

## **FILTERPURE CERAMIC FILTER**

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### **What is the FilterPure ceramic filter?**

The filter has two parts: a plastic container fitted with a spigot and a lid and the ceramic filter insert through which the water passes through for cleaning. It can provide potable water for families who draw their water from contaminated sources such as springs, rivers, aqueduct systems or standing surface waters. The filter is appropriate technology at a reasonable cost to the end user.

Benefits and desired outcomes include, but are not limited to:

- Better health
  - stabilizes the welfare of impoverished families
  - increases productivity in adults
  - improves learning capacity of children
- Convenient and reliable source for clean water
  - frees women to do other important work needed by the family
- Eco-friendly
  - burning wood and coal are not required to boil water.
- Employment opportunities for local craftsmen and artists.

Large scale and expensive water projects do not have to be in place to use this technology. As soon as the filters are manufactured, they can be distributed to the population for immediate use.

### **How does the filter work?**



The technology is simple, appropriate, and, therefore, sustainable. A round-bottom ceramic pot is made from a mixture of clay, a combustible material, and nano particle silver addition that enables bacteriostasis and increases microbiological effectiveness.

Any agricultural waste such as sawdust, rice husks, and/or coffee husks can serve as a combustible additive. After the clay and combustible have both been sieved through a fine mesh, they are mixed together with a measured amount of silver and water until a homogeneous mixture is formed. The mixture is then made into a filter using a filter press. Then it is fired to burn out the combustible material. The combustible leaving behind micro pores coated with the silver to filter the water, and fired correctly a half an inch of activated charcoal for added filtration. The micro pore size has been measured at less than 1.3 microns.

The filter, which is designed with a flange, is placed on the rim of a five-gallon plastic storage bucket with a spigot at the bottom for dispensing. A lid is placed on the filter to prevent contamination.

In use, water is poured through the ceramic pot and filtered into the plastic bucket. The flow rate ranges from 1 to 2.5 liters per hour depending upon the volume of water in the filter. Filters are cleaned by lightly scrubbing the surface when flow rate is reduced. The effective useful life of the filter is at least 5 years.

The water poured through the ceramic filter is purified in three ways.

- 1) The pore size of 1.3 microns filters out turbidity and the large bacteria and parasites that are contained in the water by trapping them in the pores.
- 2) The nano particle silver addition integrated into the ceramic membrane creates a hostile environment, killing the bacteria as they pass through the membrane.
- 3) One layer of activated charcoal is integrated into the membrane adding an extra component of filtration for improving things like taste and color.

### What are the test results?

Test	Total Coliforms	Presence of E. Coli	Total Fecal Coliforms	Presence of Salmonella	Presence of Pseudomonas	Durezza : 60-180	Classification
River Buyacanes	>2420	Positive	1120	Negative	Positive	68.4	D
FilterPure Initial Test	<1.1	Negative	<1.1	Negative	Negative	17.12	A
FilterPure 13 Mos. Of use	<1.1	Negative	<1.1	Negative	Negative	154	A

A - Water fit for human consumption.

D - Water contaminated, not fit for human consumption.

Test Results by government certified laboratories. Translated and compiled by Lisa Ballantine, Director Filter Pure.

### How is the filter used and maintained?

The filter is easy to distribute, use and maintain. It weighs 8 pounds and is the size of a 5 gallon utility bucket allowing for easy transportation. Transportability of the filter facilitates distribution to even the most remote areas affected by contaminated water, reaching the poorest and most isolated communities.

The filter should be located in a safe and convenient place, like the kitchen. It is simple to use and even the smallest members of the family will pour water on their own. The ceramic filter insert is filled with water from the available source, and maintained as full as possible for the most efficient flow rate. The filter uses the gravity weight of the water to pass it

through. It is recommended to fill the filter each evening for the next day's water supply, which can be periodically topped off throughout the day. The pore size of the filter keeps the water's flow rate to 2-3 liters per hour. This may seem slow, but filtration is highly effective at this rate removing bacteria and parasites.

The filter is easy to maintain. The filter is cleaned with a brush every one to two months, depending upon the turbidity of the water used. The more turbid the water, the more need there is to clean the pores. The receptacle bucket should also be maintained and it is recommended that when the ceramic insert is cleaned that the bucket be sanitized with a small amount of dilute chlorine in water. After three months of use, the pores tend to be clogged with trapped bacteria, and it is recommended that the membrane be submerged in boiling water for about 10 minutes. This will return the filter to normal use and increase its useful life.

### **How long will the filter last?**

We recommend the ceramic filter insert be replaced after five years of use. Only the membrane needs to be replaced, not the entire unit. Our hope is that with continued testing and research and development, we can guarantee a longer life.

What is the cost?

The cost of the filter to non-profit organizations is \$35. This is a low price for point of use filters, especially considering its very high effectiveness of removing 99.9% of the bacteria. The cost will vary slightly in each country, as the main cost of the filter is the buckets and plastic faucets. The other main cost is the silver, which is purchased at market value and, in order to maintain filter integrity, must be used in the recommended quantities. The cost of the ceramic filter insert alone is \$25.

Community acceptance.

Where the filter is in use, there is significant acceptance. Those individuals who are educated in the need for clean, safe drinking water more readily use and purchase the filter. The ease of use and the reasonable cost are the main selling points.

We have found that 90% of the filters in use are maintained correctly and those customers drink only purified water. A recent health impact study done by a student of PUCMM University of the Dominican Republic, found that 100% of those using the filter saw an improvement in their health.

The FilterPure filter provides a solution to people who are in need of clean, safe drinking water. The user can be assured that the water they and their families are drinking is clean, because they themselves clean and maintain the filter.

## **FILTER PURE ORGANIZATION**

FilterPure is a U.S. non-profit 501(c)3 organization focused on solving the problem of contaminated drinking water world-wide. FilterPure works in developing countries to facilitate production of a ceramic water filter that eliminates turbidity and micro bacteria at a rate of 99.9%. The filters are produced to be affordable and accessible to those who have little resources and are at high risk of exposure to contaminated water. FilterPure is committed to enabling sustainable enterprise, providing a quality product and service, and educating people about sanitation, hygiene and life styles – while always maintaining respect for the culture and the individual.

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