

## Ceramic water filter

### Ceramic colloidal silver impregnated water filter

The ceramic colloidal silver impregnated water filter (CSF) is a point-of-use system based on a ceramic pot filter. These filters can be produced by local enterprises in country and are generally more cost-effective than alternative water treatment options as chlorination or other filtration systems.

### The context

Access to safe drinking water is essential to a person's health. The World Health Organization (WHO)/UNICEF assessed in 2000 that 1.1 billion people do not have access to 'improved drinking-water sources'. Drinking unsafe water is still the major cause of diarrhoeal diseases, killing over 2.2 million people a year, mostly children in developing countries.

One of the options to improve the drinking water quality are the household water treatment and safe storage (HWTS) options, giving individual households access to safe drinking water.

The ceramic water filter can be applied in situations where water is contaminated with bacteria and solids, producing enough water to provide drinking water for an average family.

### The technology

The filter set consists of a filter element and a receptacle with faucet and lid. The receptacle can be made of ceramics, stainless steel or plastic, depending on local preferences. Plastic receptacles can either be of-the-shelf products or custom made to fit the filter elements. The filter element material is porous ceramics, which gets its porosity by mixing the clay with an organic burn-out material as sawdust or rice husks. The mixture of clay and organic material is pressed into shape and fired, leaving a very fine pore structure that blocks bacteria while allowing water to seep through. To prevent re-growth of bacteria in the filter, the fired filters are coated with a colloidal silver solution which acts as a bacteriostatic agent.

The filter element is placed in the receptacle and raw water is poured into the filter element. The element holds 8 litres of water, producing potable water at a rate of 1 to 2 litres per hour. With 3 fillings a day, the filter can deliver 20 - 40 litres per day, which is sufficient for an average family. Maintenance consists of scrubbing the ceramic element with a soft brush when the pores are clogged. At the same time the receptacle is cleaned to prevent bacterial growth. Although studies indicate that the silver in the ceramic element remains effective up to 7 years, it is recommended to change the element every 2 to 3 years.

### The application

Ceramic filters are widely applicable in situations where the drinking water source is bacterially unsafe, which is often the case where people rely on surface water sources or open (hand dug) wells. Ceramic filters do not remove arsenic, fluoride, iron and pesticides. For places with these specific contaminations, other filters shall be used. Deep groundwater is considered to be bacterially safe. In cases where groundwater is contaminated with arsenic, fluoride or iron, people can switch to using surface water in combination with a ceramic filter to remove bacterial contamination.

Filter production facilities have been established in Cambodia, Nicaragua, Ghana, Sri Lanka, El Salvador and Myanmar.

### The facts

Output of clean water:	1-2 ltrs / hour
Costs of a full system:	10 - 20 Euro (depending on country of implementation)
Replacement filter costs:	3 - 6 Euro (depending on country of implementation)
Life span:	2 years for the filter element; 10 years for bucket and tap
Cleaning of the filter:	weekly; rubbing with a brush

### Training and introduction

PRACTICA can assist in setting up local production of these filters. For production, PRACTICA works with existing ceramic producers (floor tiles, roof tiles, other (semi)industrial ceramic items) to be able to reach high quality standards. Large scale introduction of the filters is preferably done by a local NGO with experience in the field of health and hygiene promotion.



Filtron filter model



filter in use in Cambodia



filter production in Sri Lanka

