

A Credible Safe Water Solution

The HydrAid® BioSand Water filter represents the culmination of nearly two decades of development and research conducted around the world by leading experts and trusted organizations.

Triple Quest

The HydrAid® BioSand Water filter is a product of Triple Quest, a joint venture between Cascade Engineering Family of Companies and Windquest. HydrAid® uses a patented design technology by Dr. David Manz the originator of biosand filter technology. We acquired the global manufacturing and distribution rights to that technology for both humanitarian and commercial purposes. Several organizations provided funding to conduct field research on HydrAid® in Honduras, Ghana, and Cambodia including DOW Chemical and the Kellogg Foundation. That research was conducted by Dr. Mark Sobsey, a leading water expert at the University of North Carolina and advisor to the World Health Organization.

MANZ

Biosand water filter technology has grown out of work conducted in Nicaragua in the early 1990's by Dr. David Manz of the University Of Calgary, Alberta, Canada. Today at least at half million biosand water filters are used in over 65 countries.

Biosand water filters have been extensively tested in laboratories at the University of Calgary, MIT, Dartmouth College, and elsewhere. They have consistently proven to be effective, reliable, and economical.

Many technical reports have been published attesting to the effectiveness of the water filtration system. The reports confirm that under optimal operating conditions, the bio-sand filter is capable of removing 97% of fecal coliform, 100% of giardia cysts, 99.98% cytosporidium oocysts, 100% worms, 100% parasites, and up to 90% of organic and inorganic toxicants from contaminated water.

SOBSEY

Environmental Science Technology published a peer reviewed paper by Dr. Mark Sobsey of the University of North Carolina titled Point of Use Household Drinking Water Filtration: A Practice, Effective Solution for Providing Sustained Access to Safe Drinking Water in the Developing World. The document discusses the relative advantages of five point-of-use (POU) safe water technologies – chlorination, coagulant chlorine disinfection systems, SODIS, Ceramic Filter, and biosand filter.



The study acknowledges the availability of other POU technologies but points out that “they lack scientifically sound evidence documenting their ability to improve water quality and reduce waterborne infectious disease.”

The paper goes on to compare the performance of the five technologies against five criteria – quantity of water produced, quality of water, ease of use, cost, and supply chain. An overall score was then calculated for each technology. Biosand filters earned the highest overall score of the five technologies.

Scoring of Point-Of-Use (POU) Treatment Technologies Based on Sustainability Criteria

| Technology | Quantity | Quality | Ease of Use | Cost | Supply Chain | Overall Score |
|--------------------------|----------|---------|-------------|------|--------------|---------------|
| Free chlorine | 3 | 1 | 3 | 3 | 1 | 11 |
| Coagulation/chlorination | 2 | 3 | 1 | 1 | 1 | 8 |
| SODIS | 1 | 1 | 1 | 3 | 3 | 9 |
| Ceramic filters | 2 | 3 | 2 | 3 | 2 | 12 |
| *BioSand Water Filter | 3 | 3 | 2 | 2 | 3 | 13 |

*Source: Point of Use Household Drinking Water Filtration: A Practice, Effective Solution for Providing Sustained Access to Safe Drinking Water in the Developing World, Sobsey, Environmental Science Technology. *Emphasis added*

The positive health impact of safe water technologies is commonly assessed on the basis of its effectiveness in reducing diarrheal disease (a leading cause of death amongst children under age 5). The paper references two other studies conducted in the Dominican Republic and Cambodia that demonstrated a 47% reduction in diarrheal disease with the use of biosand filters alone. It is noteworthy that a 15% reduction is considered statistically significant.

Also cited in the paper is reference to a Cambodia study demonstrating greater than 85% continued use (sustainability) of biosand water filters over an eight year period.

In closing the paper states the following:

“... biosand filters are able to overcome these sustainability obstacles by requiring only one-time purchase, producing sufficient water for daily household use with little time and effort, and achieving large scale adoption and continued, long-term use.”

“...filters have been shown to improve water quality and reduce diarrheal disease in rigorous epidemiological studies, and follow-up studies document sustained, effective performance long after implementation, with filter usage rates remaining high years post-implementation.

“...biosand filter technologies have also shown the potential for large scale adoption as they are used by over ...1.5 million people.”

“...biosand filters have promise as effective, affordable ways to achieve sustained access to sufficient quantities of safe drinking water for those people worldwide who most need it.”

In a yet unpublished study completed in 2008 in Cambodia and Ghana using the HydrAid® BioSand plastic water filter, Sobsey's preliminary data indicate diarrhea disease reductions that significantly surpass those reported using concrete biosand filters.

UNICEF

In January 2008 UNICEF released a document titled Promotion of Household Water Treatment and Safe Storage in UNICEF Wash Programs. The document discusses why household water treatment and safe storage (HWTS) is an important intervention for preventing disease and its relevance to the United Nations Millennium Development Goals. The document concludes that, "Based on the evidence, UNICEF has made HWTS an important programme priority."

The document goes on to reference a study commissioned by the World Health Organization (WHO) and completed by Dr. Mark Sobsey in 2002. The study examined 37 different products, technologies and approaches that were identified for treating drinking water in the home, only a few of which had been rigorously assessed for microbiological performance and health impact. Four technologies are discussed – chlorination, filtration, flocculation and disinfection, and boiling and solar disinfection.

The document says this about filtration...

"Slow-sand filters, which remove suspended solids and microbes by means of a slime layer (schmutzdecke) that develops within the top few centimetres of sand, are capable of removing 99% or more of enteric pathogens if properly constructed, operated and maintained (Hijnen 2004). A simpler but more advanced version, known as the "bio-sand" filter, was specifically designed for intermittent use and is more suitable for household applications. It has been tested both in the laboratory and the field (Stauber 2006) and is being deployed widely in development settings by the Center for Alternative Water and Sanitation Technologies (CAWST) and by different organisations in various countries."

In closing, the UNICEF document calls for National-level commitments to advance HWTS globally using such point-of-use technologies as the HydrAid® BioSand Water filter.

Stauber

Dr. Christine Stauber of the University of Georgia published a randomized controlled trial of biosand filters in the American Journal of Tropical Medicine and Hygiene (2009). The study, conducted in the Dominican Republic, demonstrated a 47% reduction in diarrheal disease – this was absent any other hygiene and sanitation interventions. The reduction of diarrheal disease was greatest amongst children ages 2-4 who are commonly most at risk.



Wikipedia

The Wikipedia provides a concise summary of the history, functionality, and effectiveness of biosand filters. In summary it states that:

“BioSand Filters remove 95.0% to 99.0% of organic contaminants, including bacteria, viruses, protozoa, worms, and particles. Safe water produced by the filters is free of discoloration, odor, and unpleasant taste, and can be used for drinking, food preparation, personal hygiene, and sanitation.”