

Results of Round II

of the WHO International
Scheme to Evaluate Household
Water Treatment Technologies



Summary results:

TULIP TABLE TOP WATER FILTER

Performance classification:

Targeted protection



Tulip Table Top Water Filter

Manufacturer: Basic Water Needs B.V.

Manufacturer location: Netherlands

Treatment technology







Ceramic candle filter

Product description^a

The Tulip Table Top Water Filter is a ceramic candle filter with activated carbon that is impregnated with colloidal silver. Microorganisms are physically removed from water as it filters through the ceramic candle under gravity. The assembled filter set comprises two 9 L buckets stacked on top of each other; these buckets serve as receptacles for raw and filtered water. The ceramic candle is screwed to the bottom of the raw water bucket. Water is filtered through the ceramic candle into the clean water bucket.

The full product description, illustrations and use instructions can be found on the manufacturer’s website at www.basicwaterneeds.com.

Product specifications^a

	Water quality conditions	Includes a fabric prefilter that fits around the candle, to be used when treating turbid water
	Fail-safe/indicator of treatment complete	Includes a plastic tool to measure the diameter of the candle; once the plastic sensor fits around the thinnest part of the candle, the candle must be replaced
	Maintenance and lifespan	Depending on the turbidity of the water, the filter candle should be cleaned regularly; the prefilter should be washed periodically The filter candle should be cleaned gently with the scrub pad included with the filter Treats up to 7000 L of water, depending on the turbidity of the untreated water
	Integrated safe container/residual protection	Yes
	Energy requirements	None
	Estimated annual production (no. of units)	45 000 complete Table Top water filters 80 000 Tulip filter elements Sold in more than 35 countries around the world

^a Based on information provided by the manufacturer

Product evaluation

Testing of the Tulip Table Top Water Filter followed requirements of the Filtration Batch System Technology Protocol. Testing investigated the ability of the Tulip Table Top Water Filter to reduce bacteria (*E. coli*) and viruses (coliphages MS2 and phiX174). Performance against protozoan cysts (*C. parvum*) was assigned based on the bacterial reduction achieved. Posttreatment silver and arsenic concentrations were collected and analysed.



BOX 1

Water safety and point-of-use / household water treatment

A preventable crisis

2 billion
people

drink water that is contaminated with faeces

2.9 million
people

are affected by cholera and other waterborne disease outbreaks annually

829 000
deaths

deaths are due to diarrhoeal disease annually

26% of health care facilities

lack basic water services

31% of schools

lack an improved* source of drinking-water

* Improved drinking water sources are those that have the potential to deliver safe water by nature of their design and construction, and include: piped water, boreholes or tubewells, protected dug wells, protected springs, rainwater, and packaged or delivered water.

Improving water safety

Waterborne diarrhoeal disease is largely preventable through interventions aimed at identifying and managing water safety risks, including water safety planning. Household/point-of-use water treatment as an interim measure, allows households, schools and health care facilities to take charge of water safety



HWTS

When effective products are used correctly and consistently, HWTS can **reduce diarrhoeal disease** by as much as **61%**

Promoting maximum, sustained diarrhoeal disease reductions

HWT Scheme

Coordinate independent evaluation of HWT products against WHO norms, and strengthen capacity of countries to regulate and conduct complementary testing of HWT

HWTS Network

Support effective, collective action, share implementation strategies and disseminate knowledge

WHO's work on HWTS



Establish norms on HWT performance and evaluate products of global relevance



Support countries in implementing norms through risk-based approaches



Convene stakeholders on water safety

HWT: household water treatment; HWTS: household water treatment and safe storage; HWT Scheme: WHO International Scheme to Evaluate Household Water Treatment Technologies; HWTS Network: International Network on Household Water Treatment and Safe Storage; WHO: World Health Organization

1 Highlights

Since the establishment of the International Scheme to Evaluate Household Water Treatment Technologies (the Scheme) in 2014, WHO has been independently evaluating the performance of household water treatment (HWT) technologies in removing microbial contaminants from drinking-water. The Scheme is one part of WHO's normative programme of work on drinking-water quality. It provides the evidence to inform Member States and United Nations procuring agencies' selection of effective HWT technologies to reduce the risk of diarrhoeal disease from unsafe drinking-water. In particular, the Scheme helps to ensure that products that provide limited or no pathogen removal are kept off the market.

This Round II report of the Scheme adds to the growing number of HWT products for which comprehensive, health-based performance evaluations are available. The report summarizes the results of 19 of 20 HWT products evaluated in Round II of the Scheme¹. These represent a range of treatment methods, including chemical, solar and ultraviolet (UV) disinfection and ceramic and membrane filtration.

1.1 Improving water safety

Unsafe drinking-water still accounts for over half of the diarrhoeal disease burden globally

Although significant progress has been made in increasing access to drinking-water services, these do not always provide water that is safe at the point of consumption, including in homes, schools and health care facilities. Over 2 billion people globally lack access to safely managed drinking-water services, and approximately 485 000 diarrhoeal deaths in low- and middle-income countries each year are attributable to unsafe drinking-water.

Sustainable Development Goal (SDG) 6.1 calls for safe drinking-water along the entire water service delivery chain

SDG 6.1 represents a higher level of ambition than the previous Millennium Development Goal target related to drinking-water. SDG 6.1 focuses on the type of infrastructure available and emphasizes the quality of the service that is delivered, including safety of drinking-water. This necessitates ensuring that water safety risks are minimized from catchment to consumer, including in households where unsafe collection, storage and handling can result in contamination.

Drinking-water safety can be improved through effective household water treatment and safe storage

Household water treatment and safe storage (HWTS) can reduce the risk of diarrhoeal disease by as much as 61% when *effective* HWT methods are used *correctly and consistently* by *populations at risk* of waterborne disease (Box 2). HWTS should therefore be targeted to where the safety of water supplies is uncertain; in emergencies and outbreaks of waterborne disease such as cholera; and among vulnerable populations relying on unsafe water sources, such as young children, the malnourished and people living with HIV/AIDS. Through the Scheme, WHO works to maximize health gains from HWT by ensuring that products on the market meet global, health-based performance criteria. Governments are ultimately responsible for progressive improvements to safe drinking-water and towards achieving universal access.

¹ Testing is in progress and results are pending for one product. The results from this product will be published in a product-specific test report in Q3 2019.

BOX 2

Achieving health gains from HWTS

Both quantitative microbial risk modelling and epidemiological evidence indicate that appreciable health gains from HWTS are achieved under three main conditions. These are: (i) the water treatment method sufficiently removes contaminants; (ii) rates of use are high that is, over 90% of the time; and (iii) HWTS is actually needed.

Treating water that has low levels of contamination to begin with does not result in appreciable health gains. Supporting correct and consistent use of accepted technologies through, for example, regular promotional messaging and user training is particularly important for achieving health gains. Results of recent field trials from Bangladesh and Kenya suggest that not sufficiently engaging users in HWTS selection as well as intermittent messaging results in incorrect and inconsistent use and little to no reduction in childhood diarrhoea. Thus, significant effort is required in understanding contextual factors, including the most appropriate HWTS technology in a given setting, supporting correct and consistent use, and how technologies perform with specific source water quality characteristics.

1.2 Round II of the Scheme

Increased demand for product evaluation under the Scheme

In Round II, 39 expressions of interest (Eols) for evaluation were received. Of these, 20 products were evaluated – twice the number evaluated in Round I (Fig. 1).

More HWT products meet WHO performance criteria

The performance criteria are shown in Table 1. Of the 19 products for which results are available, 15 meet these performance criteria.

FIG. 1
Eols submitted to the Scheme, Rounds I-II

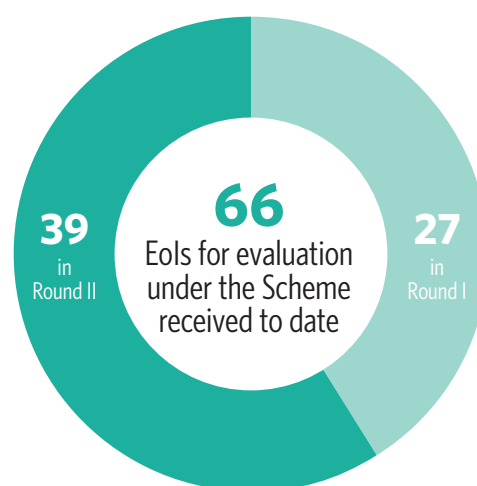


TABLE 1
WHO performance criteria for HWT technologies

Performance classification	Bacteria (log ₁₀ reduction required)	Viruses (log ₁₀ reduction required)	Protozoa (log ₁₀ reduction required)	Interpretation (with correct and consistent use)
★★★	≥ 4	≥ 5	≥ 4	Comprehensive protection
★★	≥ 2	≥ 3	≥ 2	
★	Meets at least 2-star (★★) criteria for two classes of pathogens			Targeted protection
—	Fails to meet WHO performance criteria			Little or no protection

Building on the 10 products evaluated in Round I, a total of 30 products have been evaluated under the Scheme to date, and 23 of these meet WHO performance criteria² (Table 2).

² Testing is in progress and results are pending for one product. The results from this product will be published in a product-specific test report in Q3 2019.

WHO's work on household water treatment and safe storage



Establish norms on household water treatment performance and evaluate products of global relevance



Support countries in implementing norms through risk-based approaches



Convene stakeholders on water safety

For more information, contact:

Water, Sanitation, Hygiene and Health Unit
Department of Public Health, Environmental
and Social Determinants of Health
World Health Organization
20, avenue Appia
1211 Geneva 27
Switzerland

http://www.who.int/water_sanitation_health/en/
http://www.who.int/household_water/scheme/en/

hhwater@who.int

ISBN 978 92 4 151603 7



9 789241 516037