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Professor develops water purification system used in India

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An invention by Auburn professor S. D. Worley is helping improve drinking water on the other side of the world.

Worley developed a new means of water purification that is now used in Washington-based HaloSource's HaloPure water filtration system distributed in Bombay, India.

His invention, known as N-halamine technology, consists of polystyrene beads chemically bonded with chlorine. The technology in these filters kills any microorganisms that may be present in the water.

Worley developed N-halamine technology in the early 1980s when he and colleagues were trying to develop a new water-soluble compound to kill water-borne bacteria and microorganisms in swimming pools.

Worley realized, however, that any type of chemical meant to be dissolved in the water it cleans would be under heavy scrutiny by the Environmental Protection Agency and other organizations, greatly increasing the cost of development.

He soon shifted his focus to developing a new type of water purification filter. By the mid-1990s, the N-halamine technology was born and HaloSource Inc. was formed around it.

HaloSource's director of drinking water, Duane Dunk, said India desperately needs safe drinking water.

He said although the majority of drinking water in India is cleaned at central treatment plants and then pumped into homes, it doesn't mean that the water is safe to drink.

"Pipes age, and oftentimes they're laid in the same trench with sewage pipes," Dunk said. "Electrical power is intermittent, water pressure can't be maintained inside of the pipes, so any leakage that ceases to be out-flowing can cause inflowing and contamination."

Because of the condition of the pipes, the once-clean water is no longer pure when it reaches the home.

"While it's nice to say 86 percent (of the population) has access to clean water, really nobody has access to safe tap water," Dunk said.

Fortunately, according to HaloSource co-founder Jeff Williams, the company's new system seems perfectly suited for the conditions in India, where it went on sale March 1.

"The opportunity is great there to satisfy a need for safe water at all levels," he said. "Obviously, the greatest impact might come from something which would be of a nature in terms of convenience, price and usability that would be available to all sectors of society."

Through years of development, the company has aimed its HaloPure system at all of these issues.

Because of the unpredictability of the electrical and water systems in India, many homes and businesses rely on rooftop reservoirs as their principle sources of water, Williams said.

These tanks are periodically filled by street vendors and rely on gravity to provide water pressure.

Because the HaloPure is a passive system, requiring neither electricity nor water, it can be quickly and easily retrofitted to these homes' existing systems, providing safe, clean water with little need for instruction on how to use the product.

Another important feature of the HaloPure is its efficiency.

Because of the nature of the system's filtration process, only a miniscule amount of chemical actually makes its way into the final, filtered water.

Not only is it safe to drink, but it tastes clean and fresh, having none of the chemical taste and smell that results from other means of purification.

This is also a major plus for consumers.

“Because we’re not wasting that much chemical down the drain in excess quantity, it’s cost efficient, so it’s affordable,” Dunk said. “You put all of that together and there’s nothing like it. It’s ideal for their needs and for the market. It drives the cost of disinfecting water down lower than the cost of boiling water because of the fuel consumption.

“It literally can be the most cost effective way, on the small scale, of disinfecting water that there is.”

This allows the HaloPure system to do its job where it was intended, in the homes of those who need it most.

“The idea,” Worley said, “is to reach a large number of people and try to make the water safe for them to drink.”

If the HaloPure catches on in India, HaloSource hopes to broaden its market to other countries, such as Africa and Indonesia, where the lack of clean drinking water is an issue.

“What we envision is that HaloPure devices become the standard way for people throughout the world who are in need of safe water in their households to get that resource,” Williams said. “We think that a vision of changing the world by making devices with a high level of convenience, availability and low cost is an admirable vision, but it is also an attainable one.”