



AguaClara Foam Filtration



AguaClara Foam Filtration Objectives and Impact

Serve smaller communities unable to economically support conventional water treatment technologies

Use locally sourced materials and trained operators from within the community

Empower community members to manage their own water supply and maintain system

Eliminate particles and pathogens in water source using innovative and gravity-powered technologies

Implement in Honduras with expectations for a more global outreach



A Global Educational Tool

Research on design and implementation of foam filtration educates Cornell University students. Non-patented technologies allow for public reports of all research advancements made in foam filtration. Iterative feedback loop between students and implementation partner quickens improvements



Comprehensive Outcomes

Streamlined life cycle costing & analysis

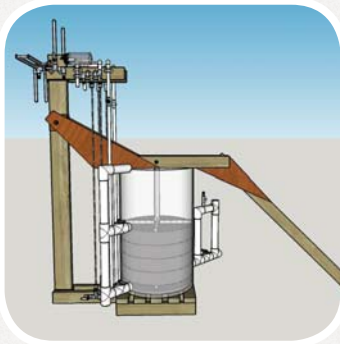
Incremental cost of community-based water treatment required to replace the foam is estimated to be less than 1/10000th of the cost of bottled water

Including operation and maintenance cost for the foam filtration system, the cost is 1/500th that of bottled water

Benefits to people, prosperity, & planet

Potential to reduce disease and mortality rates

Increase the quality of life in communities where implemented



Current Implementation

Recent Improvements

Phase 1 yielded key filter cleaning and chemical dosing improvements

Filter backwash plunge cleaning method determined more efficient than previous compression method: ~70% efficiency

Pilot Filter Constructed

In January 2015, pilot foam filter was built in El Carpintero, Honduras.

New, compact Chemical Dose Controller (CDC) integrated into design: completes water treatment train

Repeated cleanings (backwash cycles) necessary to clean foam filter

Future Developments

Add flocculation to achieve more efficient filtration

Enhance cleaning techniques to achieve longer run times

Use two or more filters with different pore sizes in series: improve cleaning and filtration efficiency

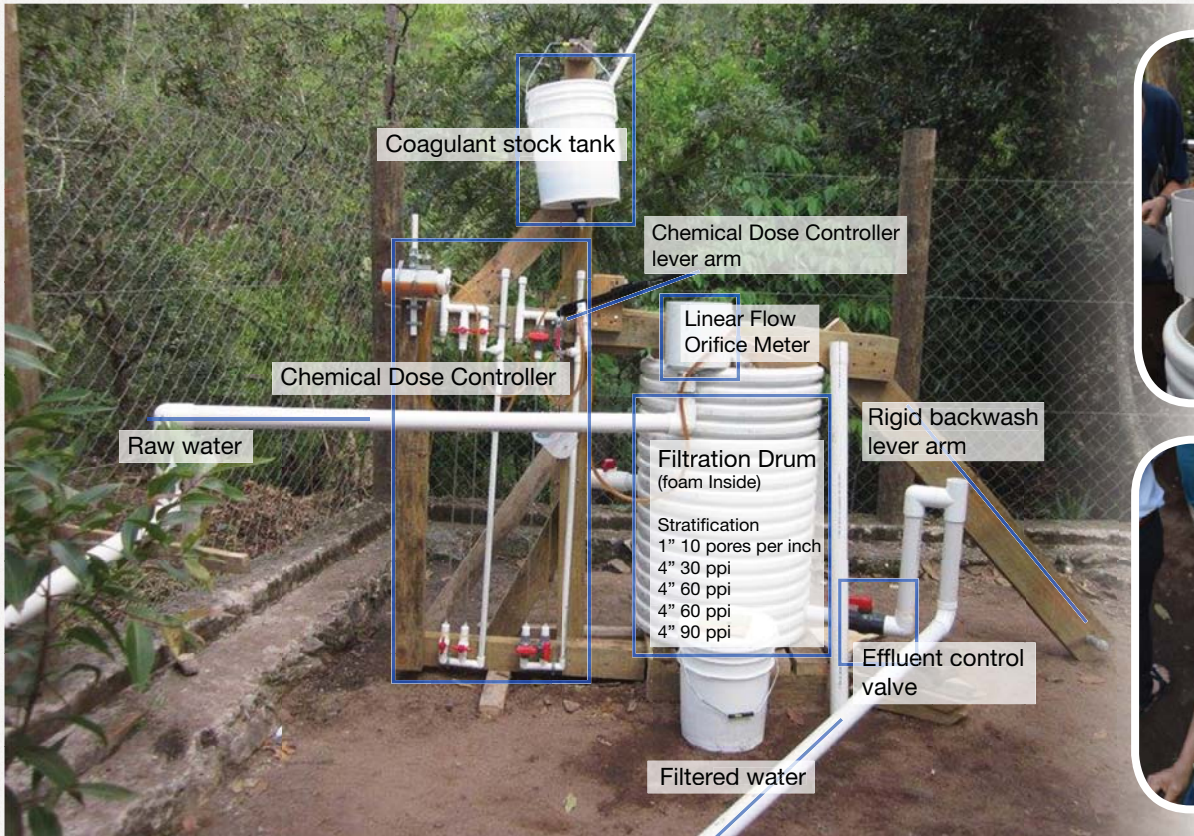
Test for presence of chemical leaching from foam to assess safety



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AguaClara Foam Filtration Features

High filtration rate and solids loading capacity

Simplified materials requirements for fabrication and implementation, thus more affordable

Minimal carbon footprint compared to conventional technologies

Longer filter runs and greater approach velocities supported by high porosity foam

Smaller filtration area necessary to treat same flow rate

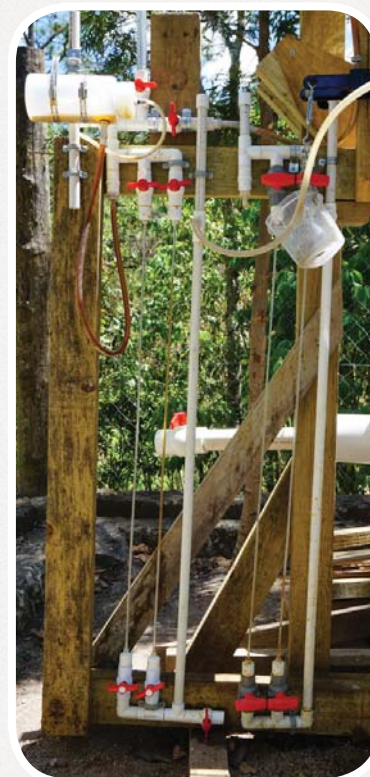
AguaClara Foam Filtration Process

Forward Flow Filtration Mode

- 1** Water enters into the water filtration system from the storage tank (coming from ground water source) through the influent water pipe
- 2** Passing through the Linear Flow Orifice Meter (LFOM), the water level alters the position of the Chemical Dose Controller lever arm. This regulates the amount of coagulant that enters into the influent water.
- 3** The water then passes through the filter, flowing from top to bottom. Coarse foam is layered above finer foam, slightly flocculating the water before it passes through the finer foam, which traps the colloids
- 4** After filtration the water is disinfected with chlorine and then flows to the community's distribution tank.

Backwash Cycle Cleaning Mode

- 1** Initially, the effluent control valve is closed. Then, the operator begins to lift the rigid backwash lever arm, at approximately the rate of forward flow. He does this using the handles of the large lever arm.
- 2** The operator plunges the backwash lever arm to the ground and then opens the waste drain valve to discharge the dirty water.



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