

Disinfection Water Wells by Chlorination*

Chlorination, or "shock chlorination", is the process of flushing your well and water system with a chlorine solution to kill bacteria and other microorganisms. Disinfection by chlorination is usually recommended if a water sample from the well has tested positive for bacteria. It is an effective method to eliminate a "one-time" case of bacterial contamination; however if there is an on-going problem related to faulty well construction or contaminated groundwater, disinfection is only a temporary fix and the problem should be investigated and corrected at the source.

How do I disinfect my well?

It may take up to 24 hours to complete the disinfection process. Before you begin, make sure you store enough water to meet your household needs during this period. If you have a water softener or other treatment units, check with your treatment dealer whether disinfection could adversely affect the unit or not.

Step 1. Determine the amount of chlorine required to sanitize your well. Chlorine in the form of Calcium Hypochlorite pellets is most effective for sanitizing your well (See Table 2). Dissolve half of the pellets in 2 to 5 gallons of water. Sodium hypochlorite (liquid bleach) can also be used. Mix the amount of liquid bleach shown in Table 1-1 for our well in 2 to 5 gallons of water. Use common, unscented household bleach that does not contain detergent or other additives such as fabric-guard. Chlorine can be dangerous if not used properly. Always follow the directions on the label for safe storage, handling and use.

Step 2. Remove the well cap and pour the pellets and/or mixed chlorine solution into the well. If the well is equipped with a well seal top, remove the well seal and pour the solution directly into the well, or pour the solution through a clean funnel into the air vent or siphon through the vent (flush the air line with clean water after chlorination).

Step 3. Open one faucet in the system and let the water run until the chlorine odor is detected. Turn this faucet off. Repeat at each faucet in the system in turn, one at a time, until all faucets have been completed (include inside and outside faucets, dishwashers, toilets, baths, showers, sinks, etc..)

Step 4. If possible, connect a garden hose to a nearby tap and place the other end in the well. Turn on the tap and allow the water to circulate for about one hour to ensure that the chlorine is thoroughly mixed in the well. During this process, add additional chlorine solution if the chlorine odor is not strong. Make sure to wash the top of pitless adapter of chlorine. Note that although recirculation is desirable if possible, it may not be appropriate in wells with screens, gravel packs, heavy mineral buildup, poor condition of casing, soft or caving zones, and less common conditions.

Step 5. Seal the top of the well and let the system sit idle for about 12 hours, preferable overnight. Toilets may be used sparingly. Do not use the water for aquariums or pets during this time. Check with your physician about other uses of the water, such as bathing, if you have allergies or other medical concerns. It is not recommended to leave chlorine for more than 24 hours as it may affect some pump parts.

Step 6. After this time, flush the system by discharging the chlorinated water through an outside tap. Pump at a low rate, 2 gallons per minute or less. Monitor the end of the hose throughout the flushing procedure to verify continued flow. Debris may temporarily plug up the outside hose spigot. If this occurs, open and close the valve quickly to dislodge the debris and continue flushing. Flushing can take anywhere from 2-10 hours. Flush the well until the water is clear and there is no chlorine odor present. To verify that the water is clear, fill up a glass jar / cup and make sure that is transparent and there is no debris settling out when you let it sit for one minute. During the flushing process, do not discharge the chlorinated water to a natural water body (such as streams or lakes, etc.) or to areas where it can harm desired vegetation (e.g. vegetable gardens, landscaped areas, etc.). Do not discharge this water into your septic system.

Sampling after Disinfection. After disinfection, sample the water for total coliform and E.coli bacteria to confirm that the water is safe to drink. It is best to wait 5 days after disinfection before sampling to obtain a representative sample

Final Notes

You may experience some temporary inconveniences as a result of the disinfection process such as dirty or discolored water, staining, plugging of fixtures, or sedimentation problems. However, the water should clear with time. In some cases a few days may be necessary.

Please note that under some conditions, such as biofilm buildup in a well, more than one disinfection or mechanical cleaning and disinfection may be required.

If you have questions about disinfecting or flushing your well, or wish to have a certified person do the work for you, please contact T.Huemann Well & Pump.

**These are general chlorination instructions for you to perform on your own water system. T.Huemann Well & Pump makes no guarantee on the condition of your well, pump, tank, success of sample results, etc. Adapted from <http://www.gov.ns.ca/nse/water/> chlorination guidelines*



Table 2 Wells: Pounds of 1 gram dry pellets needed for disinfection to obtain approximately a 50 ppm chlorine solution in the well.

Well Casing Diameter	Distance From Water Level to Bottom of Well (Water Depth)					
	0' – 50'	50' – 100'	100 – 200'	200' - 300'	300' – 400'	400' – 500'
4"	0.1	0.4	0.8	1.2	1.5	2.0
6"	0.5	1.0	1.8	2.5	3.5	4.5
8" – 12"	1.2	2.5	5.0	7.2	10.0	12.0
12" – 16"	3.0	6.0	12.5	19.0	25.0	31.0
20" - 24"	7.0	14.0	28.0	42.0	56.5	71.0
30" – 36"	16.0	32.0	63.5	95.0	127.0	159.0

TABLE 1-1

Depth of water in well		Amount of unscented household bleach ¹	
		Drilled Well	Dug Well
metres	feet	Casing Diameter 15 cm (6 inches) ²	Casing Diameter 92 cm (36 inches) ²
1	3	40 mL	1.5 L
3	10	120 mL	4.5 L
5	15	200 mL	7.5 L
10	30	400 mL	15.0 L
30	100	1.2 L	
50	150	2.0 L	
100	300	4.0 L	

As a general rule, 8 oz. of dry chlorine pellets with 70% available chlorine, dissolved in 1000 gallons of water, will produce 50 ppm of total chlorine residual.

8 oz = 1/2 lb which = 200 pellets.

Notes:

- ¹ Assumes liquid bleach with approximately 5.2% hypochlorite. This will produce about 100 mg/L of chlorine solution when mixed with the water in the well.
- ² For wells with other casing diameters, contact your local Department of Environment and Labour Office

Example Calculation for a Drilled Well:

Measurements:

- Well diameter = 150 mm (6 in)
- Well depth = 60 m (200 ft)
- Depth to water from surface = 10 m (30 ft)

Calculations:

- Depth of water in well = 60 - 10 = 50 m or depth of water in well = 200 - 30 = 170 ft
- From Table 1-1, required volume of bleach to get 100 mg/L solution is about 2 litres

