

DISINFECTION Start-Up TIPS

Systems without storage tank. If there's no storage tank or spring box, use these steps to flush and disinfect the well, pressure tank and distribution system:

1. Operate the pump until the discharge is clear and clean.

For shock-chlorinating, non-NSF bleach can be used as long as it is not scented and the water is not available for human consumption.

2. Determine the volume of well water to be disinfected. (See [related technical bulletin](#) (PDF); for a 6-inch diameter well casing, each 65 feet of water column totals approximately 100 gallons.)
3. Dosage – Use two cups of household (5.25 percent) bleach solution for every 100 gallons of standing water in the well. This creates a chlorine concentration of approximately 50 mg/L (also equivalent to 50 ppm) in the well water. First, dilute the amount of bleach needed into 4 to 5 gallons of clear water.
4. After mixing, pour the solution into the well through a plug or casing vent hole at the top of the sanitary seal. Ideally you should use a garden hose lowered to the bottom of the well to inject the chlorine solution into the well. Moving the hose up and down in the well while introducing the solution will better disperse it throughout the water column. Mix within the well casing if possible.
5. Operate the pump until the distinct odor of chlorine is detected in the water discharged from the well.
6. Open all cold water faucets until the odor of chlorine is detected (with larger distribution systems, you may need to add additional bleach solution to the well).
7. Allow the chlorine solution to sit in the water system; we recommend 24 hours. (National standards give a bare minimum of 6 hours once you have verified a concentration of 50 mg/L in system components.)

SAFETY PRECAUTIONS

A. Household bleach - Usually 5.25% chlorine, is a skin and eye irritant; handle with care when mixing the solution. Wearing rubber gloves and goggles is recommended when mixing or applying chlorine solution.

B. Working inside tanks - A water tank or reservoir is a confined space and requires a confined space entry permit. Chlorine fumes can sometimes be given off when washing the interior of the reservoir. Therefore, never work alone, consider wearing a respirator, and take frequent fresh air breaks to prevent irritation of mucous membranes. If you experience any burning of the eyes, nose, or mouth, or start coughing, leave the reservoir immediately. Slips, trips and falls can be a safety hazard when entering or leaving a reservoir. Make sure an adequate ladder is properly secured before entering the reservoir.

Systems with a storage tank or spring box. Follow these steps to disinfect a water storage tank or spring box and the distribution system. *Note: If the water storage tank is very large, or the available flow rate is very small, you may want to use an alternative disinfection method (See ANSI/AWWA C652-02 standards) which involves spraying the tank walls with a 200 mg/L chlorine solution and allowing it to sit unused for 3 hours. Applicators must be trained and certified for wearing a self-contained breathing apparatus in addition to the confined space training.*

1. Inspect and rinse the tank/reservoir. If empty, use broom and dust pan to remove large particles, sweep smaller stuff out through the drain. The screen on the drain line may need to be removed for cleaning. Remember to replace it.
2. Optional: Wash the interior of the reservoir with a strong chlorine solution (for example, 1 cup 5.25% chlorine bleach in 5 gallons of water, to approach 200 mg/L - see Safety Precautions). Rinse the reservoir again.
3. Close drain valves and reinstall any hydrants that were removed for the winter.
4. Turn on well pump, or close spring overflow, so the storage tank or spring box and pipes begin filling with water.
5. Shock-chlorinate tanks or spring boxes with 50 mg/L of chlorine. **Table 1 (below)** shows how much 5.25 percent chlorine is needed to attain 50 mg/L for various sized tanks.
6. When the storage tanks are full of chlorinated water, check the chlorine residual, and add chlorine as needed to keep 50 mg/L in the tank or spring box.
7. To disinfect the distribution system, begin opening each spigot working away from the tank and let it run until you detect a strong odor of chlorine at each one, then close it off again. This includes drain valves and the faucets inside buildings. Check for leaks in the faucets and valves while chlorinating the system. Ideally, you would test the water at the farthest point in the line until a 50 mg/L residual has been achieved, but not all test kits will read concentrations that high. One option is to use bottled water to dilute the sample, say in a ratio of 1 part chlorinated water to 9 parts bottled water (i.e., reducing the concentration to 1/10th), until your test kit can measure the results at approximately 5 mg/L (note that this dilution method only gives approximate results).
8. Let the water sit in the tank and distribution system for at least 6 hours if you are sure the water system has 50 mg/L throughout. If you know you have more than 10 mg/L, but perhaps not 50 mg/L, wait at least 24 hours.
9. Test the chlorine residual again at the end of the 24 hours. If the level is below 50 mg/L after 6 hours, or below 10 mg/L after 24 hours, repeat the process.

Table 1. Amount of 5.25% chlorine needed for various tank sizes

Tank Size	5.25% chlorine to achieve 50 mg/L		5.25% chlorine to achieve 2 mg/L	
	US	Metric	US	Metric
500 gallons	0.5 gallon	1.8 L	2.5 ounces	70 mL

750 gallons	0.75 gallon	2.8 L	3.75 ounces	105 mL
1,000 gallons	1 gallon	3.8 L	5 ounces	145 mL
2,500 gallons	2.5 gallons	9.5 L	1.5 cups	360 mL
5,000 gallons	4.75 gallons	18 L	3 cups	720 mL
10,000 gallons	9.5 gallons	36 L	6 cups	1.4 L
15,000 gallons	14.25 gallons	48 L	0.6 gallons	2.2 L
20,000 gallons	19 gallons	72 L	18 gallons	3.0L