

## Calculating Hypochlorite Use

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**A**s we travel the state providing technical assistance and training, we have noticed that many systems are operating and recording their hypochlorite use in different ways.

Many systems choose to record the number of gallons or quarts of hypochlorite added to the solution tank (crock) on a certain day and then divide the number of gallons used by the number of days in the month to come up with a daily average chlorine demand. While this technique is generally acceptable, you may want to consider performing the math calculations and record your actual daily chlorine demand every day.

We understand that math is a four letter word in the water industry. However, there has been a great deal of talk about elevating the profession of a water operator. What better way to achieve this objective than to go the extra mile. The calculations are not that difficult, and you can customize this information to fit your system and create a reference sheet so you can cross check your math each day.

First, sodium hypochlorite is the most commonly used disinfection product, but is sold and marketed under a wide variety of names and concentrations. Be sure the product you are using is approved for potable water use. It should state on the container that it is NSF approved and have an approval number.

Now that we all have the correct product, lets check the container to see what the chlorine concentration level of the product is. Typically, most sodium hypochlorite solutions are sold with a chlorine concentration between 3 and 15 percent.

Let's review some material from a system we recently assisted. This system is a small municipal water system with 2 separate wells. This is the disinfection system information :

- When the solution tank (crock) is full it equals 28gal
- Solution tank mix is 6:1 ( 6 gallons of water to 1 gallon chlorine)
- Using 12.5% hypochlorite

Okay, to start we need to fill the solution tank. We will add 6 gallons of water to every 1 gallon of hypochlorite. The solution tank holds 28 gallons, so we will mix 24 gallons of water with 4 gallons of hypochlorite.

Next, we need to determine the hypochlorite solution strength now that we have mixed it with water. To accomplish this, we will divide the solution strength (12.5%) by the ratio  $6:1 = 7$ . So we will divide 12.5% hypochlorite by 7 gallon mix = 1.79% hypochlorite.

The next step is to measure your solution tank while

it is full – measure from the bottom of the tank to the full line. In this case, the solution measured 28.75” when the tank was full.

Now we can calculate our chlorine use using the tape measure. Ideally you could remove the tape and fasten it to your solution tank.

Mathematically, we divide 28 gallons (number of gallons in tank) by 24.75” (depth of solution in tank when full) which equals 1.13 gal/inch. When we use 1” of solution, we have used 1.13 gallons of 1.79% hypochlorite solution.

If you use this same equation, you will now be able to calculate and create a reference sheet that would list the usage information by the inch, ½ inch, ¼”, etc...

Some other things to take into consideration are to check your chlorine residual in your distribution system at roughly the same time everyday. You should try to check your system flow meters, chemical use and treatment processes at the same time each day too.

Another important issue with your solution tank is to regulate the solution use and only mix and store enough solution to last 1 week. Also, let your tank run down before refilling, but don't let your tank run out. If you know it won't last another day, then refill it. But don't refill the solution tank every time it gets down to half full. This practice will make it easier to refill your solution tank with the proper ratio mix and will not allow “old” hypochlorite to weaken and change your solution strength.

Most of these suggestions are easy tasks to complete and do not require a large amount of time. If you manage your disinfection system with a routine, do the math daily and refill when needed with the proper mix, you will have better control and documentation of your system. You will be able to identify potential problems more quickly and react in a timely fashion.

Try to do the math, its really not that difficult. The closer you regulate your system and its functions – the easier your system will be to operate. As always, if you need any assistance incorporating this information into your operation, please feel free to contact us. 💧

