

The information presented here is basically a collection of the previous articles I have already written on this subject that has appeared in a number of magazines and catalogs over the years. I have combined all this information into this one document to help sort out all the questions on this neat technique. Hope you enjoy it and find it helpful.

Latex House Paints for Models

Part 1

By: Roy Vaillancourt

As we read through the newspapers on a Sunday morning or watch the evening news, we see that environmental concerns are increasingly in the headlines. We see that some of the materials that we have been using in our hobby have been known for a long time as not being environmentally friendly. As the EPA and other agencies push the discontinuance of these materials we as hobbyists will be forced to find suitable alternatives to keep our hobby off the "endangered species" list. Here's one step I have taken to try to find such environmentally alternate materials.

A little history first.....

I started to use latex paints as an alternate finish on R/C models around 1983. My first concern at that time was to find an alternative finish that was more economical than the standard finishing methods used by most modelers. At that time most scale guys were using epoxy, lacquer or polyurethane paints. All of which were relatively expensive when it came to finishing off a large-scale bird. Not only did these materials cost a good deal but they were not very healthy for the user if you did not have proper ventilation or filtering systems in place. As time progressed I got to find out that not only were latex paints a lot cheaper and easier to use than conventional materials but the latex paints were and still are a lot more environmentally friendly than almost any other form of finishing material.

The first plane that I used latex on was a **P-47 Thunderbolt**. I had built three of these over the years due to attrition. As one left the fleet I liked it so much I just had to build another. I designed and built my first P-47 in 1983 and finished it in K&B epoxy paints. Just like every other good scale modeler of that time I was convinced that epoxy paint was the way to go. As happens to many modelers, I damaged the plane really bad one-day while sleeping at the sticks on landing. After completing the extensive repairs and trying to sand and fix the paint job, I was getting very frustrated. So.... I decide to strip the entire plane and do it over in something easier to work with and also less expensive. While hunting for a suitable alternative I visited my local Benjamin Moore dealer. He shows me some of his line and says he can match my colors perfectly for a much lower cost. Sounded very good and the price was right, so what the heck, I decide to give it a try. After spending some time on the learning curve and after all the dust settled the plane was re-done in the same color scheme as before the "accident". It looked just great all ready for action once again. An interesting observation I made here was that I weighed the plane and it **LOST** weight in the repair / repaint process. (When was the last time you had that happen?) Not just a little.... 4 1/2 lbs. for the 92" plane..... **WOW....** The latex I used was Exterior semi-gloss and mixed to match the previous colors exact. Even had the same "finish" qualities. It just took a little longer to apply



due to the learning curve and a slightly different drying time.... Needless to say Thunderbolt's number 2 and 3 were done in latex... Each one was getting easier to finish.

The next design to escape from my pencil was the **Hawker Hurricane**. I did not even consider using epoxy or lacquer paints on this ship. I went straight to the latex. This model turned out great too. It had all balsa-sheeted surfaces covered with fiberglass cloth and polyester resin and all open frame fabric areas were covered with Super Coverite. The entire ship was then primed with automotive lacquer primer. I applied the latex over the conventional automotive primer and did the panel lines and rivet stuff just like usual. I just had to be careful as to how heavy the latex paint was applied as not to hide the details. Once I learned how to thin and spray this stuff properly, the rest was easy. The Hurricane also met with some tough times and required some "repairs" (what model doesn't?). It was different sanding the latex and some learning was once again in order but it all worked ok. I found that it doesn't wet sand too well. Get it too wet for an extended period of time while sanding and it starts to "roll" as you sand. But with some practice I found that it could be sanded successfully and also be feathered pretty good if kept dry. After flying this Hurricane at the Masters and such for a few more years it also went "to the great hanger in the sky". I liked having a Hurricane so much I decide to build another. This time when I got to the finishing stages I did not prime the fabric-covered areas. Here, as before, I used Super Coverite with the latex applied directly to the "raw" Coverite. The latex took to the Coverite like it was made especially for it. Great.... Nice thing here was that even when the fabric sags or takes a dent you can apply heat and re-shrink the fabric and the paint just goes along for the trip. Another thing I discovered is that latex paints don't crack due to vibration or expansion / shrinkage of parts. It's rubber, right....



Next was the **Hawker Sea Fury**... I have done three of these over the years. I really like the Sea Fury....Great flying model. I used the same finish treatment on all three. All three had similar stories.... Fly it, damage it, repair, repaint etc. One of these went to the masters and one of them went to Top Gun. Impressed all the judges at both contest. They though I used automotive paints or epoxy. Nah....



Then the **L-5** and **L-19** came along. Both planes were done entirely in latex with vinyl pressure sensitive markings. An interesting thing on the L-5. The L-5 is basically an all fabric-covered plane. I covered the entire plane in Super Coverite. Nice stuff in its own right. I did not



use any primer at all even on the fiberglass parts. I painted the whole plane OD (Olive Drab for you non-military guys) first then added the light gray underside colors. I did this because, with the plane being an all fabric plane you could see the inside of the fabric in the cockpit areas. This area is supposed to be OD like the outside. Applying the OD first did double duty here. I didn't have to paint the inside now. You could see the OD right thru the fabric very nicely. The exterior of the plane took three coats of the OD and only two

coats of the light gray for under the wings and on the lower fuselage to cover the OD. Talk about breaking all the rules..... You are supposed to do light colors first followed by darker ones. The L-5 is still in active service and has been since 1992. It has flown at two US Scale Masters Championships and at Top Gun one year. After many years of flying and many repair sessions the L-5 still looks as good as the day it left the shop.... It just seems to get better with age. The paint sunk into the fabric just right and you can still see the weave in the fabric like you are supposed to.



The **L-19** was an all sheet metal airplane in full size so the model was done all over with



fiberglass cloth and polyester resin. On this plane I only used primer where panel lines were going to be. I basically sanded the primer off every place else exposing the raw fiberglass surfaces. This helped eliminate the extra weight that all that primer would have added. I used 320 sandpaper used dry and then I applied the latex paint. This stuff sticks to the fiberglass like it was welded on. I found that I only had to sand the glass parts with 280 / 320 grit paper. Leaving the parts just a little

rougher than usual helps the latex bite. Then the paint flows just enough to even out the surface. It is really strange to watch this happen and see a great surface appear.

The next plane I did to see latex paints was the **FW-190**. So far I have done two FW-190's using this technique. Both were different color schemes and both made the usual contest



rounds with great results. On the first Focke Wulf I used latex for the base color and all the camouflage but used epoxy paint over the latex for the markings. (The Thunderbolt and the



Hurricane also used this treatment). This works ok as long as the epoxy paint is not flooded on. You can't get the latex too wet with anything that has acetone or toluene in it. These chemicals turn the latex to a rubber cement kind of goo. On the second FW-190 I used latex for all the colors including all the camouflage and markings. The first FW-190 had a coat of satin clear epoxy over the latex, the second FW-190 had no clear coat on it. In my opinion the second one came out better.

*Ah.... Grasshopper! I see by now you have many questions.
Peaked your curiosity huh...*

Equipment:

What do you spray this stuff with? The compressor I used was an old Sears's 1/2-hp unit. Keeps up just fine with the different guns I have used.... Even some of the better diaphragm compressors will work well. Just be sure they can supply enough volume of air to match the requirements of the spray gun(s) being used. Most good compressors should have a water and oil trap installed. If there is neither I would still use the oil trap. Mostly to separate the OIL in the air from the compressor. Oil makes fish eye.... Regardless of the compressor you use, there should be an air pressure regulator installed. With this you will be able to control the flow of air to the spray gun which in turn will vary the intensity and the amount of paint. I use a number of different styles and sizes of spray guns. For big areas I use an auto touch up gun with the MEDIUM needle and orifice. For finer work I use an airbrush. I have all types of airbrushes and have used latex in them all. From the cheapest Badger to an expensive Pache'. Don't listen to the guys at the auto store. They will tell you that latex paint can't be sprayed. Hog wash... You should also be able to use the HVLP guns on the market today. As with any spraying system you choose, the air pressure would have to be played with as well as the amount of "thinner". Everything is a slight experiment as latex from different manufacturers will act differently.



Paint:

I have had the best results using Benjamin Moore "Semi-gloss exterior" paints on my giant scale warbirds. The "semi-gloss" seems to best duplicate the "smooth yet worn" finish that most combat aircraft get. I have also used their "Flat" or "Satin" finish paints on certain subjects with equal success. For sport and aerobatic types or "restored" military stuff, I have had good results with the "High Gloss" versions. After full curing the high gloss paints can be polished with many of the automotive waxes to produce an excellent shine. I have also found that furniture polish will produce great results too. Besides the Benjamin Moore paints, there are many other good brands on the market that would probably work just as well.



Whichever brand you chose just be sure to use "exterior" paint. Interior paints will not take the abuse we dish out. Exterior paint will take being exposed to handling and the weather just great. After all when was the last time you took your outside walls or trim of your house in from the rain?.....

A nice feature of latex is that it can be accelerated to dry faster by using a heat gun. It will be dry enough to touch in 15 min. and dry enough to mask over in 6 hrs. Even though it can be dried rapidly it still has a peculiar trait. Squeeze it with your hand / fingers and there will be prints in the paint. BUT... even though the paint seems dry and hard these prints will flow out and disappear in 12 -20 hrs. Presto. All gone. This "print and disappear" bit will go on in lessening stages for about two or three MONTHS. After that the paint is as stable as epoxy or lacquer yet is still flexible and heat shrinkable on the fabric. Cool stuff when you get it down.

Latex can be applied over Nitrate or Butyrate dopes. The key here though is to make sure the dope is fully cured. Most dopes out gas for a fairly long time. Sometimes three to five weeks depending on the temperature and humidity. A good test is to sniff the surface up close. If you can still smell the dope then it hasn't finished out gassing. The problem with this is that when you paint over the dope while it is still out gassing you trap this gas and it will eventually dissolve or lift the latex. This lifting process would also occur if you put epoxy or any other paints over dope that is not fully cured. In most cases you will not need a primer for the latex over the dope. If you do chose to use a primer either solvent or water based will work. If using water based primer you'll need to wait for the dope to out gas. If you are using a solvent based primer you'll need to wait for it to finish out gassing before applying the latex. In either event, primer or not, Just sand with 300 wet and dry prior to applying the latex to give the latex a surface to bite to. You'll also find that the color itself will cause changes in settings and techniques... Just remember to go easy and only change one setting at a time.

Latex doesn't need to be top coated if you are using a gas engine. It takes exposure to gasoline very well after the full cure time. However, it turns to a gooey mess if glow fuel gets on it.... If you are using glow fuel the latex most definitely has to be top coated... Here clear epoxy or polyurethane works good. But you must wait until the latex has cured fully and then be careful not to flood on the clear. Remember that both epoxy and polyurethane paints use a toluene based thinner. I have also used water-based polyurethane with equally good results.

How do you get the colors mixed you may ask? I just used the color chips from my documentation package. Handed these to my paint store guy and showed him what I wanted. To match a color he places the chip in front of an optical spectrometer. This neat little device shines a beam of light on the chip and analyses it as to what the "formula" is to mix that color exactly. A minute or two later out comes the formula from his computer. He then mixes up the quantity I need per the formula and presto I'm off to the paint booth. Simple as that. A quart of paint will generally cost between \$8.00 and \$14.00 mixed to my color chips. IF I painted a whole plane a solid color this quart will generally paint FOUR or FIVE planes.

Thinner:

What do you use for thinner you ask? Naturally most people would expect me to say to use water. Some guys would suggest regular tap water others would suggest distilled water. Both will work just fine but I now thin the paint with an alcohol/water mix OR better yet.... Windshield washer fluid. Yep..... Windshield washer fluid... Anybody's. Cheap stuff from AID auto stores or NAPA etc.... The interesting thing about most windshield washer fluids is the soap content. They all have some. The soap is what slows the drying process of latex paints.

Not the alcohol. The alcohol evaporates fast and leaves the soap and water behind. Water goes next leaving the soap. The soap eventually leaves. Slowly. This does slow down the drying time a bit which allows the paint to “flow” more and results in an even better finish on almost any kind of part. Once fully cured, this stuff can even be weathered just like the epoxy and lacquers. Really neat... Don’t worry about the blue tint of the windshield washer fluid. It will not affect the finished color shade after all has dried.

Additives:

The only additive I put in latex is a material called FLOETROL. This is used to allow the latex to flow out without running. It also acts as a lubricant for spray guns. It will also reduce the sheen of the latex just a tad. The latex dealers will tell you it won't but it does. This stuff can be got from the guys that supply pro house painters. They use it in rolling and spraying. FLOETROL looks like milk (but don’t drink it or put it in your coffee!). Only add about 2 oz of FLOETROL to a quart of paint before you do anything else. This is the only time you’ll add this stuff so you won't need to buy much.

Spraying:

With a touch up gun or airbrush I start with around 20 psi. air pressure from the regulator. This will vary plus / minus 5 lbs depending on the paint being used. Funny, but not only does the brand of paint and the amount of thinner matter here but SO DOES THE COLOR. Different colors use varying amounts of pigment particles. You can use any type of paint, just be ready to play the air pressure Vs thinner game. In any gun I start with about 20 % thinner added to the paint. Mix up a very small amount. Baby food jar size. Try spraying it thru the gun. If the paint does not come thru the gun then increase the air pressure a bit. If it still does not come thru put the air pressure back to where you started and add more thinner. Try again. If the paint spits, then you’ll need more thinner, If it comes out real wet and runny you went to far on the thinner. Just add more paint. The game here is to use this small jar to find what mixing ratio that color needs. All colors will be different even if from the same manufacturer. Try test spraying on a scrap piece of window glass. Set you gun for a low paint flow at first. If you get runny stuff even at low flow settings then you have too much thinner. You can try increasing the air pressure but usually the mix will require more paint.... If it comes out dry looking, increase the flow of paint or add thinner. Very rarely will you get the air pressure below 15 lbs. You should try to avoid having to have the pressure above 30 psi. Latex acts like it is thick and heavy compared to other paints yet you’ll find that most times it is lighter after it has dried. Some of the real nice features about latex are that it is non-toxic and develops very little over-spray. It is also very easy to clean up. All tools and equipment can be cleaned with regular soap and water.

When to Paint:

As far as weather conditions when you paint. It doesn't matter. I generally paint in my basement in mid winter here in the northeast. The average temp in my shop then is around 55 degrees. (I like it cool). Latex can be sprayed on a rainy, cold, damp day and it will give the same or better results as on a sunny day in the middle of July. In fact, the cold damp day is easier to work with the paint. I just keep a heat gun around to accelerate the dry between coats. Here I spray the first coat on just barely enough to see coverage. Dry with the heat gun. Spray a second coat on just a bit wetter. Dry again with the heat gun. Spray a third coat on and go up stairs. Come back the next day and you’ll see you are all done with that color. Go over the part with the heat gun once again just to make sure that all is cured and you are ready to mask for the next color.

Masking:

Use the good 3M plastic type masking tapes that are of the low tack variety. Don't use cheap stationary store grade masking tape, this stuff will weld itself to your plane. After applying the proper tape and covering all surrounding areas you don't want paint on, spray the latex paint lightly along the taped edge. Dry this area with the heat gun. Repeat this two more times before doing the whole area required. Do the spray and heat gun bit here again as described above. Only this time after the last coat is applied partially force dry the paint in the area near the tape. Then carefully remove the tape by pulling back on itself and head for a cup of coffee....



The finger print thing I talked about before is a function of the total time the paint requires to fully dry / cure. Time is the most important ingredient here.. Although I have found that sun light seems to speed the "hardening". When I have finished a model I set it out on the patio table each day in the sun to help "out gas" the paint. I also suspect that the amount of soap that was in the washer fluid may have an influence too. One note here. If you put a plane together too soon before this "hardening" has happened and the plane is subjected to a hot day, sometimes the wing and fuse stick together. So for the first few times the plane is assembled I use baby powder on the wing saddle..... OR, you can mask off the wing saddle area when painting and avoid this problem and also save a little on the weight of the paint! Another really neat thing about all this stuff is if you don't like the paint job or you have produced runs, spits and stuff, or dog or cat hairs have gotten in it. Just wash it off with a damp rag and dry with your heat gun and start again. You could also try this, if you have a part all painted and nice and wet, and some dog hair or a bug gets in it, just pick out the offender with some tweezers. Leave the paint alone and by morning the stuff will have flowed over to cover the spot you touched.



I have also used latex paints to paint my pilot figures. Using latex paints makes painting your pilot figure fast and easy with very little expense and a breeze to clean up. There are so many colors available that it is very easy to get all the right shades etc for that scale guy. Here again the weathering techniques will come in handy to make your "little guy" look life-like. If you use a heat gun to speed dry each color you might be able to get the whole job done at one sitting. Talk about a fast and easy method !



If you decide to try these methods and are having a tough time, even if your gun is loaded should you have questions, give me a call. Glad to help you out....