Epoxying a Tank: Things to Do (and Not to Do)

By Mike Taglieri

I epoxied the inside of my fiberglass Norton Interstate tank with the Caswell epoxy kit over a year ago. Doing that once hardly makes me an expert, but I thought people might like to hear about the things I did right, and the several things I did wrong.

Size of Caswell Kits

Caswell makes a one-pint kit and a gallon kit, and I bought the pint kit, which was a mistake. Caswell says this will coat "up to two" five-gallon tanks, so I figured one six-gallon Interstate tank would be a cinch, but Commando tanks aren't normal. Because of the fat backbone tube on the Commando frame, the tank doesn't have sides and a flat bottom but is saddle-shaped, with an inside hump that has a lot more surface area than a flat-bottom, and the hump is also hard to get the epoxy up to when you slosh it around. I'm not sure I managed to reach all of the hump on mine, but that wasn't an area of concern on my tank anyway, so I expect the coating job I did on my tank will be fine. But if I ever have to do the tank again, I'll team up with another Interstate tank owner and use a gallon size for both. I think the one-pint kit would be enough for a Roadster tank.

There are also some things you have to do with a Norton fiberglass tank that are different from what the instructions say. Caswell says to turn the tank upside down to drain the extra epoxy out after coating, but this doesn't work. The filler opening on the fiberglass Interstate tank (and probably the Roadster tank also) isn't level with the tank on the inside but sticks down an inch or more. So if you tip the tank upside down, nothing comes out. I wound up draining the tank through the petcock holes at the bottom by resting the tank crosswise on a cardboard box and tipping it back and forth. This made the extra epoxy slosh from one end of the tank to the other, and every time it went past the petcock holes, some would dribble out until it was gone. A syphon might also work here.

In addition, since the petcock holes are the main way you're getting the epoxy out, you shouldn't plug them with "putty or Play-Doh" as Caswell says, because you have to get them open quickly and completely to drain the epoxy. I used threaded brass plugs that fit the petcock openings, and you could also use broken petcocks. If I didn't have either of these, I'd use rubber stoppers, corks, or make plugs out of wood and screw them into the holes. One area that's easier to seal on a Commando tank than Caswell says is the filler opening. The instructions say to seal it with Glad Wrap and a rubber band, but I found that if I put an unopened Zip-lock bag over the opening and closed the cover on it, the spring pressure of the cap would make a perfect leak-proof seal.

Tank Preparation

Caswell lists six preparation steps but only four are needed for a stock fiberglass tank:

1. Rinse with acetone or lacquer thinner and allow to dry.
2. Rinse with Dawn dishwashing liquid and hot water and allow to dry.
3. Rinse with lye solution. Only for aluminum tanks].
4. Shake with a handful of drywall screws and acetone for several minutes and allow to dry
5. Seal holes, weeping seams, etc. with duct tape.
6. Protect paint from harm with Glad Wrap and aluminum foil. There's no paint to harm on a stock black fiberglass tank, and the epoxy won't harm the gel coat.

I decided to do these steps at least as thoroughly than Caswell said, and I wanted go overboard whenever I could to make sure it

wouldn't be my fault if the stuff didn't work. So for step one I did two rinses in acetone, and the second rinse did come out cleaner than the first. Also, I used drywall screws with both the dishwashing liquid rinse in step 2 and the acetone rinse in step 3, and I used most of the box, not just a handful The first time, when I used the screws in the water and dishwashing liquid, might have helped scour the tank more, and it also gave me practice removing the damn things while they were just wet with water instead of acetone. (Again, it doesn't help to tip the tank upside down. I used a magnet on a stick).

Caswell tells you to "rinse and allow to dry" between each step, but they don't give a clue how you're supposed to get the inside of a wet tank dry. After several tries, I discovered I could take the motor part off my shop vac, connect the hose to the output, and use it as a blower. With the motor out and sitting on the floor, it blew only clean air into the tank on the work bench, and after a few minutes I was happy to see that it was blowing air at about 80 degrees, even though the motor wasn't warm. This was perfect for drying both the water and the acetone, and a regular vacuum cleaner should work just as well. Areas where water or acetone are still evaporating will feel cooler than the rest of the tank, and I gave the tank about half an hour more after it was completely warm, just to be sure it was totally dry. WARNING — It's okay to blow air INTO a tank with a vacuum cleaner but don't suck air OUT OF a tank with a vacuum cleaner. A spark in the motor could make the acetone fumes explode. Also, the sloshing and spilling-out of the acetone should be outdoors for the same reason.

Mixing and Pouring

Once the tank preparation is done, it's time to mix the epoxy. The stuff is about as thick as maple syrup, and the two parts have to be thoroughly mixed. Caswell says bad mixing is the #1 reason for failure. The instructions say to mix in a plastic container for two minutes, and I used a yogurt container stirred with a knife. They recommend pouring the epoxy into the tank between 65 and 85 F so it won't be too thick or thin. I let the tank and the epoxy cans sit on a warm, enclosed porch at about 77 for an hour or two, then I mixed the epoxy and poured it into the tank with cardboard on the floor to catch the (considerable) mess of getting rid of the extra epoxy by spilling it out of the petcock holes.

Initial Setting Up of the Epoxy

I also made a decision at that time that turned out to be both good and bad. The left side of my tank was the worst area, with serious bubbling in the gel coat that meant the fiberglass underneath had been penetrated, and I think that area would have started leaking before the season was over. So I decided to let the epoxy set up with the left side of the tank

Fig. 1. Makeshift drying setup.

Fig. 2. Threadchaser to clean threads for the petcocks. This is easier to do before the epoxy has set up completely.

on the bottom, so any excess epoxy would trickle down and help reinforce that area.

This is what happened, but it had a bad side effect — setting epoxy generates heat, and with that side of the tank resting on cardboard the heat of the extra epoxy was trapped and it made the gel coat bubbles worse. So now the left side of my tank is stronger than it's been in years, but it looks worse than it did when it was falling apart. If I'd known this would happen, I could have used a fan to cool that area while the epoxy set, but I had no idea the heat produced by the setting epoxy would cause gel coat blistering.

Caswell said to "trim up any excess material" after 45 to 60 minutes when the epoxy would become "plastic like." Mine took longer than that — it was still slightly soft after two hours — and at that point I easily got the excess dribbles off the outside of the tank with acetone on a cloth. The stock black Norton fiberglass tank is not painted. Don't try this on a painted tank. The instructions explain how to protect a painted tank from the epoxy.

Curing the Epoxy Fully

The Caswell instructions say to let the tank cure for 24 to 36 hours before use, or "if you elevate the temperature of the tank up to 140 F for 4 hours, this will 'post cure' the resin and the tank may be put into immediate service." I didn't need immediate service, but I decided this was another area where I could "go overboard" and get the best possible job. I didn't want to go higher than 140 , because Caswell must have picked that number for a reason. But there was no reason I couldn't go longer than 4 hours. So I decided to "post cure" the tank at 140 for three times longer than Caswell says — 12 hours instead of 4. (This was probably more than necessary. If I ever need to do it again, I'd probably cure it for 6 hours or so instead of 12).

The tank was too big to fit in my oven, and that doesn't go down to 140 anyway. So I made my own oven out of cardboard. I took two large cardboard boxes and fastened them together, one on top of the other, with a hair dryer stuck in one end and held with duct tape (see Figure 1). I had a dial-type oven thermometer in the other end. This was a Conair "professional model" hair dryer that one of my sisters gave me 25 years ago because she found it too heavy and bulky. It's done yeoman service ever since for projects where moderate heat is necessary (and I've even dried my hair with it a couple of times). The tank lay on its side in the box and I taped the hair dryer so it would blow down through the tunnel in the middle of the tank and not blast directly against the fiberglass walls. I discovered that the "medium" setting was enough to get the inside of the box up to 110 , and there was a lot of hot air leaking out. So I went around and around, closing off leaks with duct tape, masking tape, Vise Grips, clamps, and even nuts and bolts in some places. I kept checking the temperature until I got it up to 140 , then I left it alone for awhile to see if the hair dryer motor would get overheated. I located the hair dryer where it would be out in the air, and the motor was barely getting warm, so I didn't worry about overheating and left it for the full 12 hours. After three times the cure period Caswell recommends

for "immediate service" I'd say the resin in my tank is as hard as it's ever gonna get.

Letting the gel coat get blistered on the left side of the tank was my first mistake. When I was installing the tank on the bike I discovered my second one — I forgot to clean out the threads where the petcocks screw on. I could still do it, but it would've been much easier to do it before I hardened the epoxy for 12 hours! The way I cleaned out the threads was to make one petcock into a cleanout tool by filing a groove in the threads (see Figure 2). I used a small triangular file to cut the groove at the end of the petcock threads, angled so screwing the petcock in would push material up the groove. If you look closely, you also see that the trailing edge of the groove is more vertical than the leading edge.

This kind of groove is useful to have on a petcock not only to clean epoxy out of the petcock threads but also to clean out the general crap that gets in there. It has no effect on the sealing ability of the petcock because it only goes halfway down the threads and the threads aren't what seal the petcock anyway — there's a fiber washer to do that.

To use such a tool, you screw it into the threaded boss on the tank as far as you can, removing it each time to clean out the groove. You'll need a wrench to turn it, but don't force it in too far or turn it too hard or it may jam or even break. (A little WD-40 can make it easier to turn). Each pass up the threads will remove a little bit of epoxy, and eventually you find that the petcock screws easily into the bottom of the hole, then further up, then up to the middle, and eventually all the way up. With semi-hard epoxy fresh from setting, you could probably clean the threads out in 15 minutes, but I was there cranking that petcock in and out for a couple of hours because it could only scrape off a hair of the super hard epoxy each time. Finally, I blew the tank out, installed the petcocks with their washers and the job was done.

Conclusion

I expect this epoxy coat will last me for many years, but not forever. Epoxy and other resins that chemically set have an advantage over tank coatings that just dry from evaporating solvents. But, as several people knowledgeable about resins have explained on the Brit-Iron Internet group, epoxy is more resistant to ethanol in gasoline than the polyester resins the tank was made with, but it's not totally resistant. So eventually an epoxy coating like Caswell's will have to be done again. Our old polyester resins stood up to MTBE and then alcohol in gasoline for 5-10 years before they started giving trouble, and the thinner — but more resistant — layer of epoxy will probably do equally well, and the layer is thin enough that you could recoat every 5-10 years without decreasing the tank capacity enough to worry about. So for the time being, I'm sticking with epoxy, and I'll probably be doing all this again sometime around 2016. ■