

## Repairing / Sealing an Aquarium

If you keep tanks for any period of time, at some point you will need to re-seal a tank or two. There is something in the blood of a fishkeeper that prevents them from being able to part with an aquarium where the glass is intact, but it just leaks. The problem is that many of us then end up with tanks that leak, or that can only be filled to a certain point, etc. Re-sealing a tank is not difficult, anyone can do it, and as a result of your effort that tank will last for many more years. I have some Plexiglas tanks here that have been resealed 2 and 3 times over 20-30 years!

When a tank begins to leak, or worse, opens up along a seam, a repair can be done. A cracked side can also be fixed, and I will get to that later in this essay. Because a mistake can result in, at best, a tank that still leaks, or, at worst, a broken pane, please read through the article before attempting to do any of this!

### You will need-

- A package of one sided razor blades
- Some paper towels that can be thrown away to wipe silicone on.
- A pair of needlenose pliers to pull pieces of silicone from the seams and corners
- Possibly duct tape (depending on type of tanks you are doing) to hold sides together once sealant is removed.
- Aquarium safe silicone. I buy the best I can find, and there are a number of truly quality silicones out there, made specifically for aquarium use. The silicone listed as "Aquarium Safe" in home improvement stores is great for tanks up to 30 gallons, but over that size it doesn't work as well and leaks may happen. DO NOT use a multipurpose household silicone. Though some may disagree, I have learned that silicone does vary by quality, widely, between manufacturers. Sealants made specifically for aquarium use are made with a texture that when handled correctly does not easily allow air bubbles to develop, nor does it develop channels or crack as it dries (many silicones do). With a 5 or 10 gallon aquarium, where the water pressure is mild, using cheaper silicones can work. With bigger tanks you are seeking out problems by skimping on the quality of the silicone. Also- and this is important- the process of removing the silicone is time consuming and can be tiring. If a job is completed, and the tank ends up still leaking, it all must be redone from scratch- scraping out and throwing away all of the silicone you just put in, so you want to do it correctly, thoroughly, the first time.
- Dustpan and dry washcloth. You will need to remove all of the silicone pieces as they clutter the bottom of the aquarium. For a good eventual seal, the entire work area must stay dry. I have found that a dry terrycloth type washcloth sweeps up the sticky silicone most effectively.
- A well ventilated area to do the work. The silicone can be quite strong smelling giving off all those vapors we are all supposed to avoid. The tank will also need to stay in the well ventilated area to dry for up to 48 hours.
- Lastly, a place to test the tank once it is ready. If the tank is within a close fitting rack or stand, you may want a work area where the tank can be filled to test that it is properly waterproof before putting it into use, where all sides can be observed and watched closely.

### Part 1:

- The first thing you need to do is totally empty the tank, and totally dry it out. Remove every last bit of gravel, dirt, etc. The specifics of problems with larger tanks (50 gallons and over) will be discussed later. At this point the same procedures apply.
- With a one sided razor blade, remove all of the previous silicone. This is actually easier than it sounds, and the more you do it, the easier it gets. The trick is to easily slide the blade under the previous bead of sealant along the seam, doing one seam at a time. Go back often and do the same along the adjoining wall so that you can remove the old silicone in a long, triangular strip, and do that with each of the 8 seams of

the tank. With corners I will cut under the sealant from every angle, then pull out the plug of sealant from the corner with a pair of needlenose pliers. Get all of the sealant out of the tank. A cloudy film on the glass anywhere in the tank where silicone will be placed must be totally cleaned- any film of the old silicone on the glass will need to be entirely scraped out!

- Plexiglas Tanks- I treat my Plexiglas the same way as I do my glass tanks with respect to sealing. However, a correctly sealed Plexiglas tank does not show the bead that is routinely seen in a glass tank. To separate a Plexiglas tank and reseal using Plexiglas specific sealant is not what I will discuss here. Because Plexiglas tanks generally are not made as glass tanks are, with a silicone bead along the seams, the first time a Plexiglas tank is resealed, I will simply apply the sealant over the previous seams, sealing it the same way as I would a glass tank.. I have sealed up to 20 gallon size Plexiglas tanks this way with success.

- Now BE CAREFUL- once the sealant is removed from within the tank the razor blade should be able to slide between the meeting edges of the glass, and the glass panes will free up such that with less than gentle handling the pane could be removed. On tanks without an outer frame holding the panes in place, use duct tape around each outside corner to hold the tank together. When leaving for any period of time on a tank of up to 50 gallons, after the sealant has been removed, leave the tank sitting in its normal, upright position. I will usually turn the tank on its side, and remove the sealant sitting down in front of it where I can reach into the tank easily, so I must always carefully turn the tank upright after finishing the work before doing the resealing. With 50 gallon+ tanks, trying to move them unsealed could be dangerous. A pane may become dislodged and fall in, or the panes may become misaligned if allowed to sit, unsealed, on any side other than the bottom.

- The panes are generally not "finished"- the edges are not usually rounded or polished, so contact with the edge of a pane must be done carefully so as not to be cut. If done right, however, you should never come in contact with the edge of any pane of glass.

## Part 2-

Silicone does not stick to itself- putting new silicone on a layer of dried, already cured silicone will lead to a separation that will leak over time. So Step 2 is simply removing all of the silicone that still exists, but that you thought you'd removed. With the one sided razorblade, scrape and polish the glass where the old sealant had sat, shaving off any residue that may be left, cleaning down into each corner. It will come out easily enough- but it has to be removed. If the glass below where the old sealant was is opaque and not clear, a layer of silicone is still there. I mention this as a separate step because the entire job comes down to whether the tank leaks or not when this is done. When there are leaks, not having done this step effectively enough is often the reason why. Some people will use acetone and rub out the old silicone that way. I prefer scraping with the razor blade, changing the blade often, changing the directions of the strokes.

After that is done, totally wipe out the tank. I will sometimes use a hand vacuum to remove every last bit of silicone dust from the work done. Provided the tank is also fully dry, it is time to apply the silicone.

## Applying the Silicone-

Cut the nozzle on the silicone tube to allow for a healthy bead of silicone. I will use the second largest gradation from the base of the nozzle. Have the number of tubes you will need ready to go. The silicone all needs to apply in one shot so that all of the silicone is connected in a uniformly wet state. Start at one corner with the nozzle close to the seam. Gently but firmly apply the silicone so that it goes out in a thick bead, evenly, firmly and effectively filling the seam. Keep the nozzle close to the inside of the seam so that air does not get between the silicone bead as it leaves the nozzle and rests in the crook of the seam. Do not worry about occasional missteps- it can be cleaned up easily later- keep focused on a continuous thick bead resting in every seam without any bubbling or air beneath it.

Then, in stages- I will generally do the bottom first and then the sides, use a finger to smooth out the silicone into each seam. Only shape the silicone to a nice, thick wedge that fills each seam, do not push more deeply than it takes to fill the seams and leave the familiar triangle of silicone around its inner edges. If too much silicone was initially applied and substantial ridges are apparent around your finger, they can be removed and smoothed back at this time. They can be difficult to remove if allowed to cure. Continue around the tank until all seams are done. Try to complete within 10-15 minutes. Ensure that corners are filled fully without any air pockets that might cause trouble after it is filled. Then let dry for 24-48 hours.

**Larger tanks-** Some tanks over 50 gallons are sometimes made so that they cannot be resealed easily, so the resealing process can be slightly more involved. Essentially, the bottom plate seams often need to be reinforced, to seal with the aftermarket sealant. I realized this may seem counterintuitive, but I have done a number of 50 gallon, 100 and 125s to find that without reinforcement, they need to be totally redone. I once did a 50 gallon 5 times before sealing it successfully through reinforcement.

## Reinforcing Larger Tanks

Reinforcement means this. You will need to go to a glass store, and have pieces of 1/4" glass cut in 1" strips, the

length of each bottom seam, shorted by 1/2" to give yourself some room to work with. You will need 4 pieces the length of the longer sides, 4 pieces the shorter sides. You will probably need about twice the silicone you would use without the strips. The larger aquariums are very expensive, and you are totally reconditioning it, so the expense is worth it.

You will be laying down on the bottom plate 2 strips against each side plate of glass to increase the surface area of the bond holding the plates together. The trick is complete the job without an air channel having formed. Removing the strips and re-doing the job is generally not an option.

Lay a thick bead of silicone down against the bottom seam about to have the 1" strip put in place. When laying in the strip, place the far edge into the seam and lower the edge to the bottom, to not let any air bubbles form. Pat in evenly. Lay a thick fresh bead in the new seam formed, careful to keep the nozzle near the surface being applied, to prevent any bubbling. Lay in second strip on top of the first, also laying in the far edge first and tilt it down to form an airless bond with the first strip. Then lay a third bead down on that new seam formed, and carefully run finger along to spread it out over the seam as explained above. Repeat for each bottom seam. Then let dry for 48-72 hours before testing it.

### **Replacing/ Fixing a broken pane:**

When doing a repair, the extent of the damage may be such that the fix could cost more than the price of a new tank. With a tank that has a broken pane, to have a piece of glass cut with the accuracy required so it will not leak can easily cost more than the cost of a new tank- particularly if the tank is of a size less than 40 gallons. But if you have a replacement piece, Here is what you would do.

Place strips of tape around the corners of the outside of the tank, in at least 2 places per corner. Totally strip the old tank of its silicone. You will need to do the entire tank as the silicone will not stick to itself. Any spots where old silicone would meet new silicone could be a place where a leak could develop.

After removing the silicone, gently run the one sided razor blade between the sides of the broken pane, gently freeing up the shards. Remove every bit of the old glass. When totally clean, slide in the new plate of glass. be sure to put the new piece in exactly as the old piece sat, paying attention to whether the plate is sitting on or next to the pieces around it.

When the glass is sitting as it should, put tape on the outside holding the new pane in place. Then reseal as above.

There is another option, and though it works it can be very unsightly. When a tank must be replaced as it is not economical to repair, I will study the break to see if it can be patched. An occasional crack can be covered with siliconed ceramic 6" tiles.

In a similar fashion, I have seen others who, rather than remove the broken pane, will silicone in a new pane on top of the old one. This way there is no resealing at all of the seams.

### **Fixing a leak without tearing the tank down:**

I mentioned there was a right way and a wrong way to seal tanks. This is the wrong way. But it often works, sometimes permanently if not for just awhile, and it is far easier. Sometimes, if a tank has a small leak after you have just finished repairing it, this way can work so that you don't need to scrape out all of the silicone you had just put in.

Still tear down the tank (at least to below where the leak is. If it's a big leak, or a cracked plate, this method won't work. After the area where the leak is occurring can be clearly seen- both, if possible, where the water is going into the silicone from the inside and where it is coming out on the outside, thoroughly dry the area around the leak, and clean any glass nearby. What you are going to do is cover the spot where water is getting out with a spread of silicone over the spot that leaks, anchored to the glass on either side of the previous bead. Then, on the outside, put a thin bead over the place where the water is coming out. Let dry for 24-48 hrs., and retest.

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