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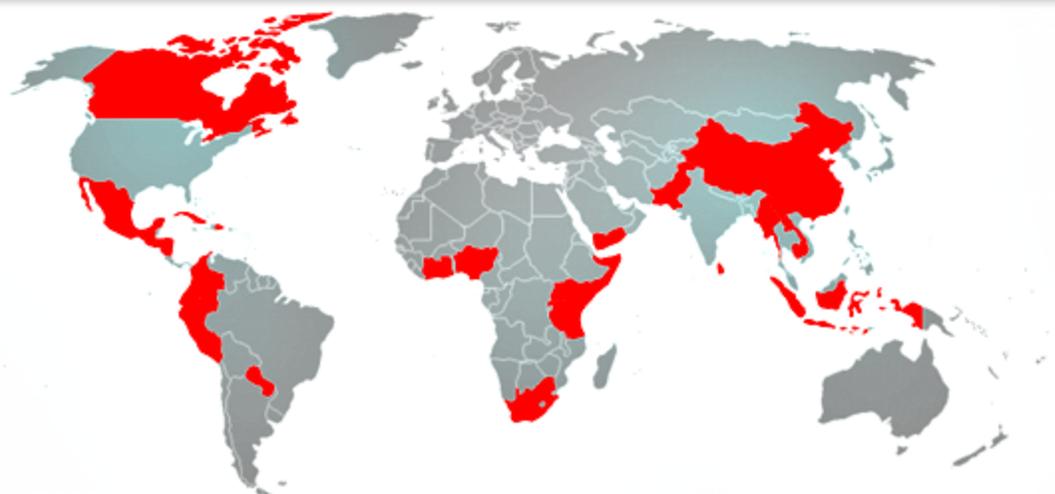
Ceramic Pot Filter Community Newsletter

Issue 1, February 2016

brought to you by Potters for Peace

Welcome

You are receiving this newsletter because you are considered by Potters for Peace (PFP) to be a part of the Ceramic Pot Filter Community. We hope that this new, bi-annual newsletter will facilitate communication between PFP and filter manufacturers. In these newsletters we will share filter information including worldwide news, research and resources related to filter production and distribution. Please email us any information you would like to share, as well as questions and suggestions for topics so that we can improve the support we offer to filter manufacturers worldwide.

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Our Purpose

PfP has 17 years of experience working with ceramic water filter projects around the world. We have seen firsthand what works and what does not, and our goal is to share this knowledge with our partners including private, public, for-profit and not-for-profit organizations. PfP does not own any filter facilities, does not sell filters, and does not have funds to create new facilities. What we do is act as a clearinghouse of information gathered by staff, researchers, and worldwide contacts. We share existing knowledge both online and through our on-site training and consulting services. We also help existing factories troubleshoot production problems and scale up production capacity as their filter markets grow. It is our hope that filter production facilities started in collaboration with PfP become profitable, self-sustaining businesses that are run for the benefit of the owners, workers, and end-users.

FACTORIES - Win \$500US for factory improvements or promotion!

Please fill out a brief survey that has been compiled by Potters for Peace. From the surveys **completed by March 15, 2016**, one name will be chosen at random to win \$500US for filter factory improvement or filter promotion. The information we collect will help the whole filter community.



We really want to hear from you! Here's the link:

<https://www.surveymonkey.com/r/H75HXJD>

News

United Nations Sustainable Development Goals

The United Nations Sustainable Development Goals have now been set for the year 2030. By providing local employment and access to safe drinking water, Ceramic Pot Water Filter factories can help to address the



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- **Goal 1.** End poverty in all its forms everywhere
- **Goal 3.** Ensure healthy lives and promote well-being for all at all ages, especially
 - **Goal 3.3.** By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases
- **Goal 6.** Ensure availability and sustainable management of water and sanitation for all, especially
 - **Goal 6.1.** By 2030, achieve universal and equitable access to safe and affordable drinking water for all
- **Goal 8.** Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all



Ceramic Pot Filter Use = Better Health



A recent scientific review including data from 18 different point-of-use filter trials conducted with over 15,500 participants concluded that point-of-use filtration systems likely reduce diarrhea by about 50%. This meta-analysis included 5 different ceramic filter trials conducted with over 5,500 participants (Clausen *et. al.* 2015).

Another recent scientific review including data from 61 studies regarding drinking water found that household interventions involving filters with safe storage were associated with a significant reduction in diarrheal disease (Wolf *et. al.* 2014). Together, these studies indicate that the Ceramic Pot Filter is still one of the most effective point-of-use water treatment solutions available on the market.

Silver nanoparticles more effective than silver nitrate

(Contributed by Daniele Lantagne, Usen Family Career Development Assistant Professor of Civil & Environmental Engineering at Tufts University)

Recently, there has been quite a bit of debate and seemingly contradictory evidence about the role of silver in ceramic filters. When looked at as a whole, however, the data on the role of silver in ceramic filters is quite consistent. First, silver has three functions in the ceramic filter:

1. Preventing the growth of bacteria within the filter itself (preventing the filter from becoming a “bacterial sponge”).
2. Increasing the reduction of bacteria in comparison with non-silver treated filters.
3. As small amounts of silver come out (elute) from the filter, the silver residual in the treated water has a bactericidal effect during storage.



The goal is to achieve these functions without exceeding the United States Environmental Protection Agency’s (USEPA) and World Health Organization’s (WHO) health-based

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shown that:

1. Silver nanoparticles increase bacterial reduction more than silver nitrate.
2. Silver nanoparticles elute more slowly from the filter than silver nitrate. As a result, silver nanoparticle filters have a longer life span and meet EPA and WHO standards more reliably than do silver nitrate filters.
3. Silver elution after application of either silver nanoparticles or silver nitrate varies with changes in influent water chemistry.

As water chemistry is both generally untested and can vary daily, based on season and weather conditions, silver concentration in treated water is an unreliable primary treatment mechanism. The recommendations from current evidence are:

1. The filter should be well and consistently produced, as the pore structure of the filter is the primary mechanism for pathogen reduction.
2. 0.3 mg/g of silver nanoparticles should be applied to each filter to prevent bacterial growth in the filter, increase bacterial reduction during filtration, and leave a small silver residual that does not exceed health based guidelines and may also increase bacterial reduction in storage.

Using flow rate to evaluate production consistency

(Contributed by Justine Rayner, a member of the Ceramic Manufacturing Working Group, and PhD student in Environmental Health at Tufts University)

Establishing a minimum acceptable filter flow rate is important for meeting household drinking water needs, and may help ensure adequate contact time between pathogens and silver, though silver should not be relied upon as the primary treatment mechanism. Flow rate is also used to evaluate production consistency.



However, flow rate does not guarantee that a filter will effectively remove bacteria, as filters with a few large pores could have similar flow rates as filters with many small pores, and differences in pore sizes may affect bacteria removal. Therefore, once materials and manufacturing methods have been established—by testing prototype filters for bacteria removal and flow rate—subsequently manufactured filters should be manufactured with consistent materials and methods such that flow rate is also used to evaluate production consistency.

If consistent materials and production methods (input material characteristics, mixture preparation, firing profile, etc.) are used, then flow rates should be consistent. If there is variability in flow rates of filters from the same batch or between batches (for example, if more than 20% do not fall within the expected flow rate range), production is not well controlled, the filters may not work to remove bacteria as well as previously tested prototype filters, and the source of the variation should be identified and corrected.

Tips from Fellow Producers

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The **Ceramic Water Filter Factory in Yunnan, China** has had excellent success with filter transportation and distribution. They recommend transporting filters using specialized cardboard forms and small pieces of foam. While it may be more complicated and expensive to implement, this system of packaging has reduced filter breakage during transport from the factory in China to less than 0.3%. To see how the China factory packages their filters, check out the illustrated, [step-by-step instructions](#) at pottersforpeace.org.



The **Chujio Factory in Limuru, Kenya** recommends transporting filters in a tight-fitting, 5-ply cardboard box. Using this method, Chujio has reduced filter breakage to less than 2%, even when filters are transported to remote regions of the country by truck.

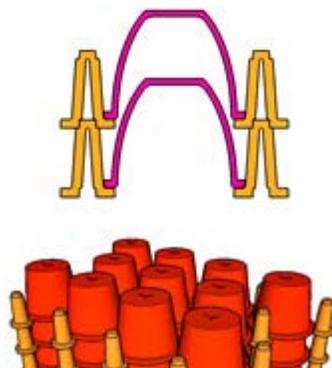
Ware setters increase kiln capacity, reduce fuel consumption per filter, and stabilize stacks of filters in the kiln

(Contributed by Burt Cohen and Kai Morrill of Potters Without Borders)

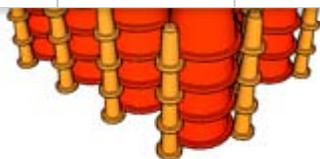
For the last 18 months Potters Without Borders has been testing different types of "ware setters," which are devices that support the ware in the kiln during firing. Ware setters have been used in the ceramic industry for many centuries but are new to ceramic filter production.



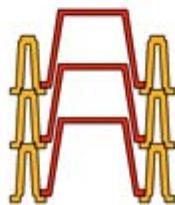
Potters Without Borders, through a collaboration with French architectural designer Jean-Marc Pitet, have developed the "**Pitet setter**," which is well adapted to the CWF production.



The "Pitet Setter" is an interlocking cone made from the same clays as the filters (without the combustible content). The tapered top of one setter locks into the base of the setter above it. Each filter rests on three setters in such a manner as to allow them to nest in bungs or stacks. The setters are designed to bear the weight of filters and insure that there is sufficient air space so that carbon will not be trapped in the filter wall. Additionally setters stabilize the stacks of filters to provide a very strong load that is less likely to shift during firing.

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Depending on the design of the filter, the setters increase the number of filters per firing from 10 to 30% over standard methods: for flat bottom forms one gains as little as 10% in height, but for semi-elliptical and other rounded forms up to 30% more units can be loaded into the same volume of space. The resulting increase of kiln capacity reduces the per-filter fuel consumption. It also equates to a reduction in labor hours.



The final stage of the research will be to come up with a forming process so that setters can be produced using the raw materials and equipment already in use in filter factories. The "Pitet" is currently in use at the Potters Without Borders research workshop in British Columbia, Canada.

For background reading on the development of filter setters go to:

<http://www.potterswithoutborders.com/2015/02/filter-setter-project-timeline/>

VIDEO: How Profit Can Power a Clean Water Program

Ecofiltro started out as a non-profit organization working to help the rural poor in Guatemala and elsewhere in Central America get access to clean water, but CEO Philip Wilson soon realized that forming a for-profit company would be a better way to realize his social goals.



Upcoming Conferences and Events

African Water Association 18th International Congress and Exhibition

Place: Nairobi, Kenya

[Subscribe](#)[Share ▼](#)[Past Issues](#)[Translate ▼](#)**Global Water Safety Conference**

Place: Palawan, Philippines

Date: April 25-28, 2016

Water, Engineering and Development Centre (WEDC) Conference

Place: Kumasi, Ghana

Date: July 11-15, 2016

World Water Congress and Exhibition

Place: Brisbane / Queensland, Australia

Date: October 9-13, 2016

Water and Health Conference

Place: Chapel Hill, North Carolina, United States

Date: October 10-14, 2016

OU Water Conference

Place: Norman, Oklahoma, United States

Date: September 18-20, 2017

Water and Health Conference

Place: Chapel Hill, North Carolina, United States

Date: October 16-20, 2017

Water, Engineering and Development Centre (WEDC) Conference

Place: Loughborough, United Kingdom

Date: 2017

World Water Forum

Place: Brasilia, Brazil

Date: 2018

We want to hear from you!

Please send your feedback and ideas to us at pottersforpeace@gmail.com so that we can make the next issue even better.

- What did you think of this newsletter?
- Was it helpful?
- Did we get something wrong?
- Is there something else we could include that would be helpful?
- Do you have an idea that you would like to share with the rest of the filter community?

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AND remember to let us know if your contact information or filter production status changes so that we can connect you with potential investors, future customers, and other useful opportunities as they arise!

Here are some ways to stay in touch:

- **Visit our website:** pottersforpeace.org
- **Follow us on twitter:** [@pottersforpeace](https://twitter.com/pottersforpeace)
- **Connect with other members of the Filter Pot Community through the Google Group:** <https://groups.google.com/forum/#!forum/ceramic-pot-filters>.
(To join the forum, email: ceramic-pot-filters+subscribe@googlegroups.com)<http://pottersforpeace.org>

And please forward this to any other producer you know who might not be on our list....or email their contact information to us!



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Our mailing address is:

PFP

PO Box 2214

Boulder CO 80306

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