

Board repair tutorial

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Time required: ~30min + overnight curing

Windsurf board are light in order to take off more easily, but they tend to break sometimes, due to accidental shocks on the pier or the dreaded frontnose. Because the gear is shared among the wonderful members of the Cal Sailing Club, it is important to make sure the inventory stays in working condition – either because you had an unfortunate incident, because your favorite board is broken or simply because you want to accrue volunteering hours and contribute to the community during a windless day or in between sessions.

In this tutorial, we will explain the basic steps on how to repair common damages to windsurf board, particularly because the covid situation makes it difficult to ask for training or supervision. This should cover 80% of the dents that typically occur, but if the dents are too large or you're unsure, make sure to ask for advice on what the best repair.

Good repair requires attention and care, so we recommend you bring some music to get into the flow and do things mindfully.

1. Drying the board

The first step is to make sure the dent is dry, and that the water that might have gotten in has had the time to dry up (especially if the dent is all new.) Generally, the dent is small and there is not much water that got in, and a 24h dry is usually sufficient.

The board is made of foam and in some case, it can absorb a lot. If you think it has absorbed a lot a water, you may want to loosen the pressure relief screw near the mast base, and leave the board in the sun.

2. Sanding the board

When the board is dry, you can start sanding the board. You can use the rotary sander to sand down the cracked paint around the dent, and a little further (Fig. 1.) Try to sand down so as to leave a relatively smooth surface (use the center of the rotary disk, not the edge.) It doesn't matter if you sand down too much paint, but be moderate since you do not want to sand too deep (it actually goes quite fast if you're not careful). You can use coarse manual sand paper to finish up – making coarse scratches around the main damaged area will help the epoxy adhere better.



Figure 1. Sanding down a damaged area

a) initial dent. b) sanding with a rotary sander. c) the damaged area after sanding

When you're done sanding, it's a good idea to clean the area with a cloth and some water.

3. Preparing fiberglass

For most repairs, you will have to use fiberglass, that gives strength and structure to the repair. You want to cut a piece of fiber glass with a pair of scissors (a box with pieces of different sizes can be found in the locker, otherwise ask other members to get you a large piece from the other repair room.)

You want a piece that will cover the dent and goes a little beyond (it's ok to be liberal with the fiberglass, you are in Berkeley after all, Fig 2.) Do not worry about making clean edges, they will be sanded down later on, though regular edges are easier to work with.



Figure 2. Cutting fiberglass to size. a) the fiberglass box in the locker. b) cutting the fiberglass to make sure it covers the dent and beyond.

4. Mixing the epoxy

Epoxy is the principal ingredient of a repair. It is like a glue that takes a long time to cure, and it comes in two elements which are individually shelf-stable: the **resin** and the **hardener**, that will make it become hard after some time (Fig. 3.) There are two kinds of hardener: the slow hardener and the fast hardener. We typically recommend the **slow hardener**, since it will allow to work better. The fast hardener is useful for tricky repairs when one wants to leave the repair shop with the epoxy hard already, but it doesn't allow to sand it right away, so you'll have to wait overnight in any case.

Before mixing, you probably want to **put on gloves** and a hazmat suit. Epoxy is not particularly toxic (if you don't ingest it or put in contact with sensitive part), but it's really hard to take off from your hands (soap doesn't help) or from your clothes.

You will typically one mix standard dose, which is **four parts of resin** to one part of hardener, in a plastic cup by using a full the pump on the bottles. You can have fractional quantities by pressing the pumps only partially, but make sure the proportions of resin and hardener are roughly correct.



Figure 3. Mixing the epoxy.

a) the epoxy comes in two parts: resin (105) and hardener (which comes in two flavors: fast (205) and slow (206), the latter is recommended.) c) use the pumps all the way to fill a cup with appropriate amount of resin and hardener, before thoroughly mixing.

After to have mixed the resin and the hardener, stir thoroughly with a wooden stirrer. It should look like a nice champagne with bubbles in it. Let it sit for about ten minutes, while you do other things, so that the bubbles get to the surface and disappear. The epoxy will remain liquid for over an hour with the slow hardener, you have time.

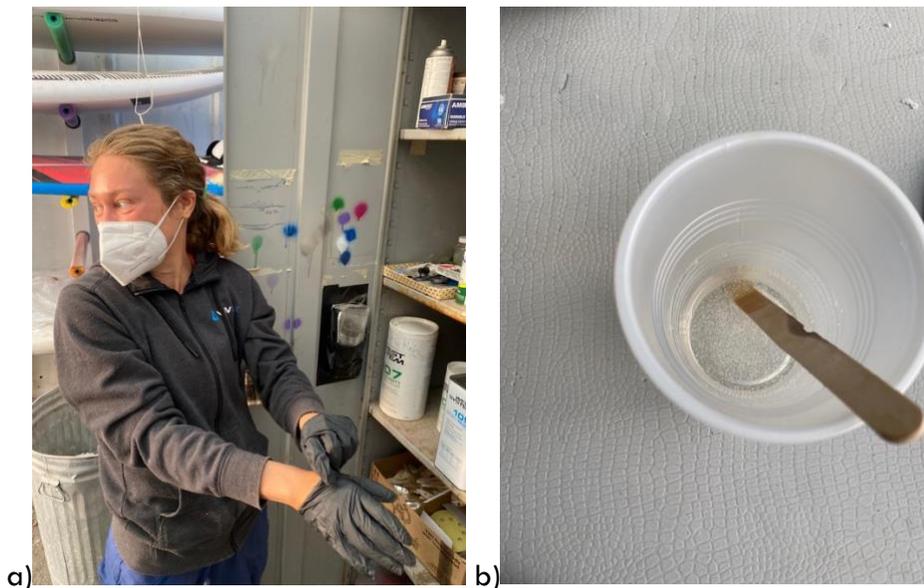


Figure 4. Stirring the epoxy

a) Put on your gloves because you want to look like a pro. b) stir the epoxy mix (resin+hardener) and let it sit so that the bubbles disappear.

5. Adding filler

Epoxy is fun, but a little hard to work with, since it will drip like honey. For that reason, you need to add what is called a filler, which is a light powder that mixes well with the epoxy and makes its viscosity much lower. There are different types of filler for various applications, though for relatively small dents it doesn't matter. The light beige (410) is recommended, but the red one works too.

You will need plain epoxy later on, so **split your dose into two**, with one dose that will be used for filling (Fig. 5a.) Then get the filler and add it progressively to one plastic cup of epoxy. Continue adding filler until you reach the desired consistency, typically close to peanut butter (Fig 5c.)



Figure 5. Adding filler to the epoxy to increase viscosity a) split your dose of epoxy to have some pure epoxy later on. b) The filler is in the closet. c) Progressively add filler to the epoxy until you get a viscosity close to peanut butter

6. Applying filler

You're now ready to fill in the dent! With a wooden stirrer, apply the filler on the board as if it was nice PB&J sandwich (Fig. 6) Try to remove potential air bubbles; the surface finish is not very important for now, but make sure you don't have too much of filler.

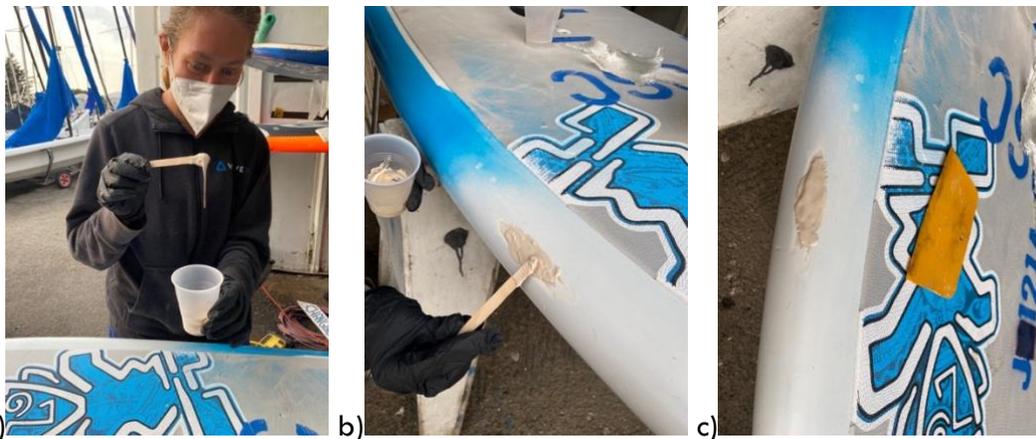


Figure 6: Applying epoxy+filler to the dent.

a) Make sure the viscosity is low enough so it won't drip under the influence of gravity. b) Apply the filler on the dent with a wooden stirrer. c) make sure you have enough filler, but not too much. It doesn't need to be smooth for now

7. Adding fiber glass

The fiber glass will add structural integrity to the repair and will help having a relatively smooth surface that will follow the shape of the board.

The next step is to add the fiber glass on top of the filler (Fig. 7a), and soak it with the non-filler epoxy that you had left aside (Fig. 7b.)

After a minute or so, the fiber glass eventually become clear (Fig. 7c) and you can add epoxy on the fiber glass a little outside the damages area. Make sure there are no bubbles between the filler and the fiber glass, other try to slide them out. Be careful also not to add too much epoxy, otherwise it will start dripping.

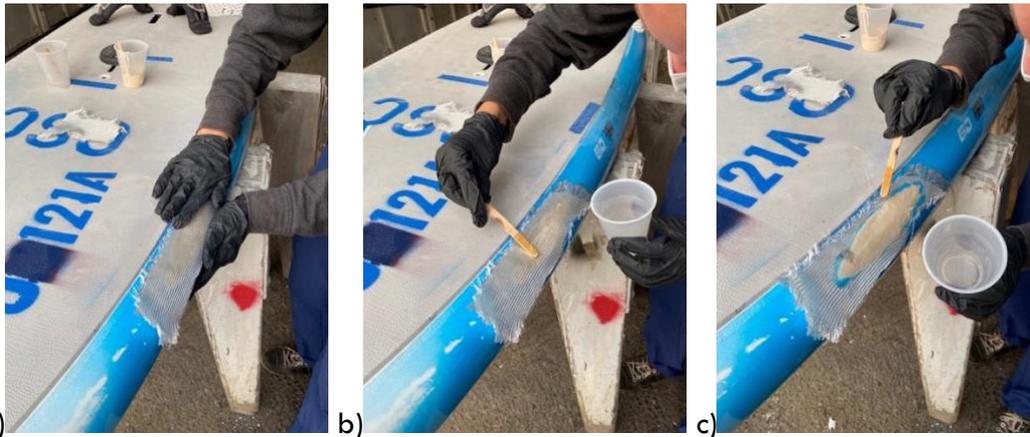


Figure 7: applying the fiberglass. a) Put the fiber glass on top of the dent b) Add non-filler epoxy on top of the fiber glass

Note that the epoxy doesn't need to extend all the way to the edge of the fiber glass (you can cut the extra fiberglass with scissors next day.)

8. Add a note and let the repair sit overnight

You're done for the day! You'll have to leave the epoxy overnight for it to cure, so that you can sand it down slightly and achieve a smooth finish.

Before you leave, make sure put your name, the date, what has been done and what is left to do, in case someone else wanted to complete the repair, or if for some reason you wouldn't able to come in the next few days



Figure 8. Repair complete! Add a note for the next person who would like to finish the job (sand, polish and paint)

9. Sand and polish

The next day, the repair will be rock solid, and you can sand it down to finish the repair. It is recommended to sand down by hand, first with coarse sand paper then with fine sand paper. You can use scissors to remove extra fiber glass that hasn't been impregnated. Try to make the transition between the paint and the fiberglass as gradual as possible.

10. Paint the board

Now that the repair is polished, you can paint it. Before painting, try to gather old pieces of newspaper and make a mask around the repair, so that the paint won't inadvertently paint other parts of the board. Typically, you want to apply spray paint in two steps, to avoid making drops of paint, with a 5 min dry period between the two steps (Fig. 9.)

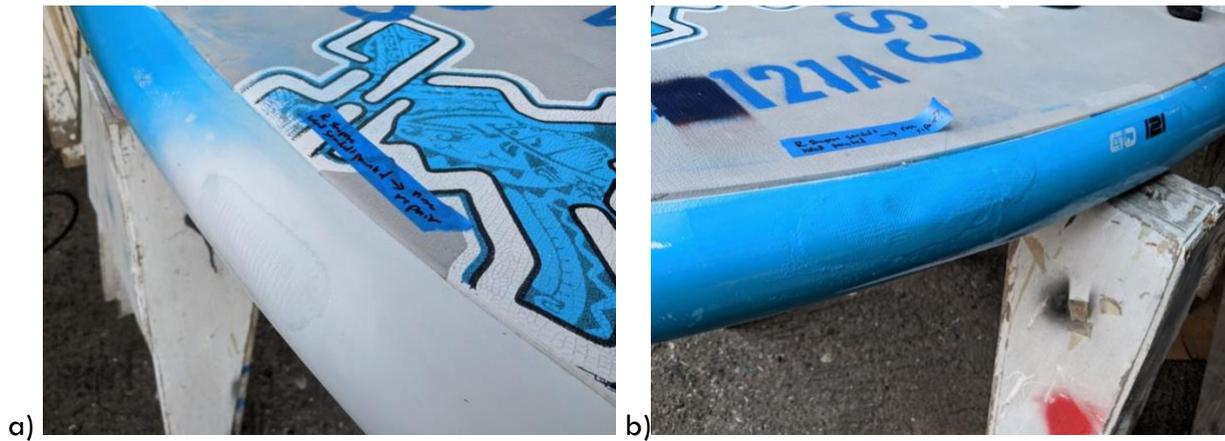


Figure 9. Painted repairs a) Repair #1 b) Repair #2

Feel free to sand down the fiberglass until the surface is smooth (get rid of these ripples.) It's ok if the fiberglass is half removed, it shouldn't impact the integrity of the repair very much.

The board is now ready to go!

11. Sail!

Your hard work needs to be rewarded, and it's time for you to go sailing, and practice this freestyle move that you care about. You now know how to repair a board, so you can go all in! Make sure you don't hurt yourself though, repairing humans is a little more involved.