



*Serving Western Colorado Since 1985*

2511 S. Townsend Ave  
Montrose, Co 81401  
970-249-2566

## **Removal of Pseudomonas Bacteria**

1. Fill your spa to the maximum level and temperature setting. This will fill the air lines along the bar top of the spa.
2. If your spa has an ozonator, unplug it. The ozone counteracts with the algaecide treatment.
3. Remove the filter or filters and clean thoroughly. Do not replace them until bacteria formation has been dissipated.
4. With jets running, add approximately 2-3 ounces of spa chlorine. Then add 4-6 ounces of spa algaecide.
5. Turn on air blower (if applicable) and run jets on high speed for approximately 15-20 minutes. If spa has diverter valves, make sure to rotate valve thru all positions during to ensure you have complete water movement through the entire plumbing system. Completely shut down all systems.
6. Remove all visible particles with a skimmer net or spa vacuum. The more of these physical particles that can be removed, the quicker the process will go.
7. Turn jets and blower on again for another 5-10 minutes. Shut down all systems and begin to skim or vacuum out all physical particles
8. Repeat this process until no visible particles remain.
9. Reinstall cleaned filters and circulate water overnight.
10. Inspect spa next day for more particles, if they are still present, continue to skim particles, and add another 1-2 ounces of chlorine and algaecide and inspect again the next day.
11. Once you have no more physical particulates, drain, clean and wipe out entire spa surface and remove as much water as possible. After refill, add recommended amounts of chlorine and install new filter (s).

**\* This is a form of bacteria and can once obtained, can be very difficult to eliminate. Be patient and persistent as it can be controlled. We recommend using Spa Algaecide as part of your regular maintenance if you ever have a pseudomonas problem, simply follow the instructions located on the bottle of algaecide. Once all the pseudomonas has been removed, we strongly recommend that you install new filters and reconnect your ozonator at this time.**



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Hot tub folliculitis is a superficial skin infection caused by *Pseudomonas* bacteria. It occurs following exposure to inadequately treated water in spas and hot tubs. The rash consists of red elevated lesions (papules), some of which may be pus-filled. The rash may appear 12 hours to 2 days following exposure, typically itches, and usually resolves spontaneously.

Most folliculitis is caused by the common organism *Staphylococcus aureus*. Hot tub folliculitis is different in that it is caused by *Pseudomonas aeruginosa*. Hot tub folliculitis becomes noticeable within half a day to two days after exposure. It first appears as itchy (pruritic) bumps, some pus filled, and may develop into dark red tender nodules. The rash may be denser under swimsuit areas where the material has held the contaminated water in contact with the skin for a longer period of time.

*Pseudomonas* is a common problem in warm water pools and spas in particular. Fortunately the most common symptom is an itchy rash. It is often confused with bug bites (often complaints are received that a hotel has "bed bugs"), chicken pox, and other types of rashes. It can occasionally be much more serious including severe rashes requiring hospitalization, ear infections, urinary and vaginal infections, and probably most serious is pneumonia.

There are two kinds of *Pseudomonas* outbreaks. Most often seen is what some call transitory *Pseudomonas* contamination of a spa. About 15% of the population have *Pseudomonas* as a naturally part of the flora and fauna of their skin. When a "party" occurs in the spa, all the disinfectant is used up and the organism is spread to everyone in the tub from the carrier. Because the hot water opens up the pores, the *Pseudomonas* can enter the pores, "follicles", in the skin, even of the carrier, and will cause the *Pseudomonas* Folliculitis problems. Once the party is over, everyone gets out, the spa can reestablish the disinfectant residual and the organisms are killed before setting up residence in the spa.

The second kind problem is when *Pseudomonas* sets up residence in your spa. If the disinfectant residual is not re-established soon enough, the organism can set up residence in the water. This is a much more serious problem for maintenance. Once it sets up residence, it covers itself with a slime layer to protect itself against the chlorine.



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It likes to set up residence on surfaces, and is often found in areas of low flow. Sometimes in such large amounts that one can scoop out a handful of the stuff. Generally superchlorinating will eliminate most infestations.

As a prophylactic measure one can drain the spa after several hours of high chlorine, and brush and scrub the spa with a 200-ppm solution of chlorine (2 oz. of household bleach per gallon of water, or 1 oz of 12% hypochlorite solution). The key is to brush and break up the protective layer.

Conscientious maintenance of disinfectant is the best procedure, don't let it set up residence in the first place, and kill it before it passes from person-to-person.

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### Procedure for Chemical Cleansing

#### **Filters:**

1. Cartridge Filters: Remove the filter cartridge(s) and either clean or replace. To clean cartridge(s), first use a filter cleaner as per label directions. After rinsing the filter cartridge(s), completely submerge the cartridge(s) in a 1/10 solution of sodium hypochlorite (liquid bleach) and water for two hours. Inspect and clean the filter housing. Set the filters aside for installation after the spa decontamination is complete.

Warning: Contains sodium hypochlorite.  
Causes substantial, but temporary eye injury.  
Harmful if swallowed.

May irritate skin. Do not get in eyes or on clothing.  
For prolonged use, wear gloves.

Note: Baqua users (Biquanide) drain and refill spa before adding any chlorine.

2. Raise the water level in the spa 1/2 inch above the high water mark, and remove pillow if possible.
3. Turn on the jets - all of them - set them to run for one hour.

#### **Superchlorination and Neutralization:**



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4. Add at least 100 ppm chlorine to the spa being sure not to allow the Dichlor to come into direct contact with spa surface before it dissolves.

Sodium Dichloroisocyanurate - 56%

6.25 ounces per 250 gallons,

8.75 ounces per 350 gallons,

12.50 ounces per 500 gallons.

5. During Superchlorination, be sure to rotate any diverter valves or other systems to allow water flow through all jets and systems for at least 5-10 minutes in each position.

6. For the first 60 minutes, do not cover the spa with the spa cover.

7. Neutralize the chlorine in the water with 16 oz of Hydrogen Peroxide (3%). Test for chlorine: more Hydrogen Peroxide may be needed.

**Warning:** Hydrogen Peroxide, 3% U.S.P.,

For external use, topically to the skin and mucous membranes.

Keep out of eyes.

8. Circulate the spa water for 10 minutes, during the Chlorine neutralizing process.

9. Stop circulation by turning off all jets.

10. Drain and flush the spa.

11. Clean the spa surface with a surface cleaner approved for your type of spa shell surface. Rinse the spa thoroughly!

**Water Replacement and Treatment:**

12. Refill the spa with water, reinstall the filter, which has been sanitized (or replaced).

13. Follow the startup procedure for your particular spa. Balance water chemistry before use.