# PRIVATE DRINKING WATER IN CONNECTICUT

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## *Publication No. 7: Distillation Treatment Systems for Private Drinking Water System*

**Effective Against:** heavy metals, dissolved solids, some bacteria and viruses, inorganic materials such as nitrate, sodium, fluoride, and sulfate, and some organic chemicals.

**Not Effective Against:** most volatile and semi-volatile organic compounds, and some bacteria.

### How Distillation Works

The distilling unit heats tap water to boiling, which kills most bacteria and viruses. The unit produces steam, which rises and leaves impurities behind. The steam then enters condensing coils where it cools and converts back to a liquid. The distilled water then goes into a storage tank. With very little other treatment, distillers produce nearly pure water. Distilled water is almost entirely free of minerals and salts. This results in a "flat" taste due to the removal of minerals.

Distillation normally removes 99.9 percent of the dissolved materials. Nevertheless, there are certain volatile and semi-volatile organic compounds that may not be removed by distillation. When the boiling point of these volatile chemicals is near water, it is difficult to separate these materials from water using distillation. If these contaminants are present in the water, they should be removed prior to distillation. If they are not removed, then they may be carried along with the steam to the condensed water and re-contaminate the purified water.

### Types of Units

Distillers vary from small, round units that distill less than one quart of water per hour to larger, rectangular carts, which distill about one-half gallon of water per hour. Because distillation units produce a small amount of treated water, they are typically installed as point-of-use units at the faucet and not used to treat all the water entering the house. Before purchasing a system, verify that the treatment system you are purchasing has been tested and certified by a third party to ensure manufacturer's claims. See the section on **Product Certification** at the end of this fact sheet.

Distillers can be filled with water either manually or by a connection to a water supply line. Permanently installed water distillers should have a drain opening to remove contaminated water. Faucets facilitate the draining of countertop units.

Storage containers store the distilled water. Glass jars are attached to the unit on some models. Other units have a metal tank into which the condensed steam drips. A third type of container is a plastic bottle. The

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containers hold from one and a half to 15 gallons of water. All types of storage containers are suitable when properly maintained as directed by the manufacturer.

Automatic features on units include reset switches and timers that make automatic operation possible on some installed models. These features might be desirable when distilled water is used continuously.

**Maintenance**

Regardless of the quality of the equipment purchased, it will not perform satisfactorily unless maintained in accordance with the manufacturer's recommendations for maintenance, cleaning, and part replacement. Keep a logbook to record equipment maintenance and repairs.

The boiling chamber of a distillation system accumulates minerals over time and needs to be cleaned periodically. Cleaning frequency will depend on the level of minerals in the water and the amount of water being used. In some cases the mineral build-up can be dissolved by diluting acid cleaners in a heated condition. Always follow the manufacturer's cleaning recommendations.

**Other Considerations**

Ensure the system you choose is installed and operated according to the manufacturer's instructions. After installation, retest both the raw water (prior to treatment) and the treated water at a state certified laboratory to ensure it is working properly and removing the contaminants. You should continue to test the quality of both the raw and treated water annually or more frequently (quarterly or semi-annually) if high levels of contaminants are present in the raw water. Frequent testing will also help you determine how well your treatment system is working and whether maintenance or replacement of components may be necessary.

**Questions to Ask Before You Buy**

Before purchasing a water treatment device, have your water tested at a state certified laboratory to determine the contaminants present. This will help you determine if distillation is an effective treatment method for your situation. See the Publication # 19 *Questions to Ask When Purchasing Home Water Treatment Equipment* for more information.

Consumers should inquire about the following before purchasing a distillation system:

- Confirm that distillation is the effective treatment method and will remove the contaminant (s) present in your water.
- What type of distiller best suits my water quality needs?
- Has the treatment system been tested and certified by a third party to ensure that it meets manufacturer's claims?
- Does the storage tank hold enough treated water for daily uses?
- How often will the distillers need to be cleaned?
- Are there any special installation requirements that may add to the equipment cost, for instance, changes to your household plumbing?

**Product Certification**

NSF International is a non-profit organization that sets performance standards for water treatment devices. Because companies can make unsubstantiated statements regarding product effectiveness, the consumer must evaluate test results of the device to determine if claims are realistic. Products that have been tested or

evaluate by NSF and meet their minimum requirements are entitled to display the NSF listing mark on the products or in advertising literature for products.

Manufacturers and models that meet NSF's standard are included in a listing published twice a year. For more information contact NSF at 1-800-NSF-MARK or http://www.nsf.org/consumer/drinking_water/

For more information please click on the following links:
*EPA Office of Groundwater and Drinking Water*
http://www.epa.gov/ogwdw/
*EPA New England*
http://www.epa.gov/region01/

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