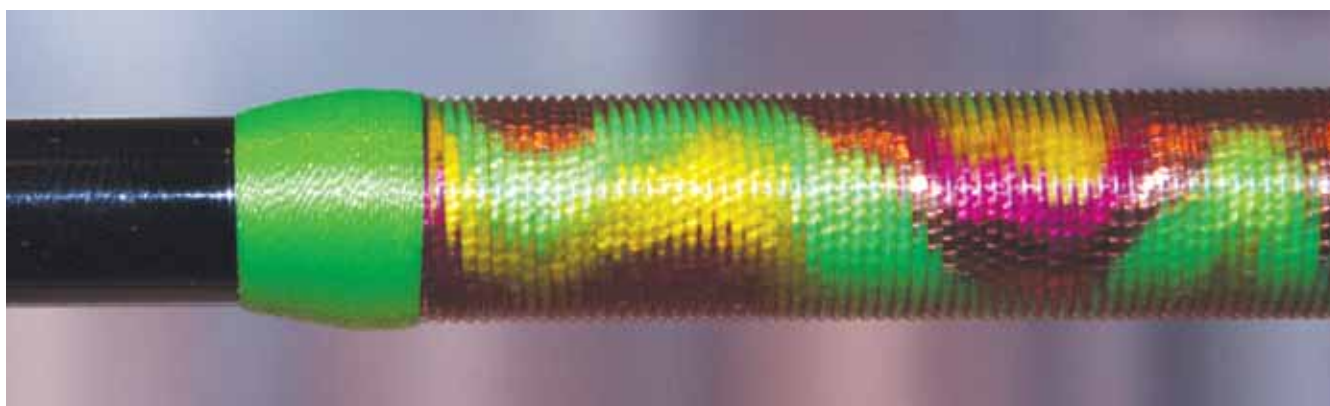
I have found that applying clear PVC shrink tubing over the top of the mono works quite well. Don't use polyolefin shrink, as it is not UV stable, nor is it as clear as PVC. I have done some CKW grips using this method with thick wall PVC shrink tubing. With this option, I have been sealing the PVC ends with epoxy: first epoxy and shrink to one end, shrink the tubing up to near the other end, apply epoxy there, and then complete the shrinking.



Hint: there is also thinwall PVC shrink with as thin as a .004" wall. You could use that to seal the CKW and then even epoxy over the top if you wish, resulting in a smooth epoxied wrap.

Wrap Ends

Almost done. All that is left is to tie off the ends. I tend to put a drop of flexible CA glue on the mono ends to be sure it doesn't lift, and then trim it with a razor. Then overwrap the ends and apply finish to them.



Final Result

You now have a finished CKW, and can finish the rest of the rod. Once completed and cured, I prefer to apply 303 Aerospace Protectant to all plastic parts of a rod, including the CKW.

Variants

There are many CKW variants possible, limited mostly by your imagination. For instance, instead of thread underneath, you could use a holographic tape or fabric. Or you could mono wrap a crosswrap to mutate it. Or make a form of reverse CKW by unwrapping the mono after the epoxy has set up and leaving behind the grooved epoxy.

Or if being tricky, you could machine/form/emboss the epoxy surface in various ways without the mono at all to create new refractions. You could even just lay a thread in the mono groove, epoxy the lot, and have a true Tiger variant. As simple as the basic CKW is to create, there are lots of opportunities for creativity.

