Someone queried the members of the EAA on their web site about using latex paint on aircraft, and the responses were interesting.
Some people had used it. One gentleman said he was 72 years old and had been in aviation for 55 years. He thought these facts gave the knowledge to predict dire results from its use.

His attitude, and that of the other nay Sayers, reminds me of when the Wright brothers' father, a few days before their historic escapade at Kill Devil Hills, emphatically said to the press that "If God had wanted men to fly, he'd have given them feathers!" Or it's similar to the sagacity of the long-departed IBM CEO, who said, in the late 1970s that "As near as I can calculate, there will be a worldwide market for a total of about five home computers."

Actually, the following are several good reasons to give serious consideration to the use of latex paint on fabric-covered aircraft:

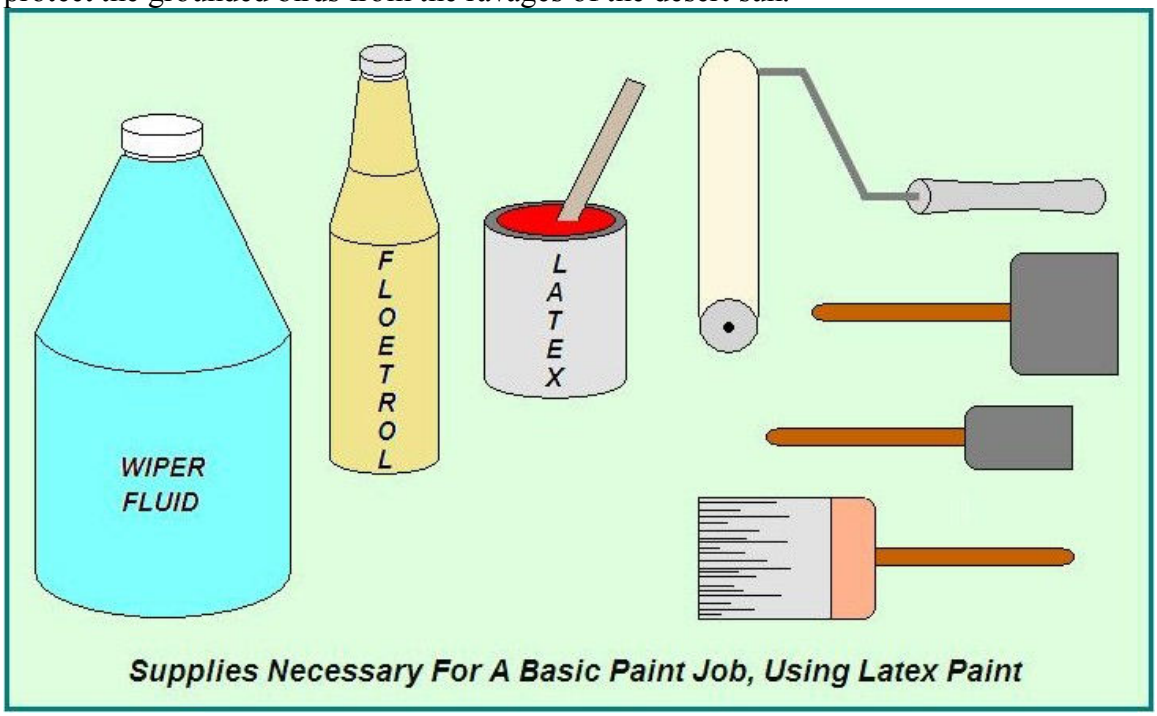
*A low cost of about $20 a gallon, compared to several hundred dollars per gallon for more exotic paints
*Ease of application and total lack of toxicity
*Its tenacious hold on fabric fibers
*Its flexibility
*Its resistance to UV damage
*An infinite variety of colors
*The dealer's ability of computer-match paint samples

Years ago, model aircraft builders who had an aversion to the cost of automotive-type paints discovered the usefulness of latex paint on aircraft. And, in many cases, they didn't have the equipment or the knowledge for proper application of these exotic materials. In addition, automotive paints require expensive breathing apparatuses; in curing they give off cyanide and they're extremely unfriendly to the environment. Many award-winning giant-scale model aircraft are finished with latex paint today, and there are several web sites devoted to the subject.

Note: To be called "giant-scale," a model has to be at least ¼ scale or have a wingspan of al least 80 inches for a single wing or 6o inches for a biplane.

One excellent article on painting and detailing giant-scale models can be found at http://www.modelairplanenews.com/how_to/latex.asp. The author, a nationally known, award-winning modeler, has used latex to finish his planes since 1983. He had been using expensive epoxy paint, but he couldn't match the colors on a plane he had repaired after a crash. He went to the local Benjamin Moore dealer for help and learned they could match the colors exactly-for about 1/8 the cost–by using a computerized spectrometer. After refinishing the model with Benjamin Moore latex applied over conventional automotive primer, he was surprised to discover that the newly repaired plane was now 4.5 pounds lighter than the original had been-even with all the extra material used for the repairs.

It's interesting that the SR-71 Blackbirds on display at the Blackbird Airpark in Palmdale, California, were painted with black latex to protect them from the vicious UV content of the high-desert sun. During flight, the plane's skin temperature approached 575 degrees F, so latex obviously wouldn't be suitable for flight. But, it works great to protect the grounded birds from the ravages of the desert sun.



Supplies Necessary For A Basic Paint Job, Using Latex Paint

The picture (above) shows all the equipment required for a basic paint job using latex paint. In the center is the paint; I used a can of bright red I had sitting on my shelf. To the right of the paint are a foam roller, a couple of foam brushes and a good-quality bristle brush. To the left of the paint is a product called Floetol. It lowers the viscosity and surface tension of the paint and helps it to spread more easily, making for thinner coats and easier application.

The jug on the far left contains windshield-washer solvent. It's an excellent thinner for latex paint, although the paint folks won't recommend it (they recommend no thinning or thinning with water only). Latex paint contains ammonia and so does windshield-washer solvent. The solvent also contains small quantities of detergent, which also contributes to ease of spreading. Small brush marks left in the paint quickly even out while the paint is still wet and small marks continue to disappear over the next several days. And cleanup is with water, as long as the paint is still damp. Like any other paint, it resists solvents after it dries. After all, that's what it's for, isn't it? By the way, latex is impervious to gasoline after it sets.

Latex is also easy to spray, although most folks recommend brushing on the first coat to control the application of the paint to the raw covering material, which should be cleaned with MEK to remove any grease, oil or residue from adhesives. Care must be taken in this step; obviously, because MEK is the solvent used in the adhesives, and we certainly don't want to loosen the covering after it's applied and stretched.

Just as in the application of sealers and primers, care must be taken not to apply such a heavy layer of paint that puddles begin to form on the backside of the cloth. That's the reason for the recommendation to brush the first coat, which allows much better control for those of us who aren't expert spray painters.

Latex doesn't form a chemical bond with the fibers of the covering, but it forms a tenacious mechanical bond as it wraps around them. Succeeding coats then form an excellent bond to the preceding coats, especially if the last coat has been scuff-sanded. Note that latex paint doesn't like being wet-sanded. Even when it's well cured if it's kept wet for any length of time, it'll begin to roll up under the sandpaper. When it must be feathered it must be done with care, patience and practice.

When spraying my models, I use either an automotive-type touch-up spray gun or an airbrush. I've used my quart-size gun to spray my house with latex, and it works just as well with latex as the others. I have a 2-hp compressor I use with the larger guns, and I've always used my small diaphragm-type compressor with the airbrush, although there's no reason not to use the larger compressor with it. It's essential that the compressor is equipped with water and oil trap, any minute quantity of oil in the paint will cause it to fisheye. This will necessitate removing the paint. Fortunately, any goofs we make can be immediately corrected while the paint is still wet. Just use a wet rag to wipe it off.

Roy Vaillancourt's Web site has an excellent discussion about the way he prepares his paint for spraying. He also writes about the application of the paint. For him, it's usually on fiber glassed and primed surfaces, but the principle is the same. Start with a very light coat, and after drying; add two more coats, with the second being allowed to dry before adding the third. Because the solvent in latex is water, the paint dries rapidly, depending on the temperature and humidity. Vaillancourt uses a heat gun to dry the paint on his models.

One of the neat things about latex paint is its opacity. The old rule about never putting light colors on top of dark doesn't apply with latex. Although it's still a good idea to use dark over light, it isn't a necessity with latex. One manufacturer advertised that its paint contains 48% solids, by weight, far higher than anything else I've seen, other than polyurethane, perhaps. This certainly accounts for the high opacity of the paint.
Some folks who use latex on full-scale planes use a base coat of black paint for ultraviolet protection. However, if the bare fabric is going to be visible in the finished plane, the black color isn't too desirable. An interesting Web site (http://www.larryvile.com/dcd/tandem/latex1.htm) describes the painting of a Ragwing Ultra-Piet (a ¾-scale Pietenpol Aircamper).

The author didn't use an undercoat of black on his Ragwing because he didn't want the black to show in the cockpit. Also, he says he was concerned about the weight-saving possibilities. He said, "If I was still flying the airplane in 10 years, it would probably be ready for new fabric anyway, I figured, UV degradation or no."

Then he describes how he devised what he calls “an accelerated aging test, something much harsher than it would see on a hangared airplane.” He prepared a sample of fabric, stretched on a wood frame, and applied single coats of red and white latex to various parts of it. Then he placed the sample outside, learning against the south wall of his shop. He left it there for the next 6-1/2 years. Believe me the south wall, in Lawrence, Kansas, does get a lot of sunshine!

He tested the sample periodically for deterioration of the fabric, and only at the end of the 61/2 years was he able to detect any UV deterioration. He makes no claim for the scientific accuracy of his field test, but he says it satisfied him to know that his plane could be safely flown without a black base coat. More than one coat of paint would greatly increase the opacity of the paint and serve even further to prevent UV damage.

There’s some humor included in the description of the test. One of the lower corners of the test sample, painted white, is severely discolored. Aha! Have we finally found a weakness in latex paint? Does it turn yellow when exposed to sunlight? Not necessarily. The author said the yellowing is the effect of canine urine on latex paint! Hopefully, that won’t be a problem for paint used on airplanes.

Regarding flexibility, the Web site said the author has taken a painted piece of fabric, wadded it up tightly in his hand, rolled it about and opened it back up with no cracking or other damage to the paint. I visited our local paint store and was shown some test samples that showed the same result. One was a strip of painted plastic that had been bent doubles, and then a larger weight was applied to fix the crease. This didn’t damage the paint. This flexibility makes the paint suitable for use on unsupported fabric surfaces that will be subjected to flexure during normal flight service.

Latex manufacturers all recommend their paint for use on metals and fiberglass that have been prepared by scuff sanding or the use of etching solutions and then carefully cleaned. The EAA site has a query from an aircraft owner seeking information abut how to get latex off an aluminum-skinned plane. If latex has a fault, it’s that it’s impervious to most, if not all, of the normally used paint solvents. There are solvents available that will remove it, however. Check with any well-stocked paint store with knowledgeable salespeople.

Most of the large paint stores now have computerized spectrometers they can use to match any paint sample. The sample is placed in the spectrometer’s viewing window, the computer takes a few minutes to analyze the color components of the sample and then it prints out a formula for mixing the paint. Lighting and eyeballs are removed from the equation. The color chips, that are available at most stores, show the complete spectrum form which colors can be chosen, and the computer can match anything in between the chips. This is particularly useful when trying to repaint repaired surfaces after the surrounding paint has been weathered enough to begin fading. The computer sees the sample, as it is, not what it used to be. The formula it gives matches what it looked at. There may be a difference in the gloss of the weathered paint and the new paint, but that can usually be taken care of with a good wax job.

It seems that homebuilders are really missing something if we don't at least look at the possibilities for using latex paint on our projects, the nay Sayers not with standing. Where would we be if the Wright boys had listened to their nay saying father without at least testing their ideas?
The above courtesy of
http://www.lightminiatureaircraft.com/generic31.html