
making and using a

Finishing Spatula

There is a proper tool for every job. When it comes to applying epoxy thread wrap coatings, a specially shaped spatula may well be the correct tool.

by Ralph O'Quinn

How many of you out there were building rods in the middle 70's and before? I'm getting to the stage of life where a lot of things just ain't what they used to be and memory is one of them! But it was about this time in history that a marvelous revolution in rod building first appeared. The advent of the epoxy polymer rod finish was truly revolutionary, but was not recognized as being so at the time. Part of this was due to the less than satisfactory resins that were initially introduced but mostly it was due to the very difficult time that most rod builders had in trying to utilize these resins. The horror stories from those days makes one wonder how epoxy thread wrap finish ever survived and prospered. Not just from the standpoint of the individual rod builders, but also from some of the commercial rod companies.

I remember that the first product labeled for rodbuilding that I thought was on the right track was a product called Diamond Coat. It was followed a bit later by an even better product called Diamond 2. A fellow down in Texas named Gene Bullard marketed these. With the eventual closing of his company, Bullard Tackle, this particular rod wrap finish disappeared in the mid to late 1980's. It wasn't very long afterwards before Flexcoat came onto the scene and it remains the major player in the industry today.

Paints Versus Epoxies

Before Diamond coat and Flexcoat there was nothing out there except varnish and lacquers. The concept of completely covering the threads was not yet invented. We coated the threads. Two coats, three coats, four coats, whatever, but the threads were never completely covered. Of course this meant the threads were subject to abrasive damage which made a good case for the large size D and E threads on salt water rods.

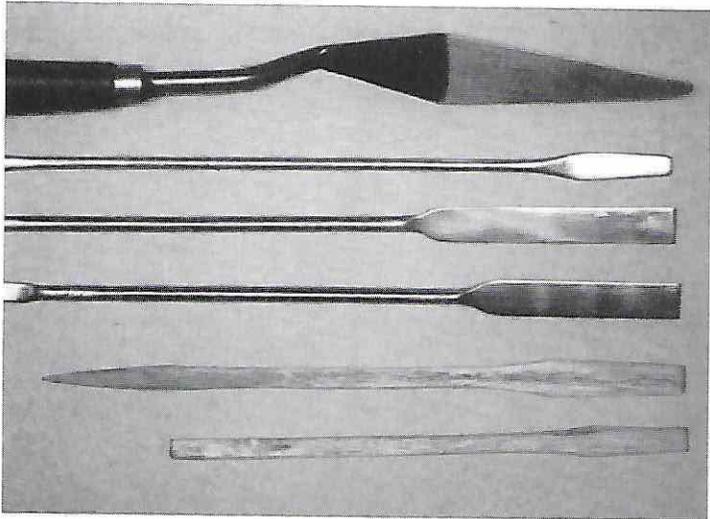
Varnish and lacquers are classified as *paint*. Paint is typically applied via a bristle brush. Our two part epoxy polymers are certainly not paint. They are classified as *casting resins* and are

typically 100% solids, while the paints contain solvents which evaporate and leave behind the solids to form a paint film. It is technically correct and socially acceptable to apply paints, lacquers, varnish with a bristle brush. But it just ain't fittin' and proper to use these brushes to apply our epoxy resins. There is one exception - some of our epoxy finishes are truly a paint in the strictest sense of the word. There are a few brands that contain a solvent, sometimes in the resin, sometimes in the hardener, sometimes in both. These brands are properly applied via the bristle brush because they are not a casting resin. The addition of a solvent removes them from the casting resin category. But most of the more popular epoxy wrap finishes fall into the category of a casting resin.

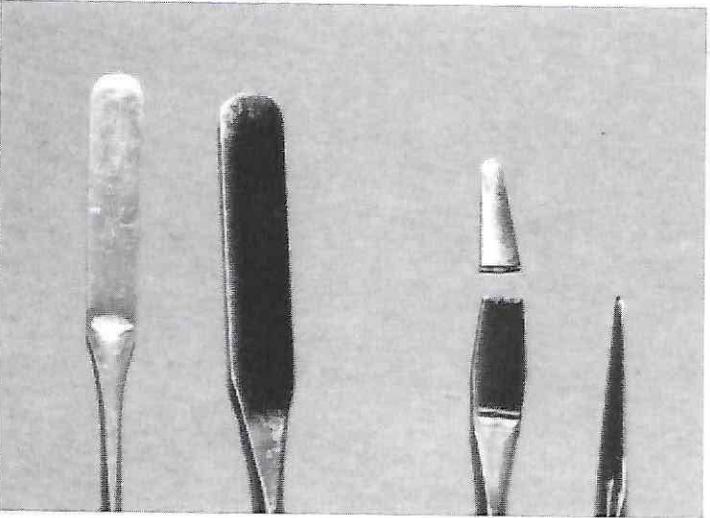
Application Tools

As I think back in time and reminisce about why we use brushes with our epoxies today, it is perfectly obvious that when the epoxies were introduced, the widespread usage of brushes that was already established guaranteed the carryover of the technology to the new finishes. Nobody knew any different and it just seemed natural to use the brush on epoxy. Nobody knew of any other method. Well, nobody in the rodbuilding industry maybe, but in those industries where the epoxies were established prior to being introduced to rod builders, other application techniques were already widely used. Casting resins are commonly applied to reinforcing materials. usually glass cloth. They are applied by sweeping the resin into the cloth with sweeping tools made of polyethylene, Teflon, Nylon, or some such thing. Sweeping tools are made in various shapes and forms depending upon the contours of the part to be formed. Tools are always designed for the particular job at hand. A brush is merely a tool used for applying paints to surfaces. If brushes hadn't already been established, a tool would have been developed for applying epoxy to wrapping threads just as tools were developed for applying epoxy to fiberglass cloth.

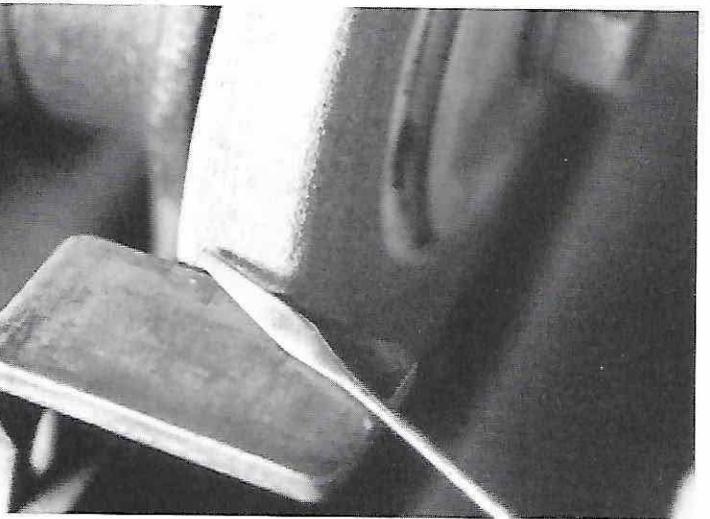
There are some things in life that live with us for all eternity. My first attempt to apply epoxy to a rod is in such a category. I had watched one of the local custom builders demonstrate "how to" at a sportsman's consumer show, acquired a kit of the stuff and took it home. At this time I had been working with epoxies in aerospace for about 15 years so there was nothing new or frightening about it. I just hadn't ever considered using an epoxy as a thread finish on rods. The guy at the show demonstrating the "how to" did everything wrong - as we all did in those days - but his biggest sin in my eyes was using a brush for applying the mixed resin to the threads. When I asked why the brush, everyone in the crowd looked at me like I was some sort of nut and the demonstrator made some clever remark at which the crowd snickered. At that point I decided it was time to shut up.



From top to bottom: 1 - Artist's Pallet, 2 - design for fly rods, 3 - design for Rod Bond epoxy, 4 - standard all-purpose design, 5 & 6- wood replicas.



Use a cold chisel, or whatever method you prefer, to cut the spatula to the proper length.



Grinding to the desired shape. *Always wear eye protection when working with a grinder.

I took the kit home and immediately mixed a batch to see what gives. The directions were very poor - equal portions were derived by graduated marks on each container. There was nothing provided for mixing and I had nothing proper on hand at this time. In those days I didn't even have a rod lathe and certainly nothing so sophisticated as a dryer/turner. I did all my tying with a neat little Thompson thread tensioner clamped to the edge of my worktable. I built hundreds of rods with that little Thompson and its clone from Herters. (I get a real charge out of today's generation whenever I hear from some guy that wants to get into rod building but first, he has to save enough money to buy a rod lathe!) I finally mixed up a batch of the epoxy using a large bottle cap as a mixing bowl and whittled off a piece of tongue depressor for a mixing tool. I had tied up a piece of blank with several old guides just for this purpose - a practice piece - and had determined to try a knitting needle as an application tool. The knitting needles worked just fine. I know builders who use them routinely, even today. I remember that the applied finish did not wet properly, the threads were mottled with dry areas and I thought to myself that this stuff is no good and will never be popular for coating wrapping threads.

I used up that first kit doing experimental work and never did get to finish a rod with it. My rod finish of choice at this time was a Urethane - the forerunner of what is now Permagloss, so I had lots of brushes on hand. I confess to wasting a brush or two on the new epoxy, but not until I had thinned it with Acetone at about 25%, if I recall correctly.

A Better Tool

Somehow the idea of poking a bristle brush into a casting resin is akin to eating a grapefruit with a soda straw. But it was obvious from the very beginning that there just has to be a better way than knitting needles. I tried sucker sticks, various and sundry artists' paddles, many a medical spatula and nothing I have ever found along these lines is suitable for applying epoxies to the threads on a rod. So, somewhere along the way during the painful transition from age old rod thread finishes to epoxies began the cut and try, which soon expanded into a full bloom research program.

After going through many shapes and forms of various plastics - polyethylene, teflon, nylon - I failed to find anything that felt comfortable. Nothing I could find would perform the entire operation, at least not with just one tool. Wood can make a pretty good tool but lacks durability and aesthetic appeal. The best material for the job is stainless steel. It is readily available, is cost effective, durable, aesthetically appealing, has all the physical attributes lacking in the plastics. Its stiffness ratio is good even in a thin light

design. Stainless steel spatulas are widely available from medical supply outlets and some tool houses. The trick is finding the right one at the right price that can be modified to be suitable for our purposes. I spent several years shaping, then re-shaping, and then re-shaping again, many different configurations before settling on the final design, which I am presenting to you in the photos that accompany this article. All the readily available commercial shapes that I have been able to acquire have not been satisfactory. I was seeking and finally designed a tool that will do it all. Blend the resins, apply it to the threads, apply it to guide foot tunnels and behind the guides, form a neat ring around the end of the wrap, distribute the resin evenly on a long butt wrap. Then you can take it and go to another step and use the tool with RodBond adhesive to do the job required of that product.

It was imperative in my designing that we come up with a tool that could be used on a rotating rod and yet be just as useful for those rod builders that do not have a rod turner and just apply the resins while holding the rod in their hands. Most of the commercial grade spatulas I have come across are about as useful as a scoop shovel. I know that the reason that so many of you have been discouraged in attempting to use the spatula is because you did not have the proper design. Design features seem to be universal - everyone likes or dislikes the same features. We don't use a #2 Phillips screw driver to drive roofing nails.

Very subtle alterations in the shape made enormous differences in the application functions. Long ago I had decided that a flat blade type tool of some kind is going to be the way to go. How wide, how thick, how long - these became the fun things. There are stainless steel lab spatulas that have this flat blade and yet none of them suited me. It became apparent that there is a noticeable difference between a 1/4 inch, a 5/16 inch, and a 3/8 inch width, with the 5/16 inch width proving to be superior in handling and application. Length of the flat area can be just as critical. Anything less than 1 inch in length is unacceptable, and I settled on a length of 1&1/2 inch as the norm. The longer lengths are crucial in scraping the sides of mixing bowls, in spreading RodBond out in a film for proper mixing of the paste, and for leveling certain butt wrap sections.

It seems as though all laboratory spatulas have a rounded end. This is unacceptable for the purpose of applying an epoxy finish to thread wraps. The end must be flat for proper application. The corners must have a slight radius, just enough to knock off the sharp point. All three sides (two sides and one end) of this 5/16 inch X 1&1/2 inch section must be beveled. I grind and sand the overall thickness to about .030 inch and then bevel the sides to the conformity of a dull knife edge, making positively sure that this edge is straight and true and is also an accurate 90 degrees with the flattened end.

Making The Tool

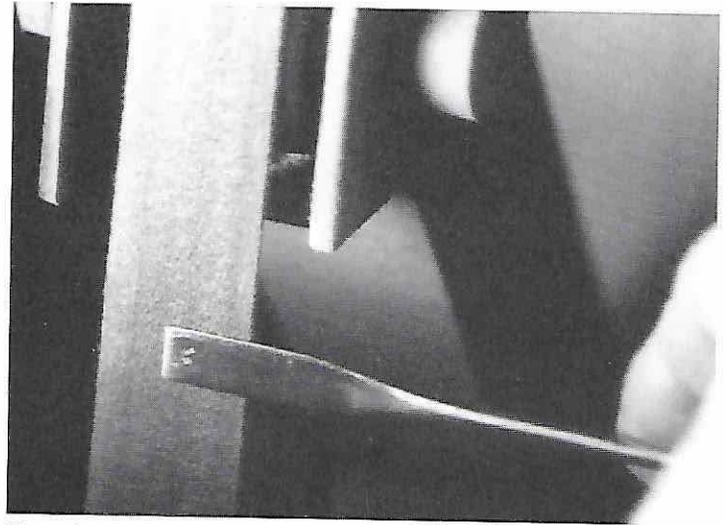
This tool will do about 90% of all spatula operations, but you need another tool for the other 10%. You need a tool to get behind guide feet. A tool to apply a drop or two here and there, the back side of single foot guides etc. The other end of our stainless spatula in the making will do nicely. With a metal cold chisel, cut off the spatula to a desired total length. My standard length for all my tools is 6 & 1/2 inches and there is a good sound reason for that length. It just so happens that 6 & 1/2 inch length is the width of the tool carriage that attaches to my Renzetti Lathe. All my rod building tools - scissors, knives, picks, chisels, etc must fit into this carriage. Actually I tested spatulas from 5 & 1/2 to 7 inches in length and found 6 & 1/2 inch to be ideal for this tool, but the length can vary with the maker's individual taste or to fit his individual tool carriage.

Once it is chiseled or somehow cut to length, this end is ground to a pointed end. The functional section should be about an inch long, starting from the shaft base to the end. It should be constantly tapered and have beveled edges as with the flat end. The tip must be almost pointed and ending in about a .030 dimension. Ideally the end is almost round and about .030 wide and thick. This configuration will place a drop or two right where you want it; the flat section near the shaft will carry enough resin to handle small fly rod guide wraps, in cases where the big end is too wide for small wraps.

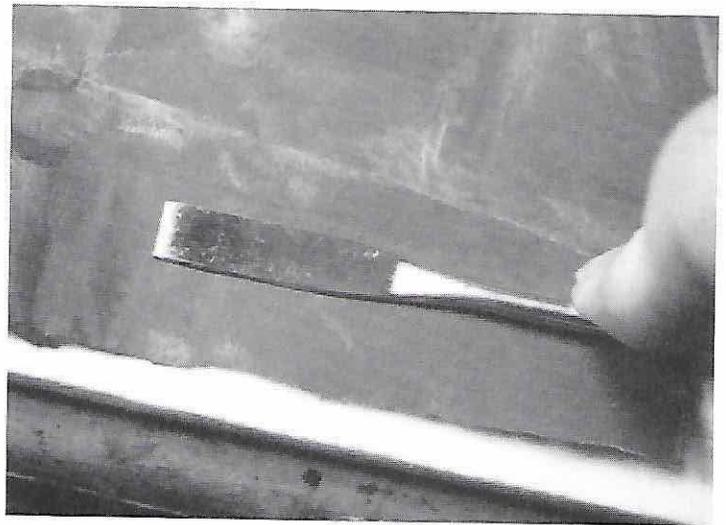
When the tool is ground to your liking the real fun begins. It must be polished to a mirror finish. Absolutely no scratches are allowed in the end product. Any tiny visible scratch is a resin trap and a problem area later down the pike. I am not a metal polishing expert and have only a rudimentary knowledge and primitive tools. After grinding on a bench grinder, I took it to a 1 inch belt sander and removed most of the marks left by the grinder. After the belt sander, I hand sanded on a flat surface with 400 grit wet or dry silicon carbide paper, then ditto with 600 grit. Then I polished with a scotchbrite wheel, followed by a final polishing with a cloth wheel. I simply keep polishing until I have a mirror finish and won't settle for anything less.

Using The Tool

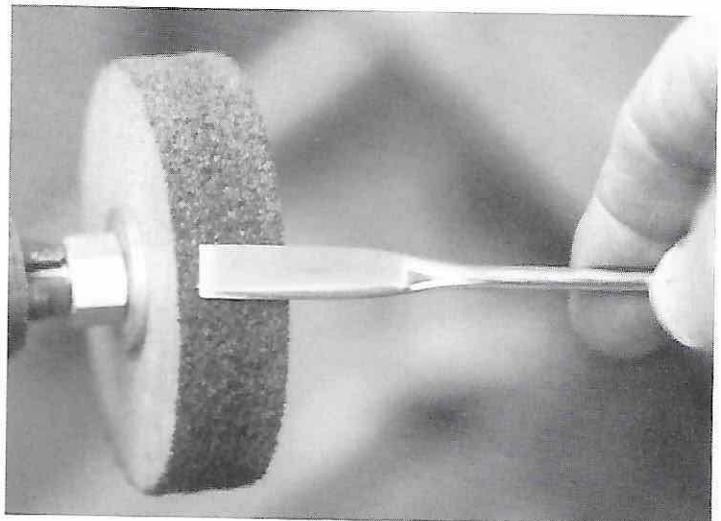
Now that you have a good tool, how do you use it? First and foremost note that it is NOT a brush. Good spatulas have been known to be highly insulted when stored in the same case with something so mundane as brushes. In fact they would prefer that now that you have come to your senses, you complete your education and get rid of all your brushes. Well, maybe not all - keep one or two on hand for color preserver, cork seal and such secondary stuff - just be sure and store them on the other side of the bench. It is important that you get used to the heft of your



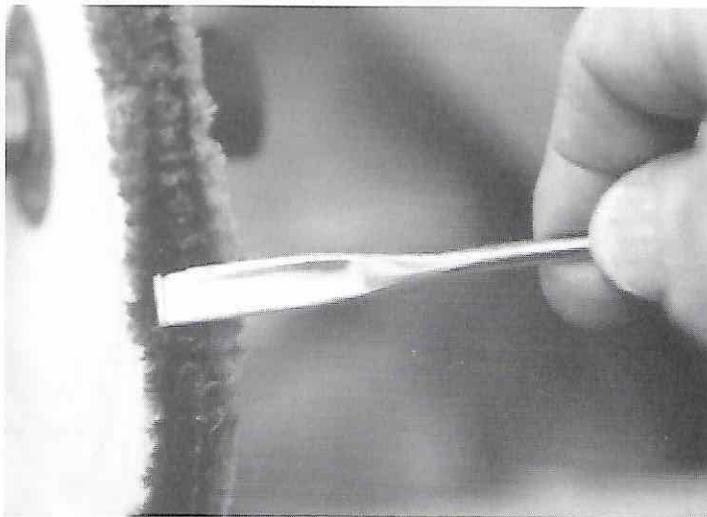
The marks left from grinding are taken out by sanding. Here, a belt sander is being utilized to take out the worst marks left from the grinding operation.



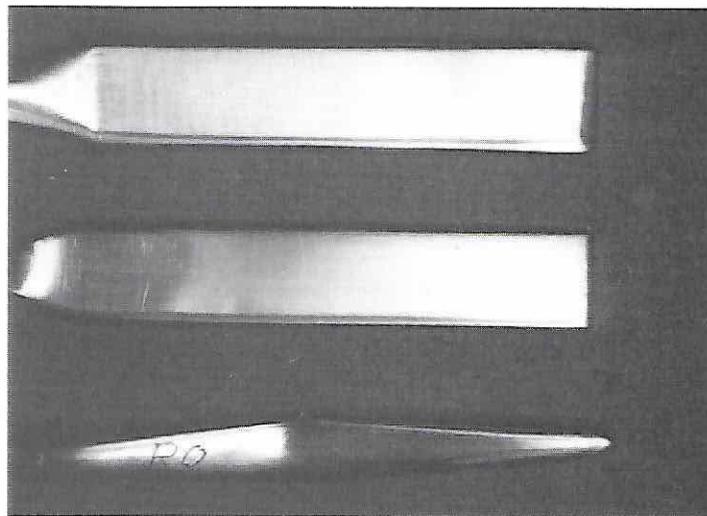
Hand sanding on finer sandpaper removes the small marks left from the earlier sanding operation.



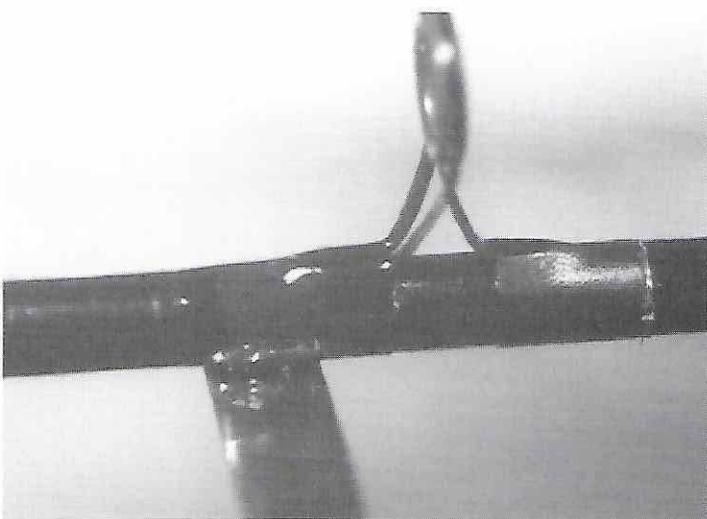
A Unified or Scotchbrite wheel further polishes the spatula. The spatula must possess a mirror smooth finish in order to achieve the best finishing results with it.



A mirror finish is finally obtained by buffing on a loose wheel with fine compound.



The polished ends of three spatulas. Shape determines use.



Using the spatula to apply epoxy resin to a turning rod. The spatula is the tool of choice for applying finish either while under power or while turning by hand.

tool. Hold it between thumb and forefinger as if it were a writing pen. This is the normal grip you will use when mixing resins and applying them. This is the greatest tool you will ever encounter for mixing your resins. When the hardener and resin have been injected into your 1 ounce cup, use the flat side of the tool to stir the mixture and the edge of the tool to scrape the sides of the container. Rotate the container around the spatula like a cement mixer then pour the mixed resin out into a flat container and wipe the spatula with a paper towel.

I like to apply my epoxies to a rotating rod. A comfortable turning speed for me is 150 to 200 rpm. There is a neat application jig for applying resin on a production basis made by the Flexcoat Company. It is used by several companies involved in mass production; its turning speed is - guess what, you guessed it, 200rpm. Many hullabalooos have been written about this 200 rpm application speed, but once you have tried it you can see that it is really a comfortable productive speed. Obviously you will need a rod lathe or equivalent for this procedure. If your rod is turning toward you (like it is on my Renzetti), apply the resin to the bottom of the turning rod. If it is turning away from you (Custom Power Wrap and others), apply the resin to the top of the rod. Scoop a spatula full of resin from your flat container and use it like you would use a spoon or a scoop shovel. Simply fill your spatula and transfer the resin to the rod by the complicated feat of touching it to the area where you desire the resin to be. You don't have to be all that accurate, at least not just yet. The resin knows what to do once you apply it to the threads. The rod is rotating and the spatula will spread the applied resin evenly around the entire wrap. Keep the spatula a true 90 degrees to the wraps and don't let it angle off to one side or the other.

When the wrap is full of resin, hold your spatula just over the edge of the thread wrap and you will form a neat even ridge of resin on the edge of the wrap. Now you will find that there is a bare spot on the back side of the guide foot. Stop the rod turning for a moment and simply apply a blob of resin on that spot. Then resume the turning and use the spatula to evenly distribute the resin lengthwise along the entire wrap. Use your other (pointed) end to apply resin into the guide foot tunnels and behind the leg on single foot guides.

For Manual Turning

For those of you who do not have a lathe for turning your rod while you apply the finish, fret not, the spatula is still the best of all worlds. Simply hold your wrapped rod in your lap and apply the resin to the threads by merely daubing a gob or two onto the threads. Turn the rod on your lap so you can daub all sides of the wrap and let the resin do its thing by hand turning. Another trick is to cut "V" sections in a cardboard box. Mount the rod section

into the V-notches and apply the resin while turning by hand and let gravity and the resins combine to do their thing.

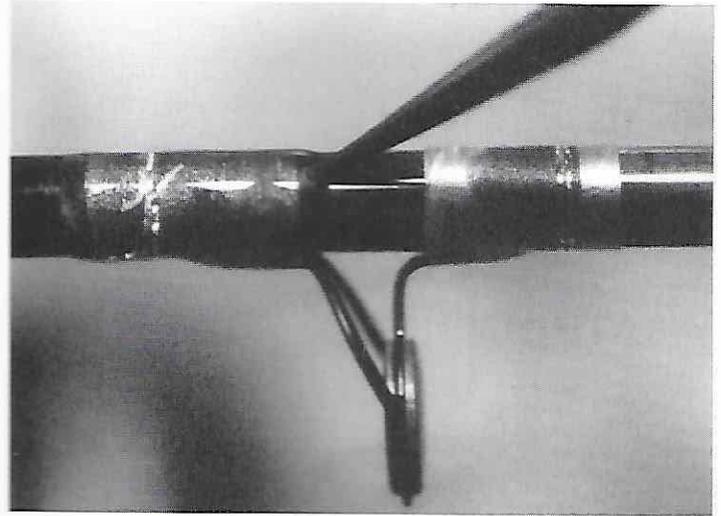
Optional Tool Material

So you would like to try the spatula method but figure the cost of acquiring a stainless blank for grinding and polishing is a bit much for just one? I agree, and realize the fact that not everyone owns a grinder or belt sander or even a cloth wheel. The answer to this realistic problem is quite simple. Just whittle the tool out of wood! Follow the general design concepts of the metal spatula as shown in the picture. I whittled some wooden ones out of wooden tongue depressors and they work just fine. Don't fall for the old rumor that wood causes bubbles to form in the epoxy. Wood doesn't cause the bubbles - you cause the bubbles. Besides, after your wooden tool has been soaked with epoxy and set aside to cure, it is completely sealed. If you really get serious about wooden tools, seal them with a coat or two of Permagloss. If a person is inclined toward working with woods and has proper woodworking tools, obtain a piece of hardwood - Oak, Maple, or even something exotic and really do it right. The tool will be every bit as practical as the stainless ones that I make.

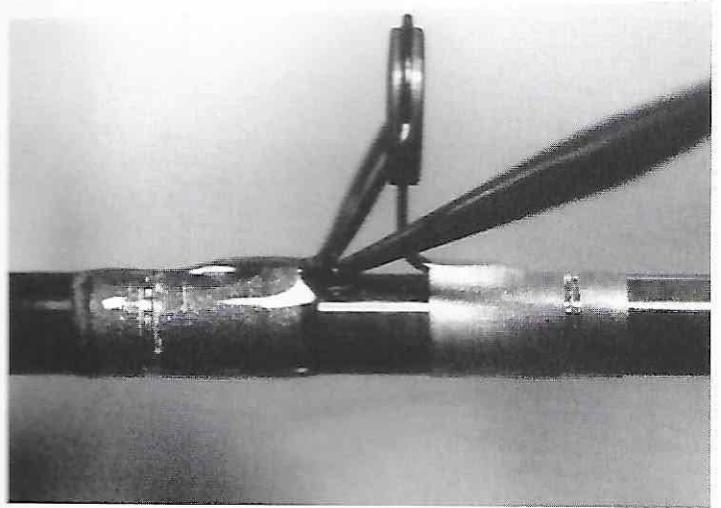
Other Uses

Mixing and applying thread epoxies is only one of the functions of this marvelous tool. Just as important is the mixing and applying of paste epoxies or "bonding resins", namely RodBond. One of the reasons that paste epoxies give many people trouble is because they mix them wrong. We never stir the paste epoxies in an open cup as we do with the liquids. Paste epoxies are ALWAYS measured out onto a flat surface. A small piece of cardboard works fine. When both portions are in place, take the spatula and using the long flat section, sweep both portions across the cardboard surface as though you were spreading butter on toast. Scrape up the spread out mass, then spread out again. Do this three or four times and you have a thoroughly mixed, bubble free, paste adhesive ready for doing its thing. This is where the 1&1/2 inch length of the flat blade becomes a real jewel of a tool. Both ends of the tool are used for applying the paste as the conditions demand.

When you throw away all those brushes you can also throw away that brush solvent container and even throw away all that brush solvent. Every time you use your spatula and are ready to put it away, simply wipe it off with a paper towel. Occasionally you may want to wipe it with a little IPA on your paper towel, but that's all it will ever require. Treat it with the respect that any quality tool deserves; after all, it delivered you from the curse of the "cult of the brushes." ☞



Forming a closure head on the inside edge of the thread wrap. The narrow, or pointed spatula accomplishes this easily.



The pointed spatula is used here to fill the "tunnel" with epoxy. This weatherproofs and adds stability to the guide.



Using the straight ended spatula to apply epoxy resin to a long thread and inscription area. This is also done while the rod is turning.