Keep AquaCure and it's generated HydrOxy away from open flames or any item(s) that generate static electrical sparks.
(Except when properly and appropriately igniting torch).

The HydrOxy mixture is easily ignited when it is 'pure' but becomes non-combustible when mixed with enough air.
As long as the percentage of hydrogen in the air is less than 4%, the mixture is NON-combustible.

AquaCure Assembly Instructions

Items you will need:

- Philips screwdriver
- 1 quart (or 1 liter) wide mouth **glass** container (mason jar or large measuring cup).
  It's OK to mix in smaller batches if you only have a smaller container.
- Stainless steel table knife (or equivalent for stirring)
- 1 ounce (or 30 gram) measuring spoon
- About 4 ounces (112 grams) of lye (the exact amount isn't critical)
- Rubber dishwashing gloves
- Safety glasses or goggles
- 1 gallon (4 liters) of distilled water (we recommend buying a home distiller, *to make your own distilled water*).

<u>Mix Electrolyte Solution</u>

Put on rubber gloves and safety glasses.

Place the glass mixing container in a well-ventilated area (I prefer outdoors) and on a surface that won't be damaged by lye spills (a stainless steel sink, plastic tray or plastic tablecloth are examples). **Don't use a plastic jar for mixing**; the heat might melt it.

Fill your glass container with about 3 cups (750ml) of distilled water and **slowly pour** 4 to 5 ounces (about 100 grams or 8 to 9 tablespoons) of Lye into the distilled water, **while stirring the water*** with a metallic stirring item**.

You stir so that the lye doesn't fall to the bottom and stick there like concrete. If this happens, stir until it dissolves.

The exact amount of lye isn't critical. It should be at least 100 grams and not more than about 150 grams. Adding more than about 100 grams does not significantly affect (improve) performance and might be a detriment (too much lye can plug things up).

Continue to stir until the lye is completely dissolved. It will heat up somewhat*****, *which is one reason to use glass as the mixing container*, not plastic (plastic might melt).

Set the solution aside to cool until transparent (may take an hour or so).

DON'T add Citric Acid as previous instructions optionally allowed; **use ONLY lye**. Impurities (oils) in Citric Acid can cause foaming and excessive sludge formation that causes plugging issues inside the machine.

DON'T use any other electrolyte in the AquaCure (only lye). ALL other electrolytes either cause health issues and/or damage the AquaCure.
The AquaCure is designed exclusively to use lye as the catalyst (based on thousands of tests and experiments since 1986).

*The solution may become hot and turn cloudy. It may also emit noxious fumes for a few minutes as the lye pre-conditions the water. The fumes will irritate your throat if breathed.

**Do not use aluminum utensils or containers! Lye will dissolve aluminum.

Additional Notes:
Having a handy container (spray bottle) of vinegar or lime or lemon juice, to spray on and neutralize lye spills, is a good idea.

Don't use the 1 liter Drinking Water Bubbler that came with your AquaCure to mix your lye solution, because you don't want to contaminate it and heat could cause it to melt.

Which reminds me to mention that while ALL the containers and tubes we use are FOOD SAFE, they are NOT dishwasher safe. They'll melt in a dishwasher.

DON'T replace the plastic Drinking Water Bubbler with a glass jar. The problem is the explosive potential of the HydrOxy. If the gas explodes in a plastic container, it's like a loud balloon pop. If it explodes in a glass container, glass shards can fly everywhere. **Be SAFE, use PLASTIC**.

To clean the lye from all containers, utensils, gloves, surfaces, etc. just wash with warm tap water until the 'slippery' feeling is gone. They'll be REALLY clean because lye used to be a main ingredient in soap, for thousands of years.

There's no need to worry about mold in the tubes. Oxygen and lye are natural preventatives to mold. In all the decades I've used my electrolyzers I've never had mold form in the tubes or containers.

Filling the Electrolyzer with electrolyte solution

While the AquaCure AC50 as a whole is often called an electrolyzer or a Water Gas Generator; technically the ACTUAL electrolyzer (that splits the water into HydrOxy) is a plastic block located in a stainless steel tank inside the machine.

The actual electrolyzer needs a catalyst to make the electrolysis (water splitting) work. We choose lye (NaOH) as the most practical catalyst (out of *thousands of tests* since 1986) to find the most practical electrolyte solution.
Do NOT use KOH, Baking Soda, Sodium Chloride, Citric Acid, etc. as a catalyst
Lye has the best balance of catalytic efficiency, minimal sludge formation, no poisonous gas formation, low cost, easy availability, purity, caustic safety, etc.

Once the lye solution has cooled enough, remove the 'Black Fill Cap' from the top of the machine. Then, using the appropriate funnel and protecting the AquaCure from spills (I use a towel), carefully pour the electrolyte solution into the 'water-fill' pipe.

It is OK to have the main power switch on, so the sight tube light is turned on as you fill the machine, to help you see the liquid level.

The initial fill of lye solution **will not quite be enough** to see the liquid level, float the ball or shut off the low level alarm. While occasionally checking the sight tube, **SLOWLY** add **another** 500 mL (about 2 cups) of distilled (pure) water (no more lye). This *still won't fill the machine* **but is enough** to get you started.
I recommend NOT filling the AquaCure to more than 80% of full *to start the first time*.

Don't ever fill the machine all the way up because when the machine turns on, the gas bubbles need room and will 'raise' the liquid level more. If the liquid level is too high, the high liquid level alarm will sound and the gas production will shut off.

We added the blue LED and a floating ball to make it easier to see the liquid level, but the ball can (usually temporarily) get stuck.

So look for and pay attention to the ACTUAL liquid level (the liquid level 'meniscus' or liquid level line in the tube).
The ball getting stuck often happens when the machine is shipped (after being drained) and the lye crystals (formed by drying) can 'glue' the ball to the tube. It usually comes free (starts floating) after the lye crystals dissolve (it may take a few days).

The ball getting stuck is NOT a warranty repair issue.
While inconvenient, it does not affect the performance of the machine.

What to do in case of an accidental overfill

An alarm will sound and the red light will light up. Your AquaCure will not produce gas if it is overfilled. This is a SAFETY FEATURE unique to the AquaCure (prevents lye from being ejected).
If this happens, please carefully follow these steps.

Turn the AquaCure off and remove the power cord from the back of the unit.
Remove all the tubes and the humidifier.

Unscrew the Tower Cap (if installed).

Place a glass or plastic container into the sink and slowly pour out a little lye solution. Set the machine upright and wait 30 seconds. If the liquid level is still above the full mark, then repeat the above process until the liquid level is below the full mark.

We recommend saving the excess lye solution that was poured out (pour it into a sealable jar or plastic container) and using it the next time the AquaCure needs liquid. The REASON for this is that you also poured out some of the lye (catalyst) that your AquaCure needs to make gas.

Lye used to be a main ingredient in soap. Lye is a main ingredient in drain cleaner. It is safe for your plumbing and the environment to dispose of it down the drain if necessary.

Do not use the syringe with concentrated lye solution!
Do not put concentrated lye solution through the Tower Cap check valve!
The reason for this is that lye crystals can cause the check valve to malfunction, either holding it closed (causing back-filling) or open (causing gas leak).

Lye solution should only be put in the machine using the provided funnel. Yes, you'll need to remove the Tower Cap. But only for initial fill of lye and for maintenance.

Tower Cap:

The Tower Cap is your first line of defense against lye contamination of the HydrOxy gas. The height of the Tower Cap allows most of the lye mist to separate from the HydrOxy and settle back into the electrolyzer.

Also the Tower Cap clear tube allows you to **see if you have a foaming issue**. If you see foam in the clear tube, stop the AquaCure and completely clean it (rinse it out). *Dump*

the contaminated electrolyte down the drain. Impurities (like oils) cause the foaming, so if you have foaming your electrolyte has become contaminated and needs to be replaced.

If foam rises to the gas outlet of your Tower Cap, you will quickly lose your lye (it rides out on the foam). *Foam looks like the bubbles formed in a sink when you put in dishwashing detergent to wash dishes.*
So one way or another, the Tower Cap helps keep the lye inside your machine.

Install Tower Cap
Screw the Tower Cap onto the electrolyzer water-fill pipe. Tighten until it's sealed enough to prevent gas leaks and condensation from leaking down the stem… but not so tight that you break the plastic ring inside the tower.

Once the Tower Cap is installed, you should not remove it unless you are doing the 200 hour maintenance cleaning or if you need to see inside the electrolyzer (for diagnostic purposes). So seldom remove it. **Fill pure water through the tower check valve**.

The reasons for this are:
1. The Tower Cap has plastic threads, so to make them last for 20+ years I don't want them unscrewed very often. *This would be considered user abuse*.
2. Squirting pure water into / through the check valve keeps the check valve clean and functional (prevents lye crystal formation and plugging).
3. The fewer times the Tower Cap is removed, the fewer times care needs to be taken not to break the inner plastic ring as you tighten it.

Note: **If the Tower Cap leaks** (gas and/or fluid) **out the bottom threads**, it means that the inner rubber sealing ring isn't sealing properly.
You can then use several wraps of Teflon Tape to seal the threads. Depending on the thickness of the tape, it takes about 12 wraps. You want enough to seal but not so much you can't screw the cap on.
Wrap the tape in clockwise direction, so that screwing the Tower Cap on tightens the tape into the threads.

Note that 'condensation' liquid droplets that are in the Tower Cap can pour down the electrolyzer stem when you unscrew the tower, *another reason not to remove it too often*.

If liquid drips down the stem, then it can get past the fill stem collar and drip into the machine, where it will cause issues. So wrap a cloth around the stem when removing the tower, to catch the drips.

After the first fill (of catalyst solution) poured directly into the fill stem (not through the Tower Cap), **you will only fill** the AquaCure with pure water using the syringe through the check valve mounted on the top of the Tower Cap. **Do Not ever plug** or cap this check valve or it won't be able to mitigate the electrolyzer vacuum.

NOTE: Squirt SLOWLY into the check valve or water will spit back at you.

Sometimes the water doesn't go down into the electrolyzer immediately when you are squirting it into the tower, causing it to LOOK like the machine is over-filled. It is not. If this is happening, stop filling and run the machine. As the gas comes up into the tower, it'll cause the water to drop down to where it's supposed to be. And *it's OK to run the AquaCure as you squirt in the water*.

Note: The electrolyte (lye) solution is a catalyst and stays in the machine. **You do NOT add more lye** or replace the lye unless you've somehow lost your lye or it's gotten contaminated. After the initial fill, add ONLY pure distilled water to the AquaCure through the Tower Cap, using the supplied syringe.

Save the black 'water fill' cap and store it in place where it won't get lost so you'll have it in case you need to ship the machine.

Install Humidifier Holding Bracket and Humidifier

- Remove the screw on the right of the AquaCure.
- Install the Humidifier holder using the same screw.
- The Humidifier bracket has two holes for screws. We use the upper one.
- *The rubber tape helps hold the bracket from swinging* but it IS permissible to drill another hole in the AquaCure and install another screw in the lower hole.

Fill the Humidifier up to at LEAST 80% full (90% recommended). Yes this will be far ABOVE the MAX fill line with distilled water.

The Humidifier is your second line of defense against lye contamination of the HydrOxy gas. Assuming the humidifier water is pure, it will reliably trap any residual lye (scrub the lye out of the gas).
Reinstall the humidifier lid (don't cross-thread)
Thread the humidifier input tube to the top of the lid.
Place the humidifier in the holder.

Install the Humidifier output tube from the output on the side of the Humidifier lid to the small nipple on the drinking water bubbler (the one leading to the bubbling stone in the bubbler).

NOTE: When putting on tubes, *ONLY push on tight enough to seal*. Some people have been pushing the tubes on so far that they are impossible to remove without cutting them off with a razor… *You should only need to gently rock the tube to have it come free*.

Change out the Humidifier water *about* every 10 hours of use at 100% operation.

The AquaCure has about 10 hours of run time between full and low (assuming 100% gas production) so **change the Humidifier water when the AquaCure needs water**...

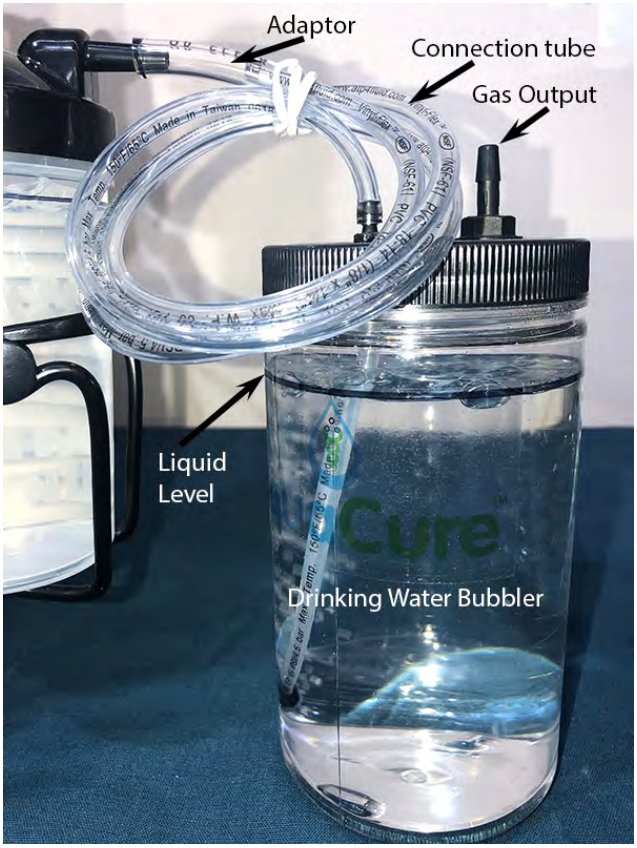
And since you use pure (distilled) water in the Humidifier it's **the PERFECT water** to put into the AquaCure… Because if there was any lye trapped, you are now putting it back into the AquaCure. *Another way to prevent lye loss*.

Fill the AquaCure with what you need from the Humidifier and then discard any excess water down the drain.

We do not recommend using the Humidifier water for health purposes or for feeding to plants, animals, etc. (it may have lye in it).
Use this water to refill the AquaCure.

Drinking Water Bubbler

FILL the 1 liter (1 quart) drinking water Bubbler container **at least 80% (recommend 90%) full** of water. Leave enough room so that the bubbles bursting up out of the liquid don't splash water up into the gas out tube. It's not dangerous to have water in the tubes, but *liquid squirting from the tube will tickle your nose*.



Note that it is normal to have some water in the tubes because the HydrOxy gas has a very high humidity, which condenses in the tubes.
The Drinking Water Bubbler liquid level needs to be high so you make full volume of drinking water AND because the Drinking Water Bubbler is the final water to make sure you have NO LYE in your breathing gas.

ALWAYS fill the Humidifier and Drinking Water Bubbler to at least 80% (90% recommended), **less than that isn't safe**.

Just to be safe, NEVER breathe gas that hasn't gone through BOTH the Humidifier and the Drinking Water Bubbler… And that both are FULL of water.

Water in the Drinking Water Bubbler can be safely drunk IF the gas first went through the Humidifier and the Humidifier has been changed out regularly.

Water that is too impure will not absorb (aka trap or scrub) the residual lye out of the HydrOxy. The Humidifier water needs to be refreshed regularly so that it retains it's 'absorption capability'. So, because the humidifier water has the 'trapped lye' it's the perfect water to refill the AquaCure *water so I recommend using the Humidifier water to refill the AquaCure*.

Back in 1996 I once breathed the gas without first putting it through a bubbler and it had lye mist in it and it HURT (burning in the lungs). It took over a week to heal.
So please be safe, bubble the gas through TWO FULL containers of pure water before using it for any health application.

Tube attachments

1. Attach the Tower Cap to the Humidifier using the appropriate short connection tube.

2. Attach the Humidifier to the Bubbler using the 1/8" ID vinyl tube with the appropriate adaptor(s). The 1/8" OD tube just slides tightly into the ¼" ID adaptors.

Make sure to attach Humidifier output to the Drinking Water Bubbler fitting that leads to the bubbling stone in the Drinking Water Bubbler container.

Now you are ready to attach **any accessory tube** to the gas out fitting of the Drinking Water Bubbler. Accessories like:
Tube from bubbler to nose cannula (for gas inhalation)
Tube from bubbler to bag (for general topical gas application)
Tube from bubbler to collapsible silicone funnel (for spot topical gas application)
Tube from bubbler to bubbling stone (for remote bubbling of water).

The AquaCure is now ready to be plugged in and started.

Check fluid levels (AquaCure 80%, Humidifier 90% and Drinking Bubbler 90% full).
Plug in the AquaCure into an appropriate electrical receptacle (outlet).
(*you can safely leave it plugged in between uses*).

Turn on the Main Power switch (*you can safely leave the power switch on between uses*).
Turning off the Main Power switch is pretty much the same as unplugging the AquaCure.

When Main Power is turned on, *the below lights will come on*.
1. The Main Power switch red internal
2. The Blue sight tube illumination light
3. The tiny yellow light on the bottom of the Timer switch (120 VAC version only)

Timer Switch

Once the timer is turned on, **the Green 'Gas Production' light** should shine, **indicating that gas is being produced.** *Actually it only indicates that electricity is going to the electrolyzer so we ASSUME gas is being produced* (more on that later).

Note that the 240 VAC version has a mechanical timer switch so doesn't have indicator lights on the timer. *See below for 240 VAC specific details*

Turn on the desired setting on timer switch (10*, 20, 30 or 60 minutes).

*The included 1 quart (1 liter) Drinking Water Bubbler's water will be fully infused with the hydrogen, oxygen and ExW in about 10 minutes (assuming 100% DUTY). Larger volumes (bigger containers full of water) will require more time.
Calculate bigger containers at 10 minutes per liter, (so 4 liters = 40 minutes).

The (120 VAC) timer switch has:

1. A yellow LED under the stop button (bottom button) that indicates that the **timer switch is off**.

2. A green LED to the left of each timing option that lights up when the timing option is active
   Note: **as the timer counts down** the next lower green button LED will light up.

3. You can **shut off** the timer anytime by pushing the **bottom button**.

4. Note: if you shut off the main power switch when the timer switch is still activated, it will 'remember' the setting it was at and continue when you turn the power on

5. The yellow LED under the stop button will change color to RED when you put the timer into '**continuous mode**'.
   To turn on continuous mode, press and **hold the top timing button for 5 seconds**. This continuous setting bypasses the timer function and the AquaCure AC50 will stay ON (producing gas) until you shut it off manually (timer off button) or until it runs low on water and the alarm sounds (after about 10 hours if water level starts at the recommended 80% and the AquaCure is producing gas at 100%).