Faculty of Health Sciences

WATER AND HEALTH RESEARCH CENTRE

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UNIVERSITY OF JOHANNESBURG

Things to consider before you purchase a home water treatment device

In the last few years we have been bombarded with reports of how bad our tap water quality is. You have probably also been contacted by a sales person to show you how "contaminated" your tap water is. They will often suggest that you urgently need a home water treatment device to ensure safe tap water for you and your family.

In order to make an informed decision, and to ensure your family's safety, you as the consumer have the responsibility to ask yourself:

- What do I really know about tap water quality in South Africa?
- What can these home water treatment devices really do for me?

What do I really know about tap water quality in South Africa?

The Department of Water Affairs initiated the Blue Drop Certification Programme in September 2008 with the objective of introducing key requirements for the effective, efficient and transparent management of drinking water by Water Services Authorities (municipalities) and providers (any institution involved with the treatment and provision of water).

How can I find out what the quality of my tap water is?

There are two ways to find information on your tap water quality:

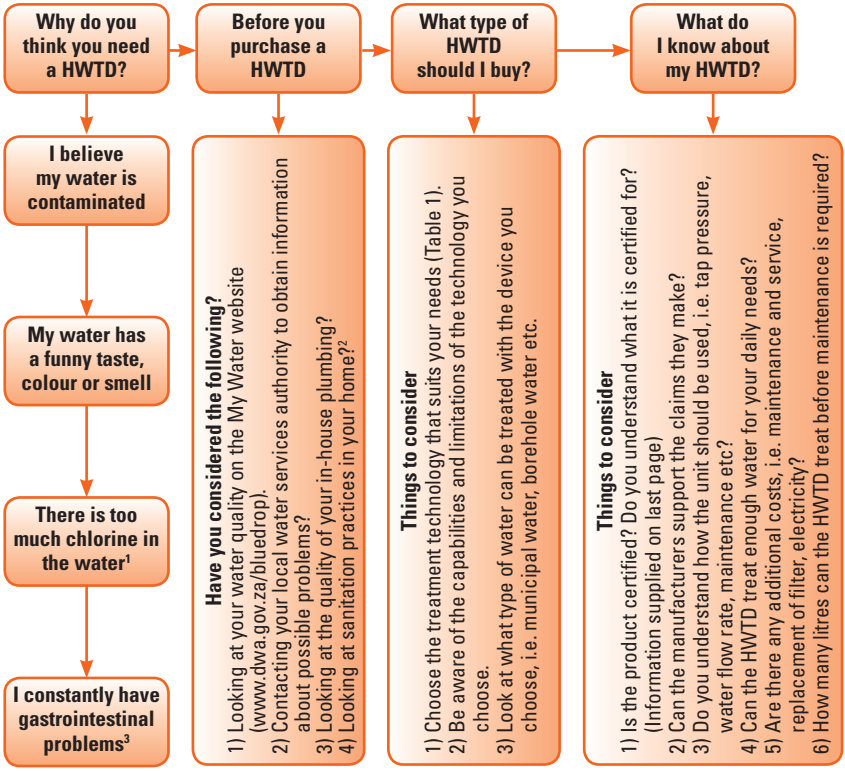
- Consult the "My Water" function on the Department of Water Affairs website (www.dwa.gov.za/bluedrop). Here you can monitor the tap water quality of any town, suburb or street on a daily basis.
- Have your tap water privately analyzed by a laboratory certified to provide credible results with reference to the South African National Drinking Water Standard (SANS 241) and the World Health Organization Guidelines.

What do you know about home water treatment devices?

Home water treatment devices use various technologies to remove pollutants from water. The devices can use one treatment technology, or a combination of the treatment technologies as listed in Table 1, to remove specific contaminants. Regardless of the treatment technology used, these water treatment devices are often collectively referred to as "water filtration devices".

Choosing the best home water treatment technology for your specific needs can be a daunting task. We include a flow diagram to guide you through the decision making process to help you decide if you need a home water treatment device. We also included a Table with a summary of treatment technology available in South Africa, to assist you in choosing the correct home water treatment technology to meet your family's specific water treatment needs.

Do you need a home water treatment device (HWTD)?



Things to remember:

1 The chlorine levels at your tap might be higher if you are closer to the reservoir where chlorine dosing occurs.

1 A small amount of chlorine is needed to prevent bacterial growth in pipes.

1 Chlorine is only harmful to your health when levels exceed 5 mg/L, however, you can smell and taste chlorine at 0.2 mg/L.

2 Sanitation practices in your house can influence your water quality.

2 The faucet outlet of your tap can become contaminated from various sources and contaminants can also enter your water when the tap is open.

3 Diarrhoea is not only caused by waterborne pathogens but can enter your household via children, contaminated food or unsanitary practices.

Table 1: Different types of drinking water treatment technologies*

Device	Primary use	Limitations
Activated Carbon Filter	Removes chlorine, Volatile Organic Compounds (VOCs), radon, some Synthetic Organic Compounds (SOCs), and general taste and odour problems.	• Does not remove nitrate, bacteria or inorganic compounds. • Periodic replacement of activated charcoal required to prevent saturation of the charcoal and prevent bacteria build-up.
Reverse Osmosis	Removes more contaminants than any other treatment system except distillation, some organic chemicals (not volatile or semi volatile), pesticides, bacteria, viruses, uranium and radium.	• Does not remove all organic chemicals, such as chloroform. • Does not remove 100 percent of most chemicals. • Uses large amounts of water and in some cases electricity. • Not recommended for bacteria and dissolved gases.
Ion Exchange	**Cation Exchange Units** Removes positively charged ions, inorganic compounds, such as iron and manganese ions, arsenic, chromium, and hard water minerals – calcium and magnesium. **Anion Exchange Units** Removes negatively charged ions such as nitrates, bicarbonate, selenium, and sulphate.	• Removal of one type of ion replaced with another, for example iron removed may be replaced with sodium. • Periodic backwashing and regeneration required.
Microfiltration	Removes 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).	• Filter replacement based on concentration of contaminant, pressure head loss and water usage in the home.
Distillation	Removes dissolved minerals, trace amounts of metals, and some toxic organic chemicals.	• Might produce bland-tasting water. • Small capacity units produce limited quantity for drinking, cooking. • Large units require kitchen or adjoining space or small diameter plastic plumbing can be run to the faucet location from a basement unit. • Not effective against most volatile and semi-volatile chemicals and some bacteria.

Device	Primary use	Limitations
Aeration	Dissolved gases like radon, carbon dioxide, methane, and hydrogen sulphide, as well as volatile organic compounds, like MTBE or industrial solvents. Aeration can be used for the precipitation and removal of dissolved iron and manganese.	• If iron and manganese are present in solid form, pre-treatment of the water to remove these particles before entering the aeration treatment and post-treatment may be necessary. • Waste air must be vented from the house in such a way as to prevent contamination of indoor air quality.
Ultraviolet Radiation	Efficient at inactivating vegetative and sporous forms of bacteria, viruses, and other pathogenic microorganisms.	• Not recommended if the untreated water contains high levels of total coliform bacteria, substantial colour or turbidity. • Does not improve the taste, odour, or clarity of water.
Ozone	Inactivation of pathogenic (disease-causing) organisms including bacteria and viruses, phenols (aromatic organic compounds), some colour, taste, and odour problems, iron and manganese, and turbidity.	• Not effective for large cysts and some other large organisms, inorganic chemicals and heavy metals.
Activated Alumina	Used primarily for removing fluoride and arsenic.	• May require a post-treatment system for bacteria removal and pre-treatment to oxidize 'arsenite" to filterable "arsenate".

***DPH (2009). Publication No. 19 Private Drinking Water, Questions to Ask When Purchasing Water Treatment Equipment for Your Home.**www.ct.gov/.../Questions_to_Ask_When_Purchasing_WTE_for_Your_Home_03-09.pdf

What do you know about certification?

1) Certification can be done either for the effectiveness of the treatment technology used, for the individual device components used or for systems quality management.
2) There are a number of different standards and different levels of compliance within the standards. Some products may have only been tested for material safety, while others may be tested for both material safety and performance.
3) You have the right to enquire if the certification displayed is authentic. An example of this is for the NSF (National Sanitation Foundation) certification that can be confirmed online at www.nsf.org/certified/dwtu/.
4) Certification does not mean much unless you know exactly what each specific certification standard stands for.

Certification for drinking water treatment technology performance:

National Sanitation Foundation (NSF)
NSF/ANSI 42: Drinking water treatment units: Aesthetic effects.
NSF/ANSI 44: Cation exchange water softeners.
NSF/ANSI 53: Drinking water treatment units: Health effects.
NSF/ANSI 55: Ultraviolet microbiological water treatment systems.
NSF/ANSI 58: Reverse osmosis drinking water treatment systems.
NSF/ANSI 60: Drinking water chemicals.
NSF/ANSI 62: Drinking water distillation systems.

Water Quality Association (WQA)
WQA S-100: Household and commercial softeners.
WQA S-200: Household and commercial water filters (in-line).
WQA S-300: Point-of-use reverse osmosis drinking water systems.
WQA S-400: Point-of-use distillation drinking water systems.

South African Bureau of Standards (SABS)
SANS 1865: Point-of-use drinking water treatment units.

Certification for system quality management and material safety:

National Sanitation Foundation (NSF)
NSF/ANSI 61: Point-of-entry (POE) components covered for materials safety compliance.

South African Bureau of Standards (SABS)
ISO 9001:2008: Systems quality management standard.
ISO 11014:2009: Standard for compilation and completion of a safety data sheet – replaced ISO 11014-1:1994.

International Organization for Standardization (ISO)
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Microban
Antimicrobial product housing (i.e. plastic parts)

European Conformity (CE)
The CE marking certifies that a product has met European Union consumer safety, health and environmental requirements.

Federal Drug Administration (FDA)
All component materials meet FDA requirements for food-grade materials. The performance claims of a filtration system should be validated and certified by an independent third party organization such as the NSF.

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