Replacing Mylar® Gap Seals

By Jay Campbell

There are two big hassles involved in replacing the Mylar seals on your sailplane: getting the old 'stic-kum' off and getting the new Mylar on in exactly the right place and without any buckling.

However, I am a little ahead of myself. Why replace the seals in the first place?

1. Safety
2. Performance
3. Cosmetics

Is seal inspection part of your preflight? If not, be sure to put it high on your list. Figure 1 shows an all-too-typical aileron seal. It is slightly buckled and has some areas of separation from the double-sticky adhesive (DSA), generally called "transfer tape." Intuitively, you know that this is going to cost you some performance. Worse than performance issues, I have seen a ship that had total separation of the Mylar from the DSA on the bottom of the wing. The only thing holding the Mylar to the ship was the "safety" tape at the leading edge of the Mylar. It literally "flapped" in the breeze. Further, I have seen a ship with total separation of the Mylar from both the top and bottom join between the elevator and horizontal stabilizer. I don't know about you, but I do not want to fly a plane with a "spoiler" extended right in front of the aileron…let alone the elevator.

An insidious problem must be mentioned. When you order replacement seals, do you simply measure what is already on the ship and order that? I did once. The entire brand-new seal suffered complete separation from the DSA after only a few months of flying. I was told variously that I "had not cleaned properly," that I "had not pressed hard enough," that I "should have sanded the wing in the area of the DSA," that I "must have gotten hand-oil on the Mylar," that…well, you get the picture: I was told that I had screwed up.

However, I was not the culprit. After requesting the sealing

Figure 1

Figure 2

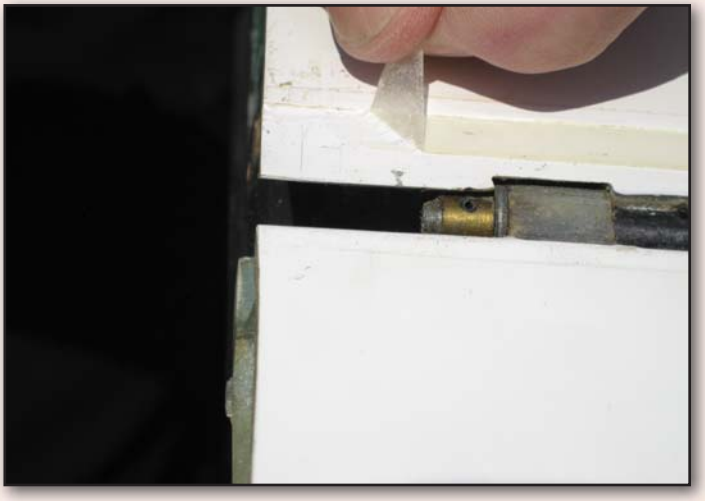

Figure 3

Figure 4

scheme from the factory, I found that the seal I had measured and copied was the wrong width – 8 mm, or about 5/16" too wide. This extra width allowed the aileron to "lever" the Mylar off the DSA. Moral: get the specifications from the factory. This will include both the positions and the dimensions of the Mylar, the DSA, and the safety tape. Anything else is little better than guesswork.

Okay, now you know why seals may need to be replaced and how to order the right stuff. Let's get to work.

The Mylar and the safety tape will probably come off in one piece, but will usually leave behind the DSA (Figure 2). Even if you can peel off the DSA, you will generally leave behind some very tenacious glue (Figure 3). I have found that putting a one-and-one-half inch strip of bed sheet on the DSA residue and

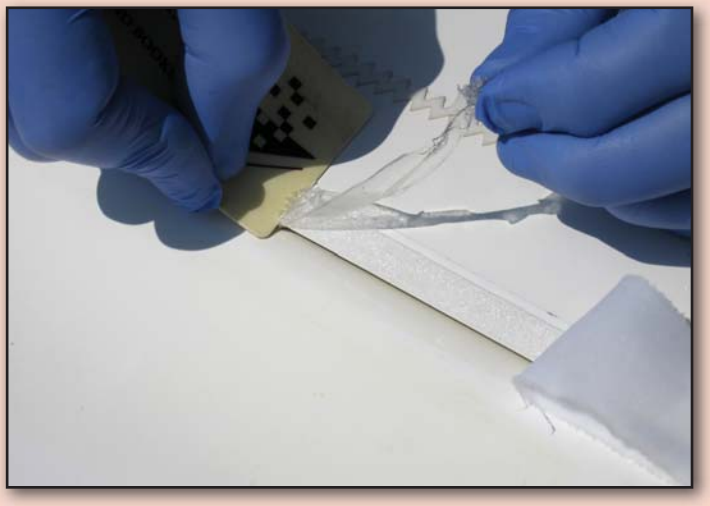

Figure 5

Figure 6

Figure 7

Figure 8

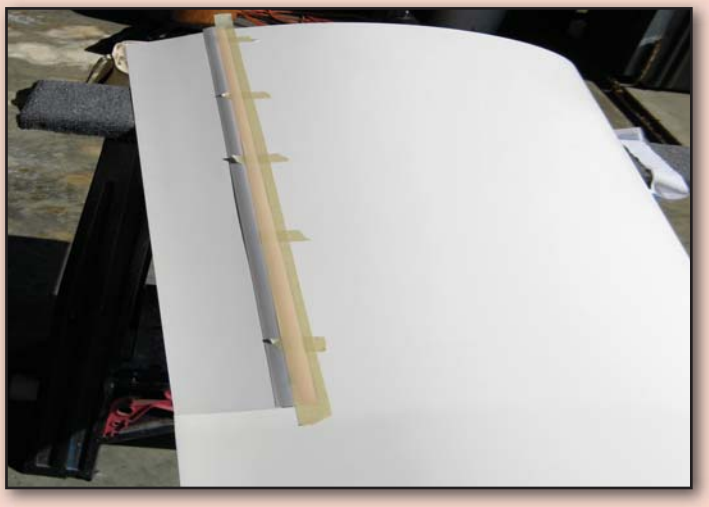

Figure 9

Figure 10

wetting it with 3M Adhesive Remover (Figure 4) for about 3-5 minutes greatly eases the removal of the DSA residue as well as the safety tape residue. I use an old motel key-card for this (Figure 5). There will still be a little residue, so simply clean up with a fresh rag and some more adhesive remover. Note: be certain that your rags were simply washed and dried. Fabric softener may leave a residue limiting the DSA's ability to adhere properly.

Everything is now as clean and oil-free as possible and ready for placing the proper DSA in the proper position. Follow the sealing scheme provided by the factory. If you put slight tension on the DSA while doing this, you will get no bubbles and no creases. It helps greatly to have a second pair of hands at this point. Figure 6 shows the beginning of the application. The darker-pink areas are where the adhesive is properly "down" while the lighter areas show that more pressure (applied by finger, then a key card) needs to be added. Figure 7 Shows DSA that has been properly pressed into place and is being trimmed.

Figure 8 shows small pieces of adhesive tape at 12 - 15 inch intervals holding the Mylar in place. Figure 9) shows adhesive tape along the entire length of the seal. It is important to really get the adhesive tape on firmly by again using the key card for pressure.

Lift one end of the Mylar slightly (Figure10) and, using a dental pick or tweezers, separate the backing from the DSA. While folding the Mylar back into position and pressing it to the DSA (Figure 11), continue to pull the backing away from the DSA while pressing the Mylar firmly (Figure 12). After carefully removing the masking tape, again use the key card to press the Mylar securely onto the DSA (Figure 13).

After applying the safety tape per the factory drawing, trim the ends as appropriate for your glider. (Figure 14)

A few final thoughts:

The 3M product is fantastic, but must be used in a well-ventilated area only. Also, wear chemical-resistant gloves when using this or any harsh chemicals. I use Nitrile gloves.

Always apply each tape and seal in the same direction (e.g. left to right) and press down firmly at each step.

Check in an inconspicuous spot to see if the adhesive remover does something that you do not want: discoloration, etching, delaminating. I have never seen this occur either on gel coat or epoxy finishes, but you won't *know* until you try it on *your* plane.

If you need to get into a tight corner to remove DSA, simply cut the keycard with scissors to get a perfect angle.

(Figure 15) Make sure that the Mylar does not bind at a junction between moving and fixed parts by rounding the corners and cutting it just shy of the full opening.

Many thanks to Robin Fleming, "RF1," for his work both as the photographer and hand model for this article.

About the Author:

Jay Campbell, (below right), "56," began soaring at Bermuda High in 1994. He primarily flies a Ventus 2b, but also enjoys some of his time in a PW-5 and a Duo Discus. He competes yearly, and since 2001 has helped organize many wave camps based from Shiflet (Marion) North Carolina, where many gold and diamond altitude legs have been achieved. He has been the South Carolina Record-Keeper since 2005.

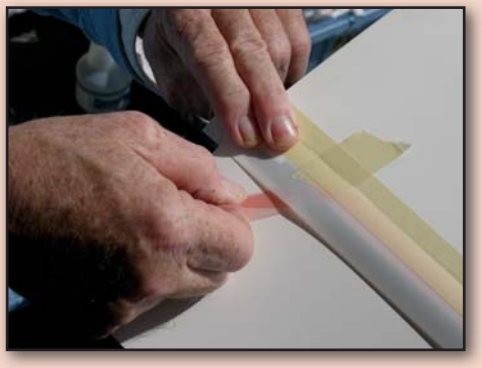

Figure 11

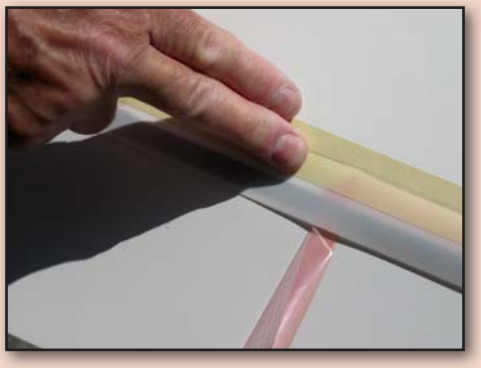

Figure 12

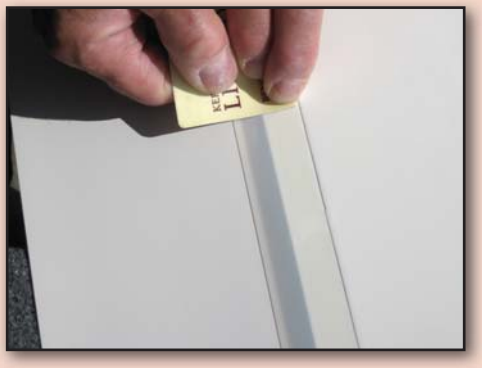

Figure 13

Figure 14

Figure 15

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