



Composite Techniques Part 2 - Material Identification, Repair and Changes on a Cowling

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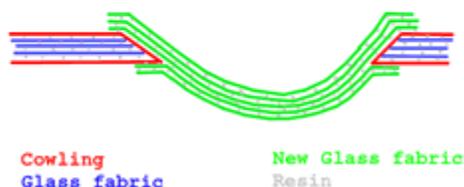
Sonerai.net presents part 2 of Juergen's article on composite techniques. Juergen lives in Germany and owns and flies a Sonerai I.

Let's talk about a very interesting material used in composite construction called "peel-ply." Peel-ply, which is available from Aircraft Spruce and Wicks, is a Poly/Dacron fabric that does not adhere to epoxy or polyester resins.

Many epoxy manufacturers introduce a very low amount of silicone to their resins to improve material flow. If we apply peel-ply on the upper surface of a layup, the silicone in the resin will tend to soak into the peel-ply instead of remaining on the layup's surface. According to a friend, this technique is commonly used by aircraft manufacturers during production of molded spars.

I will now describe how I used peel-ply during the modification of my Sonerai I cowling. The modification, which will be discussed in an upcoming article, is to improve aerodynamics, reduce noise and aid engine cooling.

The diagram below shows a typical cross section of the of a composite patch on an existing molded part like a cowling. The new layers are applied mostly to the outside of the existing cowl surface for strong adhesion (good static connection) as well as better appearance and easier sanding .



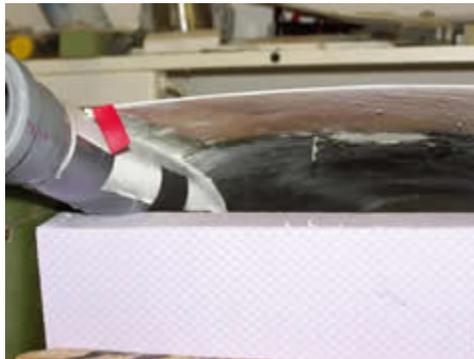
First we draw the outline for the modified section to the existing cowling as seen here:



The next step is to cut along the lines to create the space for the mold form. I then sand the edge of the cuts to an angle of about 45 degrees to provide a lip for the layup to adhere to.



Now comes our trick with peel-ply. Apply the peel-ply on a waxed form securing it temporarily with a few pieces of adhesive tape. In this example, a discharge pipe was used for a mold form.



Now that the form is prepared we can mold the two outer layers of glass to the cowling. The red tape on the cowling limits the flow of the resin which will save on finish sanding work.



When the resin begins to harden, which is in about 30 minutes for polyester and 2-4 hours for epoxy, the excess glass cloth is trimmed with a sharp knife.

Once the resin has cured, remove the form (the drainage tubes in my case) along with the peel-ply. You now see the surface left behind by the texture of the peel-ply. It is the negative imprint of the peel-ply which increases the surface area by a factor of about two. I now mold an additional three layers of glass to the inside of the cowling as seen in the next photo.



After cutting, sanding, filling and painting, the modified cowling looks like this:





I hope this modification will give me some additional speed

If you have comments on this or other articles, please post them to the Sonerai.net [Forum](#)