ColorPreserver

Some rod builders swear by it, others swear at it. There's no question that in the right hands it does exactly what it is intended to do and in the wrong hands it can cause plenty of trouble. You may be a proponent or an enemy of the stuff, but a little background information on what it is, what it does and how to use it can go a long way in your decision to use it or not, and how to get good results if you do.

An ally to some, an enemy to others, color preserver can be a useful tool if you understand when, why and how to use it.

by
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What Is It?

In the old days of rod building, color preserver was most often nothing more than a clear nitro-cellulose lacquer with about a 10% solids content contained in lacquer thinner. It didn't work very well in most respects, usually sealing but not preserving the thread color very well. Made originally for silk thread, it worked decently enough for that purpose, but really fell off when used on the newer nylon threads. Of course, during this period of time it was expected that rods would be rewrapped and refinished every few years anyway. Expectations were lower then and the old nitro-cellulose color preservers were viewed as being not great but good enough. Certainly on par with the other rod building products in use at the time.

The Modern Era

Most color preservers sold today are water based acrylics. These are usually manufactured as an interior lacquer (water base) and then repackaged for use in the rod building industry as a color preserver. They are usually easy to identify as they are an emulsion and appear milky white in color. The Acrylics will preserve the thread color and act as a barrier to the top coat of epoxy or urethane.

In recent years, a new breed of Urethane/Acrylic color preserver has emerged and it has created quite a stir. Appearing clearer but still somewhat cloudy, this type of product is often used as exterior paint, floor

coatings and even in the marine industry. Its use as a color preserver for rod winding thread is a fairly recent addition. Normally a coalescing solvent such as Butyl Cellusolve is added by the formulator to these raw Urethane/Acrylic products. This is necessary in order to make the raw materials combine and work as intended. Without it, the product would simply remain a urethane and an acrylic. This also moves the product away from a pure water based product. Nothing wrong with this except these coalescing solvents can sometimes interfere in some manner with the dye used in the winding thread and cause some subtle but definite problems. Luckily, this happens on only very rare occasions. The Urethane/Acrylic types do offer some advantages in terms of penetration and color retention.

Problems

Color preserver is used mostly in an attempt to retain the original color of nylon rod wrapping thread. Without color preserver, any direct type of wrap coating, epoxy, lacquer, urethane, etc., will penetrate the threads and tend to make them take on the coloration of the background on which they are wrapped. In many respects the threads become transparent. Many rod builders don't care and even feel that such a wrap is better looking and stronger than any made with the use of color preserver. (More on the strength issue in a moment.) Other rod builders wish to retain the vibrancy and brilliance of regular nylon thread which when coupled with color preserver and the top coating of your choice exhibits a subtle sparkle in the daylight. By penetrating and sealing the thread so that the top coating/finish cannot penetrate the thread, the color is retained much as it appeared on the spool from whence it came.

Of course, ask just about any rod builder and they'll tell you that it doesn't always work so well or so easily. Some of the various color preservers are lacking in some qualities, although most do work well when used as intended. Trouble is, many rod builders have some peculiar thoughts and ways of using color preserver and thus create a host of variables which cause unnecessary problems to emerge.

The first of these is simple color retention. It is difficult to get a very light thread color to retain perfect color retention when it is wrapped on top of a dark colored blank. This problem is exacerbated by the use of small diameter thread sizes such as OO or A. Even the Urethane/Acrylic type color preservers, which work better than previous types in this regard, have a hard time perfectly preserving the original shade of thread when used on wraps made in this manner. Another bothersome trait is blotchiness. In this instance the thread will appear to retain color perfectly in some areas, but darken horribly in others. Most of the time this can be traced to over thinning of the color preserver itself by the rod builder. When this is done, the carrier does not contain enough solids to fully inhabit the thread and some amount of top coating/finish will penetrate the thread in certain areas and darken those. The result is rather ugly and usually only rears its head after the first coat of finish is put down.

Problems with color preserver can most often be traced to improper use rather than with the color preserver iteself.

Most Acrylic color preservers are somewhat hazy in appearance. Normally this only seems to show when very dark threads are being used, but it is there nonetheless, all the time. This is the price which is paid for the surfactants in the emulsion that are necessary to get them to emulsify. Another cause of haziness stems from thinning with water which is not de-ionized (distilled). Regular tap water contains all sorts of things that can cause problems. Chloride, chemicals, minerals and the like can cause some serious problems when added to color preserver. Again, you should only thin your color preserver upon the instructions of the manufacturer and then only with distilled water if working with an Acrylic, and isopropyl or denatured alcohol if working with a Urethane/Acrylic type.

There is another problem that can result from thinning a color preserver and this regards the time it takes for the solution to fully assimilate what you have added. If you just toss some water in there you

will find that there is a shock effect which results in some insoluble material floating around in suspension for several hours before the shock effect normalizes and everything goes into solution again. This insoluble material increases the visibile haze considerably. The best way to add water to the Acrylic types is to use distilled water which has been warmed to around 90F and add it slowly to the Acrylic emulsion while stirring. For the Urethane/Acrylics, you should add the alcohol at room temp, slowly and while stirring. With either type, shaking the bottle in order to mix everything is only likely to introduce bubbles. Again, thinning is normally not necessary but if you feel the need, following these instructions should reduce the likelihood of problems to some extent.

It is very important to use a good "flood" coat of color preserver on the wraps. The threads need to be completely saturated.

It is rare that a color preserver is too thick to work properly but it does happen. In this instance the color preserver is usually old and the solvent or carrier has evaporated to the extent where a high level of solids is left in the bottle. When the rod builder attempts to apply this overly thick mixture, penetration is poor and incomplete. Once finish is applied the result is usually a mottled or blotchy appearance. If you suspect that your color preserver has thickened in the bottle, throw it out and purchase new stock. You may try to thin it back to the original consistency, but such attempts are fraught with disaster in many instances as the correct ratio of solids to solvent is not easily arrived at by the average rod builder. Your odds are much better with a fresh bottle.

One of the more easily recognized problems that occurs with most color preservers is the tendency for them to freeze if stored or shipped in very cold weather. If this happens, you might as well toss it out - there is no hope of restoring it to a useful condition. If you live in a climate where the winters are very cold and very long, you should plan to purchase whatever amount of color preserver you need during that time span well before the onset of the cold weather. Some shippers do allow you to specify a "premium freight' service which can alleviate this freezing problem so you do have this option. But most rod builders have learned the hard way to just order what they think they will need before the weather turns extreme.

Proper Use

In an effort to provide a product that penetrates the thread to the degree necessary, manufacturers will cut the color preserver until it contains the minimum amount of solids needed to perform the required task. When a rod builder further thins the color preserver, for whatever ill-informed reason he or she has decided upon, the ratio of solids to carrier is reduced below the point where the required task can be performed. Rarely is there any reason to thin any color preserver more than 10% to 15%. Most times, it is perfectly acceptable to use it straight out of the bottle, unless the manufacturer specifies otherwise. If you have an old bottle of color preserver than has started to set-up or thicken in the bottle, you are better off tossing it out rather than trying to restore it, by thinning, to its original consistency. There is no question that this can be done, but what are you willing to risk for a few dollars against hours of thread work?

Remember that it is the solids left behind after the carrier evaporates that seal the thread. Thinning only creates a color preserver with fewer solids to be left behind. As an example, if you heavily thin a water base color preserver, which is mostly water to begin with, you end up applying mostly just water to the wraps. Yes the threads will turn dark and then return to their original color, but very few solids are actually left behind to effectively seal the threads. When finish is applied the threads change shade, become mottled, etc., and the poor rod builder is left scratching his head wondering why his color preserver didn't do the job.

Keep in mind that it is the first coat of color preserver that does most of the work. It penetrates and fills the thread, preventing the absorption of the wrap finish. This is why it is important to use a good flood

Color Preserver - The Strength Issue

The strength debate over the merits of either using color preserver or not using it on guide wraps has been raging for many years. Most rod builders will concede that using color preserver under regular epoxy finish results in a wrap that sacrifices some strength. The real question is just how much actual strength do you sacrifice when utilizing color preserver on your wraps?

We attempted to find out a little bit more about this subject with a simple test which we performed here at the RodMaker shop. The results have added a bit more in the way of facts to this long time debate. However, there are several things which cannot and should not be assumed. First, not all epoxy finishes are the same in terms of thread penetration and adhesion. Use of any finish which is different from that used in our test could yield slightly different results. The same goes for color preserver and the degree to which you may thin it and your particular application technique. It is important to keep these factors in mind as you follow our test and results.

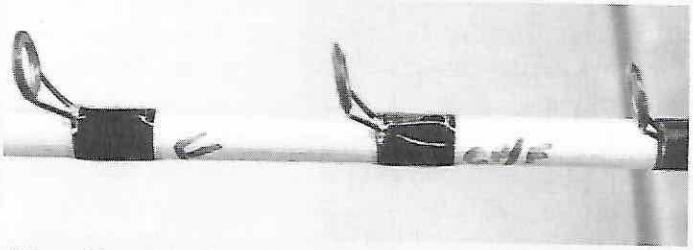
The Set-Up

We wrapped 3 #16 single foot guides onto a steel mandrel which had been thoroughly cleaned with solvent. Its surface was clean and smooth, but not scuffed or roughened in any way. Both the finish and color preserver used were very popular brands well known and favored by many rod builders. They were chosen based on their broad appeal and market acceptance.

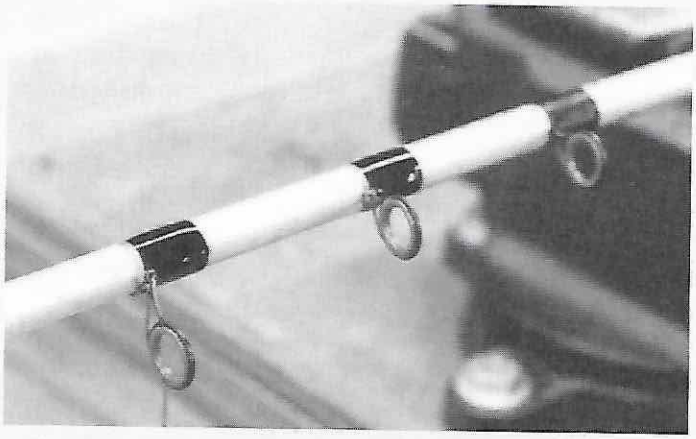
The first guide wrap had a direct application of the epoxy rod finish. The second guide wrap was coated with full strength color preserver, allowed to dry for 24 hours and then covered with the same epoxy finish. The third guide wrap was given an application of full strength color preserver only. This same procedure was then performed on 9 more mandrels, for a total of 10 mandrels and 30 guides. The figures given below are the average for each group.

The Test

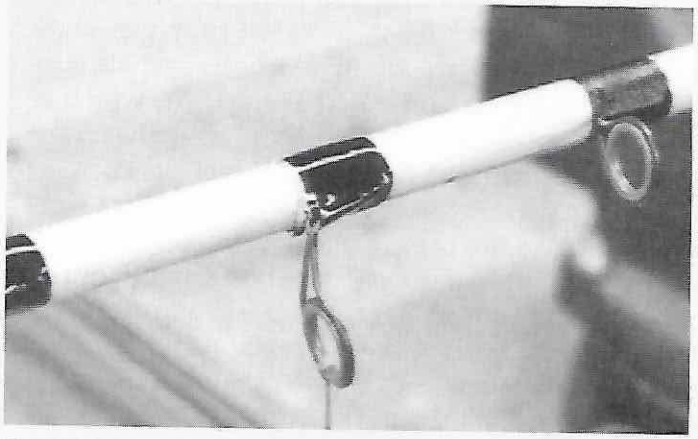
It would be hard to duplicate the forces that act upon guides and wraps during the course of actual fishing without a long term test performed under actual fishing conditions. Even then, the chance that those forces could be duplicated exactly from rod to rod would be nil. We settled for a test performed under controlled conditions that would subject maximum force upon each guide wrap until failure was achieved. Granted, this isn't likely to approximate what actually happens to guides



10 test sticks with 3 guides each were prepared. On each stick a guide was wrapped and coated with epoxy wrap finish only, color preserver only, and color preserver and epoxy wrap finish. Each specimen was then loaded at 90 degrees to the mount until the guide to blank bond was broken. (Remember that such a test must be judged upon relative strength of the wraps to each other and may not be indicative of the varied forces placed upon rod guides in actual use.)



Guides used were single foot high-frame #12's. In each instance the guide frame seriously distorted before the guide to blank bond was broken.



Test results showed that wraps where epoxy finish is applied directly to the threads to be only marginally stronger than those where color preserver was also used. Results are relative in nature and not an accurate indication of what all guide types, threads, color preservers and finishes will produce.

and wraps over long term fishing pressure, but it did reveal something about the strength of these combinations nonetheless.

Each guide/wrap combination was connected via a braided line to a scale and was then loaded in 1lb increments. (Earlier it was mentioned that these guides were wrapped on a steel mandrel. The tests had actually been performed earlier with the guides wrapped on an actual rod blank but the amount of flexure and twist made the results hard to gauge. The heavy steel mandrel allowed the introduced loads to be carried directly by the wraps themselves.) The guide/wraps were positioned at 90 degrees from the introduced load which subjected them to the most damaging force which could likely be introduced. We were looking for the point when the guide would actually break loose from the blank and within the wrap and reorient itself underneath the threads.

On each wrap we discovered that the guide itself would noticeably deform under about 7 lbs. of pull. On the first set of wraps, the ones with epoxy finish applied directly to the threads with no color preserver, the guides let loose with an audible "crack" and shifted its position under an average of 11 lbs. of pull. Any amount of further loading easily shifted the guides under the thread wrap. In other words, the wraps were pretty much destroyed at that point. The second set of wraps had been given a full strength application of color preserver and then epoxy finish. When subjected to the same test we found that they broke loose and shifted position under the wrap at an average of 10 lbs. of pull. The third set of wraps had been given an application of color preserver only. They broke loose at just 5 lbs. of pull on average. It should be mentioned that the averages given here were arrived at from figures which were all fairly close to begin with. In each instance, the overall amount of difference from top to bottom in each respective group was less than 1 lb.

Additional Test

One of the things we couldn't help but wonder about was the penetration of our color preserver and epoxy rod finish. Obviously, had the epoxy not fully penetrated our thread wrap, it is doubtful that it would have been even as strong as the wrap we made which was coated with color preserver only. To make sure, we cut the wraps off the mandrel and made sure that in each case the applied product had indeed fully penetrated the wraps and made contact with the underlying surface. In each case they had. Although our test seemed to indicate that the epoxy which was built up around the junction of guide foot/leg and blank area had much to do with overall strength, whether color preserver was used or not. Another factor which would appear to add to the strength of the wraps in our tests was the accumulation of either color preserver or epoxy wrap finish along the edges of the guide foot, creating a slot or channel that appeared to hold the guide in place.

Some Conclusions

In this particular situation the wrap coated with epoxy finish alone proved to be the strongest by a narrow margin. The wrap upon which both color preserver and epoxy had been applied actually held up pretty well considering the things many rod builders have to say about wraps made with color preserver. The other wrap was really not in the running and would have to be considered suspect if expected to be used under actual fishing conditions for any length of time.

One thing that was noticed concerned the fact that adhesion of the finish through the wrap and onto the mandrel was not the only place were strength is created. Judging by the results of the wrap where both color preserver and epoxy had been applied, versus the wrap where color preserver alone had been applied, it is obvious that the build up of epoxy around the foot/leg junction plays a major role concerning the force needed to twist a guide out of position.

Rod builders wishing to achieve the greatest amount of wrap strength would be advised to apply epoxy finish directly to their thread wraps. Of course those rod builders who prefer to use color preserver in conjunction with epoxy rod finish can be reasonably sure that the procedure does not inherently create a terribly weak wrap that would fail to hold up under normal fishing conditions. Remember that the amount of direct sideways load used in our test on an individual guide is rather extreme considering the forces that most guides are subjected to under most freshwater and light to medium saltwater fishing conditions. Make no mistake - the wrap made with color preserver was only marginally weaker than the one made with direct epoxy when subjected to such a load. On the aspect of long-term durability, we suspect it would also be less, but perhaps by only a marginal amount again. (Our test did not and will not confirm durability over long-term fishing use.)

Obviously, similar tests made with different guide styles, different size thread, different epoxy and color preservers may result in different findings. But relatively speaking, we would expect the difference between wraps coated with color preserver and those without to prove as marginal as those in our own test.

So that's how things panned out under this test. Remember the results must be viewed in a relative manner. Wraps coated directly with epoxy were stronger, by a narrow margin, than those where color preserver and epoxy were used. It is doubtful that the results were shocking enough in either case to cause proponents of either method to move to the opposite camp.