Sealing 1-26 Wingroot to Fuselage

Using Garage-Door Seal Material

From its introduction, I admired the rubber seal along the wing-root/fuselage joint of the later 1-26's. Soon, a few people adapted that "h" shaped material to fit on their earlier ships. It required that the gap be a rather uniform distance, and that meant that for most 1-26B's (like mine) it was necessary to trim off some of the inboard wing skin. Sometimes there were also places near the trailing edge where the gap was too wide for the material to fill. These problems caused me to continue using electrical tape. However, tape is a bother--and its residue can be very troublesome in our hot, dry weather. In recent years I have had several friends tell me that air still leaks around their Schweizer seals, and so they still tape at least part of the wing joint.

About 1980 I noticed that The Pickle (007) had a flexible seal attached to the wings which fit tightly against the fuselage all the way around. When I inquired about it, Mockler said that it was garage door seal material from the hardware store. This flexible vinyl material is shaped similar to an "L" lying on its long side. Mine is 1-1/8" on the long side which is attached to the wing. The short side, which is slightly curved and at about a 120 degree angle to the other, extends 11/16" onto the fuselage side. It is available in several colors (white, black, gray, brownish, etc.) at larger home-DIY-type stores.

My original installation in 1983 used contact cement to attach the seal to the wings. It did the job very well and eliminated the need for tape completely. However, the adhesive did not last long. It tended to come loose in the heat, especially when the wings were trailered (root first) at 70 mph. After reworking it a time or two, I started looking for a better adhesive. I finally settled on Pliobond. I now buy it at a local gasket company, but it is available through many outlets -- including aviation supply places such as Aircraft Spruce and Chief Aircraft. See:

<http://www.chiefaircraft.com/Aircraft/Chemical/AdhesiveSealant.html>

It is available in two consistencies--we need the thin one (#20). The catalogs say to use MEK for thinning. On the can it says use either MEK or acetone for activation. I have used acetone exclusively because it is readily available (and probably, safer).

If you decide to try this method, keep in mind that it is a permanent solution, and do it right the first time. Pliobond is almost impossible to remove from bare metal and painted surfaces once it has completely set. However, I had good results using acetone to re-activate what was already on the wings when I replaced the seal material on #196 several years ago. Before getting too involved, make certain that acetone will not seriously attack the paint on your glider's wings. You will need two 11-foot pieces of the seal material (probably two packages). One half-pint (brushtop) can of Pliobond should be enough. Get a quart of acetone (two if you are clumsy like me). Clamping is very important to the bonding, so you will want several small C-clamps (borrow all your friends'). The more material you can clamp at once, the faster the job will go. Flexible wood strips are needed between the clamps and the seal and between the inside of the wing skin and the clamps. Get some old wooden yardsticks and make several pairs of pieces about 4 to 8 inches long. Longer ones can be used from the spar to the trailing edge. These need to be 3/4" to 7/8" wide for the seal side.

To position the seal on the wings, make a marking jig from a small block of wood about 1/2" thick. It should be exactly the width of your seal material (1-1/8" for mine) and have sides that make a 90-degree angle with the wing. While the wings are rigged to the glider, slide the jig along the wing keeping it against the fuselage, and make a continuous pencil mark completely around the top and bottom wing surfaces. Accuracy counts! Be careful to preserve this mark when you remove the wing and set it on your saw horses. Later, when the material is installed with its edge exactly on your line, the base of the "L" will be against the fuselage and the curve of the short side of the "L" will press tightly against it and form a good seal.

Using masking tape and butcher paper or similar, mask off 2 or 3 feet of the wing up to about 1/8" of your pencil line. Clean the wing surface being careful not to erase your pencil line. Do top and bottom surfaces at the same time.

Roughly measure the seal material for one wing with a bit extra allowed at each trailing edge. Later you may want to fasten the top and bottom parts of the material together just aft of the wing and trim it off at a 45-degre angle. Apply a generous coating of Pliobond to the entire length of seal material. Set it aside to dry. You will probably need a helper for this procedure. Don't use a wing for a workbench!

If your 1-26 has the type of trailing edge that is attached with P-K screws, remove the last screw on both the top and bottom trailing edges. These will later be replaced--but extending through the seal material. If yours does not have these screws, you might consider putting one on each top and bottom surface at the trailing edges (4 in all).

Apply Pliobond generously to all of the wing edge right up to the line. Let it dry completely! You need the adhesives to be dry enough that the two parts can be brought together and re-positioned without sticking tight or pulling away from one surface..

Beginning with the lower surface trailing edge, use a few bits of masking tape to hold the seal material on the butcher paper near its final position. With a clean rag soaked in acetone, "activate" the adhesive on both surfaces for about 2-1/2 to 3 feet beginning at the trailing edge. Don't hurry it and be certain to thoroughly soak the Pliobond. Keep it over the floor and off the butcher paper. Mate the two parts accurately along your pencil line. A helper is a definite asset in this procedure. He probably should be assigned to manage the seal material to keep it off the wing until you are ready for it. The vinyl should be pulled tight--but NOT stretched. Clamp it snugly. Repeat this procedure up to but not including the tight curve around the leading edge. Use shorter wood strips for clamping forward of the spar. Drill a mating hole through the vinyl and put the P-K screw back.

Turn the wing on the sawhorses. At this point, I would wait overnight for a thorough bonding before working around the leading edge curve. Because of the tight curve, it is necessary to "slice" the narrow side of the vinyl in 2 places close to the maximum curve. Check the fit before activating the Pliobond. Again, pull the material tight, but do NOT stretch it. Plan so that you can work around the maximum curve and clamp it on the wider curve on the top of the leading edge in one step. If plenty of clamps are available, you can then continue to the trailing edge with two or three more steps. Put in the top side P-K screw.

Do wing #2. Allow plenty of setup time before installing the wing on the glider. Pliobond gains strength with curing.

Alternative bonding: Use a very thinned mix of Pliobond after the activating acetone before mating the parts. Difficult to keep mess off the wing. I originally considered several weather-strip adhesives, but all I found were much too thick and stringy which made them difficult to use. They also set up too fast and once really dry were hard, inflexible and impossible to remove. The tubes they come in are also a problem.

Avoid over-tightening the clamps; it makes the vinyl want to "slide" off your mark.

Consider using plastic masking tape instead of the pencil line. I haven't tried this.

If you are not satisfied with a section, rip it off. Apply new Pliobond to the vinyl; let dry. Activate and bond as before. I completely removed (ripped off) the seal from #196 and masked off the wing Pliobond to keep it clean when we had the glider repainted about 10 years ago. After the recover job was done, I removed the masking tape and sanded the Pliobond. Then I put on a new seal using thinned Pliobond on the wing surface.

If, after time, some spots of the vinyl begin to turn loose right at the edge of the wing skin: Using an eyedropper or syringe, apply acetone to the dry Pliobond in the gap, work the seal material by flexing it to encourage thorough wetting and softening of the inner parts, apply more acetone, do it again. Clamp tightly for 48 hours.

The white garage-door seal has a tendency to yellow slightly with age. Keep it nice by hard scrubbing with Ajax, Comet or SoftScrub every year or two. Protect the wing paint.

Good luck with your project. It is quite a bit of work, but it gives very satisfying and attractive results. Best of all, it will completely stop the air leaks and associated noise.

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