## Filtration after Storage

Since water stored in plastic containers for long periods of time may contain chemicals which leach out of the plastic into the water, filtration with a good quality carbon filter before drinking will remove these chemicals producing better tasting, healthier water.

## Filters vs Purifiers

The difference between filters and purifiers is defined by the EPA: A filter must be capable of " 4 Log" contaminant reduction, and a purifier must be capable of a " 6 Log" contaminant reduction. 4 Log (simple filtration) means at least $99.99 \%$ of contaminants are removed, leaving no more than 1 part per ten thousand of the original contaminant. This "filtration level" of reduction is sufficient for many conditions. The higher "purification" reduction of 6 Log means that >99.9999\% of contaminants are removed, leaving no more than 1 part per ten million of the original contaminant (1000x the effectiveness of the "filter" specification.) Systems that achieve this "purifier level" of performance provide ultra-pure water not only in normal conditions, but also in circumstances of extreme and highly dangerous contamination.

## Liquid Bleach Dosage Chart (emergency only)

Treating Water with a 5-6 Percent Liquid Chlorine Bleach Solution

| Volume of Water to be <br> Treated | Treating Clear (possibly <br> contaminated) Water: <br> Bleach Solution to Add | Treating Cloudy, Very <br> Cold, or Surface Water: <br> Bleach Solution to Add |
| :--- | :--- | :--- |
| 1 quart/1 liter | 3 drops | 5 drops |
| $1 / 2$ gallon/2 quarts/2 <br> liters | 5 drops | 10 drops |
| 1 gallon | 10 drops | 20 drops |
| 5 gallons | $1 / 2$ teaspoon | 1 teaspoon |
| 10 gallons | 1 teaspoon | 2 teaspoons |
| 50 gallons | $1 / 2$ ounce (1 Clorox <br> bottle capful) | 1 ounce (2 Clorox <br> bottle capfuls) |

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## The Basics of Emergency Home Water Storage

In times of emergency or disaster, we can survive just:

- 3 minutes without air
- 3 hours without shelter
- 3 days without water
- 3 weeks without food

When storing water at home, a three tier system is best suited for a complete and inexpensive emergency water storage plan:

1. Grab and Run (Bug-Out Bag) - Store water in small containers that can be carried on your person or in a 72 hour kit, if you have to run or drive to evacuate your home or area.
2. Bulk Home Water Storage - Store enough water for your family at your house for a month during a short term disaster such as a storm, power outage or water line break.
3. Water Treatment Method - Have equipment or a system available that can treat or filter contaminated water and make it safe to drink until normal activities are re-established. It can be as simple as a $\$ 10$ straw filter and as complex as a neighborhood dual process treatment system. This could provide emergency water for months after a long-term disaster.

Treatment - CDC states, "The most effective pathogen reduction method in untreated or poorly treated drinking water is a combination treatment, using the appropriate filtration and disinfection methods." Chlorine dioxide and a coconut carbon micro filter are best:

- Chlorine dioxide kills or inactivates the microorganisms, and
- Coconut carbon removes the excess chlorine and associated taste and odor. Micro filtration with cyst removal capability is very important for removing Cryptosporidium or Giardia in surface waters such as lakes and streams.


## Prepare an Emergency Water Supply

CDC Recommends:

- Storing 2 gallons of water per day for each person and each pet. You should consider storing more water than this for hot climates, for pregnant women, and for persons who are sick.
- Storing at least a two week supply of water for each person and each pet - 28 gallons minimum/person/pet.
- Store chlorine dioxide or $5.25 \%$ unscented liquid household chlorine bleach (rotated annually) to disinfect your water and use for general cleaning and sanitizing.

Note: Caffeinated drinks and alcohol dehydrate the body, which increases the need for drinking water.

## Water Containers (Cleaning and Storage)

$\checkmark$ Use ONLY commercial food-grade water storage containers
Before filling with safe water, use these steps to clean and sanitize storage containers:

- Wash the storage container with dishwashing soap and water and rinse completely with clean water.
- Sanitize the container by adding a solution made by mixing 1 teaspoon of unscented liquid chlorine bleach per quart of water, or 1 cup bleach in 5 gallons of water for large containers.
- Cover the container and shake it well so that the sanitizing bleach solution touches all inside surfaces of the container.
- Wait at least 30 seconds and then pour the sanitizing solution out of the container.
- Let the empty sanitized container air-dry before use OR rinse the empty container with clean, safe water that already is available.
- Then - Fill the container with clean or treated water using a food quality hose which has been protected from contamination.


## Avoid using the following containers to store safe water:

- Containers that cannot be sealed tightly.
- Containers that can break, such as glass bottles.
- Second-hand containers that have ever been used for any toxic solid or liquid chemicals (ie: old bleach containers).
- Second-hand plastic or cardboard bottles, jugs, and containers previously used to store milk or fruit juice.


## For proper water storage:

- Label container as "drinking water" and include storage date.
- Keep stored water in a place with a fairly constant cool temperature.
- Do not store water containers in direct sunlight.
- Do not store water containers in areas where toxic substances such as gasoline or pesticides are present.
- Add a barrier between containers and concrete floors.


## Treatment

- Adding chlorine dioxide as the water is filling the container will assure bacteriological safety throughout the storage process. Carefully follow label directions for mixing and dosing.


## How long can water be stored?

Many sources state that water should be replaced every 6 months. If the following conditions are met, water can be stored 5 years or longer:

- A good clean food/water quality container is used.
- A clean contaminant free filling process is used.
- A tight seal is maintained with the lid.
- High quality treated water or added treatment is used at the time of filling the container, and
- The container is maintained tightly closed until use.

