

<http://www.vansaircraft.com/RVator/2008/1-2008-RVator.pdf>

IN THE SHOP *Ken S.*

Every so often we get calls from builders who want to know the secret of repairing cracks in plexiglass. The problem is that we don't know the secret, either. So when an article appeared in EAA's *Sport Aviation* magazine, detailing the repair of a badly damaged B-25 turret using a couple of "magic" products, I called the author and requested details. It turns out the author works for the company that makes the magic products (Urethane Supply Company, www.urethanesupply.com) and he kindly sent me a kit of materials and instructions.

So equipped, I headed out to my shop. Not willing to crack my own canopy to prove a point, I dug around and came up with a couple of old replacement landing light lenses. Perfect. I drilled a couple of holes a few inches from one edge and flexed the lens to crack it into the hole. Nothing. Twisted it more aggressively. Nothing. Finally, I hit it with a hammer two or three times. That did it. Fourteen or fifteen years ago, I drilled my canopy with a regular twist drill (didn't know any better) and riveted it to the steel frame with CS4-4 steel mandrel pop rivets (didn't know any better) and yanked the skirts into some semblance of matching the fuselage with padded vice grips and a hole finder (didn't know any better.)

So far, it's lasted through hot and cold weather, plenty of slamming and one runaway Chevrolet. At least in my experience, plexiglas is tougher than rumor would have it...certainly, I don't regard that canopy as a hand grenade with a pulled pin. Once I had finally achieved "crack", I set about repairing same. The first step in the instructions was to grind the plexiglass out to "V" groove a long the crack. (Forgive the photos...taking pictures of something transparent turns out to be quite difficult!) This was an acquired skill, but I finally accomplished it, using a Dremel tool with a cutting burr and a fingernail-dressing sandpaper stick. Next time I'll use the router collar that came with the Dremel.

The kit includes a bottle of powder, a bottle of liquid and a couple of syringes with tiny applicator needles. The liquid is the activator that turns the powder into a semi-transparent, permanent filler. The directions call for putting some aluminum tape over the back of the crack, filling the syringe with activator and "dipping" little balls of powder out of small cup and putting it into the crack, filling the "V" groove. That didn't work at all. What did work was filling the groove with powder and using the syringe to spread activator across the surface. In just a few seconds, the powder turned into a milky but plexiglass-like substance. After a few minutes it had hardened and bonded the crack back together.

At this point, it was time for the canopy restoration package. I used the Scratch-off kit in our catalog. Starting with a sanding block of about 320 wet-and-dry, I brought the surface of the repair material down even with the outside of the canopy. There were a couple of low spots, but a bit more powder/activator filled those. When the outer surface was smooth, I worked my way through the polishing grits to get back to a transparent, shining surface.

The result was a repaired, but not invisible, crack. It certainly seems as strong as the original plexi, but you can still see the cloudy ribbon where the crack was. I can see some small problems using this fix on a finished airplane. The surface must be horizontal, for instance, because the powder is very fine and light and won't stay in the groove any other way. It's not perfect (if anybody out there does have a perfect plexiglas repair technique...run, quickly, to the nearest email sending device and give me the details!) but I would be glad to use this kit to keep me flying, or as an alternative to replacing the canopy.

<http://www.vansairforce.com/community/showthread.php?t=23751>

I've had a crack in my canopy for four years, that I've had to stop drill twice. After reading Scott's article, I dropped him an email and he provided with some great advice. I'd accumulated several discussions strings on canopy repair over the years, none of which looked viable to me. After talking to Scott, who is in product development at the company who sells PlastiFix, I bought his product.

Scott sent me some pix of the B-25 turret canopy repair, to show me that they were not really clear, but the best you can do in a bad situation. I used their clear product in making a repair on my RV-4, but tiny bubbles form in the chemical and still prevent it from being clear. However, it seems to have made a strong repair, which I hope will stop any further problems.

I used a Dremel tool to cut a V-groove along the crack, which is the recommended method. I wasn't certain from their directions but cut it all the way through, with just a small opening along the crack on the outside. This allowed the chemical to fill in the opening down to the tape I placed on the outside along the crack, to prevent dripping. Fortunately, the crack was on the right side of my tip over canopy, allowing gravity to work for me, as I filled from the inside. A repair on a vertical surface would be more difficult.

PlastiFix comes in two bottles. One is a powder and the other a clear liquid. I poured a thin layer of powder in the groove, followed by a layer of the clear catalyst. I used a needle applicator to control the application. PlastiFix sets up in less than a minute as I used it and I applied about 5 coats to fill slightly above the

surface. Several sandings, using progressively finer grit, smoothed the finish. A final rubbing with auto rubbing compound polished it out and it was done.

The repair is opaque, but if it stops the problem, I'm happy with the repair and see it as a battle scar on my faithful "flyer."

The PlastiFix kit cost around \$30 and I've got plenty for other plastic repairs.

<http://www.urethanesupply.com/index.php>

<http://www.aircraftspruce.com/catalog/cmpages/01-00542-45.php>

<http://www.merkulow.com/index.htm>