



Ohio Department of Health

Bureau of Environmental Health and Radiation Protection  
Private Water Systems Program

"To protect and improve the health of all Ohioans"

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# Maintaining Chlorine Residuals for Hauled Water

How to Raise the Chlorine Level to Acceptable Standards for Each Water Load

Under Ohio Administrative Code (OAC) 3701-28-16, water haulers are required to maintain free chlorine residuals in their water loads at a minimum of .2 PPM from the time they fill the truck until the point the water is delivered to the private water system. Most public water supplies where the water hauler fills their trucks will already have the minimum levels of chlorine needed. However, when the free chlorine level falls below .2 PPM the water hauler is required to increase the levels. Upper level restrictions for chlorine for public water are now set at 4.0 mg/l.

To increase the free chlorine residual by about .1 PPM in 1000 gallons of water add one 1 teaspoon of 8.25% chlorine bleach initially, circulate the water, then check the chlorine residual,. Add additional chlorine, one-teaspoon at a time, until the desired residual is reached. The water should be agitated or re-circulated while the chlorine is being added.

By solving for "X" following the steps below, you will calculate the amount of 8.25% chlorine bleach needed to raise the residual chlorine in 1000 gallons of water by .1 PPM using 8.25% chlorine bleach:

60 drops = 1 teaspoon = (.17 oz)

1 tablespoon = 3 teaspoons = (.5 oz.)

1 gallon of water = 128 ounces

8.25% Chlorine = 82,500 parts per million (PPM) or (mg/l) milligrams per liter.

$$X / 1000 \text{ gal.} \times 128 \text{ oz.} = .1 \text{ PPM} / (8.25 \times 10,000)$$
$$X / 128,000 \text{ oz} = .1 \text{ PPM} / 82,500 \text{ PPM}$$
$$.1 \text{ PPM} \times 128,000 \text{ oz.} / 82,500 \text{ PPM} = X$$

X= 0.17 oz

The Chlorine Calculator for 8.25 percent chlorine may also be used by going to the Ohio Department of Health, Bureau of Environmental Health and Radiation protection, Private Water System Program Website at:

<http://www.odh.ohio.gov/~media/ODH/ASSETS/Files/eh/water/factsheet/maintainingchlorineresidualsforhauledwater.ashx>

About 0.17 oz of 8.25 % chlorine bleach can be added to 1000 gallons of water to theoretically increase the chlorine residual by .1 PPM. **But...**

Iron, sulfur and other total dissolved solids that occur naturally in the water will use up available chlorine until what is remaining is free chlorine. Most of the dissolved minerals that may be present in public water supplies will have already been oxidized by chlorine that was initially added at the plant.

However, **more** than the .17 oz. of chlorine will probably need to be added to 1000 gallons of water in order to raise the free chlorine by .1 PPM.

Chlorine test kits must be capable of measuring **.1 PPM of free chlorine residual**. They can be obtained from local water treatment dealers, swimming pool stores, fish stores, or purchased directly from the following chemical test kit companies.

## Chemical Test Kits

Hach Company  
P.O. Box 389  
Loveland, Colorado  
80539-0389  
Phone: 800-227-4224  
Fax: 970-669-2932  
[www.Hach.com](http://www.Hach.com)

LaMotte  
P.O. Box 329  
Chestertown, Maryland 21620  
Phone (800) 344-3100  
Fax (410) 778-6394  
[tech@lamotte.com](mailto:tech@lamotte.com)

Cole-Parmer North America  
625 East Bunker Court Vernon Hills, IL 60061  
Toll Free: 1-800-323-4340  
Phone: 1-888-358-4717  
Fax: 1-847-247-2929  
E-Mail: [info@coleparmer.com](mailto:info@coleparmer.com)  
[www.coleparmer.com](http://www.coleparmer.com)

Northwest Scientific Inc.  
725 Lohwest Lane  
Billings, MT 59102  
Toll Free: 1-800-628-4428  
Phone: 406-252-3269  
Fax: 406-245-2935  
[WWW.NWSCI.com](http://WWW.NWSCI.com)

USA Bluebook  
3995 Commercial Avenue  
Northbrook, IL 60062  
Phone: 800-548-1234  
Fax: 847-689-3030  
Email: [customerservice@usabluebook.com](mailto:customerservice@usabluebook.com)

*This list is not all-inclusive and does not represent any endorsements by the Ohio Department of Health, Bureau of Environmental Health and Radiation Protection.*

<http://www.odh.ohio.gov/odhprograms/eh/water/PrivateWaterSystems/main.aspx>.

### Questions?

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## Private Water Systems: Raising the Free Chlorine Residual in Hauled Water

Use a **fresh** supply of regular strength unscented household bleach. Chlorine bleach is unstable and loses available chlorine concentration over time, so it is best to always use a fresh supply. Do not use bleach that was purchased over six-months ago. The concentration of regular household bleach has recently been raised by most manufacturers from 5.25% sodium hypochlorite to 8.25% sodium hypochlorite. This calculator assumes that you are using 8.25% bleach.

Volume of water in the hauled water delivery truck:  gallons

Starting free chlorine residual (TEST the water and enter the result):  PPM or mg/L

Needed free chlorine residual:  PPM or mg/L

Change in free chlorine (Needed - Starting):  PPM or mg/L

Amount of 8.25% bleach needed per 1000 gallons =  teaspoons per 1000 gal of water

Amount of 8.25% bleach needed to raise the free chlorine by  ppm in  gallons of water

=  Teaspoons of 8.25% bleach

=  mL of 8.25% bleach

=  Tablespoons of 8.25% bleach

=  fl oz of 8.25% bleach

=  cups of 8.25% bleach

Remember to agitate and recirculate the water as the bleach is added to help ensure that the chlorine is distributed throughout the water load. You will need to test the water again after you have added the calculated amount of bleach to ensure your target concentration was reached. Other water chemistry factors such as high levels of iron or other dissolved solids will use up available chlorine and may cause the free chlorine level to NOT reach your target free chlorine level. If that happens, perform a new calculation to determine the additional amount of chlorine you will need to add.