DYING TO BE COLORFUL

-OR-

USING RIT DYE TO BRIGHTEN UP SHEET BALSA MODELS

By Andrew Tomasch

Because they are quick, easy, and fun, I build a lot of models from sheet balsa. This includes model aircraft (hand launched and catapult launched gliders) and spacemodels (boost gliders and rocket gliders). My one complaint has always been that there is no really good way to add color to these models. The standard spacemodeling practice of rubbing magic marker over the surfaces produces too uneven a result for my taste, and covering with Japanese tissue adds too much work (and on small models, weight). Things came to a head when I wanted to enter a profile scale event at an indoor aircraft meet and only had time to build a sheet balsa profile Stinson form a Peck Polymers kit. The rules for "No Cal" scale clearly state that the model must have a "reasonable imitation of the original color scheme and markings." Everyone knows that Stinsons are green and balsa is not, so I clearly had a problem.

I had heard vague rumors over the years that Rit dye can be used to color models and I decided that I'd play with some and see what happened. I chose the direct approach: Mix the dye in hot water, pour it into a disposable foil pan and dunk the finish sanded parts into the dye. It worked! I was afraid of warping the wood, but this was not a problem. If you get balsa soaking wet and then allow it to dry evenly on both sides, it doesn't warp, in fact, any warps present before wetting will still be there after the wood dries. This first attempt added one hour to the construction time of the model, and produced a beautifully uniform green color. Since then I have dyed three more models, one each in yellow, orange, and red, all with equal success. I can now do the entire dye bath procedure in 30- 45 minutes and consider it a normal step in the construction of an all balsa model.

Here are the steps involved in dying sheet balsa models:

1. **Completely finish sand the model to the desired smoothness, as no further shaping or smoothing can be done after the dye is applied. The wood must be "raw" without glue or dope on the surface. The dye will not penetrate the wood where there is glue present, so if you**

joined pieces of wood to make the finished part, be sure that all cement is sanded off the surface or a white spot will result. Water based glues such as Tite Bond cannot be used to join parts which are to be dyed unless the dye is applied first. I use old-fashioned cellulose model airplane cement (Sigment or Testors) to join parts, carefully sanding all the glue off the surface of the joint when dry.

2. **Prepare the area. The dye is very easy to work with, but spills will cause stains on counter tops etc. Cover the work surface with newspapers or plastic. It helps to have a sink as close as possible. I use my bathroom counter top. Lay out an area of paper towels to blot the parts as they come out of the bath. Mix up a pint of water with a teaspoon or so of chlorine bleach to remove any stains which do occur. These are not serious, no worse than a blueberry juice stain on Formica. I wouldn't spill dye on the carpet! Have plenty of paper towels ready for blotting/wiping and a trash bag for the soiled paper towels. The idea is to keep the dye under control at all times. By working carefully you can literally complete the process without spilling a drop. Finally, set up a drying area consisting of a flat tabletop covered with aluminum foil, large enough to spread out all the dyed parts while they dry.**
3. **Mix the Dye. I use a quart jar and microwave the water until it is very hot. For powdered dye, I use 1/2 - 3/4 of a package, more for lighter colors, less for darker. The liquid dyes work well with 1/2 a bottle in a quart of water. Since you can intensify the color by leaving the parts in longer, this is not critical, but it's probably better to err in the direction of more dye to ensure an adequately deep color. The only critical part of the procedure is to ensure that the final dye solution has no lumps of un-dissolved dye in it to cause streaks on the part. Stir well and pour off the solution slowly to leave the lumps in the mixing jar. I strain the dye through several layers of nylon stocking as further insurance. The liquid dyes are particularly nice since they are not as lump prone, and I highly recommend them.**
4. **Dye the parts. Pour the lump-free dye solution into your dying pan. For small parts, disposable foil baking pans are perfect. Plastic storage tubs work well for larger parts. The dye solution will now be nice and lukewarm. Dunk one part at a time and keep turning it over and agitating it with your fingertips. Wear disposable rubber gloves (available at hardware stores, sold for furniture stripping). Practice on a piece of scrap first to convince yourself it is going to work. After a few minutes, you will have a nice depth of color. Remove the part from the tub, and strip off the excess solution with your fingers. Place it on the paper towels and blot firmly with more paper towels. This will draw out the excess water and remove any dye that is not going to stay on the part. Set the part on your foil-covered drying space and repeat the process until all parts are done. Once you get the hang of it, several small parts can be dunked at once. Just be**

sure to keep them moving and keep flipping them over so that all surfaces take the dye evenly.

5. **Drying. Here the trick is to let the parts dry evenly on both sides. At first I weighted the parts down with glass jars and drinking glasses to keep them flat, and turned them over every 10 minutes or so until thoroughly dry. This works fine, but may not be necessary. The parts will curl the first few times they are flipped because they will have dried more on the exposed side than on the side against the table. Don't panic! Once the parts are really dry they will not be warped. The most recent model I dyed was not weighted at all, just placed on the foil and flipped over every 10 minutes. It dried nicely and never showed any warping tendencies while drying. I picked up a very slight warp in a thin stabilizer, which came out with a little hot breath and has stayed out since the part was doped. I recommend not weighting down thicker surfaces such as HLG or boost glider wings and weighting down very thin surfaces. Thick surfaces dry nicely if stood on edge against glass jars, drying evenly on both sides. Use glass for your weights, as metal might discolor your pretty finish. Be careful not to dent the wood.**
6. **Clean up. CAREFULLY pour the dye down the drain while running plenty of water from the tap. The dye solution seems to deteriorate if stored, so don't bother trying to save it for more than a few days. The dye solution will not stain a sink if it is clean and the dye is washed away quickly. It also washes out of the foil pans and plastic tubs easily and leaves no staining, so your tubs can be re- used. I store my dying supplies in my large plastic storage/dye tub. Minor stains on counters can be cleaned up with the bleach solution mentioned earlier. Get after them soon, before they set. There are no toxicity warnings on the dye, but treat it with respect and assume it is poisonous just in case.**
7. **Finishing. After the parts are thoroughly dry, apply three coats of very thin (50- 70% thinner) dope. The first coat should soak into the wood and sets the dye so it won't come loose. Apply a second coat without sanding and allow the parts to dry completely. The usual "balsa fuzz" can now be smoothed with VERY fine sandpaper, nothing more aggressive than 600 grit wet-dry that is dead worn out, finer if you have it. Fresh sandpaper will cut into your beautiful finish, so be sure the paper is well worn out to avoid scratches. A third coat of dope will begin to produce some sheen in the grain marks, and this is enough finish. You can continue to add more dope, sanding every few coats if you want a glossier doped finish, but the three coats are enough to assure good water proofing and adequate smoothness.**

The resulting finish is well worth the modest extra effort, producing a uniformity and intensity of color that rivals a good Japanese tissue finish. The color is very

even, while still showing off the character and grain of the wood. The dye is extremely stable once adhered to the surface. The brush will pick up a slight amount of dye during the application of the first coat of dope, but not enough to discolor the dope in your jar. Just clean the brush thoroughly after the first coat. Un-doped dye holds up well on indoor models. You will get water spots if un-doped dye gets wet, but it has little tendency to bleed or come off. Once doped, it is absolutely stable, and does not take watermarks if rained on. The dye remains on the surface of the wood, and does not penetrate into the bulk material. It therefore adds minimal weight. In closing, I list the following applications where dyed balsa may have advantages over other finishing methods:

1. **Sheet balsa scale models.**
2. **Colored surfaces for all types of balsa gliders.**
3. **Colored sheet balsa propeller blades for indoor models. Also ribs and spars.**
4. **As a substitute for color dope on all-balsa 1/2 A control line models. Saves much weight.**
5. **Tinted balsa components for all types of FF models, eg. gas model pylons, rudders, fuselage sides, folding propeller blades, etc.**
6. **Tinted fins for high performance spacemodels.**