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## Troubleshooting a Greensand Plus filter system

This information has been collected from our experience of troubleshooting systems over many years. Most of it is common sense that is easily forgotten. Some of what is presented may not make sense at first but has "cured" many ailing filters over many years. Check out each item on this list. *We're absolutely confident 99% of filter problems are contained in these pages.*

Please send us two samples: 1. Raw –taken before the filter. 2. Treated –taken after the filter.

Take these samples before backwashing the filter system.

VERY IMPORTANT!!! Keep this in mind when you are troubleshooting a filter system:

A backwashing filter works only if the iron can be cleaned out of the Greensand Plus media bed. When iron starts to appear in a customer's house, *most of the time the problem points back to the filter's inability to clean the iron out of the media bed during backwash.* With just a few exceptions, troubleshooting involves figuring out why the iron is not being washed out of the bed during backwash.

The four most common problem areas:

1. Homeowner is out of or forgets chlorine tablets
2. Pressure tank is bad (water logged) or well pump is cycling
3. Filter valve is not pulling the chlorine solution out of the feeder tank
4. Homeowners are using more water than the filter is designed for

### Well System

Make sure the well system is working properly. *If the filter doesn't have enough water, flow & pressure to backwash, the customer will see iron staining in the house.* Check to make sure the pump is running correctly. Also, check the pressure tank to make sure it is not water logged. Check the air pressure of the bladder to make sure it is at the correct pressure (The proper way involves emptying the tank). Also, look at the pressure switch. It should be set at 40/60. If the pressure falls below 40 there will not be enough pressure to lift and clean the media bed, no matter how much water there is.

### Water Usage

Ask the customer how much water they have been using lately.

Have they been using more than usual?

Have they had any leaks inside or outside the house?

Have they been pressure washing, filling a swimming pool or irrigating shrubs and grass with filtered water?

The customer may simply be using more water per day than the filter was designed for. If this is the case, then the filter is undersized for the application. If the extra water usage is temporary, remind the customer of the filter's limits and ask them to stop and backwash the filter every 300 gallons or simply put the filter into bypass while they are watering. (As a side note, homeowners often "forget" the times in which they use tremendous amounts of water.

THE WS1 VALVE HAS A DIAGNOSTIC SCREEN THAT SHOWS THE AMOUNT OF WATER THE HOMEOWNER HAS USED EACH DAY OF THE LAST 63 DAYS!!! THIS IS A VERY IMPORTANT TOOL!!!

To check the water usage history: Press UP and DOWN *at the same time* until the screen changes.

You should see “REGEN DAY 0” on the screen.

Press the NEXT button 3 times until you see “DAY -1” and “---GAL” flash on the screen.

The screen will flash between the day and the gallons of water used (Day 1 is yesterday, day 2 two is the day before yesterday.....etc....)

Press the UP button to see how much water was used on that particular day.

IMPORTANT!!! Go back all 63 days!!! Take note of days where 500 gallons or more were used.

## pH

pH is a really important factor in water treatment because iron and manganese are most effectively removed when the pH is over 7.0. Iron and manganese precipitate very quickly when the water has a pH of 7.0 or higher. When the pH drops below 7.0 iron does not precipitate as quickly, allowing the iron to go through the filter system in-solution and untouched.

However, Greensand Plus *will* work when the pH is as low as 6.5. In cases where the pH falls between 6.0 – 6.5 we add a fine-mesh layer of Corosex on top of the Greensand Plus. This Corosex layer will need to be recharged one to two times a year otherwise the pH will drop and iron will flow through the system and into the customer’s home.

Test the pH of the water or send a *raw and treated* sample to Filter Tech for analysis.

## Flow and Pressure

A backwashing filter works only if the iron can be cleaned out of the Greensand Plus media bed. When iron starts to appear in a customer’s house, the problem points back to the filter’s inability to clean the iron out of the media bed during backwash.

Greensand Plus requires a minimum pressure of 40 psi during the *entire* 10 minute backwash.

Here are the *minimum* flows required for a thorough backwash:

	<u>Standard Tank</u>	<u>Vortech Tech</u>
10x54”	7 – 8 gpm	5.3 gpm
12x52”	10 gpm	7 gpm***
13x54”	12 gpm	10 gpm***
14x65”	15 gpm	-----

Please Note: These figures are the bare minimum!!!

Check the drain line flow button to see if it matches the flow rates above.

## Flow Restriction

Make sure there is a rubber flow restrictor or flow control in the backwash line at the valve.

Also, make sure that there is nothing plugging up the backwash drain line such as dirt or ice (frozen drain lines create problems every winter –very common!)

A drain line that is too long can also impede a thorough backwash by putting back pressure on the system reducing the flow of water. Here is the maximum allowable length for each pipe size:

¾ “ - 8 feet

1” – 10 feet long.

1¼” - 25 feet long

## **Programming**

The programming to the filter valve is pre-set when it is built at the Filter Tech shop. Please call Jay (770-487-1066) for any questions about the programming. We will gladly take the time to walk you through the programming and diagnostic screens. The warranty is void if the customer tries to reprogram or reset the valve.

## **Bed Height**

The space between the top of the media bed and the top of the tank is called the freeboard. Make sure there is at least 16" – 18" or more of freeboard. If there is not enough freeboard in the filter, the media will not expand and the iron will not backwash out of the media bed.

If the bed is really low in the tank (25" or more of freeboard) then the filter may need to be rebedded or recharged with filter media. Consult with Filter Tech (770-487-1066) before taking any further actions.

## **Installation**

Make sure the unit is installed correctly. The filter is to be installed after the pressure tank and before the water is to be used in the house. Also make sure the unit is plumbed correctly with the water flowing through the filter in the correct direction. (Filters HAVE been installed backwards!)

## **Pressure**

Adjust the pressure switch from 30-50 to 40-60. (Please reference instructions to individual pressure switch) The air pressure in the pressure tank (without water) will need to be 38 psi. Generally, most filters need a minimum of 40 psi to backwash thoroughly.

## **Chlorine Tablets**

One of the two most common problems associated with Greensand Plus systems are the chlorine tablets. Service techs often find the feeder tank empty when they service filter system.

The chlorine solution enhances the oxidation capabilities of the mineral since Greensand Plus uses a surface oxidation process. When Greensand Plus is in contact with chlorine, a super oxidation takes place which acts in speeding up the oxidation of sulfur and iron on the surface of the media. The chlorine also acts as a scrubbing agent on the media to help keep the media clean on a continuous basis. The end result is that the media stays cleaner and the sulfur and iron removal is improved. Please contact Filter Tech for instructions on how to accomplish this.

Also, swimming pool or hot tub chlorine tablets cannot be used. Many of these tablets contain additives, such as cyanuric acid, made for swimming pools and are not made for potable drinking water. Only use tablets that are marked for use with potable water. Also, *only use tablets made from CALCIUM HYPOCHLORITE* and inert ingredients. **IF THE CHLORINE CONTAINS THESE INGREDIENTS, THEY CANNOT BE USED WITH THE GREENSAND PLUS FILTER SYSTEM:** Trichloro-S-Triazinetrione or Sodium Dichloro-S-Triazinetrione.

## **Feeder ("pot") Tank**

Check to see if the filter is pulling solution out of the brine tank by putting the filter into a brine cycle (Press REGEN, wait until motor stops, Press REGEN again). Since the filter removes the chlorine solution out of the feeder tank at 1/2gpm, it may take a minute or two before this can be detected.

If the chlorine solution is not being pulled out of the tank take the 3/8" brine tube away from the filter valve's brine port and check to see if there is a noticeable vacuum being pulled by putting your finger over the brine port.

If there is a vacuum: Soak the feeder tank's float assembly in an "Iron Out" solution and clean thoroughly. It is probably stopped with iron.

If there is not a vacuum: Clean the injector and screen located under the "gas cap" on top of the valve body. The injector will usually be white or red (Unless a bigger tank was used). Carefully pry out the injector with a flat-head screwdriver and clean until the small hole in the center is completely clear. Clean the screen located under the "gas cap".

If this does not solve the problem then the spacer stack assembly is likely to be damaged allowing an air leak that prevents a vacuum from forming.

## **“Error” is Flashing on the Screen**

Filter Tech has more detailed instructions on how to remove the piston and seal kit in another trouble-shooting guide.

“Error”, could mean that there has been an interruption in power and all that needs to be done is disconnecting the power cord from the computer board waiting 1 minute and connecting it back. This is similar to rebooting a computer.

“Error” can also mean that the piston is jammed and cannot move into the next cycle. This is an easy fix. Remove the piston and pull out the spacer stack assembly. Wash the piston and the spacer stack assembly with water thoroughly. The inside of the valve can be rinsed out with a water hose as well to make sure the inside cavity of the valve is free of debris (Do not get the wires or the circuit board wet!)

If “Error” continues to flash, the Spacer Stack Assembly will have to be replaced. In some situations the circuit board may actually be the problem.

NOTE: The circuit board has a five year manufacturer’s warranty. The spacer stack assembly is not warranted by the manufacturer, but Filter Tech will warranty it for one year only *if the Greensand Plus system is preceded by a sediment filter*. No exceptions.

## **Water Constantly Coming from the Drain Line**

The seals on the spacer stack assembly are damaged –allowing water to flow over to internal channels that direct the water toward the drain line. The spacer stack assembly will need to be replaced.

Filter Tech has more detailed instructions on how to remove the piston and seal kit in another trouble-shooting guide.

See the note about warranty under [“Error” is Flashing on the Screen](#)

## **Customer Reports a Periodic Chlorine Taste and Odor in the Water**

A chlorine taste and odor in the water can occur on mornings after the filter has backwashed. This is due to water being used in the house during the filter’s brine cycle. When this occurs, many homeowners worry the filter is not working correctly.

There are many circumstances of water usage during the night: toilets, sinks, ice makers, leaks in toilets (the tank will mysteriously make the fill noise), leaks in bathroom & kitchen fixtures. Leaks in the plumbing, etc.

In this type of situation, Filter Tech can walk the customer through the diagnostic screen so they can see the amount of water used in the house during the night.

## **Finally....**

After making any adjustments or changes to the filter keep one thing in mind. The plumbing between the filter and house may be coated with a little iron and may need a few days to clean itself out. Also, much of the plumbing in the house (including the hot water heater) will take time to drain and fill with new filtered water.

Please let the home-owner know: the top six inches of the media bed does 90% of the filtration. The top 6” of the media is also the part of the filter that is backwashed the most thoroughly. When a filter is bleeding iron into the house, it is overrun with iron and manganese that reaches down to the bottom of the media bed. Even though the problem with the filter is fixed, it may take a couple of weeks for the iron at the bottom of the filter to backwash out of the media bed.

Unfortunately, it may take up to 4 to 6 weeks for the homeowner to notice improvement in the water. Patience is needed.

You can instruct the homeowner to press REGEN on the filter valve several times a day. The filter must go through all of the cycles if this is done. Leaving the filter in the Backwash Cycle for long periods of time will make the problem worse.

If the system is running correctly and all of the above has been verified and checked. Please send a raw sample (before filter) and a filtered sample (after filter) to Filter Tech for analysis. Please contact us to discuss this sample.

## **Is it iron?**

There are several things that are often mistaken for iron. These are extremely rare but can occur:

Certain **Organics** will sequester some of the iron as it flows through the media bed. Stains will occur inside the house where the water has a chance to sit open to the environment. Longer contact time with oxygen will allow some of the iron to precipitate creating stains.

Identifying Organics requires a raw and treated water sample. When the bed is not being cleaned thoroughly, the filtered sample will show an extremely high level of manganese, but very little iron. On a filtered sample of water being affected by organics, the iron and manganese are only partially being removed. The filtered sample shows usually around half the level of iron and manganese that is found in the raw water sample.

A chlorinator will need to be added prior to the Greensand Plus filter to successfully precipitate all of the iron and manganese before the water reaches the Greensand Filter. This addition is made at the cost of the homeowner. Unfortunately, organics are hard to detect and cannot be identified until after the Greensand Plus is installed.

**Tannins** are relatively rare in Georgia but can occur in areas where large quantities of vegetation have decayed. Tannins can impart a faint yellowish or brown color to the water. Tannins are best removed by an anion water softener when the pH is over 6. If the pH is under 6 then carbon may be the best method of removal.

**Fine silt/sediment** may also be the culprit of "iron water". Greensand Plus filters can remove sediment down to about 20 – 40 microns but anything smaller will get through the system. The Greensand Plus media bed is not designed to remove such small particulates, so additional equipment may have to be added to resolve this problem. Since the fine sediment/silt looks like iron and iron is always present when the water is tested, this problem is almost always discovered only after an iron filter is installed. Contact Filter Tech for treatment options.

Hope this trouble-shooting information helps. Contact us for further assistance.

If you have any ideas to add to this guide, please give me a call.

Jay Hanlon  
President



*"Building a Quality Product You Can Trust"*



Don't have a lot of time to read?

## Trouble-shooting checklist:

**Well system:**  Well system is functioning properly. Including pump and tank?

Pressure switch should be set at 40/60. Pressure should not fall below 40 psi.

**Water Usage**  Filters should be backwashed every 300 gallons (approx). Has the customer been watering the lawn, filling swimming pool, etc?

**pH**  Is the pH of the treated water over 7.0?

Has the filter or neutralizer been recharged with calcite/corosex lately?

**Flow and pressure**  Does the pressure stay above 40 psi on the pressure switch gauge?

Is there enough flow to properly backwash the filter? (See *Flow and Pressure* for flow rates.)

**Flow Restriction**  Is there a button in the drain line flow control housing?

Is the drain line free of obstructions that can block the water flow through the drain line?

Has a hose or a spigot been installed to the end of the drain line?

Is the drain line within the proper length? Is the drain line the proper size for the length of the run?

▶ ¾" cannot be longer than 8'. ▶ 1" cannot be longer than 10'.

▶ 1¼" cannot be longer than 25'.

\*It is best if the drain line dumps into atmosphere with the shortest run possible. The customer can use 4" black corrugated gutter tubing to redirect the water –If needed.

**Chlorine Tablets**  Is there chlorine in the feeder ("pot") tank? (It will look like paste)

Is the filter pulling water out of the brine tank during brine draw?

**Programming**  Is the programming correct? (Contact Jay)

**Bed Height**  Is there about 16-18" from the top of the media bed to the top of the tank?

**Installation**  Is the filter installed after the pressure tank?

Was the filter in bypass when the problems occurred?

Is the filter plumbed in correctly? ▶ Is the water going in the inlet and out the outlet side of filter?

Valve  Is the filter valve in working order?

- Does the valve go into backwash at a time where there is no water usage? (12 to 2 am)
- Is the time on the filter valve time clock set correctly?
- Is the filter actually backwashing on its own?
- Is there constant power to the filter valve? ►Make sure the power is not controlled by the wall switch.

Finally ►Even though adjustments, corrections, or fixes have been made to the system, it may take some time for the filter to clean itself out. Patience is needed. The homeowner may not see immediate results.

Is it iron? ►Three items that are often mistaken for iron but are not removed by a Greensand Plus system: Organics – creates stains in bathroom fixtures where water sets. **Tannins** – a faint yellowish or brownish tint to the water. **Extremely fine silt** can discolor the water and stick to fixtures.

The logo for Filter Tech features the word "Filter" in a large, bold, serif font. Below it, the word "Tech" is also in a bold, serif font. A stylized red faucet with a single drop of water falling from it is positioned between the two words, partially overlapping the "l" in "Filter" and the "T" in "Tech".

*“Building a Quality Product You Can Trust”*

