

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

Microfiltration Treatment of Drinking Water Supplies

Effective Against:

small particles and suspended solids such as ferric iron, clay, silt and sand, and some pathogens such as bacteria and viruses, and colloids (suspended matter).

Not Effective Against:

any dissolved contaminants such as nitrates, dissolved iron, sodium, and volatile organic compounds (VOCs).

How Microfiltration Works

Microfiltration is a process that removes small amounts of suspended material from water. These filters are not intended for large suspended material loads. A rapid sand filter, screen, sand separator, or other treatment device is preferred for heavy loads of suspended materials. Microfilters function in two general modes: surface and depth.

Surface or screen filters remove the particles at or very near the filter surface. They function very much like a screen; particles of a certain size and larger are retained at the surface while smaller ones move through the openings.

Depth filters have a thick filter medium. Particles are retained throughout the thick filter mat. Depth filters have a gradation in the size of the filter media so the largest particles



are held at or near the filter surface, while progressively smaller particles are captured deeper in the filter where the filter media becomes smaller. Either filter type may be used for a wide range of particles sizes.

Types of Filters

There are many different types of filters used in these units. They differ in design, cost, and effectiveness. 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.

The size of the filter openings is rated in two ways. One typical method is to rate the average size particle that passes through the



Microfiltration Treatment of Drinking Water Supplies

filter. This rating is used when the filter construction results in a range of opening sizes. Some particles larger than the size rating will pass through, but how much larger and how many particles is not stated. Likewise, the filter will retain some particles smaller than the average size rating.

The other method is an absolute minimum size rating: no particle larger than the stated size may pass through the filter. This rating method is used when the filter construction results in precise opening sizes over a narrow range. Filters having an absolute size rating should be selected when control of specific-size particles is important, such as the removal of bacteria. A surface-type filter is often used when an absolute rating is needed.

Microfilters are rated by the smallest particle they will remove, stated in microns. A micron is approximately 0.00004 inches. The filter opening size to use depends upon the material to be removed by the filter. A smaller size will satisfy removal requirements but will require more frequent cleaning or replacement of the filter. If no very small material, viruses, or bacteria are present, the largest rating size that will serve the purpose will require the least maintenance. When used to pre-treat water for other water treatment devices, such as a reverse osmosis unit, follow the manufacturer's recommendations.

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.

Microfiltration is normally part of the household plumbing system, unless it is part of another water treatment system. Some



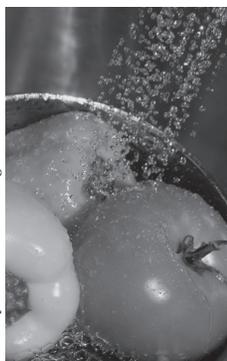
© istockphoto.com/marmion

microfilters have self-contained throwaway elements; when the filter becomes clogged or full, the unit is discarded.

Microfiltration is generally a low-cost, safe treatment process that is nearly self-monitoring. When the filter becomes clogged, the pressure drop across the filter increases and water flow decreases. This indicates that the filter needs service. As long as the filter remains in place and there are no leaks through the filter or the seals, the process works safely with little attention.

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 untreated and treated



© istockphoto.com/bluestocking



© istockphoto.com/Marek Thielka

water annually. This annual test will also help you determine how well your treatment system is working and whether maintenance or replacement of components may be necessary.

Bacteria can grow on the filter, so it is important to that you change the filter as 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 microfiltration 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 microfiltration system:

- First, have your water tested to determine the contaminants present.
- Confirm that microfiltration is the effective treatment method and will remove the contaminant(s) present in your water.
- What type and size filter do I need? The filter size should be based on the contaminant(s) needing to be removed.
- What is the cost involved in installation and maintenance?
- Where can I purchase replacement filters?
- Has the treatment system been tested and certified by a third party to ensure that it meets manufacturer's claims?
- 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/>



©istockphoto.com/Tommy Ingberg



©istockphoto.com/Tor Lindqvist

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
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>



This publication is adapted from a URI fact sheet by the same name produced by the Rhode Island Department of Health and the University of Rhode Island Cooperative Extension Water Quality Program.

UMass Extension is an equal opportunity provider and employer, United States Department of Agriculture cooperating. Contact your local Extension office for information on disability accommodations or the UMass Extension Director if you have complaints related to discrimination, 413-545-4800.

This project was funded, in part, by a grant from US EPA.

This material is based upon work supported by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture, under Agreement No. 2004-51130-03108.

06/01/07

