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In this issue

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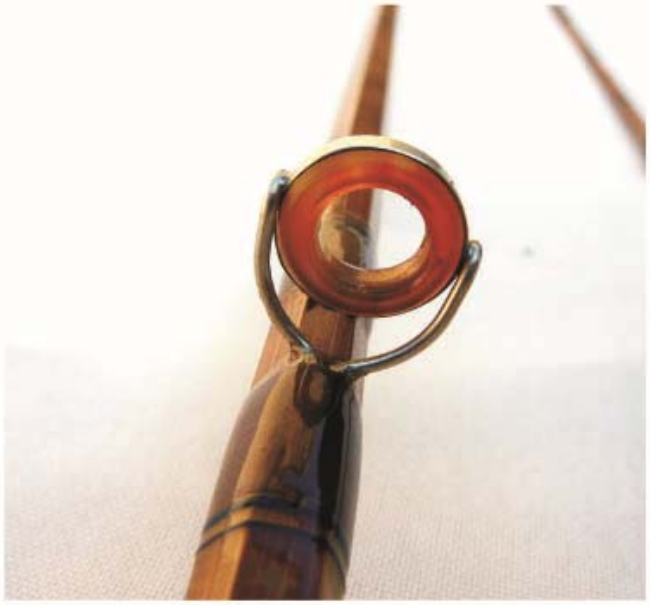
Front cover:	Marcelo Calviello, Bjarne Fries, Alberto Poratelli At the Italian Gathering 2012
Photo on page 2	*Butt cap* Bamboo rod by Leonard and Paul Young (collection Gaviraghi)

5° RENCONTRES EUROPÉENNES DES CONSTRUCTEURS DE CANNES EN BAMBOU REFENDU



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Autumn has arrived ...

... in less than a moment the cold winter will be here. The peasants will leave the fields, the shepherds will end their hard work in the high pastures and everything will await the spring and the thawing of the snows.

Even the rivers, like sheets of crystal will patiently await their moment.

As the Great Poet, the Bamboo Whisperer said: *"Winter came suddenly. Only a few days before, the sun still warmed up the air giving the impression that winter was still far away.*

But now the heavy snow was whirling in the night sky which was glowing with a pale uniform light. He lay down his plane on the old work bench next to his trusty planing form on which he had made a lot of rods: a life companion that no longer bore any secrets and he knew very well how to set it at each station to get exactly what he wanted.

He approached the window of his shop: the big black river flowed through the valley which was by now white with snow. "It will be a long cold winter", he thought while rubbing his hand together. He opened the little cabinet that he had built himself using the beautiful oak wood his woodcutting fishing friend had given him and who lived just across the big river. He took out a bottle and a glass and poured out a generous portion of ..."

No one ever found out what that bottle contained and what the Master of the River, Master Craftsman and Bamboo wizard drank...

Perhaps a Single Malt from the Isle of Skye, distilled by the Macleod family with its peculiar brine and smoky aroma?

Or perhaps a Calvados with it fruity taste, distilled along the banks of the Touques, the river which flows through Lower Normandy and which is rich in wild Brown trout and Truites de Mer?

Some swear that it was a Grappa distilled in limited quantities in a solitary valley not far from Bassano and that awaited to become of age in an Oak barrique from the forest of Tronçais – a real distillation of wisdom

Perhaps the reality was more wicked... and because of the strict directives imposed by his gastritis, it may have been a blue berry flavoured soft drink. Sad but excellent for your sight!

Now, all this to say that issue N. 9 of the Bamboo Journal is ready.

After the successful May gathering that reunited the crème de la crème of Bamboo Ferrules – perhaps a unique and once in a life time opportunity – this issue of the BJ could not but contain the echoes of this event and contain the essays by our friends. Also the article by Tim Anderson on the sleeve spigot. Tim is certainly a prominent figure in the bamboo rodmaking world with his experiments and research on avant-garde construction methods and if this were not enough, he managed to position himself as a cultural intermediary between the European and American Rod-making. A very valuable cultural mediator.

Just to mention one more contributor that appears in this issue – the work by Angelo Arnoldi on planes and his hon-ing techniques using 3M film. This intrigued me a great deal. After this, it becomes difficult to accuse the blades of our planes that they are not sharp and that give problems on our strips. There are no more excuses.

Alberto Rey is the author of the pictures between the articles. Beautiful!!

...and now...happy reading to all

Bjarne Fries

The F.I.B.H. Ferrule

(FIBH stands for: Fries Integrated Bamboo Hexaferrule)

History

At the time this story toke place I was 46 years old and had been building rods for more than 20 years. Through the years I had perfected my working methods and was convinced that the only improvement of my work from now on would come from growing experience. But a travel, exchanging ideas and thoughts with other human beings, and suddenly out of nowhere inspiration shows her lovely face and things change! I came up with an idea that not only improved the performance and spirit of my rods but hopefully also will become an inspiration for the modern bamboo fly rod of the future.

The idea for my FIBH came to me during a visit to Japan.

In 1998 my wife Hanne and I were invited to Japan by Yoichi and Mariko Nonogaki, some of our dear friends, and during our stay in Mito where they live, we were invited by my customer and friend Kenshiro Shimazaki, who among many things, is hook designer for Tiemco. He also published a fantastic innovative book: “A Fly Fishers View”, is an very inventive fly tier, excellent flamenco guitarist as well as a great guy, with a brain as quick and sharp as a samurai blade.

Things get easily crazy very fast, when Ken is involved, and a few minutes after our arrival we were standing on the balcony of his house on first floor, casting different rods and discussing rod actions. “The best catch I had from here was a cat,” he told me laughing out loudly.

Later in the evening Ken had invited some other friends, Mr. Nakazawa, editor of the Japanese fly fishing magazine Furrai no Zashi and Mr. Nakamura, who is an elder rod making colleague, building traditional Japanese rods for Ayo fishing. These rods are very long 4-6 yards long rods made of Japanese bamboo as it grows, dried, tempered, cut to pieces, varnished and so on. Suddenly Ken left the room and came back with a delicate rod of about 7‘6". “What do you think about this Bjarne?” he asked. I looked, and beside the nice work, I suddenly noticed the ferule. It was made of bamboo!! “This rod my friend Mr. Nakamura made for me”, Ken said. “He was very impressed after he saw some of the rods you built for me, and he wanted to try to built a split cane rod”. I, on the other hand, was impressed by the work of Mr. Nakamura,

I could sense the hand of a man, who new bamboo by heart. The ferrule was made of a short, thin piece of natural grown Japanese bamboo, Matake, of about 6-7mm in diameter, reamed out in the inside to a hole with exact diameter. Then Mr. Nakamura had rounded both parts of the thick end of the tip section as well as the thin part of the but section on a lathe to the same diameter as the inside of the Matake tube and glued the piece of Matake on the but section as if it was a nickel silver ferrule! But, and this is where I failed years ago, when I did some experiment on the subject, the whole female part was tightly wound with white silk thread and varnished several times! This was sufficient to hold the bamboo fibers together under the severe stresses that are put on the ferules when put together and during casting. As I learned later on, this was an old way to assemble different traditional fishing rods in Japan, used for centuries!

As we all know, bamboo is incredible strong and at the same time very fragile, the later aspect we use, when we split the cane into strips. But the part, that was my eye opener were the supporting silk wrappings. Their ability to support the natural binding of the power fibers in the cane and thus prevent them to split apart!

I instantly knew what I didn't like in Mr. Nakamura's design, which actually was like a conventional rod with metal ferrules, just that the material metal was changed with the material bamboo: the interruption of power fibers! For me cutting through power fibers is like cutting myself, I think every colleague in the craft can follow me on this part.

Later that night, when we had gone to bed I couldn't sleep, my brain was working with ideas: So how about building a swell and then have a piece of a parallel section? Drill a hole, ream it out and round the male in the lathe to fit... here we go again, cutting power fibers! No! But to avoid this, one would have to make a hexagonal hole! impossible..... but wait... removing the inner apex of each strip before gluing and you end up with a hexagonal hole after gluing! But now we are at it, why not do this on the lower end of the tip section instead, the same way as it is done on the older fiber glass rods where the tip section was pushed on the blank of the but section, this in my eyes also felt more pleasing aesthetically.

The next day I explained my idea with a lot of drawings to Ken and he said: Bjarne, since your new ferrule has a hexagonal hole, you should call it "bamboo hexaferrule"!!!

This was the how the F.I.B.H. was born during a sleepless night in Japan.

Experiments

When back home in the studio my first concern was how to make the swell, and I got a friend of mine to make me a metal planning form that had a parallel v-groove of 1mm depth and then a dropdown 1.3mm on the last two 5" increments of the form so it had a groove of 2.3mm for the last 5" (photo 1)

This would allow me to make a female with a wall thickness of 1.3mm.

Glossary:

SP = Swell point, the point where the swell starts

JP = Joint point, the point where the hole the male part starts

J = Joint, the part where male and female join.

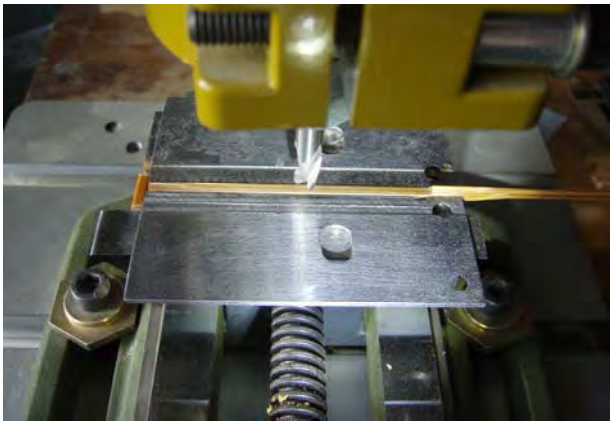
Leaway = The part that will be cut off after the ferrule is finished.

When I planned the strips I found out that the shortest swell I could manage to make was 4-4.5cm long, so I settled with a ferrule that had a swell of 4,5cm, and then a parallel section 6 to 7cm of which the last 2.5cm to 3cm would be the leaway I would cut of later on so I would end up with a ferrule having a total length of 8 to 9cm depending on how long I wanted the J to be.

When I had to perform the planning of my tapers the first problem was that the SP always was placed on a 5" point on the planning form, but the SP on the taper could be anywhere between this points where we adjust the depth of the form, so I chose to find the diameter of the SP, adjusted the form to it and then found where the next "clean" point, where the 5" distance our taper dimensions are calculated in, would be placed in the planning form. For example the SP is located on 47" in the taper, I calculate the dimension of the ½ diameter of the rod at that point and set the form to it then I mark the 45"point on the planning form which is on located 2" in front of the SP and adjust this point to be of the correct depth according to

to my taper and then mark the next 5" point (the 40" measurement of your taper) in front of this, which will be 2" in front of the 40" point of my form. The rest of the taper laying ahead of this, 35" to 0" I just set to decrease 0.05mm to 0.1mm per 5" section so I end up with the rest of the strip from 35" to 0" being over-sized to my actual taper. With this setting I plane all 6 strips and then I have the ferrule and up to 35" of the tip with the correct dimensions, while everything ahead of 35" still is oversized. After this I set my planning form to the correct dimensions from 0" to 35" and then set the form to be deeper than the actual taper on the 40" to 60" points. Then I mark where the end (including the Leaway) will be placed in the form for the final planning . Then I place the strip like 10" further down the form than it will be placed finally and start planning away the excess material. This will be mainly at the very tip part of the section in the beginning. When this is done I move the section 3 or 4" up the form, and repeat the procedure until all the strips are done at their final position in the form. Since the form is set to be too deeper than the original taper from 35" and down, I will not remove any material from the part (35" and lower) and of course I don't plane on the ferule part that will show over the groove I have set. The ferrule segment I use to hold the strip in place in the form while planning the tip section ahead of 35". If it is done correctly the plane will take material away on the first pas with your plane a little ahead of the 35" mark when the strip is placed in its final position.

The next part was to take of the material that had to be removed to produce the hole for the male. I chose to use a beveller, where I glued 2 pieces of 1mm thick steel with a 60 degree angle on the jaws so it would hold the 60 degree strips secure while beveling the strips to the desired thickness of 1.3mm.

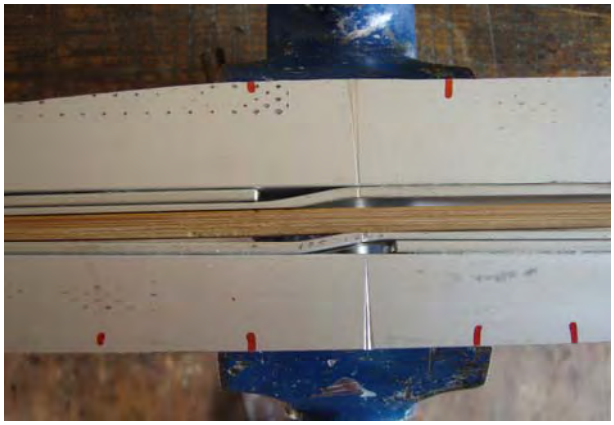


After removing the glue, I marked the Leaway on the ferrule, and wrapped the joint with a layer of white silk, gave it 2-3 layers of varnish and cut of the leaway. The first FIBH was built.

Development

The most important improvement of my design happened, when I was contacted by a German toolmaker named Detlef Kronenberg. He had heard of my FIBH from a friend and wanted to talk to me about how to make a good planning form for making the FIBH. Detlef builds rods with very heavy swells in front of the grip, so he actually had more experience with swells then I have, I detest swells in front of the grip. But actually that was what I needed for my FIBH, a swell of 2.4 to 2.8 mm on the shortest distance possible. If you want a very short heavy swell, Detlef said, than why don't you heat pre form the strip.

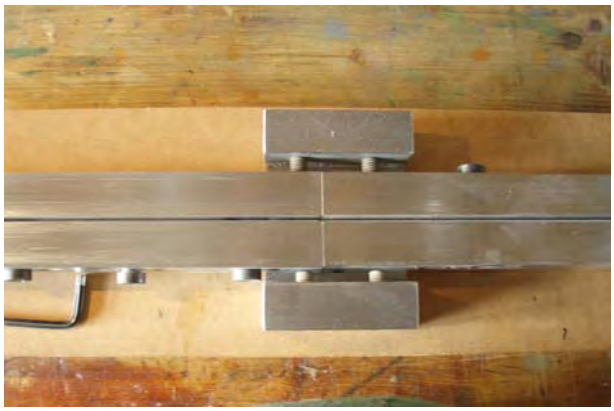
You heat the strip where you want the swell to be and then perform a parallel displacement of the surface of the strip. For this, he told me how to make some jaws for a vice



I make the step in the jaws 0.1mm bigger than the swell I want. so for a FIBH with a wall thickness of 1.3mm my jaws have a step of1.4mm. I also grind of material from the underside of the strip so it has a uniform thickness of about 3.5mm on the lower 15cm of the strip, this makes it easier to pre form the strips uniform.

After all strips are pre formed I check for the two parts in front and behind the swell to be parallel, and adjust this over a heat gun freehand. usually it needs correcting in front of the swell. This advice from Detlef allowed me to shorten down the swell area from 4.5cm to 2cm. An huge improvement , which means less interference from the ferrule on the action of the rod,

Another improvement was the planning form Detlef made for me based on my specification. It is made of 2 pieces, a usual form for the tips 60" and a 10" long piece of form with a uniform depth for the female ferrule part as well as some fundaments to place the forms on. I also asked him to make some extra adjusting screws on the lower tip part section of the form with the adjusting screws being 2½" apart.



This helps to adjust the correct depth of the taper 5" measurements ,when they are out of line of the 5" adjustment screws of the form when you place the strips in the form according to the SW. (see the explanation for this under Experiments) This planning form is excellent and made to the highest standards and with such precision that I can't feel any kind of disturbance, when I move my plan from the lower part to the tip section part. It feels and functions like one piece.

Experience with the FIBH has made me change the material of the reinforcing wraps of the female from silk (not tuff enough for heavier rods or the lowest ferrule on 3-piece rods) to Dynema (it doesn't soak up the coating) to a thin glass fiber thread (like a kind of floss silk). The coating I use for the wrappings on the female is a epoxy laminate resin before I dip varnish the finished section. Especially on the heavier rods #5 to #8 and built as 3-piece rods a silk winding did not poses enough strength as support for the lower ferrule. A weeks fly fishing in the salty ocean for Amemasu on Hokkaido proved so.

The impregnation of the male I now make with several coatings of hand rubbed gorilla glue the " Tim Anderson style". (thanks for the excellent idea Tim!)

Some advice in regard to dimensions that have proven sound:

The length of the joints of male and female as I recommend them for 2-piece rods up to #4 is 4.0cm and the wall thickness of the female 1.2mm to1.25mm and for rods #5 and upwards 4.5cm and wall thickness of the female 1.3mm.For 3-piece rods: upper ferrule, joint length of 3.5cm and wall thickness of 1.2mm. The lower ferrule, joint length for rods up to #4 is 4.5cm to 5.0cm and wall thickness 1.3mm to 1.35mm.

How to calculate the length of the segments when building a FIBH:

As an example we take a 7'3" 2-piece rod #4. The length of the J in this case would be 4cm and we use a leaway of 2cm on both ends of each section.

So each section has to be 221(87")/2 cm plus the length of the join 4/2 cm plus 4cm of leaway. This gives us the length of the two sections including leaway of 116,5 cm(45 28/32")

For the same rod as 3-piece the J of the upper ferrule is 3.5cm and the J of the lower ferrule would be 4.5cm. This gives a total of 8cm. We have 3 sections, so the math for each section is: 221(87")/3 cm plus 8/3 cm plus 4cm leaway, in total 80.3cm(31 5/8").

Different steps of making the FIBH

Conclusion

So what did all these years of gaining experience with the making of the FIBH end up with?

During the 13 years I have built the FIBH, it has proven its worth in regard to viability and functionality, and the last many years, 95% of my customers choose it instead of the traditional nickel silver ferrule, when they order one of my rods.

I am convinced that, in the future, the bamboo ferrule in one or another version will replace the conventional nickel silver ferrule. It's simply so much better!

In this issue:

Artistic works by Alberto Rey

Marcelo Calviello

Talking of wood, crisis and connection systems

I have been fishing since I was 6 and fly fishing since I was 14.

I had the great fortune of having a bamboo rod in my hands to learn to cast and to master this difficult art.

José Evaristo Anchorena. “El Bebe” as we used to call him, was my mentor, my teacher and he who taught me those secrets that are still useful and that I try to share whenever I can. He was the one that would always take me back to the origins persuading me of the advantages when, in my youth, I would be tempted by synthetic rods (fibreglass, graphite, etc.).

That is how between the ages of 30 and 40 I had a noteworthy collection of rods. He taught me what to buy and why. My collection grew to approximately 70 rods of the most famous rodmakers in the world. Hardy, Pezòn & Mitchell, Farlow and Orvis were the first as they were the most common in my country, Argentina. My collection started with a gift from “Bebe”, an 8 and a half foot Orvis Battenkill factory classified as an 8 weight but that cast a six weight wonderfully.

A very slow and very powerful rod with “Joe Brooks Favorite” written on the butt.

In time and as my knowledge increased, I added rods from rodmakers like Payne, Leonard, Gillum, Thomas &Thomas, Winston, Thomas, Dickerson, Bedford, Garrison, Howell and others I don’t remember like an antique 9’ Milward 5 weight which was one of my favourites.

I was always admiring my rods. Some cost me more than others. Each one had its own rhythm and peculiarities.

It was a good school for me because it taught me to analyse the reasons for each taper, the advantages and disadvantages of each action, each length, and each design. In time I started generating the characteristics of my ideal rod in my head. In time the necessity to build it was growing inside of me.

Everyone knows that Argentina is a country of great rivers, great fish and strong winds. The action I was looking for had to allow me to keep the fly in the water as long as possible and to cast it near or far depending on the situation.

Fly fishing in Argentina was reserved for a special class of people, not everyone had access to the equipment or the material to build rods.

The beginning of rodmaking was really difficult and I had to build all my tools. At that time the country was entering one of the worst periods of economic crisis I could remember and it was impossible to find working tools. I remember filing the steel bars by hand for a month to build my first planing form.

At the end I remember thinking “rodmaking can’t be more difficult than this”.

The bamboo was also impossible to find. Tonkin? Not in your dreams, it couldn’t be imported so I started looking at the local one. I found a type that seemed interesting and I started to work it.

There were many errors and changes of directions and after a failure it looked like everything was going smoothly until I mounted the first ferrule in brass, the only material available at that time. Once the rod was mounted the action was completely transformed to a bland, soft in the middle action and very difficult to manage.

I'll never forget the day my son came home and asked me to call the SAGE dealer on his behalf because he had broken a rod while fishing. He showed me the broken spigot.

It was magic ... automatically I thought "why not?" I can do this in one of my rods.

These were the first steps. The first ferrule shown was very ugly but it was the one that convinced me to continue because the action of the rod was really changed. The transfer of the forces was what I was looking for and the rod cast really well.

Then I had the idea to integrate the insert to the taper to avoid the leap of power between the insert and the rod. It was marvellous even if the rod would loosen the connection when it dried. Thus I had the idea to insert a small metallic ring in the female and a small metal male to ensure the connection.

Time and trials have shown that it was not necessary to increase the length of the inserts and so the BOBFS (Bamboo on Bamboo Ferrule System) was born, the system I currently use for all my rods.

I kept the metal insert on the point of the heel to protect it from humidity and to reinforce the ends where the rod seemed weaker.

The following is the rodmaking system I use.

My planing form is built with very flexible steel with the stations every 2, 5" that allows me to open the bars without deforming them and it reduces the swell on the female.

The ferrule is still 6cm long, even if I always keep a centimetre more to work in tranquillity. Once finished I cut the ferrules to the necessary size.

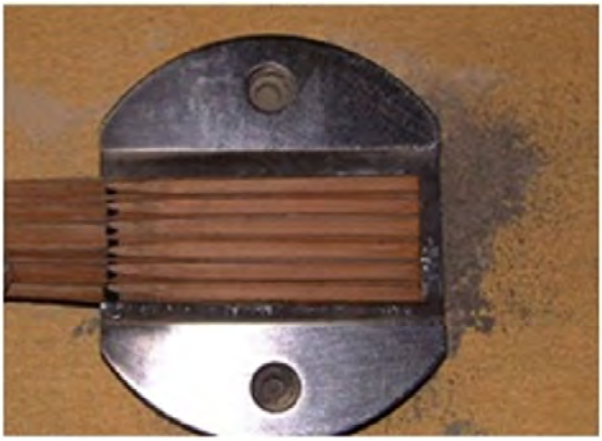
Here you can see the planing form ready for the final planing of the strips, in the right position.

Once completed the planing, the six strips are joined and fixed with paper adhesive tape.

I cut the adhesive tape with caution to open the strips and glue them in their definite form.

This is the template I designed and built to give the strips the definitive measurement. This template has a decrease of 1, 4 mm and is built with special tempered steel to ensure the necessary hardness and resistance to the file.

Here you can see the strips ready to have the same decrease.



Here you can admire the final result of the decrease that was done before the gluing.

After the gluing the strips will be blocked in their final position.

The gluing procedure is the same as that of a traditional rod, except for the portion of the ferrule where I use epoxy glue 2T (usually DEVCON) to waterproof the internal walls and guarantee the resistance in the points of greater effort.

The excess glue can be removed using a small file the same we use for the final touches.

Finally here you can see the construction procedure of the aluminium cap that reinforces the male point and protects it from humidity.


N. 00036/06 I
N. 00036/06 II

Alberto Poratelli

The bamboo ferrules

In 2000, when I started rodmaking as a leisure activity I spent my time not only splitting and planing bamboo but also reading a lot, I read the "sacred texts" on rodmaking, other texts that I thought were sacred but that now I consider to be less than mediocre and I read a lot on the Internet.

I used to read (and still do) a lot because I feel it is important for me to understand what I am doing besides executing it in the best possible way but above all because I knew little or nothing about the magical world of rodmaking.

In my surfing the net looking for news on bamboo rods I came across Bjarne Fries' website and it was love at first sight with the bamboo ferrules.

They were brilliant!

I then started studying a system to make the bamboo inserts without the need for special tools, in particular for the swell. I wanted to find a way of making a nice, harmonious and functional ferrule using the tools that every rodmaker has in his workshop; i.e. the "standard" planing form.

Initially I was very sceptical about the mechanical strength of these inserts because I was not aware of the resistance of a one millimetre bamboo strip.

So in time I looked for the extreme limit, not for the fun of it, nor to make something never seen before but only for the curiosity that pushes me to further my research and to never consider having achieved perfection.

However I have always kept in mind that this extreme limit should never be surpassed because let us not forget that rodmakers make tools for fly fishing and not showcase objects.

In 2005 at the first IBRA Gathering I presented my first rod with bamboo ferule, it was greatly appreciated and many rodmaker friends showed interest in this detail.

At this point my experience with bamboo ferrules could have ended but it was not to be; two people joined the game without which I would have stopped my search for the limit. Two special people that trusted me and gave me valuable advice for the technical study and the practical construction of better and more reliable bamboo inserts.

Gabriele Gori e Marco Giardina

Gabriele is a great new generation Italian Rodmaker who has carried out an interesting research on the comparison of the resistance moments in the various sections of full and hollow bamboo rods.

He is always available to help anyone. His practical and theoretical advice has always been indispensable for my work and has always taken care of my evident technical gaps.

“The Engineer” from Florence, is a friend and companion of adventures with IBRA of which he is the Chairman and is the person who managed to give me the right answer to continue my work in those moments when I was about to surrender.

Marco, who is known all over the world as “MOG”, in Italy is probably the most well read person when it comes to the history and the world of bamboo fly rods. He is wise and very knowledgeable and his Neapolitan spirit makes him an ideal companion in those never-ending nights spent discussing bamboo matters.

One of his words of appreciation on the work I was doing convinced me that maybe I was doing something useful for all Rodmakers.

During the 2006 Gathering, I presented a study which was carried out in the laboratory of Physics of Materials at the Bicocca University in Milan.

I took advantage of the fact that my daughter Martina had the opportunity to use the sophisticated instruments; I gave her a series of samples of Pseudosasa Amabilis to test because I was curious to know the chemical and physical differentiation of bamboo which came from different cultivations. Instead I was very surprised by the results of the tests on mechanical resistance of this splendid material: a breaking strain of 700 kg/cm² (240 pounds/inch²)! Simply fantastic! Why not take advantage of this?

The bamboo ferule I had made until then were made without any particular dimensioning method and thus without a scientific logic that would justify the length or the wall thickness.

I began asking myself: why make a bamboo ferrule? Why should justify someone to make this kind of connection?

If 99% of bamboo fly rods excluding one piece rods have metal ferule, there must be a reason. So before looking to justify the construction of bamboo ferule, I tried to understand the reasons that lead most rodmakers to the use of metal ferule. I believe that it is a common opinion that a ferrule that is not metal cannot have the right resistance to handle the stress of the action which takes place while fishing and for a few undoubted qualities:

1. Aesthetically they look great and especially over the last few years with the advent of modern profile like the super Z, the nickel silver ferrules make a mediocre blank look good.

2. The strength of the metal allows you to make ferrules with very thin walls and so with a lesser impact of the taper of the rod.

3. Rodmakers have access to a vast variety of ferrules on the market – different sizes, metal and design. The metal can be easily blued with electro colouring or chemically.

4. The metal ones are relatively simple to mount on the blank and the ones you by have no problems with the measurements. They are ready with very high tolerances.

It is also true that bamboo ferrules also have a series of not very small defects which influence a bamboo rod.

The Weight

Let's consider the more widely used ferrules in NS – their weight range from 6 grams (0,211 Oz) to 9 grams (0,317 Oz), excluding the extra sized ones like those for Spey rods.

The weight of a bamboo ferrule varies from 1,3 (0,045 Oz) grams to 2,0 (0,070 Oz) grams. A great saving in weight which corresponds to about 80%.

We can therefore confirm that a bamboo ferrule reduces the mass of a rod on average by 6 grams (0,211 Oz). This may seem little to those who do not have experience with dry fly rods but for an expert caster this adds up to a huge difference.

To those that object that 6 grams on the total weight of a rod, reel and line which is on average between 300 grams (10,582 Oz) and 400 grams (14,109 Oz), I normally suggest that they try adding a 67 gram weight to the middle of their rod and trying to cast. A mass of 6 grams places at a distance of 110/120 cm from the grip produces and enormous variation of the moment of inertia of a rod.

With this I don't want to say that metal ferrules are not valid but without doubt, their presence must be kept in consideration during the design phase of the rod especially if we are discussing short light rods for dry fly fishing. In three piece rods, metal ferrules have an enormous effect on the action.

I have considered NS ferrules which as far as weight goes, occupy an intermediate position. If we had discussed titanium ones then the effect of the weight would have been less while brass ones are much heavier.

Rigidity

Metal ferrules are rigid. This characteristic does not need to be demonstrated but it must certainly be kept in due consideration. Fishing rods are flexible by nature. If they were completely rigid, they could not perform their two main functions: casting and dampening the load on the leader during the hook setting and during the fight. The ferrule is a rigid element in the central part of the rod if it is a two piece rod and 1/3 and 2/3 if in three pieces. This also influences the action of the rod even though not as much as it affects the weight.

So the following factors:

- Number
- Position
- Weight
- Rigidity

of the ferrules, heavily condition the rod action. The same taper transformed into three pieces is completely different to the two piece rod. Rodmakers have always kept these conditions in mind when designing their tapers.

Transmission of forces

A fishing rod and particularly a fly rod is fundamentally a tool that transmits the force that the fishermen apply to the line which is cast and straightens out. I really do not want to go into this chapter, because I do not have the know - how but in this discussion on ferrules I need to take the "transmission" of the forces from the grip to the tip and subsequently the line, into consideration. Let's imagine these forces that originate from the grip and are transmitted along the fibres towards the tip. The transmission takes place through fiction of the fibres and this is particularly evident in bamboo as the fibres overlap a great deal.

One these forces reach the ferrule, these are "downloaded" by the metal and then uploaded again in the fibres of the bamboo. This bottleneck does not affect the cast very much but a great deal of force is accumulated at the beginning of the ferrule "waiting" to be uploaded. The beginning of the ferrule on the butt section is the part that receives the most strain. The part where breakages usually happen.

Turning the hexagonal section

This is not an element to be forgotten. To insert the metal ferrule, you need to slightly turn the hexagonal section of the rod to remove the angles so that it will fit into the round ferrule.

Turning this part of the bamboo is an action which rodmakers do not like doing because it means removing the best part of the power fibres which are on the outer layer. Then if we consider that this operation is carried out in the spot where the greatest strain takes place, it is clear that we are creating an extremely weak spot.

So in summary metal ferrule have a series of strong points

1. They are or can be aesthetically pleasing to look at
2. They are strong
3. They are readily available without having to take the trouble to manufacture them
4. They are easy to fit

But they have a series of defects:

1. They are heavy
2. They are more rigid than the bamboo that the rod is made out of
3. They are an obstacle to the homogenous transmission of forces
4. You need to turn the rod in the point of maximum strain

If we consider the advantages against the defects, I believe that the latter are predominant on the former. This is compensated by the ease with which these can be found and the ease in fitting.

When I started with bamboo ferrules, I kept all these factors in great consideration so the answer to the question "why a bamboo ferrule?" the answer is simply because:

A bamboo ferrule can be as aesthetically pleasing and as valid as a metal one

1. A bamboo ferrule can be as strong as a metal one
2. A bamboo ferrule can be: or rather must be easy to make
3. A bamboo ferrule is always lighter that a corresponding metal one
4. A bamboo ferrule is not rigid like a metal one
5. A bamboo ferrule allows for a better and homogenous transmission of forces
6. A bamboo ferrule does not mean a reduction of power fibres.

I wrote this short report not to argue that an bamboo ferrule is better than a metal ferrule, but it is fair to give the reasons for their choices.

Alberto Poratelli

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FITCH

Fishing Big Bamboo in British Columbia

By Bob Clay

I started fishing for steelhead in British Columbia in the early 70s.

This was the time that fiberglass was the rod material of choice. Bamboo being heavier in the longer lengths was losing favor except by those that appreciated its sensitivity and reserve power.

One of my favorite rods at this time was an EC Powell 9 1/2 foot c taper 7/8. Being hollow built gave it a great advantage in such a long rod.

You could pick up a great deal of line and with a single back cast present your fly some 70 feet. In steelhead fishing where the casts are many and the fish few, this was a wonderful advantage.

In the eighties I meet Tom Morgan, who at that time owned Winston Rod Company.

Tom loved to steelhead fish and we formed a lasting friendship.

When I decided to make the jump from a lover of bamboo rods to a maker, it was Tom who offered his help.

He had a new idea for making bamboo rods and one winter he asked me to come down to Montana to help him out on his project.

At the time I knew nothing of building rods except from the books I had gathered. I told this to Tom but he said not to worry , he would direct me. At the time Tom was in the early stages of MS. He had sold Winston and was semi retired, but looking for something to keep him busy.

It turned out I was to be the braun and he was to be the brains in building the first handmill bed. Tom directed me and I tapped and drilled. Something I never had done before. T

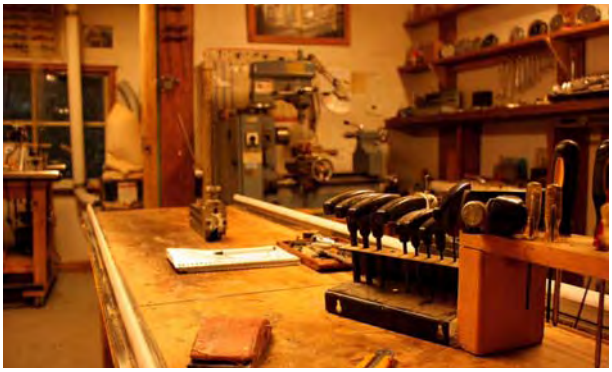
om knew where every tool in his well equipped shop was. I was careful to put it back in its exact place. I was starting to learn what kind of man Tom was and how his precise mind worked.

To say the least I was very impressed.

Over the next year I built my shop at home under Toms direction and the next winter I returned with the handmill bed to Toms in Montana. Tom had a machinist build a prototype of the first handmill and with the two pieces in place we cut the first strip. It worked!

Over the winter I would talk to Tom daily over the phone and as a result I built my first bamboo rod . A 8'9" 7/8 hollow fluted Winston tapered rod.

I can still remember the thrill of catching my first steelhead on it.



As I progressed as a rod maker the spey revolution was coming to North America. Long a favoured weapon in Europe, the advantages of the big rod was starting to be recognized on this side of the Atlantic. I became interested in making a bamboo spey rod and started doing my homework into the big rods of yesteryear.

I was not out to reinvent the wheel but learn from the rodmakers of past. Of their successes and failures to incorporate into my rods.

It was a struggle and many times I thought of giving it up. I wanted a easy casting lightweight durable rod that could handle a steelhead with ease.

From a bamboo rodmakers point of view these are the things I have learned so far.

- If you want to judge the rod you have made you better know how to cast it as spey rods are a completely different animal than a singlehanded rod.
- Having the right line is critical to making your rod cast . In single handed rods you often let out line to get the right load before releasing your line to accomplish the cast. With a spey rod there is no false casting. The rod must load and release on the first movement
- Metal ferrules are not what you want They do not bend in harmony with the bamboo and cause stress and failure of the bamboo.
- Lighter hollow rods move quicker than solid ones do and are more fun to fish
- Bamboo spey rod shine in the shorter lengths. As with single handed rods I find the under 8 foot rods compete well with rods of other material. In spey rod under rods of under 12 feet do well against rods of other materials. This is not to say that longer bamboo rods are not adequate .They have a certain rhythm of their own.
- No material other than bamboo transmits the power of the fish so directly to the flyfisher
- No other material is as beautiful as bamboo

Building bamboo spey rods will present some callanges to the rodmaker,but the rewards are great.

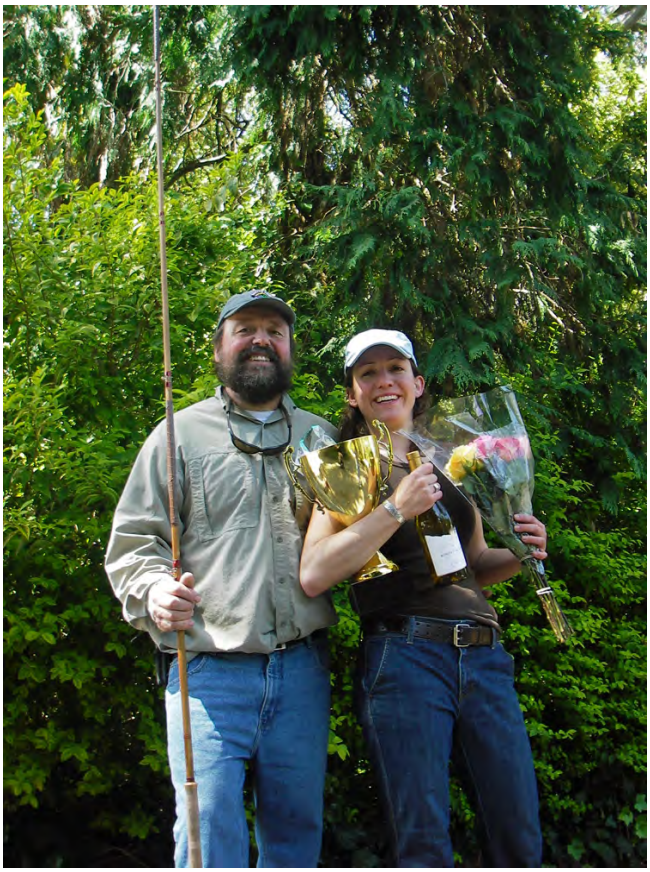
Bio

I was born in Treiste Italy in 1950 to an Italian mother and a British father.

We immigrated to Canada in 1952. I learned to fly fish on the Bow River in Alberta under the tutelage of Harry Honer.

I feel in love with steelhead and moved to B.C. where I met my wife Kathy and raised 4 children.

I became a fly fishing guide and later started to make bamboo rods



The appeal of seduction

By Giorgio Grondona

I cannot help myself; every time I leave the station and take the road that used to take me to my old High School, just past the bakery that today perfumes of bread and cakes like then, I look left to the window that was once the best hunting and fishing shop of the city.

That shop closed down thirty years ago but in my mind and in my eyes it is still there like the ones next door, a leather shop and a clothes shop that is still there, obviously with the time imposed changes and adaptations.

How many pauses in front of those windows, after school on the way to the station, an inevitable stop for my friends and me and while our eyes filled with rods and reels, baits and boots, the girls' filled with dresses and underwear, bags and shoes carefully exhibited.

Then on the train it was pleasant to listen to them planning the tactics to convince their parents that bags and shoes were worn out and that skirts and coats from the previous year were tight and it was even nicer to see them showing off something new.

It is common knowledge that adolescence is the period in our lives in which our preferences for the opposite sex are orientated...or rather, this happens for most but not all (a little confusion is some remains), in my case I must say that in that particular period of my life I was helped by Mother Nature who gave me the gift at birth of a "troop of hormones" with the hobby of fishing and orientating them towards beautiful women made me a man and a happy fisherman!!!

Going back to the joy of my female school friends when they showed off an item or accessory that enhanced their femininity, for me the joy was manifest when that same femininity was shown without too many veils or constrictions and when this was done on the banks of a river ... well, I think it is worth talking about in these pages where the topic is bamboo rods.

In the early 70's bamboo was the material most used to build fly fishing rods but other materials were spreading, first fibreglass and then carbon so on the same river one would see fishermen using rods in various materials and in this observation I began noticing the similarities (pardon the expression) between bamboo rods and women; in those years fly fishermen almost only used dry flies and preferably in summer that coincided with the school holidays, the period when the girls would accompany us to the river: we fished and they suntanned.

The sun that each day would make the skin of some of them very dark and in others it was a gold, warm and natural shade that brings to my mind the "wooden" rods called blonde or flamed according to the exterior appearance embellished by the tying of the guides, lacquered just like the nails, a typically female habit....

Some time ago, visiting Luciano Oltolini, I was fascinated by the beautiful agate stripping guides that Luciano makes, they are so perfect that seeing so many all together I could only see the various shades of the stone, from the delicate blue to the transparent grey, from the refined green to the elegant black, the warm hazel to the dark brown and couldn't help thinking of all the eyes of the women in which I had noticed the same web of colours.

Among fishing enthusiasts we often discuss rods and everyone agrees that they prefer instruments that cast a little further, a lighter tail because it is built in last generation graphite and finished with studied accessories that contribute to the performance, definitely not looking for the elegance of the finishings or the pleasure of using a nice rod and a little less "nervous".

Today those who fish with a bamboo rod do it with the same spirit as those who goes out to dinner with a "size 18" instead of a "size 14" sure that at the restaurant they will see her smile without fearing wrinkles, she will not refuse dessert because she is on diet and will be forgiven if he looks at the "sex bomb" sitting at the table in front, wanting a more sporty comparison I can think of the female athletes of the fast disciplines or those of the competitions of strength and resistance that must often sacrifice their femininity to obtain important results on the contrary of their colleagues that do artistic gymnastics or even more, synchronised swimming where beauty, grace and harmony at top level guarantee the same prestigious goals.

I don't think I am the only one with so much imagination. In my opinion when Giovanni Nese designed the flaming called "Turtle"(which I showed at the 2010 gathering) he was not thinking of a frame for glasses but rather something similar to the last photo of this article...

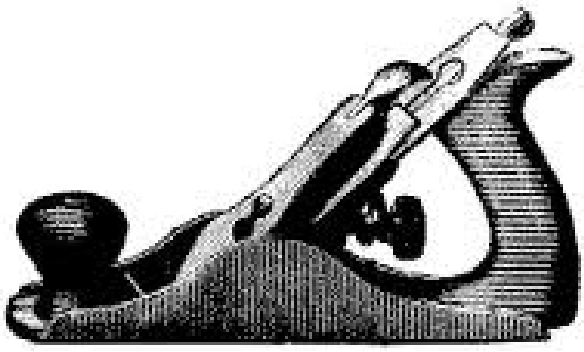
At this point I feel I should apologise to those who were hoping to read a technical or historical article, I am an apprentice rodmaker and so it is I that needs to learn from others. My apologies go above all to the women who will read these lines, they are merely a coarse attempt at trying to describe that fishing with a bamboo rod is as intriguing and fascinating as conversing with each and all of them.

De Planis

Comments on the tool

which best defines us

by Angelo Arnoldi



When a thinking being decides it is time for the big leap to rodmaking, he is faced with a long list of problems, the bamboo, the PF, the oven, the necessary know how... instead the plane is not an obstacle. He goes to a hardware store and buys a nice Stanley 9 1/2 and starts joyfully slicing bamboo strips. However, is this type of plane the only one suitable for our job? Is it the best choice?

Actually there is another type of instrument ideal for this purpose...the ordinary smoothing plane....the plane that comes for everyone's mind when uttered.

The dynamics of planing is a quite simple process composed of two phases: When the blade slides along a piece of wood or in our case, bamboo, the cutting action tends to separate the fibres.

These separated fibres, commonly known as shavings, are also formed by the lever action of the blade and thrown aside...

The planing process is as efficient as the cutting capacity of the blade, i.e. the more acute the bevel angle is the less energy is spent.

However an angle that is too acute will have difficulty to dissipate the heat that is generated in the process and even the best blades cannot bear an angle less than 20°...

Now, in the planing of bamboo or any other type of wood, a very negative and unfortunately, very common aspect that often forces us to throw away almost finished strips must be considered: It is called tear out...

Tear out occurs when the fibres split spontaneously without the plane, only by its lever action.

When this happens in bamboo, they proceed to break, causing a nice, very visible dent on the side of the strip, making it only good for walking sticks.

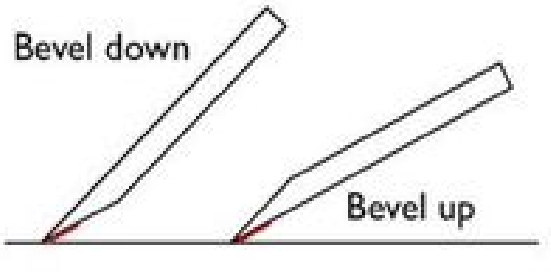
There are two ways to avoid or limit this problem: close the mouth of the plane as much as possible so that the bamboo in front of the blade is well compressed and decrease the exit angle of the shavings...

Back to our planes.

In rodmaking we mostly use a Stanley 91/2, it is a block plane. The name comes from the butcher block, the cutting board they were born to plane ...

Besides the shape and size, they have a fundamental difference compared to the smoothing planes, the carpenters' planes.

The former work "bevel up", the latter work "bevel down" i.e. with the chamfers on the upper part of the blocks, with the chamfers in the lower part of the smoothing.



Because the blade of a plane block is on a frog of about circa 20°, to have a good cutting angle (the pitch) and to plane well without tear outs, a hard and well defined essence like bamboo, a high grinding angle of at least 30° is needed.

The sum of the two angles, 20 of the frog and 30 of the grinding, gives a pitch of 50°, known as York pitch, which should also facilitate the sliding, without the risk of the shavings ...

This rather high cutting angle excludes the use of planes like the low angle block that with a frog of about 12° needs a very high grinding angle to be efficient.

Moreover, increasing the bevel angle increases the grinding difficulty and in turn increases the cutting resistance with the heating of the blade and loss of sharpness.

But this is not the case with the smoothing planes.

The cutting angle, the pitch is given only by the frog, the blade holder. It is usually 45° (common pitch) but there are as spare parts frogs of 50° (York pitch) or 60° (cabinet pitch). This angle is independent so the blades with more acute angles than the block planes can be sharpened (without overdoing it ....) and the planing is more efficient.

Another important characteristic of this type of plane is the counter iron (or chip breaker) that the block planes do not have.

It causes a large decrease of the exit angle of the shavings immediately after their cutting, thus decreasing the danger of tear out. The combination of the depth of the cut, the regulation of the opening of the mouth (that these planes have too) and of the counter iron contributes to the result of a work well done ...

So why does everyone use the block planes?

Quite simply, the smoothing planes work better but they have defects that block planes do not have.

Firstly they are big and heavy. If weight is an advantage in terms of stability, the bulk is a nuisance, above all at the start of the strip. There are even very small sizes (the Lie Nielsen n1 is 14 cm long....), but they look more like toys than working tools ...

But the biggest defect is another...they need two hands and all the best rodmakers hold the strip with one hand and plane with the other ... few use vices to hold the strip ...

I think this is the biggest handicap that limits their use in rodmaking...

This is how I do it …

by Andrea Ferranti

It is an article dedicated to the simple and practical things that do not always belong to all rodmakers. With these simple notes we want to help beginners who would like to know more.

Also, we are waiting for contributions, requests and articles from those who have perhaps seen something important to share with those who have our passion or have something in particular to ask.

Let's start with the first contribution:

Splitting our tip.

To hold the first pole of bamboo in your hand is very exciting but the doubts begin on how to proceed to obtain trips and uniform as possible and of the right number.

We'll begin with the number: theory says 24 strips is the right number and it is certainly a good choice but ..... before setting off to obtain this result observe the tip well to evaluate if the result is feasible or if you are risking to make irreparable damage.

The first parameter to consider is the diameter of the tip, so you can determine if it is possible to have 24 strips from it. I think from 6 centimetres and above we can surely obtain 24 strips. Observe then for signs of twigs or leaves stripped from the tip that will make some of them unusable. Look for pre-existing breakages and how to include them in the division.

If there is only one breakage, perhaps all along the tip, it will be easy to use it in the procedure.

If there are various the process is more difficult.

I use a stripper with six blades and with the first passage I get 6 big strips. Then with two more passages I get 12 and finally 24 strips. Among these I then look for those without signs of twigs or leaves and I try to get at least 18 good pieces. I leave three or four aside for substitutions I may need during the process.

But let's try to understand what is really important in this phase of our work.

We know that we must obtain triangular strips, possibly with 60° perfect angles, so it is important to start the shaping of our strips well. In other words: if the section of a strip has a very rhomboidal shape with two angles of 60° and two of 120°, it will take a lot of effort to have a triangle with three 60°angles.

If the shape of the section of the strip is square with angles of about 90°, it will be easier to "work" for our purpose. Moreover, when we straighten our strips after heating them and putting them in a vice, they will be much easier to work if they are almost square.

What is the process to have angles of about 90°?

If we start by using a splitter the result of the first passage will be acceptable, then it is up to us to obtain the right angles. If, like me, you use a knife gripped in a vice, or a similar accessory, the secret lies in crushing the strip you are working against the jaws of the vice. Keeping them close to the flat surface of the vice, the knife (or nail) you are using will naturally produce a 90°angle.

Abnormal angles, i.e. very different from 90° result from the fact that the bamboo is not placed on the working bench properly; in this case the jaws of the vice. In this case you will need to exert a strong pressure on the strip to keep it close.

If there are small discrepancies I make a few side passages with the plane (with a lot of iron) to have a section that is as square as possible.

From this point on the roughing work with a wooden plane will be easier and you will have better results.

Good luck, Jack


6


12


24

Lapping Films

di Angelo Arnoldi

Although, as Ron Hocs, the famous manufacturer of plane blades says, planing is a type of interior meditation in contemplation of the work to do, there is no denying that many rodmakers, including me, see this operation as a waste of time in relation to the work that needs to be done, but it has to be done...

For a clean planing, the iron of the plane must obviously have an angle as acute as possible to penetrate the bamboo fibres without effort, so it must be sharpened often.

To reach this result many different procedures are used, essentially whetstones, various stones, Japanese, from Arkansas and sanding papers.

The latter simple system consists of passages with finer and finer sandpaper until a satisfactory result is obtained. It is widely used because of the availability and low cost of sandpaper.

However, in recent years sandpaper in sheets has appeared on the market and it can be used very effectively to have very sharp tools.

They are called lapping films and they were born for purposes very different from the sharpening of tools for woodworking. They were created for shining the terminals of optic fibres but also for the finishing touches to computer fixed disks and various finishings of other electronic components, including mobile phones...

Although they are very similar to sandpaper, they are completely different.

Sandpaper has a paper or cloth substrate to which abrasive granules are attached with glue.

Lapping films are a polyester film in which abrasive granules are inserted all facing the same direction.

When you hold it in your hand, you immediately notice the almost non-existent thickness. The one I have is just over 3 thousandths of an inch...

Because of the ever increasing market they were designed for, optic fibres and electronics, there are various types according the work needed, with differences in the substrate, that can be hard or soft, the glue but above all in the abrasive used.

Most of the known abrasives are used, diamond powder, aluminium oxide, silicon carbide, cerium oxide, chromium oxide, silicon oxide.

Obviously there are sheets with granular abrasive of different sizes, from 60 micron to 0, 05 micron and if you consider that the micron is a thousandth of a millimetre, you can understand how much technology there is behind these products.

There are various manufacturers: Mipox Co Jp, Micro Mesh, Norton Abrasives, Moyco Precision Abrasives and many others but 3M, the large multinational from Minnesota specialised in adhesives, has the lion's share.

While in the USA they are very successful in woodworking and originating a sharpening system called scary sharp, in Europe they are less known because they are difficult to find.

However, I have the fortune of living in a city where the art of building musical instruments, mainly violins (Stradivarius was born here), is widely practiced and I found them in a shop specialised in equipment for violin makers but popular in woodworking too.

The shop, Cremona Tools, sells various grades of 3M film with the code 261X.

The abrasive used in these types of sheets is alumina, allotropic state of dialuminium trioxide, known as corundum or with the archaic name of emery, a very hard material suitable for sharpening blades.

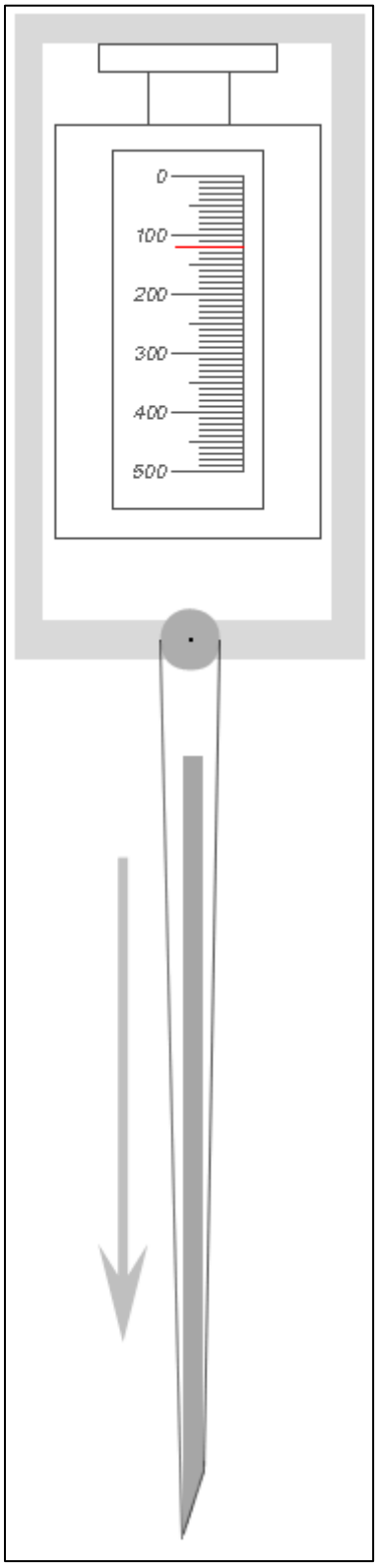
As with sandpaper the sheet is fixed to a flat support but with lapping films, considering how thin they are, the support must be really very flat and I can only recommend a nice glass plate for this system....

After wetting the sheet to avoid overheating the blade, which is very detrimental, we can start, first with a sheet of 30 micron and then of 9...

It was a very quick, clean and neat job

In a very short time, less than three minutes I have a sharp blade....

Unfortunately to measure if a blade is sharp or not is not very simple, one would need the following tool ...

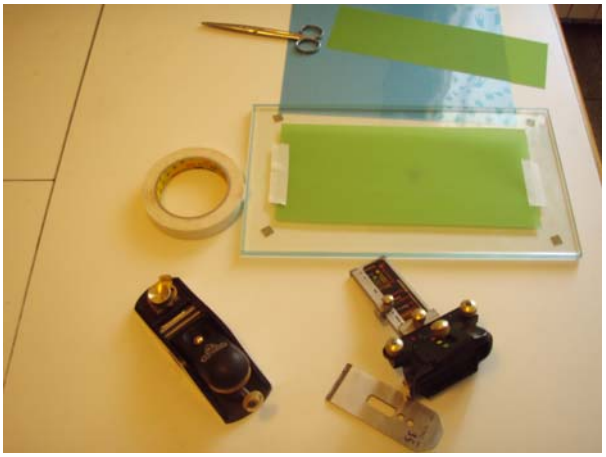


not easy to find. The system of the arm hairs seems to be too empirical to be a hard fact. Anyway, the results obtained by these types of sheets are better than expected.

Their diffusion in woodworking overseas is fully justified and the statement that once you have tried them you never let them go seems true...

An interesting fact: A while back I saw a film on the Internet about a guy cutting a hair longitudinally with a knife while holding one end with his fingers ...

Unfortunately he did not specify how he had sharpened his knife ...pity.



Sleeve-Spigot Carbon-Fiber Ferrules

by

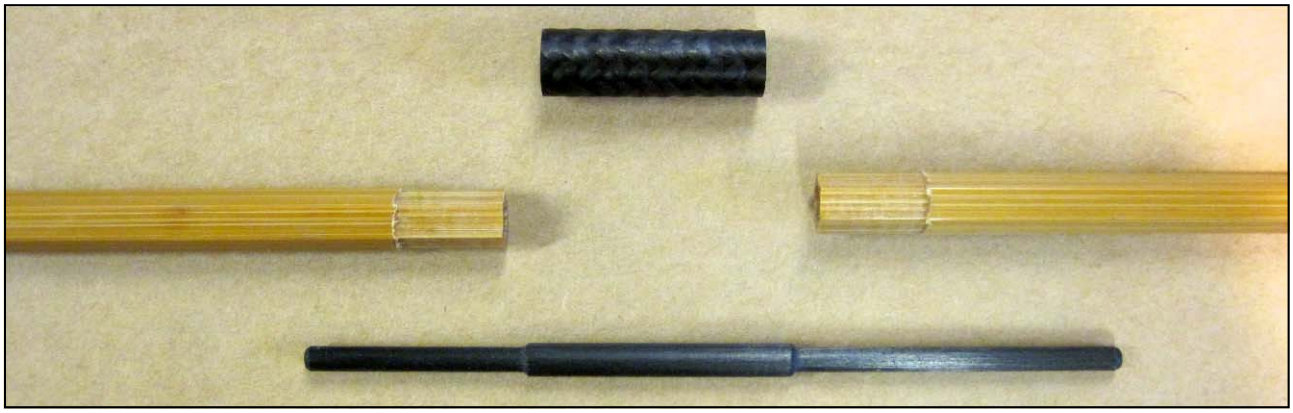
Tim Anderson

I have previously written about my spigot ferrules, using a carbon-fiber spigot, for cane rods (IBRA Bamboo Journal #7). Since then, I have developed a new, and I believe superior, carbon-fiber ferrule using an internal spigot together with an external, carbon-fiber sleeve.

Before getting into the construction of the new sleeve-spigot ferrules, let's look at some of the reasons for such carbon -fiber ferrules. The primary advantage is weight. They are lighter than ferrules made of nickel silver or other metals, so they add less swing weight to the rod. As a result, pleasant-to-cast, multi-piece rods are easier to build with carbon -fiber ferrules. A second advantage is that they flex slightly. That flex is not as much as cane without a ferrule, but is still more than the flex of metal ferrules. A third advantage is that the flats (and guides) of the rod are held in alignment when casting and fishing.

Incorporating my new sleeve-spigot carbon-fiber ferrules in a rod is quicker and easier than the spigot ferrules I built previously and I probably will no longer build rods with the older design. My methods are certainly not the only ones for making carbon-fiber ferrules. That said, these methods do yield an effective and unobtrusive ferrule.

The pictures below show the components (two sections of rod blank, carbon-fiber sleeve, and carbon-fiber spigot) of my sleeve-spigot carbon-fiber ferrule.

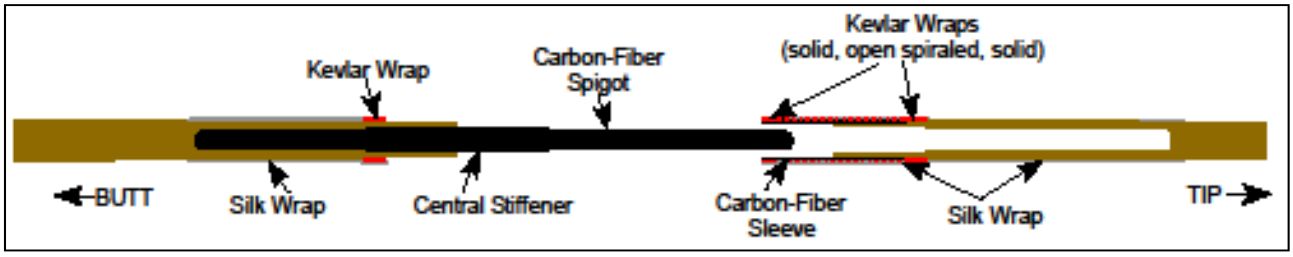


The carbon-fiber sleeve is made from biaxial, woven, carbon-fiber-cloth tube (the tube looks like a Chinese "finger puzzle") molded into a rigid hexagonal tube using epoxy. The mold mandrel is an Allen wrench. The sleeve aligns the rod's flats and is 0.8 inches (2 cm) long.

The spigot and its central stiffener are round (in cross-section) so the holes for them in the rod blank can be drilled on a lathe after the blank is glued up. The flats under the sleeve are cut down slightly.

The spigot is epoxied into the drilled hole on the spigot (butt) side. One-half of the sleeve is epoxied over the socket (tip) side. I fit the socket (tip) side to the spigot (butt) side using a 5-minute epoxy method (described later).

Here is a to-scale, cross-sectional drawing of a completed ferrule.



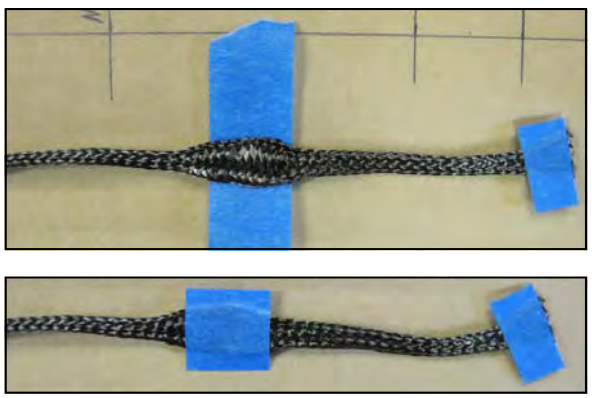
Below are pictures of a 4-piece, 8-foot, 5 weight rod and its three ferrules. The carbon-fiber sleeves are painted bamboo color under the wraps.

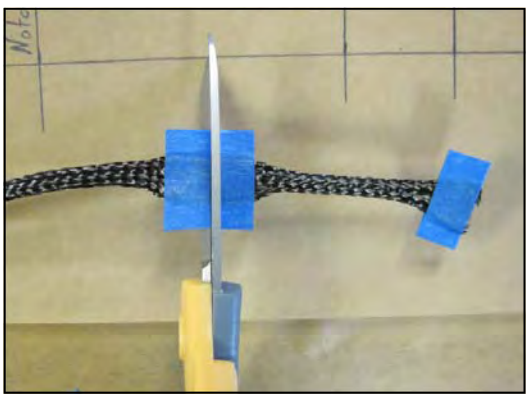
The carbon-fiber sleeves for all sizes of ferrules are 0.8 inches (2 cm) long and all the central stiffeners are 1.0 inch (2.54 cm) long. The stiffener extends beyond each end of the sleeve, just past the area where the rod's flats are cut down slightly for the sleeve. Kevlar and silk wraps add hoop strength for the entire ferrule and prevent splitting of the bamboo along the blank away from the cut-down area. Spigot diameters and lengths and sleeve sizes (based on flat-to-flat taper dimensions) are given in the tables at the end of this article.

The transitions from smaller diameter spigot to larger diameter stiffener to sleeve-plus-stiffener are intended to give gradually increased stiffness towards the center of the ferrule. The butt end of the smaller diameter part of the spigot is shorter (than the tip end) because it is epoxied into the blank and the tip part is longer to provide sufficient friction (within its socket) to hold the rod sections together when casting and fishing.

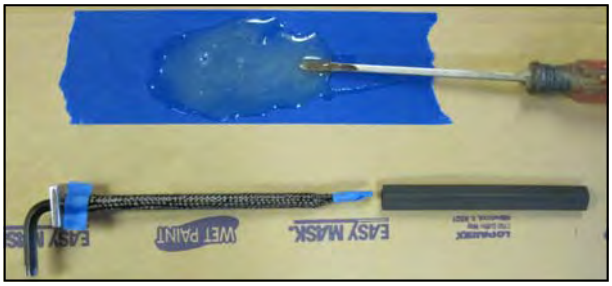
As mentioned, the carbon-fiber sleeves are molded from carbon-fiber cloth tubes and epoxy over various sizes of Allen wrenches. I use both inch and metric Allen wrenches. (As an aside, the flat-to-flat dimensions of Allen wrenches are slightly less than their nominal sizes.) The epoxy I use is UHU Plus Endfest 300, the same epoxy I use for gluing my rod blanks.

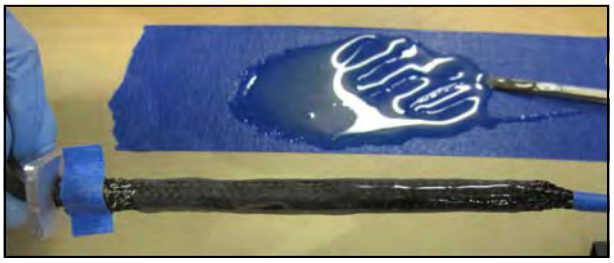
To prevent the carbon-fiber cloth tube from unraveling when cut, I tape over it and cut in the middle of the folded over tape. The tube is expanded under the tape to ease sliding over the mandrel. These pictures show the method.





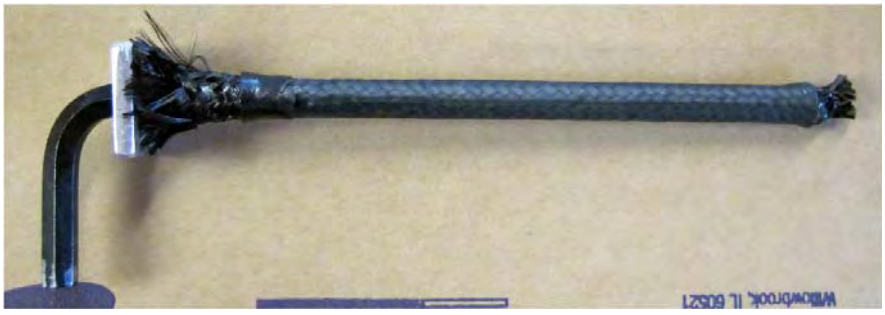
To allow removal of the sleeve-blank from its Allen-wrench mandrel, I melt beeswax onto the Allen wrench, rub that down so that a uniform coating remains, and then spray liberally with a good-quality mold release. These pictures show the first steps in making the blanks for the sleeves.





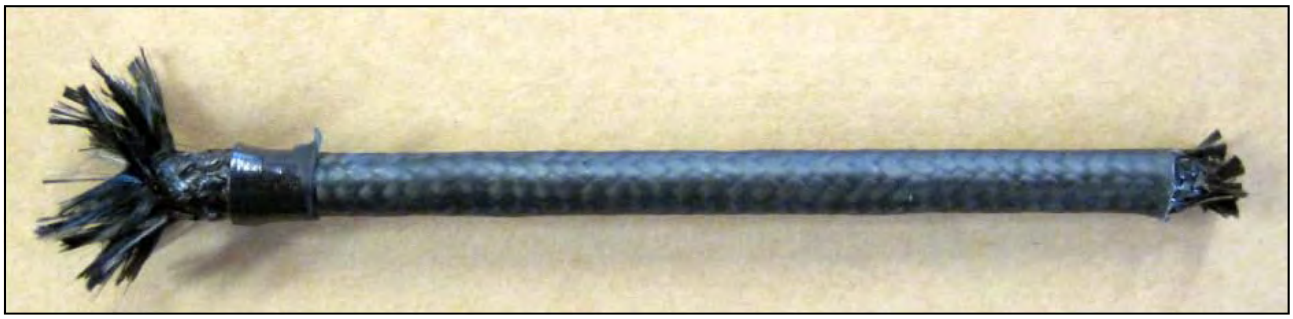
The carbon-fiber tube is slipped onto the mandrel and epoxy is applied. To help the epoxy soak into the carbon-fiber cloth, I heat it gently (after application) with a heat gun set to 300° F (150° C). Heat-shrink tubing slipped over the epoxy-soaked carbon-fiber is heated and shrunk from the center out, squeezing out excess epoxy. The taped together end (right end in the photos) of the carbon-fiber cloth tube makes it easy to stretch the cloth over the Allen-wrench mandrel. That end is kept free of epoxy.

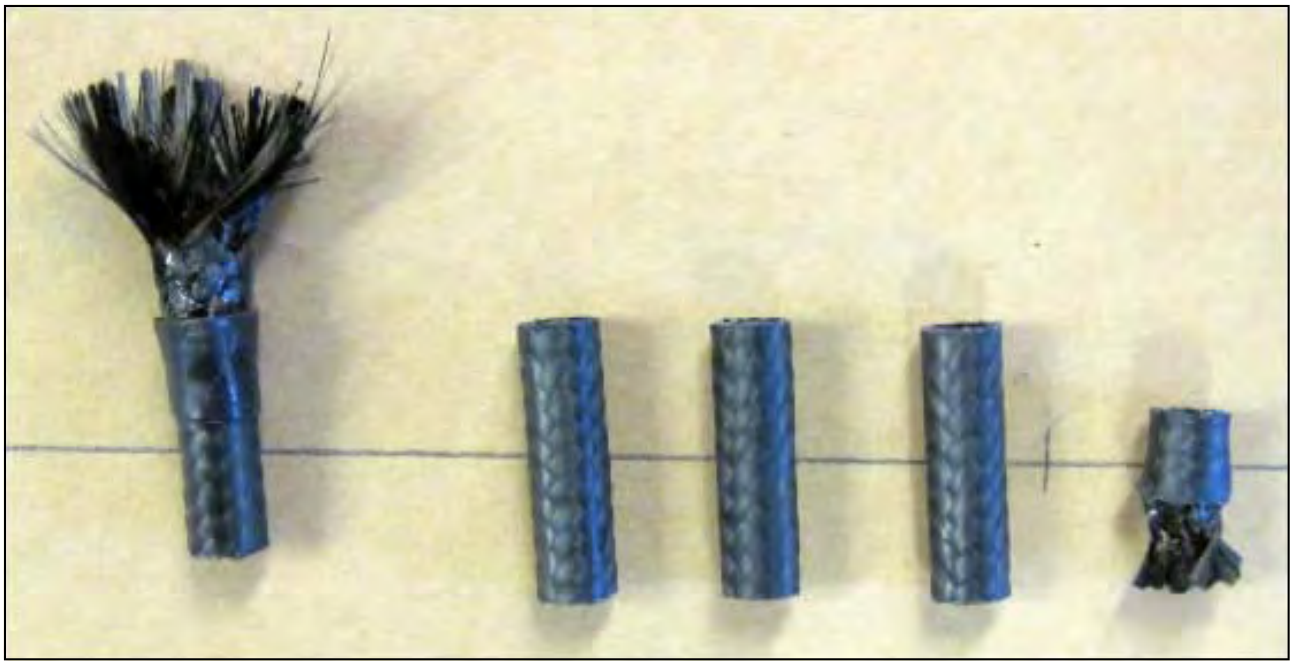
After the epoxy hardens, the heat-shrink tubing is removed.



With the Allen-wrench mandrel very lightly gripped in smooth vise jaws (so that it can slip down when hit), it is driven out of the sleeve with a pin punch and hammer. The little aluminum plate helps hold the sleeve blank while the mandrel slides out.

The result is a sleeve blank which is then cut (a dull razor saw works well) to yield the sleeves.



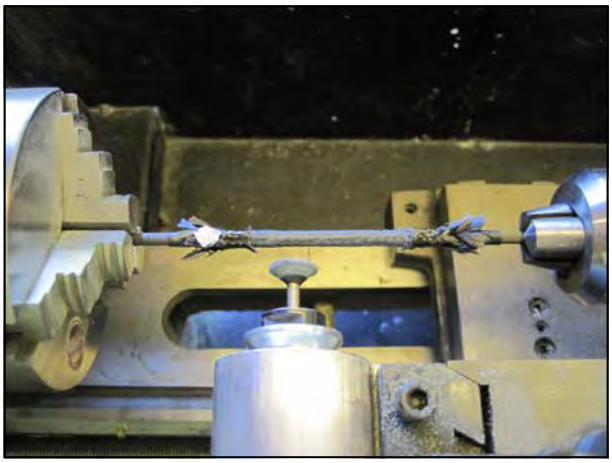


I clean the inner surfaces of the sleeves with alcohol to remove all remnants of mold release and beeswax and then heat them in an oven to heat-set the epoxy. The sawed ends of the sections are rough, so, after heat-setting, I grind them smooth on a coarse diamond sharpening "stone."

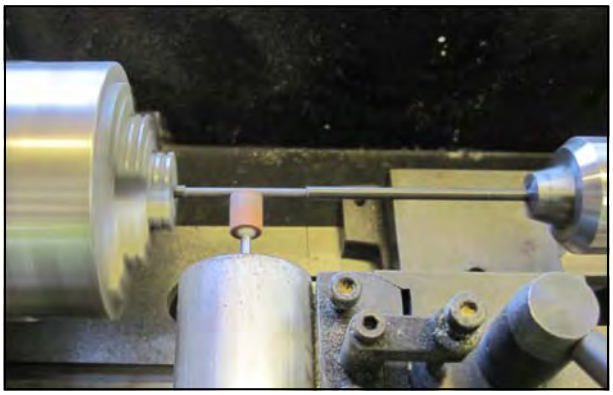
I paint the completed sleeves, if they are to have a bamboo color, with a 50-50 mix of Floquil Reefer Yellow and Floquil Rust paint.

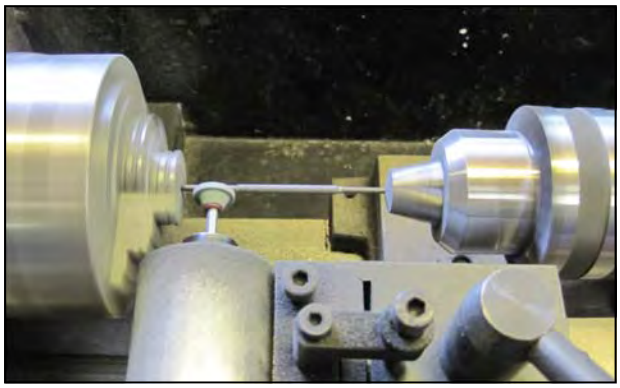
The spigots-plus-stiffeners can either be turned out of solid, unidirectional carbon-fiber rod (left picture) or can made by overlaying carbon-fiber cloth tube on unidirectional carbon-fiber rod (right picture).The spigots-plus-stiffeners can either be turned out of solid, unidirectional carbon-fiber rod (left picture) or can made by overlaying carbon-fiber cloth tube on unidirectional carbon-fiber rod (right picture).

So far, I have primarily used the overlay methods.
Here are some pictures of the overlay process.



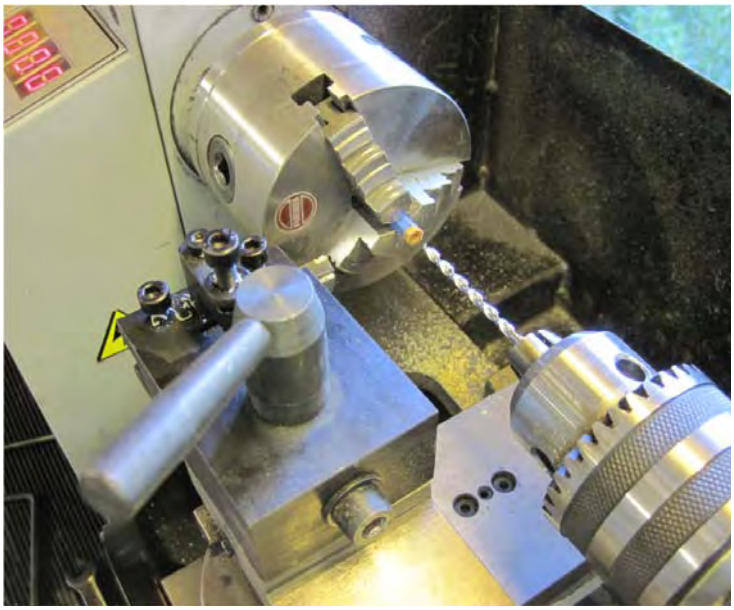
For either type of stiffener, I cut them to proper diameter with an abrasive wheel in the handpiece of a Foredom-Tool mounted in the tool holder of my lathe. A Dremel tool would also work.



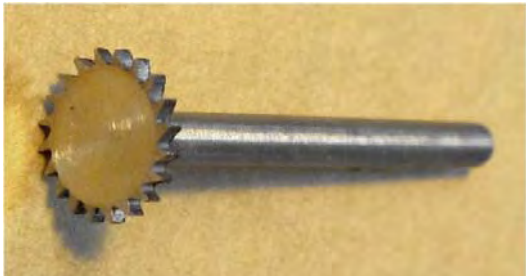


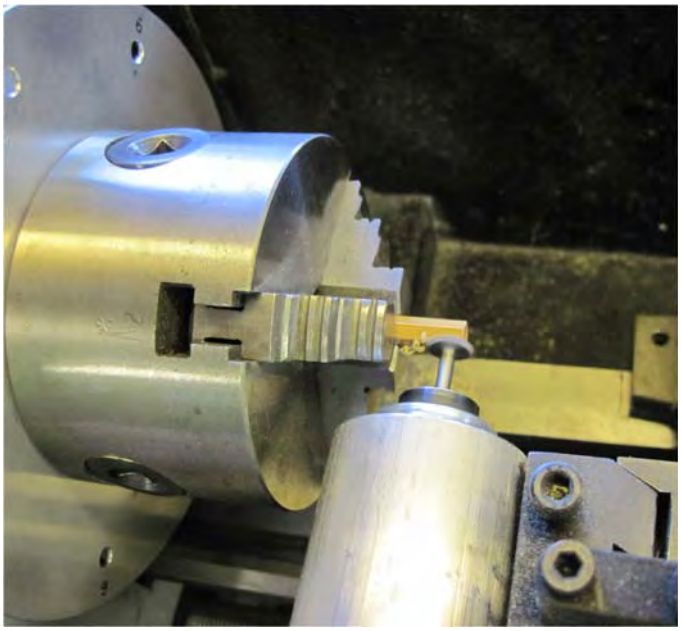
Carbon fiber has an amazing ability to dull steel or carbide lathe bits. I have found milling with abrasive wheels (in conjunction with a lathe) much easier and faster than using conventional lathe bits. The ends of the abrasive wheels should be hollow ground so that their centers do not touch the carbon fiber being cut.

Drilling straight and properly aligned sockets for the spigots can be difficult. Before glue-up of the blank, I cut the apices of the strips to form a pilot hole for the sockets. After the blank is glued-up, I drill the spigot holes with the lathe using successively larger bits to keep the holes as straight in the blank as possible. The holes should end up slightly oversize so that the spigots slip in easily. I then glue (with UHU Plus Endfest 300) the appropriate carbon fiber spigot into the hole on the spigot side of the blank.



The Foredom handpiece in the lathe's tool holder cuts the flats of the bamboo blank slightly down for the sleeves. The lathe does not turn and a small circular saw in the Foredom handpiece cuts the flats. I have made an indexing plate for the lathe chuck and it provides for quick and accurate alignment of the bamboo-blank's flats with the saw.





The circular saw is sold for Dremel Tools and I hollow grind it to provide clearance.

Hollow grinding is achieved by mounting and rotating the saw in the lathe and grinding out the center with an abrasive bit in the Foredom handpiece held (by hand) against the center part of the saw blade.

After the flats are cut, I once again use alcohol to clean any remnants of mold release from the inside of the sleeve and then slightly roughen the inside with a square needle file. After cleaning and roughing, I epoxy the sleeve (with UHU Plus Endfest 300) into place on the socket end of the blank.

After the epoxy is hard, it is necessary to remove the excess in the socket so that the spigot end of the blank slides easily into place. The round part of the sockets can be cleaned out with appropriately sized drill bits. Good for cleaning out the hexagonal sleeve is a square needle file with the tip broken off and ground into a chisel shape as shown in the picture.

I fit the spigot into the socket using 5-minute epoxy, resulting in a perfect fit. As preparation, I apply beeswax and mold release (as done with the mandrels for the carbon-fiber sleeves) on the spigot side and carefully bind the socket side of the blank with masking tape so that it does not split during the fitting process. I put mixed 5-minute epoxy into the socket, gently and briefly heat the socket with a heat gun so that the epoxy is very fluid, and push the spigot side firmly into place. After about one hour, I gently heat the socket area with a heat gun (set at about 300° F/150° C), pull the ferrule apart, and immediately push it back together. I let that sit for about 12 hours (the epoxy is now very hard) before disassembly and cleanup. The first disassembly after 12 hours commonly requires gently heating the joint again. Beeswax and mold release can be cleaned out of the socket with alcohol.

The ferrules are completed by wrapping with kevlar and silk as shown in the cross-sectional drawing near the beginning of this article. Some additional fitting after the ferrules are wrapped may be needed to relieve tightness. I suspect that the kevlar and silk wraps slightly compress the sleeve and stiffener areas of the socket side. If fitting is necessary, I take a very small amount of material off the stiffener and cut-down bamboo portions of the spigot side. The smaller diameter part of the spigot almost never needs additional fitting. I lubricate the ferrules with beeswax, making sure there is no buildup at the step-ups to the stiffener and to the cut-down part of the blank.

As already mentioned, there are other methods of producing carbon-fiber ferrules. I probably will continue to experiment and encourage others to do so, too!

Sources (in the United States) of materials:

Solid carbon-fiber rod:

http://www.dragonplate.com/ecart/categories.asp?cID=18

http://www3.towerhobbies.com/cgi-bin/WTI0095P?FVSEARCH=carbon+fiber+rod&search=Go

Carbon-fiber cloth tube:

http://www.solarcomposites.com/composites/carbon%20fiber%20sleeves.html

http://www.cstsales.com/carbon_braid.html

Taper at Ferrule Flat-to-Flat (inches)	Carbon Fiber Rod Diameter (inches)	Carbon Fiber Stiffener Diameter (inches)	Hex Sleeve Size-Inside Flat-to-Flat (inches)	Nominal Allen Wrench Size	Female Spigot Length (inches)	Male Spigot Length (inches)	Total Spigot Length (inches)
0.144	0.070	0.098	0.133		1.657	1.268	2.925
0.146	0.071	0.099	0.136		1.660	1.271	2.931
0.148	0.071	0.100	0.138	9/64 inch	1.664	1.274	2.938
0.150	0.072	0.101	0.140		1.667	1.277	2.944
0.154	0.074	0.102	0.145		1.674	1.283	2.957
0.158	0.075	0.104	0.150		1.681	1.289	2.970
0.162	0.076	0.106	0.154	5/32 inch	1.688	1.296	2.983
0.164	0.077	0.106	0.156	4 mm	1.691	1.299	2.990
0.168	0.078	0.108	0.161		1.698	1.305	3.003
0.172	0.080	0.110	0.165		1.705	1.311	3.016
0.176	0.081	0.111	0.170		1.712	1.317	3.029
0.180	0.083	0.113	0.174		1.719	1.323	3.042
0.184	0.084	0.115	0.178		1.725	1.329	3.055
0.188	0.085	0.116	0.182		1.732	1.335	3.068
0.192	0.087	0.118	0.186	3/16 inch	1.739	1.341	3.081
0.196	0.088	0.120	0.190		1.746	1.347	3.094
0.200	0.090	0.121	0.194	5 mm	1.753	1.354	3.107
0.204	0.091	0.123	0.198		1.760	1.360	3.119
0.208	0.092	0.125	0.202		1.767	1.366	3.132
0.212	0.094	0.127	0.206		1.773	1.372	3.145
0.216	0.095	0.128	0.210		1.780	1.378	3.158
0.220	0.097	0.130	0.213		1.787	1.384	3.171
0.224	0.098	0.132	0.217	7/32 inch	1.794	1.390	3.184
0.228	0.099	0.134	0.221		1.801	1.396	3.197
0.232	0.101	0.135	0.224		1.808	1.403	3.210
0.236	0.102	0.137	0.227		1.815	1.409	3.223
0.240	0.104	0.139	0.231		1.822	1.415	3.236
0.244	0.105	0.141	0.234	6 mm	1.828	1.421	3.249
0.248	0.106	0.143	0.237		1.835	1.427	3.262
0.252	0.108	0.145	0.241		1.842	1.433	3.275
0.256	0.109	0.147	0.244		1.849	1.439	3.288
0.260	0.111	0.148	0.247		1.856	1.445	3.301
0.262	0.111	0.149	0.248	1/4 inch	1.859	1.448	3.308
0.266	0.113	0.151	0.251		1.866	1.454	3.321
0.270	0.114	0.153	0.254		1.873	1.461	3.334
0.274	0.116	0.155	0.257		1.880	1.467	3.347
0.278	0.117	0.157	0.260		1.887	1.473	3.360
0.282	0.118	0.159	0.262		1.894	1.479	3.373
0.284	0.119	0.160	0.264		1.897	1.482	3.379
0.288	0.120	0.162	0.266		1.904	1.488	3.392
0.292	0.122	0.164	0.269		1.911	1.494	3.405
0.296	0.123	0.166	0.272		1.918	1.500	3.418
0.300	0.125	0.168	0.274	7 mm	1.924	1.506	3.431
0.302	0.125	0.169	0.275		1.928	1.510	3.437
0.308	0.127	0.172	0.279		1.938	1.519	3.457
0.314	0.130	0.175	0.282		1.948	1.528	3.476
0.320	0.132	0.178	0.285		1.959	1.537	3.496
0.326	0.134	0.181	0.288		1.969	1.546	3.515
0.332	0.136	0.184	0.291		1.979	1.555	3.535
0.338	0.138	0.188	0.294		1.990	1.565	3.554
0.344	0.140	0.191	0.297		2.000	1.574	3.574
0.350	0.142	0.194	0.300		2.010	1.583	3.593
0.356	0.144	0.197	0.302		2.021	1.592	3.613
0.362	0.146	0.201	0.304		2.031	1.601	3.632
0.368	0.148	0.204	0.306		2.041	1.610	3.651
0.374	0.151	0.207	0.308		2.051	1.620	3.671
0.380	0.153	0.211	0.310		2.062	1.629	3.690
0.386	0.155	0.214	0.312	5/16 inch	2.072	1.638	3.710
0.388	0.155	0.215	0.313	8 mm	2.075	1.641	3.716
0.394	0.158	0.219	0.314		2.086	1.650	3.736
0.400	0.160	0.222	0.315		2.096	1.659	3.755

Taper at Ferrule Flat-to-Flat (mm)	Carbon Fiber Rod Diameter (mm)	Carbon Fiber Stiffener Diameter (mm)	Hex Sleeve Size-Inside Flat-to-Flat (mm)	Nominal Allen Wrench Size	Female Spigot Length (mm)	Male Spigot Length (mm)	Total Spigot Length (mm)
3.66	1.78	2.50	3.38		42.08	32.21	74.29
3.71	1.80	2.52	3.44		42.17	32.29	74.46
3.76	1.81	2.54	3.51	9/64 inch	42.26	32.36	74.62
3.81	1.83	2.56	3.57		42.34	32.44	74.79
3.91	1.87	2.60	3.68		42.52	32.60	75.12
4.01	1.90	2.64	3.80		42.69	32.75	75.44
4.11	1.94	2.68	3.92	5/32 inch	42.87	32.91	75.77
4.17	1.96	2.70	3.97	4 mm	42.95	32.98	75.94
4.27	1.99	2.74	4.09		43.13	33.14	76.27
4.37	2.03	2.78	4.20		43.30	33.29	76.60
4.47	2.06	2.83	4.31		43.48	33.45	76.93
4.57	2.10	2.87	4.42		43.65	33.61	77.26
4.67	2.13	2.91	4.53		43.83	33.76	77.59
4.78	2.17	2.95	4.63		44.00	33.92	77.92
4.88	2.20	3.00	4.74	3/16 inch	44.18	34.07	78.25
4.98	2.24	3.04	4.84		44.35	34.23	78.58
5.08	2.28	3.08	4.94	5 mm	44.52	34.38	78.91
5.18	2.31	3.13	5.04		44.70	34.54	79.23
5.28	2.35	3.17	5.14		44.87	34.69	79.56
5.38	2.38	3.21	5.23		45.05	34.85	79.89
5.49	2.42	3.26	5.33		45.22	35.00	80.22
5.59	2.45	3.30	5.42		45.40	35.16	80.55
5.69	2.49	3.35	5.51	7/32 inch	45.57	35.31	80.88
5.79	2.52	3.39	5.60		45.74	35.47	81.21
5.89	2.56	3.44	5.69		45.92	35.62	81.54
5.99	2.60	3.49	5.78		46.09	35.78	81.87
6.10	2.63	3.53	5.86		46.27	35.93	82.20
6.20	2.67	3.58	5.95	6 mm	46.44	36.09	82.53
6.30	2.70	3.63	6.03		46.62	36.25	82.86
6.40	2.74	3.67	6.11		46.79	36.40	83.19
6.50	2.77	3.72	6.19		46.96	36.56	83.52
6.60	2.81	3.77	6.27		47.14	36.71	83.85
6.65	2.83	3.79	6.31	1/4 inch	47.23	36.79	84.01
6.76	2.86	3.84	6.38		47.40	36.94	84.34
6.86	2.90	3.89	6.45		47.57	37.10	84.67
6.96	2.93	3.94	6.53		47.75	37.25	85.00
7.06	2.97	3.99	6.60		47.92	37.41	85.33
7.16	3.00	4.04	6.67		48.10	37.56	85.66
7.21	3.02	4.06	6.70		48.18	37.64	85.83
7.32	3.06	4.11	6.77		48.36	37.80	86.16
7.42	3.09	4.16	6.83		48.53	37.95	86.49
7.52	3.13	4.22	6.90		48.71	38.11	86.82
7.62	3.16	4.27	6.96	7 mm	48.88	38.26	87.14
7.67	3.18	4.29	6.99		48.97	38.34	87.31
7.82	3.24	4.37	7.08		49.23	38.57	87.80
7.98	3.29	4.45	7.17		49.49	38.81	88.30
8.13	3.34	4.53	7.25		49.75	39.04	88.79
8.28	3.40	4.61	7.33		50.01	39.27	89.29
8.43	3.45	4.69	7.40		50.28	39.51	89.78
8.59	3.50	4.77	7.47		50.54	39.74	90.28
8.74	3.56	4.85	7.54		50.80	39.97	90.77
8.89	3.61	4.93	7.61		51.06	40.20	91.26
9.04	3.66	5.01	7.67		51.32	40.44	91.76
9.19	3.72	5.10	7.73		51.58	40.67	92.25
9.35	3.77	5.18	7.78		51.84	40.90	92.75
9.50	3.82	5.27	7.83		52.11	41.14	93.24
9.65	3.88	5.35	7.88		52.37	41.37	93.74
9.80	3.93	5.44	7.92	5/16 inch	52.63	41.60	94.23
9.86	3.95	5.47	7.94	8 mm	52.72	41.68	94.40
10.01	4.00	5.55	7.98		52.98	41.91	94.89
10.16	4.05	5.64	8.01		53.24	42.15	95.38

Alberto Rey

Was born in Havana, Cuba but currently resides in western New York where he is an Orvis Endosed Guide who specializes in fly fishing for steelhead.

He is also a Distinguished Professor in the Department of Visual Arts and New Media at the State University of New York in Fredonia and is also the Founder and Director of The S.A.R.E.P. Youth Fly Fishing Program.

His artwork is in over 20 museum collections and is regularly featured in Gray's Sporting Journal and many other fly fishing magazines.

He is currently working on a new educational initiative to introduce fly fishing into schools across the United States (www.childreninthestream.com).

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Bamboo rod of Walter Brunner

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