

		West Virginia Department of Health and Human Resources			
		MANUAL OF ENVIRONMENTAL HEALTH PROCEDURES			
Section	Drinking Water	Date	November 2, 1993	Procedure #	DW-38
Subject	Individual Home Water Supply Chlorination Systems			Page	1 of 2

Chlorination systems are becoming a frequent requirement on home water supplies due to groundwater contamination. To promote uniformity in the installation of chlorinators around the state, the following guidelines and attached drawings are issued. Special circumstances may require variations which are necessary in your profession judgment.

1. Chlorination systems consist of controls, hypochlorinator, injector, and contact tank.
2. Most hypochlorinators will be wired so that they are turned on by the power being tied into the well pump power so that when the well pump comes on the hypochlorinator comes on. The solution control knob on the hypochlorinator is then used to adjust the feed rate.
3. The contact tank is a tank in line after the hypochlorinator which allows the chlorine adequate time to kill any bacteria before consumer use. Chlorination without contact time is ineffective. Most bladder tanks cannot be accepted as contact tanks. No single inlet-outlet tanks can be accepted as contact tanks. Bladder tanks with separate inlet and outlet lines may be useable if the lines are separated inside the tank as shown on the attached drawings (very few are). This tank must have the required gallonage of liquid storage below the bladder and not the total volume of the tank. The contact chamber minimum size should be based on 2 gpm demand flow (average in most homes) and a 30 minute contact time which calculates out to a 60 gallon tank (liquid volume).
4. The hypochlorinator and contact chamber should be installed after any type of water treatment in the system. Chlorine will have negative effects on many of the water treatment chemicals and conversely the chemicals will greatly increase the demand for chlorine. The only exception to this is a carbon filter after the chlorine contact chamber to remove the chlorine. If a carbon filter is used it should be one impregnated with silver to retard bacteria growth and must be changed frequently as per manufacturer's recommendations. If a carbon filter is used a sampling cock should be installed between the contact tank and the filter to be able to test the chlorine residual. The carbon filter is not recommended due to minimum level as shown on the following chart should eliminate chlorine taste complaints and still provide the needed disinfection.

#### Minimum Levels of Free Chlorine Residual at Various Water Sample pH Levels

<u>pH Value</u>	<u>Free Chlorine Residual</u>
Up to 7.0	0.4 mg/l
7.1 to 8.0	0.6 mg/l
8.1 to 9.0	1.0 mg/l

5. It is recommended that sodium hypochlorite (bleach) be used rather than calcium hypochlorite (powdered chlorine). Calcium hypochlorite is harder to mix and often leaves a residue in the tank which can plug the feed lines. The sodium hypochlorite (5.25% chlorine) should be mixed at a 1:4 ratio (1 gallon of bleach to 4 gallons of water) as a starting point in setting up the system. It then can be strengthened or weakened as required to maintain the acceptable residual. The pump should routinely operate at the middle range on the feed dial so that variations can be made from that point. This is done by strengthening or weakening the solution on initial installation so that the proper residual is maintained when the dial is at the mid-range.
6. A chlorine test kit should be purchased by the homeowner in order to test the water. Most complaints about chlorine systems are about taste. Most individuals cannot taste chlorine in water at suggested levels. It is recommended that the water be tested daily for the first two weeks and then once a week thereafter.
7. Non-electrical, gravity feed, low-flow, low pressure chlorinators and ratio feeder non-electric pumps are available for water systems without electric pumps to actuate them (such as homes supplied by springs). These require the same size contact chambers as the standard systems. These systems must be reviewed by the Office of Environmental Health Services before installation to decide if they are acceptable.
8. Surface waters are not approved for water supplied even if chlorinated due to filtration requirements and potential for contamination.
9. Water supplies (wells, springs, cisterns, etc.) must be properly constructed and protect even when using an approved chlorination system.

## References

## History

## Attachments

[Approved chlorine contact chamber water inlet & outlet designs](#)