

WB-10000- Water Refining & Purification System Design Highlights

Square1 Technologies, "HYDRO-MAXX™, Water Refining & Purification System"

Manufactured Exclusively for Transform Africa

- Portable; Completely self-contained, lorry transportable
- Sets up in less than half a day
- Produces 10,000 liters a day* of clean, clear, safe, purified, healthy, drinking water
- Power requirements; 220VAC, single phase, low power consumption.
- Requires only simple periodic maintenance
- Based on NASA's Water Recovery System, (EWS) for the Space Shuttle and later ISS programs
- Patented AOP Hybrid arc tube has a service life 2X+ over other UV-C bulbs (20,000hrs)
- Patented HYDRO-MAXX™ Servo-Integrated-Controller (SIC)
- Purification Post filtration model has been tested against ANSI/NSF standards 42, 53, and 55 for lead, cyst, chlorine and turbidity reduction, and for microbial reduction.

14 Stage Water Refining & Purification System

- 1 Large particle pre-filtration
- 2 Course particle pre-filtration
- 3 Fluid pressure intensifier
- 4 Electro Water Separation
- 5 Hydroxyl Production/Release
- 6 Sediment trap micron pre-filtration
- 7 Micron Pre-filtration
- 8 Micron Filtration
- 9 Sub-Micron Filtration
- 10 Microbiological removal & disinfection
- 11 Post Filtration Ozonation Oxidation- Disinfection
- 12 Post- filtration UV irradiation & Sanitization
- 13 Microbiological removal & disinfection
- 14 Taste and odor control, Heavy Metal Reduction



Contamination production claims

lead – greater than 99%
 cysts – greater than 99.95%
 turbidity – greater than 99%
 microbial, bacteria/viruses, reduction
 E-Coli-99.999%

*A day being 8 hours of operation. System can be operated longer for increased production, potentially up to 18,000 Liters/Day depending on condition of source water.

Components tested and certified to The World Health Organization (WHO), U.S. EPA-approved laboratory standards, European-approved laboratory standards and the national laboratory standards of over 50 countries. In fact, they are the only products in this industry to meet the rigid standards of ISO 9000.

- Exceeds ANSI / NSF Standard 53 criteria for cyst reduction (100% removal of Giardia and Crypto Oosysts) and CDC / EPA guidance on drinking water for people with severely weakened immune systems.
- Filtration efficiency of 100% at 0.9 micron
- Filtration efficiency of > 98% at 0.2 micron
- Highly efficient bacteriological filtration with >90% efficiency at 0.05 microns
- Tested with live Cryptosporidium to a removal efficiency 100%

American, British and Hong Kong laboratories have tested the DE-Ceramic Cartridge (Stage 6 Function) with the following results.

- NSF 42 – exceeds 85% particle 0.05 through 1.0 Micron reduction
- NSF 53- meets 99.5% cysts and 1.0 NTU turbidity reduction
- Bacteria Reduction – 99.99%
- Removed 100% Shigella Dypenteriae, Salmonella Typhi, and Vibrio Cholerae
- Heavy Metals Reduction 99.5% – 99.9%

The DE-Ceramic Cartridge (Stage 7-8 Function) is a highly efficient ceramic micro filter which provides genuine sub-micron filtration of drinking water. The DE-Ceramic Cartridge is manufactured with the highly consistent and controlled pore structure necessary to remove a wide range of water borne contaminants over the life of the cartridge.

Oxidation (Stage 9)

Ozone destroys algae, viruses, and bacteria on contact with no harmful by-products. Ozone oxidizes combined chlorine and bromine, freeing them to be continuously reused. Therefore the use and cost of chemicals is reduced.

Precipitation

It breaks down harmful chemicals and acts as a flocculent, causing total dissolved solids to be precipitated and easily removed by the water filtration process.

Sanitation

Ozone is the most powerful sanitizer, non-selectively killing all microorganisms while producing no harmful byproducts.

The following is a UV industrial standard table showing the kill factor of the UV germicidal lamp contained in the HYDRO-MAXX™, Water Refining & Purification System, emits a 22,500 energy dose. According to this table the lamp kills 100% 53 known bacteria, viruses, protozoa, yeast, and molds.

Organisms	Energy dosage of ultraviolet radiation in $\mu\text{W}/\text{cm}$ need to kill factor	
	90%	100%
Bacillus anthracis-Anthrax	4520	8700
Bacillus anthracis spores-Anthrax spors	24,320	46,200
Bacillus magaterium sp. (spors)	2730	5200
Bacillus magaterium sp. (veg.)	1300	2500
Bacillus paratyphusus	3200	6100
Bacillus subtilis spores	11,600	22,000
Bacillus subtilis	5800	11,000
Clostridium Tetani	13,000	22,000
Corynebacterium Diphtheriae	3370	6510
Ebertelia typhosa	2140	4100
Escherichia coli	3000	6600
Legionella bozemanil	3500	7000
Legionella dumoffii	5500	11,000
Legionella gormanii	4900	9800
Legionella micdadei	3100	3100
Legionella longbeachee	2900	5800
Legionella pneumophila	3800	7600
Leptospira canicola-Infectious Jaundice	3150	6000
Micrococcus candidus	6050	12,300
Micrococcus sphaeroides	1000	15,400
Mycobacterium tuberculosis	6200	10,000
Neisseria catarrhalis	4400	8500
Phytomonas tumefaciens	4400	8000
Proteus vulgaris	3000	6600
Pseudomonas aeruginosa	5500	10,500
Pseudomonas Fluorescens	3500	6600
Salmonella enteritidis	4000	7600
Salmonella paratyphi – Enteric Fever	3200	6100
Salmonella typhosa- Typhoid Fever	2150	4100
Salmonella typhimurium	8000	15,200
Sarcina Lutea	19,700	26,400
Serratia Marcesens	2420	6160

Shigella Dysenteriae-Dysentery	2200	4200
Shigella flexneri- Dysentery	1700	3400
Shigella paradysenteriae	1680	3400
Spirillum rubrum	4400	6160
Staphylococcus Albus	1840	5720
Staphylococcus Aerius	2600	6600
Staphylococcus Hemolyticus	2160	5500
Staphylococcus Lactis	6150	8800
Staphylococcus Viridans	2000	3800
Vibrio Comma - Cholera	3375	6500
Molds	90%	100%
Aspergillus Flavus	60,000	99,000
Aspergillus Glaucus	44,000	88,000
Aspergillus niger	132,000	330,000
Mucor racemosus A	17,000	35,200
Mucor racemosus B	17,000	35,200
Oospora lactis	5000	11,000
Penicillium Expansum	13,000	22,000
Penicillium Roqueforti	13,000	26,400
Penicillium Digitatum	44,000	88,000
Rhizopus Nigricans	111,000	220,000
Protozoa	90%	100%
Chlorella Vulgaris	13,000	22,000
Nematode Eggs	4,000	92,000
Paramecium	11,000	20,000
Virus	90%	100%
Bacteriophage-E.Coli	2600	6600
Infectious Hepatitis	5800	8000
Influenza	3400	6600
Poliovirus - Poliomyelitis	3150	6600
Tobacco Mosaic	240000	440000
Yeast	90%	100%
Brewers Yeast	3300	6600
Common Yeast Cake	6000	13200
Saccharomyces Carevisiae	6000	13200
Saccharomyces Ellipsoideus	6000	13200
Saccharomyces spores	8000	17600