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PATH
A catalyst for global health

Safe Water for Small Communities

Smart Electrochlorinator 200

An electrochlorinator generates a mixed oxidant chlorine solution out of salt water and electricity; the chlorine is then used to disinfect drinking water.

What is it?

The SE200, developed by Cascade Designs, Inc (CDI) in collaboration with PATH, is a small, community scale electrochlorination system. In just seven minutes, it dispenses 60 ml of .75% chlorine—enough to treat up to 200-L of water—at the push of a button.

Why do people like it?

- Easy to use.
- Effective.
- Portable.
- Battery-operated.
- No chemical storage or transportation.
- No risk of chemical degradation over time.

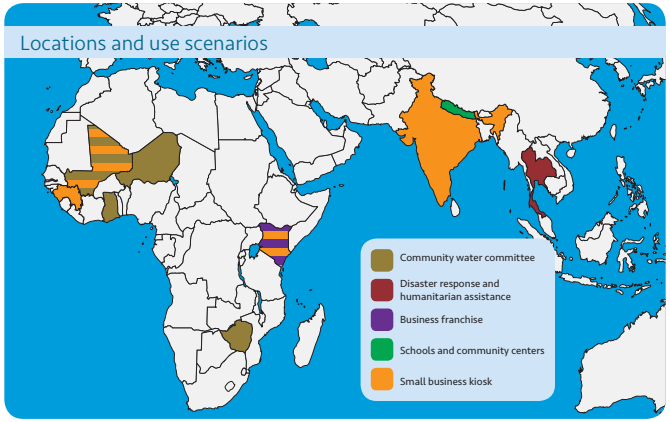
Field trials

Objectives

- Collect user feedback to inform device improvements, accessory kits, training materials, and the instruction manual.
- Validate product durability and consistent performance over time and in various settings.
- Understand the value of the device in different potential use scenarios.
- Understand the different potential business models for the SE200.
- Validate the treatment efficacy of the SE200 chlorine solution.

Field trials partnership

PATH is partnering with Cascade Design Inc. (CDI) to develop an inexpensive, small electrochlorination system for safe drinking water and conduct field studies of its use.



Partners involved in field trials

Mercy Corps, World Vision, Aquaya Institute, US and Thai militaries, PureFlow Water Solutions, Antenna Technologies, Environmental Camps for Conservation Awareness (ECCA), Tinkisso, Aidemet, Development Alternatives, and Formations sans frontiers.

Design feedback

- It is difficult to consistently hit the fill line in the reaction chamber, especially in locations without level tables. Redesign so it is difficult or impossible to over- or underfill the reaction chamber.
- Current labels are not explicit enough. Change "salt" to "low salt" and "battery" to "low battery." Label start button with the word "start" or "on."
- It was difficult for users to know if they had pushed the button all the way. Change the button to a switch or a more responsive push-type button.
- Users want a solar option for charging the battery.
- Users want to produce larger volumes of chlorine per cycle, and they are willing to wait longer cycle times for it (up to 30 minutes or 1 hour).
- Users need more guidance on dosing. Currently we provide a spoon to dose 20-L containers and a cup to dose 200-L containers. Users want a spoon for 5- and 10-L containers as well.
- Users want a label on the device with a description of use: i.e., "this makes 60 ml of 0.75% chlorine solution."

Feedback on training and instruction manuals

- Users need more information on appropriate size and type of battery and battery charger.
- Users want more guidance on water tank sizes and dosing schemes for increased efficiency.
- Users want a pre-filter or guidance on pre-filter options in areas with turbid water.
- Users need help with marketing, both sensitizing the community for the need to treat water and communicating the benefits of water treated with the SE200.

Case studies

All photos PATH/Kevin Shubert

Mama Meg is a businesswoman who sells water treated with the SE200 in a kiosk near her home.

Micro-entrepreneur, Aquaya Institute, Kenya.

Mama Meg is a businesswoman who sells treated water and other products at a small kiosk in Kisumu, Kenya. She uses the SE200 as the primary treatment for water coming from her deep well. Initial learning shows that a small business scenario is viable. Mama Meg's customer base has grown, and she is expanding her business with a submersible pump and 3500-liter tank so customers will be able to fill their containers more quickly. PATH will continue to document and model the small business approach in order to refine and replicate it.

Community water committees in Zimbabwe use the SE200 to purify water from a neighborhood borehole that was rehabilitated by Mercy Corps.

Community water committees, Mercy Corps, Zimbabwe.

Two neighborhoods in Mutare, Zimbabwe, have intermittent access to municipal water. When water stops flowing, the communities rely on two boreholes that Mercy Corps rehabilitated. Each neighborhood has been equipped with the SE200, using volunteers from their community water committees to operate the device. Initial feedback from volunteers indicates that they need more support from the community and incentives to continue volunteering their time. They suggest providing information/signage about the need to treat water, wearing uniforms to make them appear (and feel) more official and legitimate, and erecting a small kiosk where committee members can sell other health and hygiene products to subsidize their volunteer contribution.

PureFlow Water Solutions uses the SE200 to disinfect water containers prior to filling them with filtered and UV-treated water.

Business Franchise, PureFlow Water Solutions, Kenya.

PureFlow sells water treatment systems to businesses and mid- to high-income households in Kenya. In a quest to reach lower-income populations, they are piloting several franchise water refill kiosks in and around Nairobi. PureFlow uses the same high-quality water treatment systems they sell to treat, package, and sell water in branded 20-L water containers to low-income consumers. The kiosks use the SE200 to clean the 20-L water containers prior to filling. This unique application of the SE200 reveals a secondary use for the SE200 besides primary water treatment that may inform different iterations of the instruction manual and accessories "kit" to specifically address container cleaning.

Funded by the Lemelson Foundation and PATH Fund for Health Technologies