

# Healthy Drinking Waters

for

M A S S A C H U S E T T S

Safe and healthy lives in safe and healthy communities

## Distillation Treatment of Drinking Water Supplies

### *Effective Against:*

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

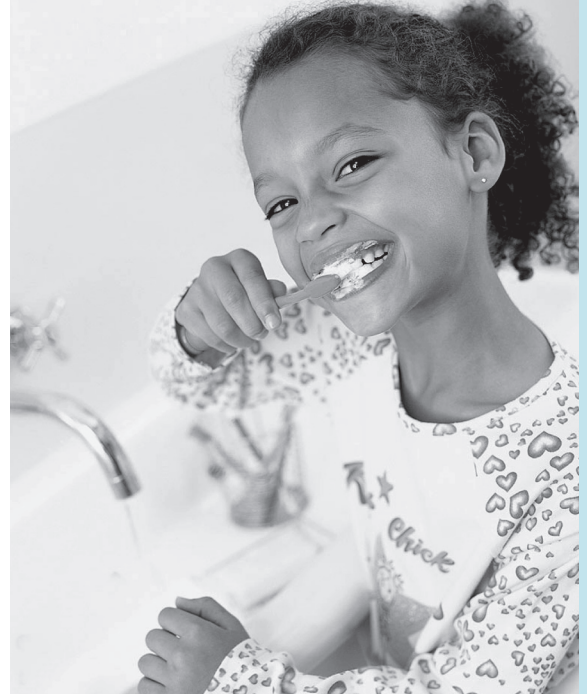
### *Not Effective Against:*

*most volatile and semi-volatile organic compounds (VOCs), 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 over 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 contami-



nants 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



## Healthy Drinking Waters for Massachusetts

### Distillation Treatment of Drinking Water Supplies

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 containers hold from one and a half to fifteen 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 buildup can be dissolved with pure water. In other cases, the mineral buildup needs to be dissolved by dilute acid cleaners in a heated condition. Always follow the manufacturer's cleaning recommendations.



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#### 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 distil-

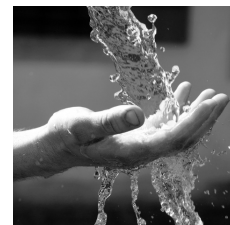
lation is an effective treatment method for your situation. See the fact sheet *Questions to Ask When Purchasing Water Treatment Equipment* for more information.

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 your 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 distiller 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 evaluated by NSF and meet their minimum requirements are entitled to display the NSF listing mark on the products and 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: 800-NSF-MARK (800-673-6275) or <http://www.nsf.org/consumer/>



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### Resources

#### UMass Extension

This fact sheet is one in a series on drinking water wells, testing, protection, common contaminants, and home water treatment methods available on-line at the University of Massachusetts website:

[http://www.umass.edu/nrec/watershed\\_water\\_quality/watershed\\_online\\_docs.html](http://www.umass.edu/nrec/watershed_water_quality/watershed_online_docs.html)  
and Cape Cod Cooperative Extension:  
508-375-6699  
<http://www.capecodextension.org>

#### MA Department of Environmental Protection, Division of Environmental Analysis

Offers assistance, information on testing and state certified laboratories: 617-292-5770  
For a listing of MassDEP certified private laboratories in Massachusetts:  
<http://www.mass.gov/dep/service/compliance/wespub02.htm>

#### U.S. Environmental Protection Agency, New England Office

Information and education on where drinking water comes from; drinking water testing and national laws; and how to prevent contamination:  
<http://www.epa.gov/ne/eco/drinkwater>

#### US Environmental Protection Agency

For a complete list of primary and secondary drinking water standards:  
<http://www.epa.gov/safewater>

#### MA Department of Conservation and Recreation, Division of Water Supply Protection

Maintains listing of registered well drillers, information on well location and construction: 617-626-1409  
<http://www.mass.gov/dcr/waterSupply/welldrill/index.htm>

#### NSF International

The NSF International has tested and certified treatment systems since 1965. For information on water treatment systems: 800-NSF-MARK (800-673-6275)  
<http://www.nsf.org/consumer/>

#### Water Quality Association

The Water Quality Association is a not-for-profit international trade association representing the household, commercial, industrial, and small community water treatment industry. For information on water quality contaminants and treatment systems:  
<http://www.wqa.org>



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