

Commercial launch of the MSR SE200 Community Chlorine Maker

Providing safe water for communities in low-resource settings

HEALTH NEED

Poor water, sanitation, and hygiene practices contribute to the spread of infections and negative health outcomes in communities and health care settings. Globally, 1.3 million people die each year from diarrheal disease; roughly a third of these deaths are attributable to contaminated drinking water.^{1,2} Chlorination at the source of drinking water collection is one of the most effective water treatment methods; however, chlorine supply chains in developing countries are inconsistent, and municipalities and other institutions frequently lack the appropriate technology or training to consistently chlorinate drinking water.

Chlorine is a widely used, effective chemical disinfectant recommended for infection prevention and control (IPC) in health care settings. Health care facility-acquired infections (HAIs) negatively affect hundreds of millions of individuals—namely mothers and infants—worldwide. Patients in low-resource countries face an increased risk of exposure to HAIs: 2–20 times higher than patients in similar settings in high-income countries.³ Factors contributing to this increased risk include unhygienic environments and lack of adequate handwashing infrastructure, and lead to disastrous outcomes: 10–15% of all maternal and newborn deaths—303,000 women and 2.7 million newborns—that occurred during labor and birth in 2015 were directly linked to unhygienic conditions.^{5,6} Nearly all of these deaths occurred in low- and middle-income countries.

Despite chlorine's proven effectiveness in IPC practices, the lack of consistent access to the solution limits the ability of health care facility staff to provide a safe and hygienic environment for patients. A recent World Health Organization survey across 52 countries revealed that 28% of health care facilities lacked disinfection solution.⁵

Additionally, weak supply chains, burdensome procurement processes, and logistical complexities involved in distribution contribute to an unsteady supply of chlorine in health care facilities, a challenge further exacerbated during times of crisis. Existing chlorine generation devices often require large capital investments, specialty replacement parts and high ongoing maintenance costs, or dedicated technical staff to constantly monitor and adjust chlorine production.

TECHNOLOGY SOLUTION

To address these gaps, PATH and Seattle manufacturer MSR® Global Health developed the MSR SE200™ Community Chlorine Maker (MSR SE200). The MSR SE200 is a portable, affordable product for low-resource settings that uses commonly available consumables—salt, water, and electricity—to produce a chlorine solution for drinking water treatment and/or IPC.



Photo: PATH/Jesse Schubert.

TECHNICAL SPECIFICATIONS

Chlorine concentration produced	0.8%
Chlorine production rate	50 mL/batch
Drinking water treatment rate	200 L/batch
Number of people served per day*	Up to 200 with 15 L each
Power flexibility	12 V DC 110-220 V AC
Target device lifetime	5+ years
Estimated cost	US\$160

*This assumes 15 batches per day. Each batch takes 7 minutes to complete.

ADVANCING THE DESIGN

For more than seven years, PATH and a team of in-country partners conducted numerous field tests with the MSR SE200 in more than ten countries in sub-Saharan Africa and Asia. This careful research informed the market analysis and potential use-modes and validated the device design to develop a simple-to-use product. User-defined features include a purple indicator light to alert the user when there is not enough salt, a red light to signal power supply issues, two white run lights that illuminate while the device is making chlorine, and a beeping sound to indicate a completed batch.

MSR Global Health commercialized the MSR SE200 in 2015. The product is currently available for purchase by individuals in the United States and for use in international low-resource health care settings. To date, approximately 1,500 devices have been sold and/or distributed globally.

Following commercialization, MSR Global Health conducted a successful field trial with World Vision in Mali and Kenya with the support of the Washington Global Health Alliance and Life Sciences Discovery Fund.

NEXT STEPS

PATH continues to work with MSR Global Health and in-country partners to identify and introduce the MSR SE200 to a wide range of markets and users in low-resource settings, including acute disaster relief, health care facilities, communities, and schools.

As adoption increases, we hope to see an increase in access to safe drinking water and an improvement in IPC, especially during disease outbreaks.

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