Sparkle® *africa*

Manual-Powered Water Filtration System

More than 1,000,000,000 people lack safe drinking water

Not a Drop to Drink

The need for pollutant-free drinking water in developing countries, especially in rural areas without access to electricity, has reached a critical juncture. Safe drinking water is currently inaccessible to more than 1 billion people, nearly one-sixth of the world's population. Unsafe drinking water is one of the leading causes of disease and death. Especially in children. A 1998 study cited that nearly 400 children per hour died in developing countries as a result of the ingestion of contaminated drinking water.

Until now, the technology for creating potable water was physically and financially out of the reach of most rural areas in third-world and developing countries. SpinTek Filtration created the Sparkle Water Filtration System as much for humanitarian reasons as for technological ones.

The Sparkle Water Filtration System is a simple yet elegant solution for creating potable drinking water from water sources high in organic, chemical and bacterial pollutants. It relies on advances in Hollow Fiber Membrane (HF) ultrafiltration technology. These membranes provide a high surface area for filtration while creating compact, self-contained water filtration systems that are easy to transport, install and maintain.

Utilizing Human Power

Unlike other filtration systems that rely on electricity to function, the Sparkle Water Filtration System generates its power from a manual source. It's as easy as riding a bicycle. In fact, the system's pumping and cleaning action is generated by a person operating a specially mounted bicycle assembly. Manually-driven pumps draw water from a source such as a pond or river, and propel it through Sparkle's unique configuration of filtration components. In an eight-hour shift of manual filtration power, recipients of the technology can expect to see on average 1,000 to 2,000 gallons of contaminant-free drinking water. All without electrical power or electric-dependent filtration systems.

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KEY BENEFITS

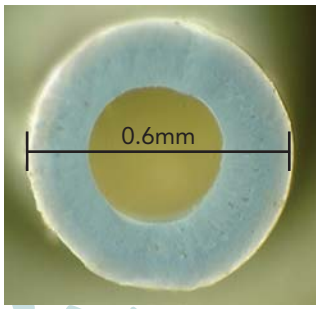
- **Uses cost-effective, high-performance Membrane Ultrafiltration Technology**
- **Low fouling system suffers little degradation of performance between maintenance periods over months of use**
- **Human powered. A complete flexible system that doesn't rely on dubious electric delivery in outlying developing regions. Can be converted to solar or animal power**
- **Little maintenance. This is an important factor in remote locations with limited technical support**
- **Combination of technologies. HF, carbon filter, and ion exchange filter eliminate virtually all contaminants while providing fresh drinking water source from 150 to 250 gallons per hour**
- **Easy to transport, install and maintain**

SpinTek™ *filtration*
Advancing the flow of industry

Sparkle®*africa*

Manual-Powered Water Filtration System

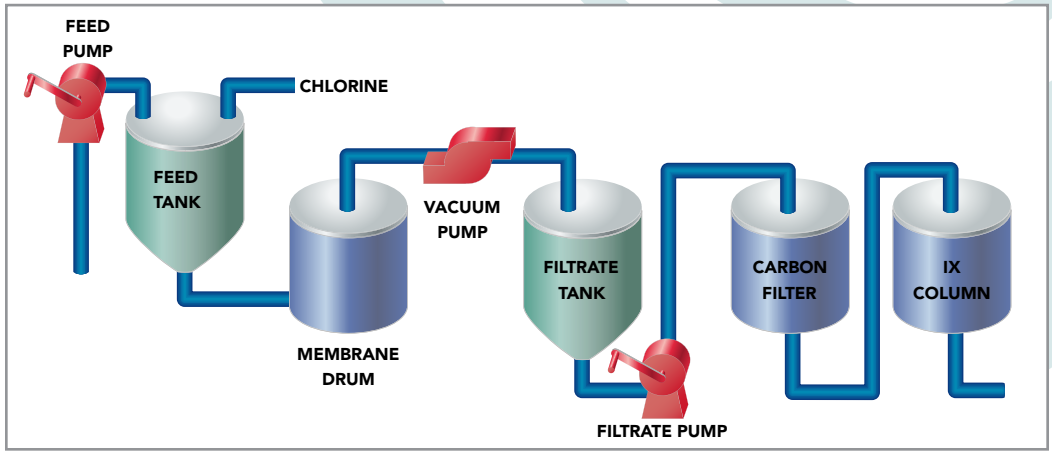
Hollow fiber membranes



Enlarged end view of the hollow fiber membrane

The Sparkle System transforms dirty, disease laden water into contaminant-free potable water.

SPARKLE*africa* SYSTEM COMPONENTS



1. **Feed Tank.** This tank houses the unfiltered source water.
2. **Membrane Drum.** This tank contains the Hollow Fiber (HF) Ultrafiltration Membrane Modules that create the first bicycle-powered filtering (washing) action.
3. **Filtrate Tank.** The ultrafiltered water is stored in a tank with manual transfer pump.
4. **Carbon Filter.** Water from the Filtrate tank is routed into the Carbon Filter, which removes chlorine from the initial process stages.
5. **Ion Exchange Column.** This removes heavy metals such as mercury and arsenic from the filtered water, creating virtually contaminant-free drinking water from the outlet valve.

SPARKLE*africa* SYSTEM OPERATION

1. Unfiltered water is drawn from a nearby water source and infused with chlorine to kill bacterial contaminants.
2. The unfiltered water is routed to the Membrane Drum where the Hollow Fiber ultrafiltration modules eliminate most organic contaminants and biological organisms.
3. Filtered water from the Membrane Drum is routed to the Filtrate Tank for distribution to the final filtering operations.
4. From the Filtrate Tank, water is fed into the Carbon Filter to eliminate the chlorine that was injected in the Feed Tank.
5. Water that is now filtered of bacterial, organic and chlorinated compounds is routed to the Ion Exchange Column to eliminate heavy metals.
6. Contaminant-free, fresh, potable water is pumped to holding tanks or directly into vessels for drinking and cooking.

SPECIFICATIONS

Filtration Data

Filter Flow Rate	200 gph (760 lph)
Bacterial, Viral Removal	99.99%
Suspended Solids	99.99% (greater than 1 micron)
Chlorine Removal	Less than 0.1 mg/L
Arsenic Removal	10 µg/L

Specifications

Height	103" (2616 mm)
Width	110" (2794 mm)
Depth	94" (2388 mm)
Weight (shipping)	700 lb (320 kg)
Weight (operating)	2900 lb (1260 kg)

SpinTek*filtration*
10863 Portal Drive
Los Alamitos, CA 90720 USA

Telephone: (714) 236-9190
Facsimile: (714) 236-9196
Internet: www.spintek.com

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