

## Fabric Covering and Finishing

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# **COVERNG AND FINISHING WITH CLOTH - PART II**

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By now you should be able to choose which fabric and which finish you want on your “latest, greatest” model. Since I like, and am familiar with, the Stits polyester fabric and Stits paint system, I’ll describe it here. Other polyester fabrics will be very similar. Silk would be similar except you would use a water spray to shrink the covering after attaching it. Silk also takes a little more care in filling the weave with the first coats of dope.

Your wing will offer a good beginning challenge if this is your first, or close to first, fabric covering job. I happen to be working on an early Waco biplane that has a more challenging covering procedure than a flat-bottomed or semi-symmetrical design. This aircraft used a slightly under-cambered airfoil that means the fabric will have to be attached to the bottom of every rib before shrinking is attempted. It also means aggressive shrinking might pull the fabric away from the ribs. This could be a great example of the need for real rib-stitching like the full scale aircraft wings use to hold the fabric against the ribs and maintain the airfoil.

The first and arguably most important step is a careful inspection of the structure for good glue joints and complete construction. Make sure there are no surface gaps that can show under the fabric. Make sure there is a surface around the perimeter to fasten the fabric. One quarter of an inch width is about right for gluing.

The next step is even more important. Sand every thing smooth using long bar sanding blocks to be sure the ribs are all the same height and shape. You should be able to start with 150 or 220 grit sandpaper and work up to 320 or even 400 grit for final sanding. I know one nut case who finishes sanding with 600 grit sandpaper.

There will still be a certain amount of ‘fuzz’ on the wooden surfaces so now I use my shop vac to vacuum any loose dust. Then give the wing framework a brush coat of dope to partially seal and ‘stand up’ the fuzz so it can be sanded away to leave a velvet smooth surface. Run your hand over the surfaces to ‘feel’ any disturbance.

With Stits products use Poly-Brush and with other finishes Nitrate Dope is the primary choice of undercoat and sealing coat of paint.

With preparation out of the way it’s time to cut some fabric. Full-scale aircraft often sew up an envelope of fabric to fit over a wing panel. That isn’t so easy with a model wing so just cut a piece of fabric that folds around the wing leading edge and extends past the trailing edge by an inch or so. You will need the excess fabric to pull and fit the cloth over the wing framework and wrap around edges. Pins can help hold the fabric in place temporarily

I use Stits Poly-Tac adhesive, but the Sig Stik-It is about the same. The Poly-Tac will usually need to be thinned a bit with MEK (Methyl-Eethyl-Keytone) which is also used for clean-up of all the painting brushes, and spray equipment. Pour just a small amount into a plastic cup or cat food can (clean it first) and add the MEK till it runs about like heavy cream. An acid brush is an inexpensive applicator and can be thrown away after use.

One easy way to cover is to paint on two coats of Poly-Tac around the perimeter of the wing and on each wing rib where the fabric will touch. This is almost a mandatory procedure on the bottom of the under-cambered wings. With the Poly-Tac dry you have very little mess and can better control where you want the adhesive. Using MEK to soften the glue, tack the upper surface covering along the root rib edge and at one spot on the wing tip. Tack along the trailing edge on the bottom of the trailing edge nearly to the tip. DO NOT glue the fabric to the leading edge.

At this point you should be ready to finish the wing tips by pulling the top surface material over the bottom edge and gluing along the bottom edge of the tip. When the glue sets you can trim the covering leaving just the glued ¼ inch.

The bottom surface material is then pulled and glued on top of the upper surface around the tip edge. Do not trim yet! Your wing should now be completely covered with a minimum of wrinkles. Polyester can shrink from 10% to 12% with application of heat up to 350 degrees F. It begins to shrink at 225 degrees F and the fabric can damage structures with excessive shrinking. When painted the fabric will not sag like many plastic coverings.

To shrink fabric covering a calibrated iron is highly recommended and I use the Coverite calibrated iron. You can get a Coverite temperature gage that can be used to calibrate any iron. Start shrinking with about a 250 degree F iron.

As you apply heat to shrink the covering avoid the glued perimeter so the fabric will not pull away from the structure. When the shrinking is finished you can go over the edge and iron down any rough edges. The iron can be used to remove all but the very worst wrinkles. If needed, use MEK to loosen the fabric and pull the fabric to remove the wrinkle. Polyester wraps around compound curves easier than any other covering.

The first coats of fill dope should be brushed on gently to get the dope into the fabric, but not so it causes big 'runs' that can show through. It will take between three and five coats of filler depending upon the viscosity of the dope.

The next coat will be an aluminum filled anti-UV coat just like on full-scale aircraft but for another reason. On models we want a uniform base coat color so final color coat(s) will have an even shading. Remember, all paints are transparent to some degree and variations on undersurfaces do show through.

Choosing a finish paint process will be your choice and I will not have space here to describe the multitude of different paints. Follow the Mfr's instructions.

Good luck. Any questions, feel free to contact me at [ron3180x@aol.com](mailto:ron3180x@aol.com) or call at 760-788-9022.