

H & D Aqua Solutions INC.

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SOLUTION FOR WATER MANAGEMENT

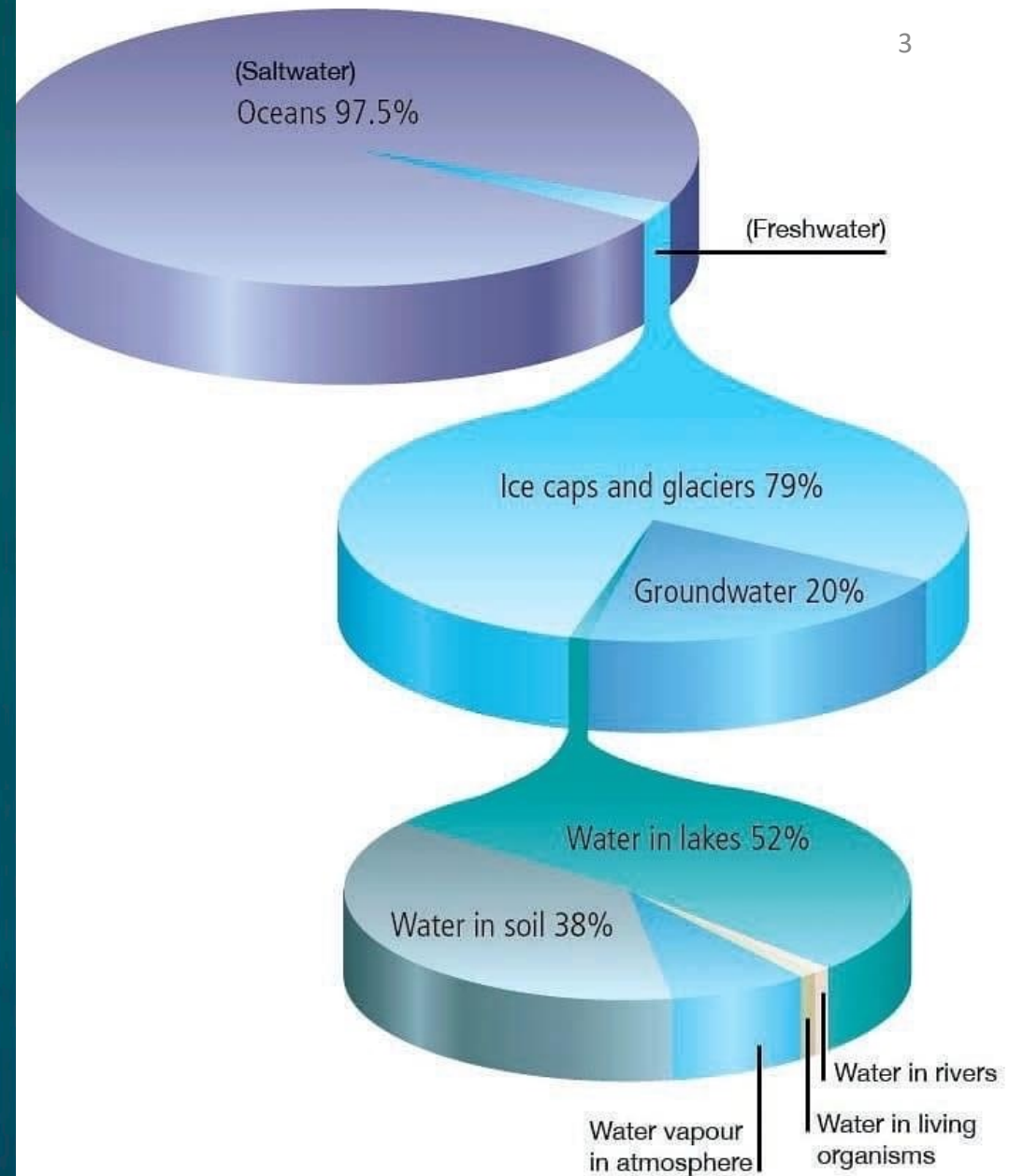
802 Hallmark Dr. Laredo, Texas – USA 78045  
Office Phone USA: 956 568 4188

Sustainable Water Solutions



# Water for human consume

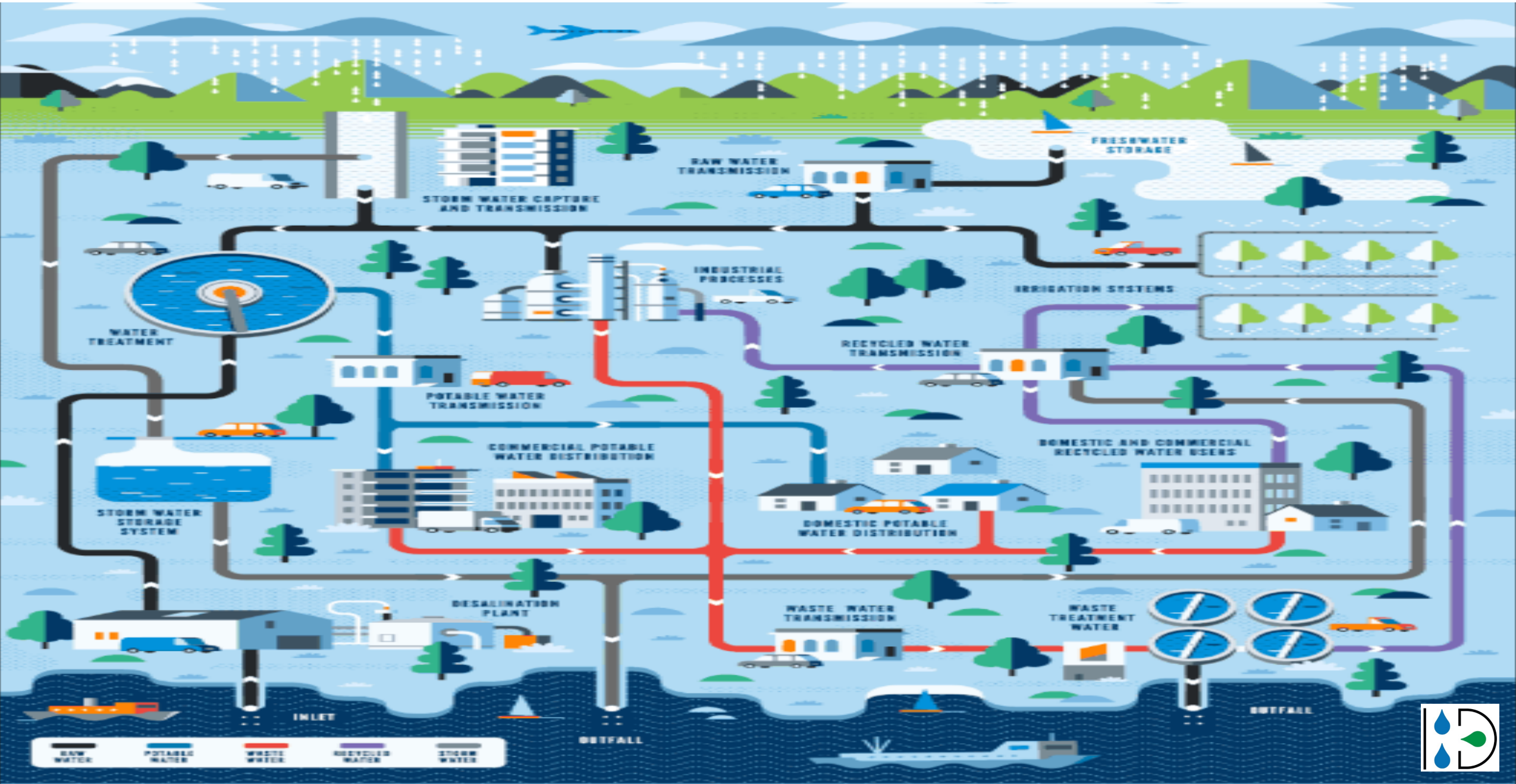
A REAL world problem



*Quando el pozo está seco, sabemos el verdadero valor del agua.*  
Benjamin Franklin, Boston 1706.









# Our business partners

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## Commercial representations

More than 20 years of experience in the market, allows us to formally represent leading manufacturing companies worldwide in water management solutions, some of them are:

**SAWYER, WATER FILTRATION**, American manufacturing of 0.1-micron absolute hollow fiber membrane provide even further protection where water sources can include viruses, heavy metals, chemicals, and other contaminants.

**ZOELLER PUMP COMPANY**, an American manufacturer with more of 80<sup>th</sup> years now in its fourth generation of family ownership. Submersible pumps for wastewater, subsidiaries: Zoeller Engineering Products, Clarus Environmental Inc, Flint & Walling, WOLF Pumps.

**AMERICAN WATER SOLUTIONS, LLC.**, American Company founded in 2015 dedicated to searching, innovation and development of water Technologies including: Reverse Osmosis, Desalination Plants for Sea Water, Ultrafiltration Plants, Microfiltration Plants, Nanofiltration Plants. Pre-treatments with Multimedia filters, Activated Carbon and Softeners, Demineralization by Ion Exchange.

**DELTA WATER TREATMENT, LLC**, American Designer of advanced wastewater treatment systems manufactured since the 1960s. Delta Systems was acquired in 2015 by Infiltrator Water Technologies. Today Infiltrator manufactures and sells multiple product lines for the onsite wastewater and water industry.

**SMITH & LOVELESS, INC.** American manufacturing of Solutions for Wastewater treatment plants and station pumps, The Company currently owns more than 75 active U.S. patents, holds foreign patents in 15 different countries, and more than 50 domestic and foreign trademarks.

**BIOMICROBICS, INC.**, American leading manufacturer of advanced decentralized wastewater treatment systems. It was founded in 1996 with a vision to manufacture simple, low-cost, and robust products to the onsite water industry. Advanced treatment units are pre-engineered for residential, commercial, and high strength applications. Systems are scalable to treat various flow and are extremely efficient, providing a cost-effective solution to managing waste and improving onsite sanitation.

# Our business partners

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## Commercial representations

More than 20 years of experience in the market, allows us to formally represent leading manufacturing companies worldwide in water management solutions, some of them are:

**HARRINGTON**, North American wholesale distributor of process items and equipment, founded in 1959. Offers a broad line of quality, corrosion-resistant, and ultra high purity piping systems including components required to meet the diverse specifications of the industrial, aquatic life support, metal plating & finishing, biotechnology, pharmaceutical, water & wastewater, and semiconductor industries.

**THETIS ENVIRONMENTAL INC.**, Canadian manufacturer of Ultrafiltration PermaFlow™ membrane successfully integrated to meet small and large water industrial separation. The membrane Solution offer products globally to large multinational corporations, government institutions and small manufacturers. Permaflux™ is the latest patented membrane technology with several successful case studies, including MBR and directly oil **water separation**.

**AQUA AZUL CORPORATION.**, American manufacturer of disinfection systems by technology of UV lamps. The arrangement include PVC (low press), SS (high press) and large flow in SS and concrete channels.

**APGNEUROS.**, Canadian manufacturer of Advanced aerospace technology, energy efficiency reliable and low maintenance, APG-Neuros Turbo Blowers and Aeration Systems, with environmentally sustainable solutions in a variety of different wastewater treatment applications.

**VOLTEA VB.** Dutch company manufacturer of the CapDI - Capacitive Deionization technology for reduction from 25 to a maximum of 90% of Dissolved Ions in the water without the use of chemicals, only electricity consumption at a rate of 0.5 kwh/m<sup>3</sup>. Maximum feed water quality 4000 micro Siemens/cm.

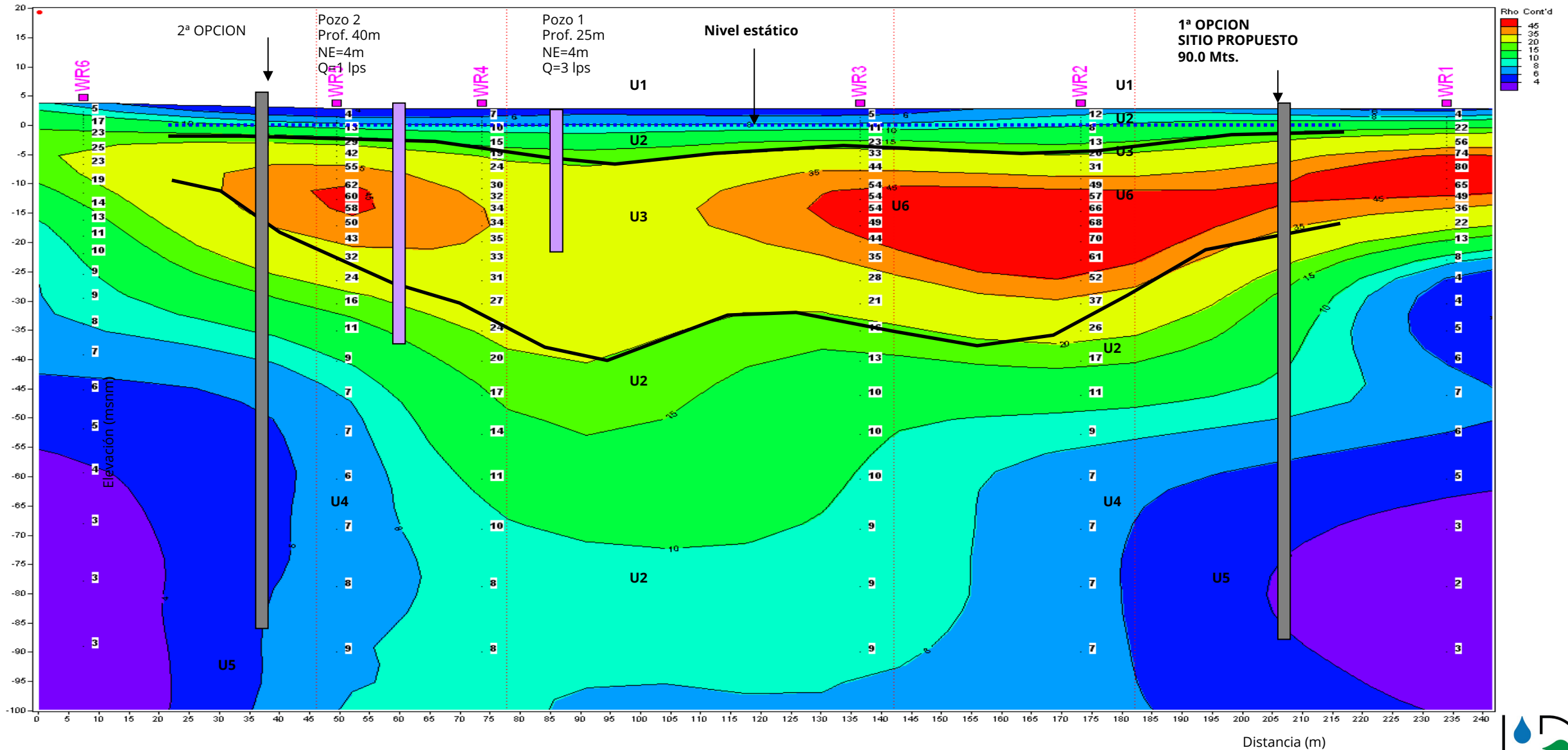
**Company Neutralox GmbH.** Germany manufacturer of equipment for odor control and exhaust gas treatment plants. Neutralox was founded in 1999. Is serious expert in odor control, exhaust gas treatment, dust removal and ventilation systems. Today, with more than 20 years of experience, Neutralox equipment has been installed in more than 700 systems worldwide, with more than 60 installations in the Americas.



Soluciones Avanzadas para localizar AGUA DULCE, SALOBRE & AGUA DE MAR



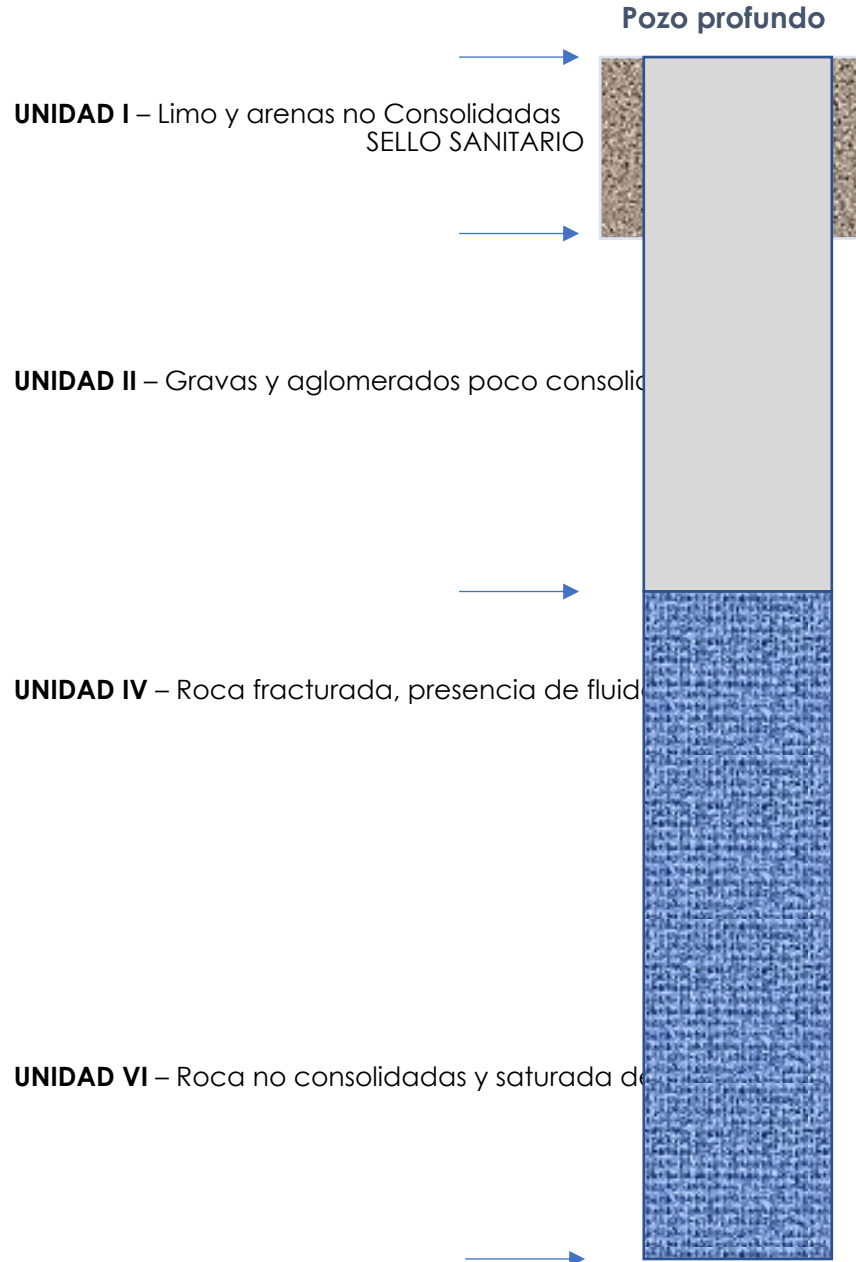
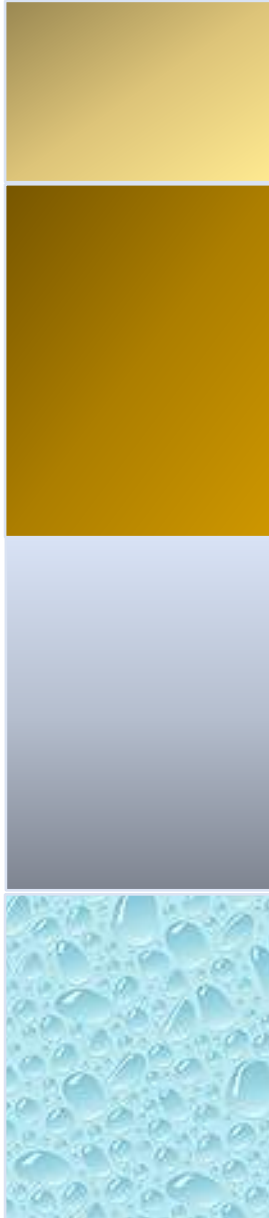
Soluciones Avanzadas para localizar AGUA DULCE, SALOBRE & AGUA DE MAR





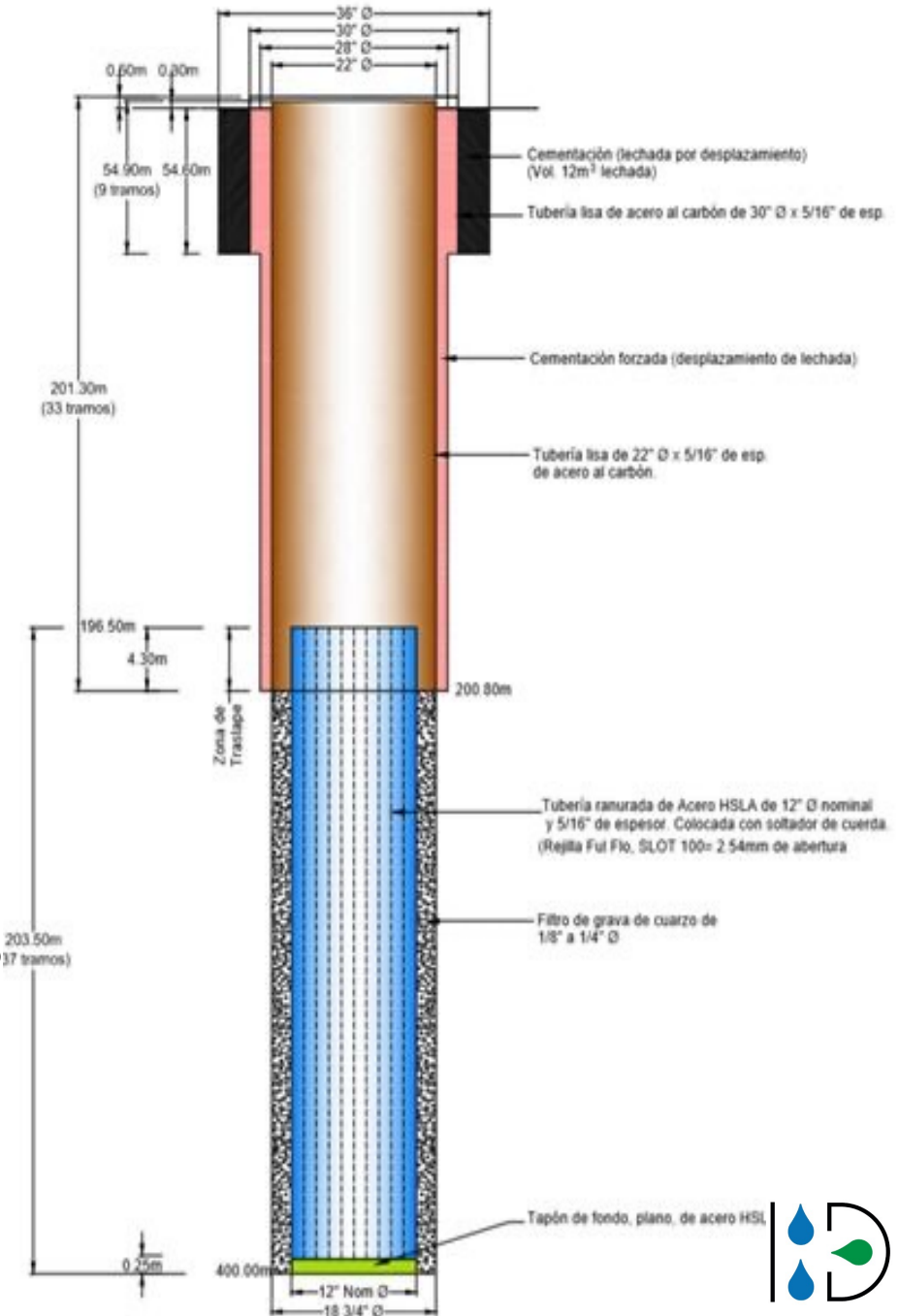
# DISEÑO PRELIMINAR DE POZO

## Perfil LITOLÓGICO



0.0 metros  
CONTRADEME  
10.0 metros  
ADEME LISO  
40.0 metros  
ADEME RANURAD  
90.0 metros

## Otros diseños





## Perforación de Pozos profundos y Obras de Toma Lago o Mar





WP0027 1119  
Supersedes 1018

### 6-INCH SUBMERSIBLE TURBINE STAINLESS STEEL



**6L SERIES**

Each pump is personally built by our expert craftsmen and then passed through our world-class testing facility to ensure your exact specifications are met.

- Produces up to 320 GPM
- Open or closed stainless steel impeller
- Durable in high-corrosive and harsh pumping environments
- Perfect for municipal, off-shore, chemical and mining applications

In most cases, Wolf can take an order and ship within 48 hours, truly delivering on our promise: Right Pump. Right Now.



WP0067  
1020  
Supersedes  
0920

### RIGHT PUMP. RIGHT NOW.



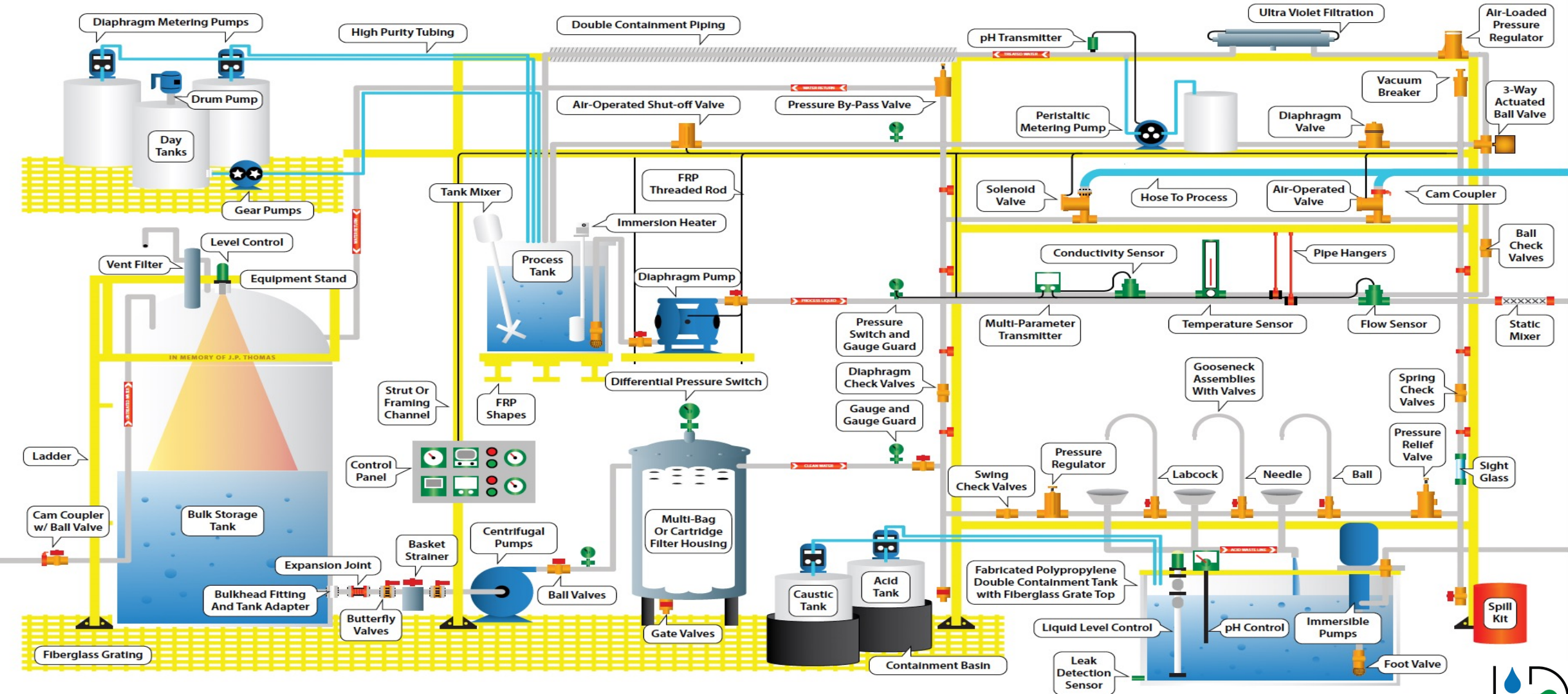
**WATERBOSS™**  
LINESHAFT TURBINE PUMPS

Wolf is a family-owned, American company, born in the most abrasive, deep well water conditions of west Texas, delivering durable, custom pump solutions when and where you need them.

- Customized, precision pump solutions
- Personal attention and quick shipping
- A 65-year reputation of excellence



# Providing Industry Leading Piping System Products







### AQUATIC LIFE SUPPORT

The Aquatic animal community is focused on the health and well-being of animals and also water quality. Which is why Harrington offers only the highest quality and most reliable products that are put into service in a life support system.



### BIO-PHARM

In Pharmaceutical and Biotechnology industries, sterility and high purity are mandatory. Harrington offers the highest quality products in order to meet these high standards and specifications.



### CHEMICAL

Chemical processing applications vary greatly, however one constant is the need for corrosion resistant products. Harrington offers the industry longer lasting, light-weight and corrosion resistant products to these applications.



### POOLS

Harrington is dedicated to providing quality products and equipment for safe water treatment. Various recreation facilities, resorts and water parks rely on Harrington's products and services in order to maintain water quality.



### FOOD & BEVERAGE PROCESSING

Harrington specializes in providing FDA and USDA-approved, easy-to-sanitize, corrosion resistant products and materials for the food and beverage processing industries.



### INDUSTRIAL FLUID HANDLING

Regardless of your processing application, Harrington will keep your operations running smoothly, thanks to our extensive corrosion resistant piping system product offering.



### COMMERCIAL WATER

Harrington provides piping systems and components for many commercial water applications including: schools, hotels, apartments, health care facilities, manufacturers and other higher volume water users needing high quality water.



### LIFE SCIENCE

Life science applications demand durability, reliability, regulatory compliance, traceability from raw materials and design flexibility. Harrington provides product solutions for these very demanding applications.



### METAL FINISHING

Harrington provides corrosion resistant piping systems, valves, actuators, and many other components ideally suited for use in many metal finishing applications.



### PETROCHEMICAL

There are several chemical applications used throughout a plant. For example, Sodium Hypochlorite is used to control microbial growth and Sulfuric Acid is used to adjust pH. These chemical applications are perfect for Harrington's line of products.



### PULP & PAPER

Corrosive environments like pulp and paper processing demand a durable, corrosion resistant solution. Harrington delivers FRP and thermoplastic products that won't rust, rot, warp or corrode.



### MICROELECTRONICS

Microelectronics manufacturing requires the cleanest water possible and handles some of the most corrosive chemicals. Harrington understands your process needs and provides the most diverse product solutions for these unique fluid & gas handling applications.



### WATER/WASTE WATER

Producing safe drinking water and treating waste water requires various chemicals that require the appropriate corrosion resistant products to handle these harsh applications. Harrington has the products required to keep these plants in safe operation.



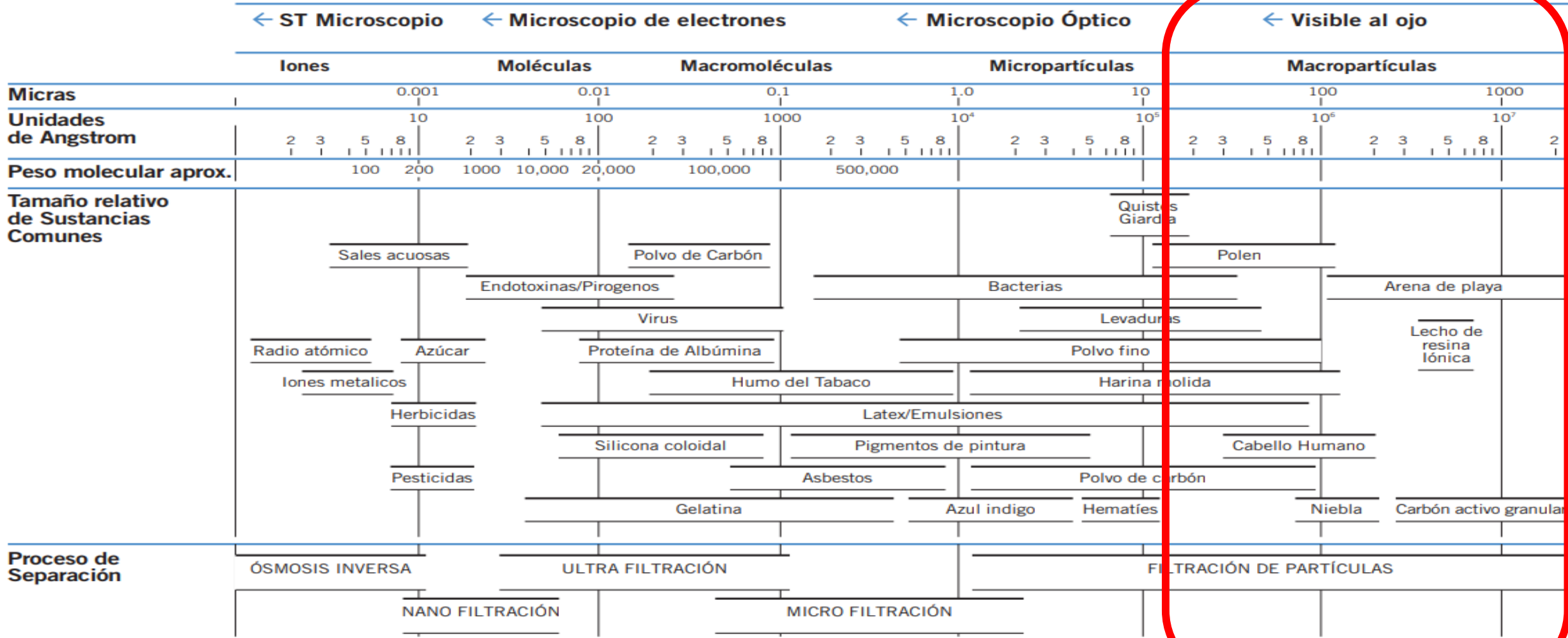
### BREWERIES & DISTILLERIES

Harrington offers a variety of solutions for the brewery, winery, and distillery markets. Whether you're a microbrew, vineyard or a large scale distillery, Harrington is your source for piping, filtration, bulk storage and all your other piping system needs.





## EL ESPECTRO DE LA FILTRACIÓN

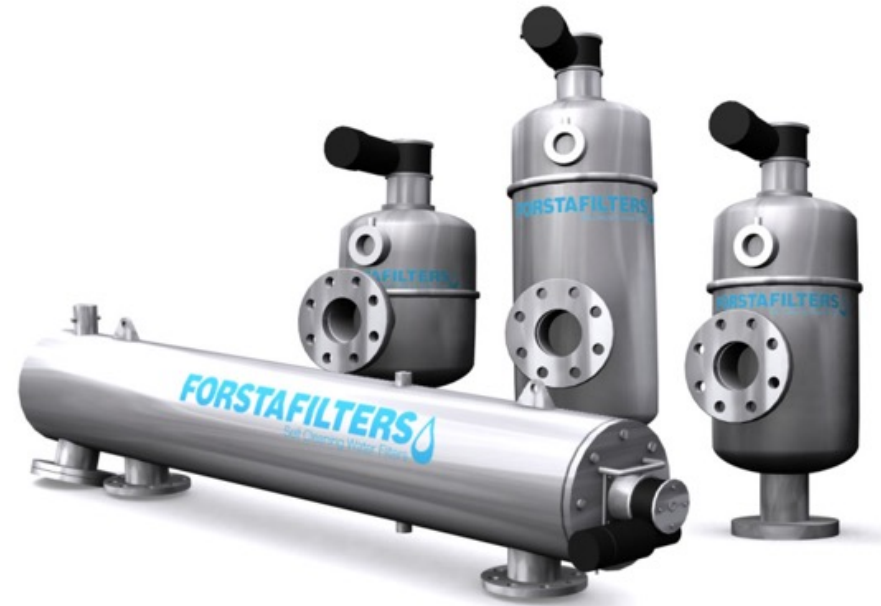


1 micra = 1 x 10<sup>-6</sup> metros  
 1 Angstrom = 1 x 10<sup>-10</sup> metros = 1 x 10<sup>-4</sup> micras



FORSTA FILTERS INC. – California USA

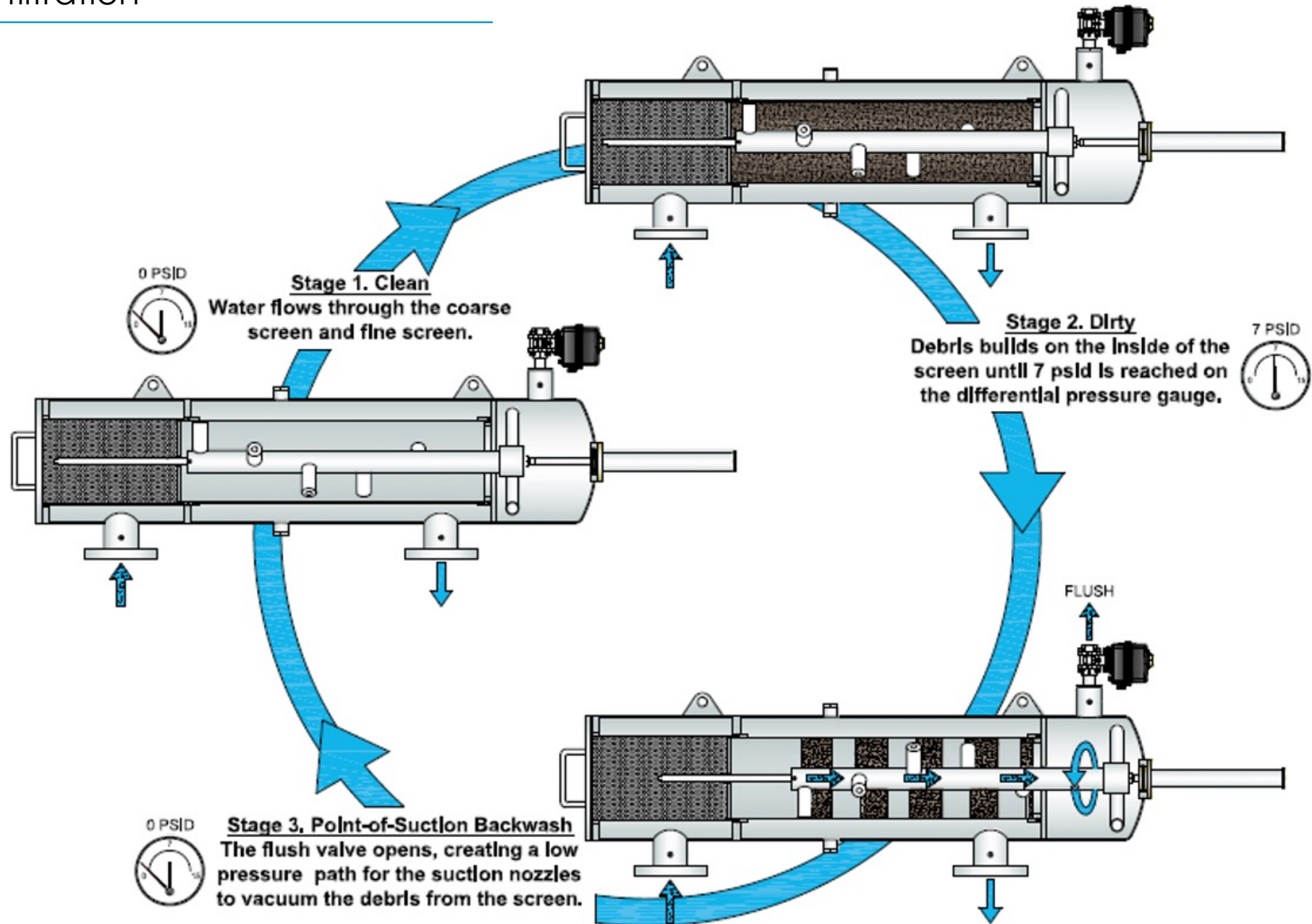
- Automatic
- Low Wastewater
- Continual Flow
- Low Maintenance
- High Efficiency
- Dependable
- Cost-effective
- Point-of-Suction Backwash





# Self-cleaning filtration

## How it Works



FORSTA FILTERS INC. – California USA

## Industrial



## Municipal



## Irrigation



HVAC - Petrochemical  
Pulp & Paper - Sugar  
Metal-works - Plastics  
Seawater - Car Wash  
Food Processing - Power

UF Pre-Filtration  
Membrane Protection  
Drinking Water  
Wastewater  
Desalination

Golf - Turf - Landscape  
Agriculture  
Greenhouse - Nursery





# Filtration and Microfiltration by Multi media

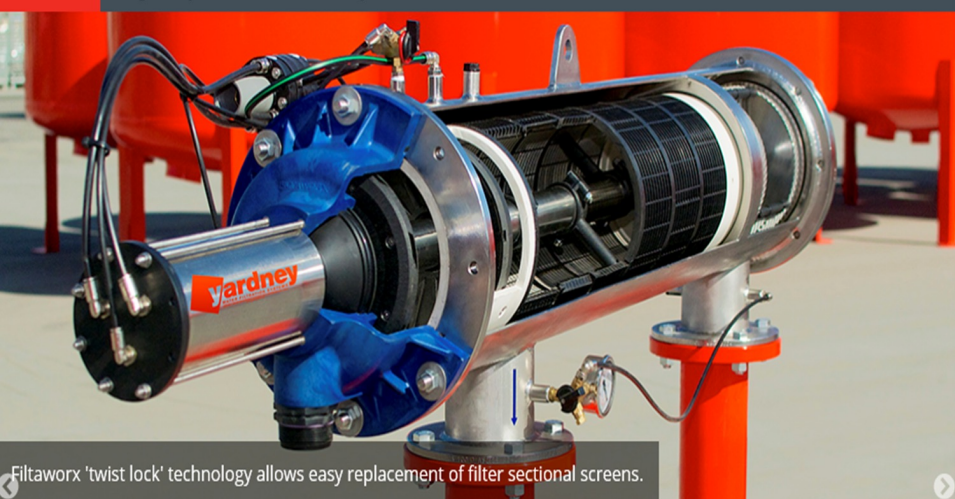
American Water Solutions LLC. – Texas USA





# Filtration and Microfiltration by Multi media

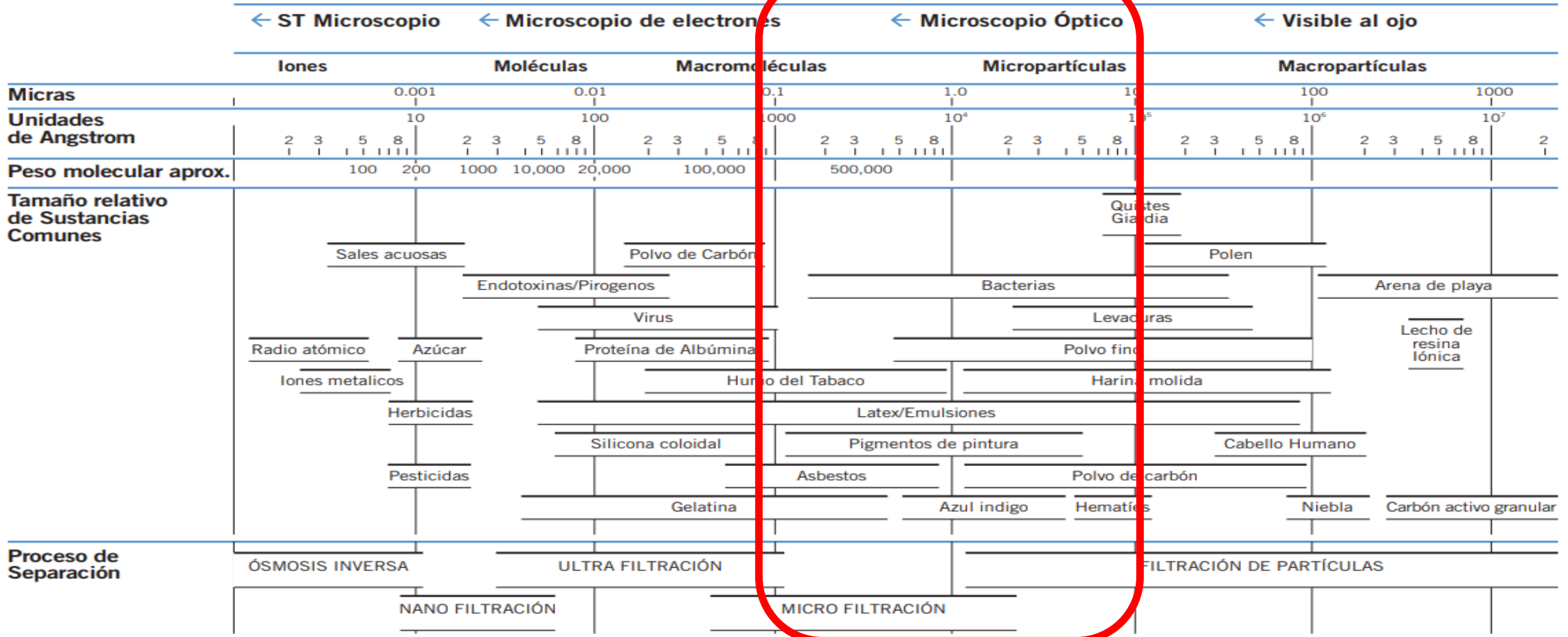
Yardney Filtration Systems INC. – California USA



Filtaworx 'twist lock' technology allows easy replacement of filter sectional screens.



## EL ESPECTRO DE LA FILTRACIÓN



1 micra = 1 x 10<sup>-6</sup> metros  
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## Membrana portátil de Microfiltración

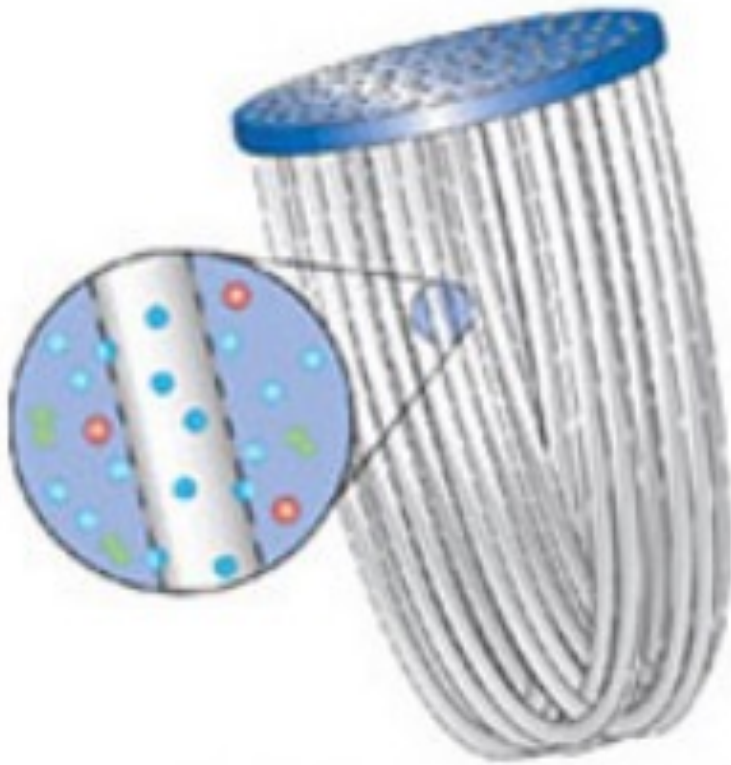


Diagrama de una Membrana de Fibra Hueca

	Enfermedades Transmitidas por el Agua	Requisito de la EPA	Supera el Requisito de la EPA	Tasa de eliminación
PURIFICADOR FILTRO	<b>Las bacterias que causan:</b> El cólera, el botulismo (Clostridium botulinum), Tifoidea (pacientes con enfermedad diarreica typhi), Disentería Amébrica, Amebiasis, E. Coli, Bacterias Coliformes, Streptococo, Salmonella	99.9999% Registro 6	<b>SI</b>	99.99999% Registro 7
	<b>Protozoarios (Quistes):</b> Giardia, Cryptosporidium, Cyclospora	99.9 Registro 3	<b>SI</b>	99.9999% Registro 6
	<b>Virus:</b> Hepatitis A (HAV), Poliovirus, Norwalk, Rotavirus, Adenovirus, Hepatitis E (HEV), Coxsackievirus, Echovirus, Reovirus, Astrovirus, Virus de Corona (SARS)	99.99% Registro 4	<b>SI</b>	99.9997% Registro 5.5

\* Filtro no remueve sólidos disueltos, incluyendo productos químicos y metales pesados.



Membrana portátil de Microfiltración









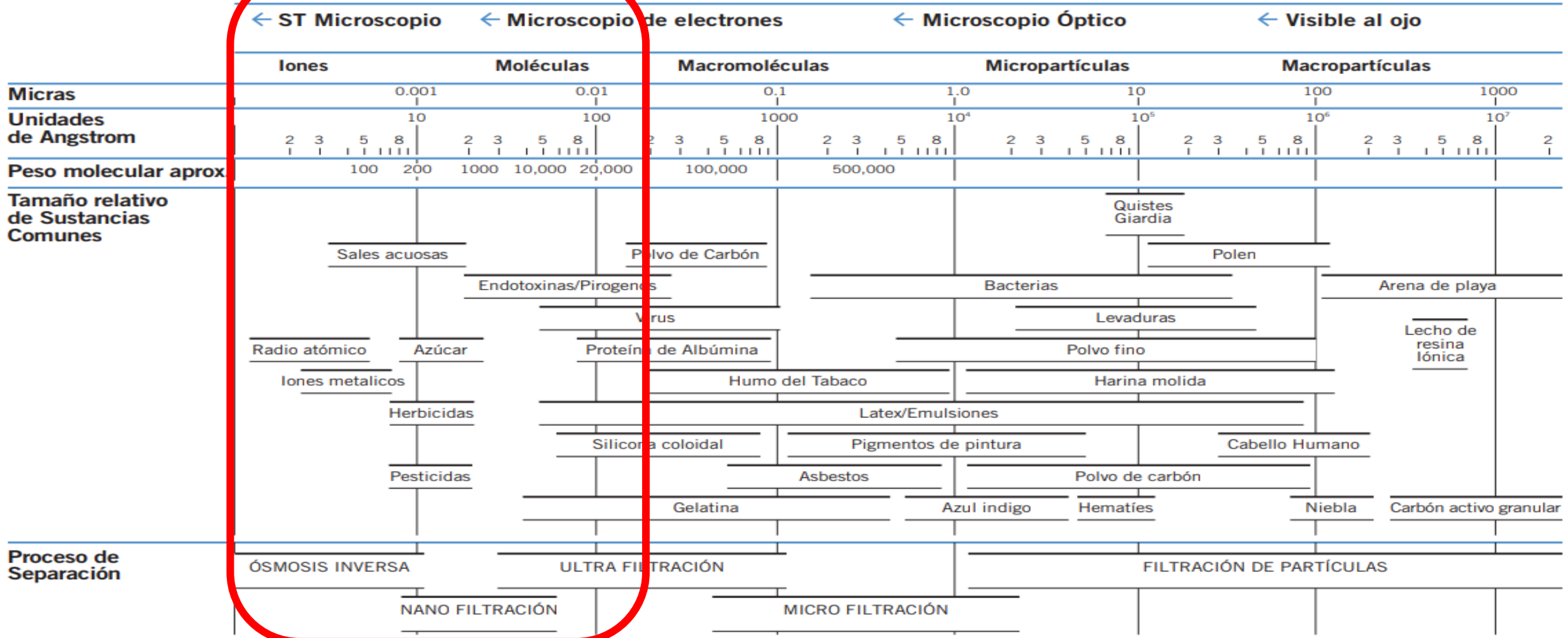
Punto de Uso - INFINITO



All SAWYER filters meet or exceed the Environmental Protection Agency (EPA) recommendations for Microorganism Removal Standards Reg. EPA-58188-FL-1.



## EL ESPECTRO DE LA FILTRACIÓN



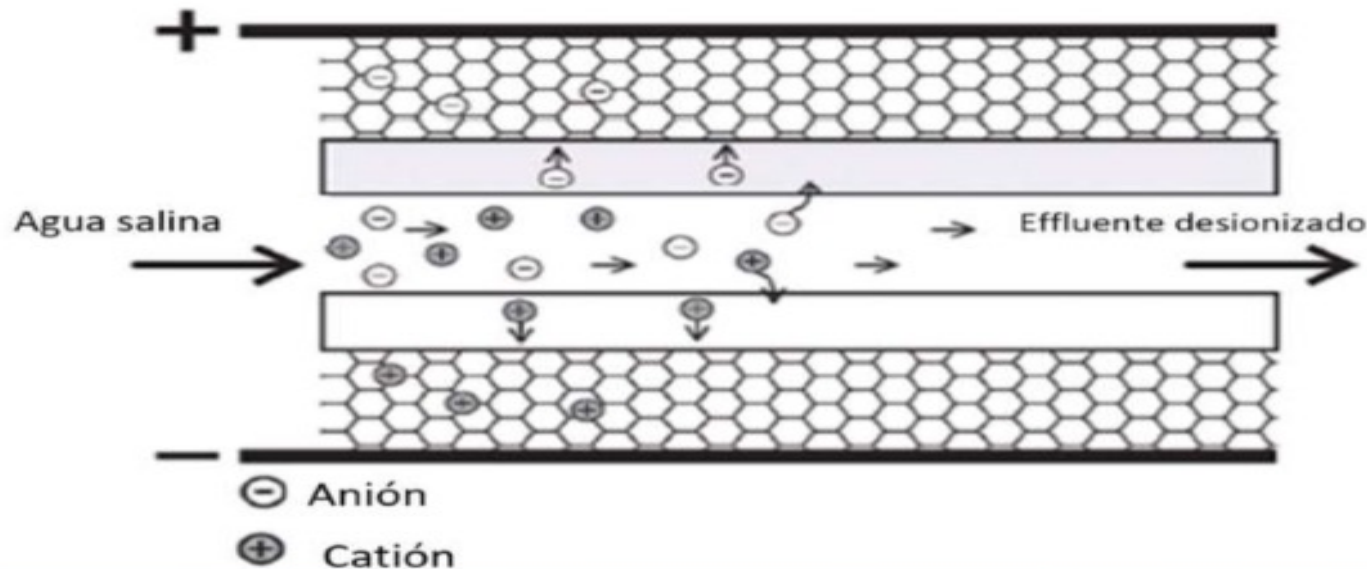
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 1 Angstrom = 1 x 10<sup>-10</sup> metros = 1 x 10<sup>-4</sup> micras





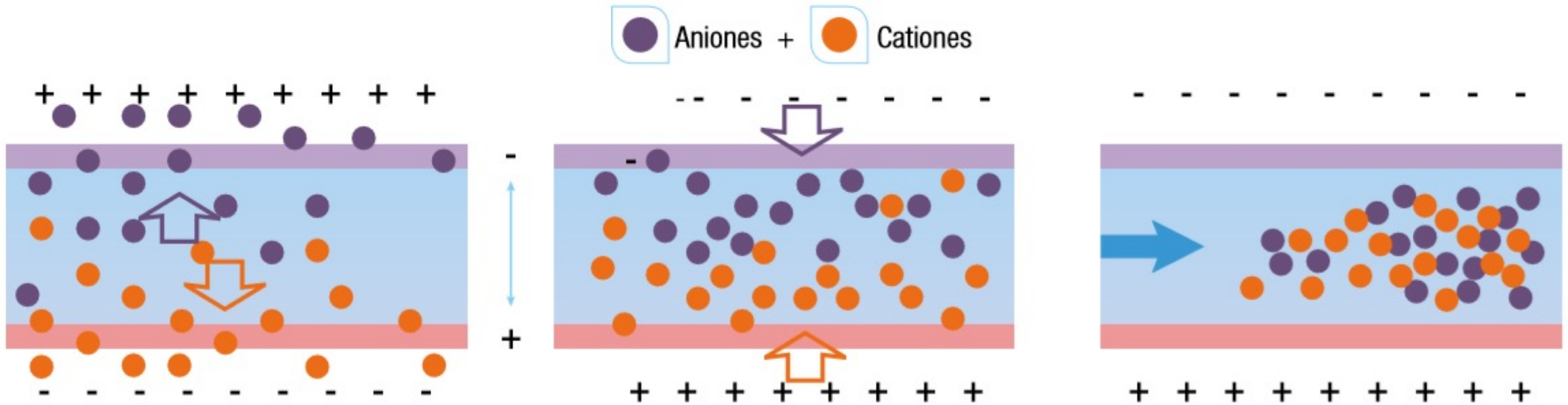
# Capacitive Deionization

Voltea BV - Holanda



- ⊕ Almacenador de corriente
- ↕ Electrodo poroso de carbono
- ↕ Membrana aniónica de intercambio iónico
- ↕ Espaciador
- ↕ Membrana catiónica de intercambio iónico
- ↕ Electrodo poroso de carbono
- ⊖ Almacenador de corriente





## 1. Purificación

Al fluir el agua salina al módulo CapDI, los electrodos con carga opuesta atraen los iones, los pasan a través de membranas selectivas, y los almacenan temporalmente. Agua limpia, desionizada, fluye del sistema.

## 2. Regeneración

Una vez que los electrodos se han saturado de iones, se regeneran mediante la inversión del campo eléctrico aplicado a estos. Debido a que las cargas iguales se repelen, los iones salen de los electrodos y son captados por el flujo entre las membranas.

## 3. Desecho

La salmuera concentrada en el flujo es desechada del sistema. La carga de los electrodos se normaliza, y el sistema está así nuevamente listo para desionizar.





## Cooling System without CapDI

A cooling tower carries away heat through the evaporation of water. This water contains natural ions such as calcium, bicarbonate, chloride and sulfate. The ions do not evaporate and build up over time causing corrosion and scaling. To prevent this chemicals are added to the cooling water to try to manage and control the damage. Eventually the water degrades to such a point where it is discharged (blowdown) and the cooling tower is refilled with fresh water.



## Cooling System with CapDI

The CapDI system treats the water before it enters the cooling tower. CapDI will provide a reduction of up to 80% of the ions on the incoming stream. This allows the water to remain in the cooling tower up to five times longer resulting in lower overall water consumption and wastewater production. The decreased water consumption also means a reduction in the scale and corrosion inhibitors required to treat the water.





## ENTRADA DE AGUA

CapDI reduce el agua de entrada hasta un 40%



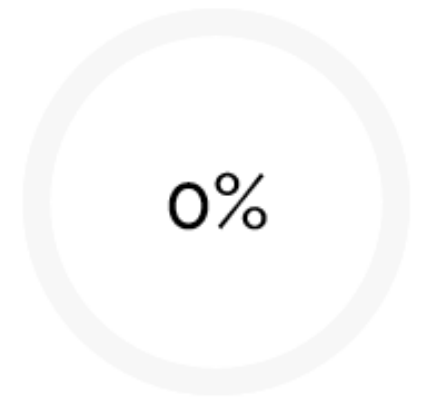
## AGUA DE DESECHO

Nuestra tecnología reduce el agua de desecho hasta en un 60%



## RECUPERACIÓN DE AGUA

CapDI recupera hasta un 95% del agua que trata.



## USO DE QUÍMICOS

CapDI no requiere ningún químico en su operación.

- NSF/ANSI 42
- CE Certified
- UL Listed





# Capacitive Deionization

Voltea BV - Holanda

DiEntry®



## CapDI DiEntry Point-of-Entry (C-12 Module)



### Design and Scope of Supply

- DiEntry User Manual
- Chemical container and containment tray
- Membrane Capacitive Deionization module
- Built-in monitoring; flow, conductivity, module voltage
- Automated cleaning triggered by cycles

### DiEntry Features

- Automated system CIP (Clean-In-Place)
- Automated safety bypass line
- Voltea remote monitoring and data collection available

Pure Outlet Conductivity Meters	0 - 10 mS/cm
Flow Meter	0 - 30 L/min (0 - 7.9 gpm)
User Interface	Built-in Display



- PoU Soda Fountain Machines

**Craft Beer/Breweries:**  
 - Tunable Water Purification  
 - Controlled Water Quality  
 - Product Differentiation

**Residential:**  
 - Dishwashing Machines  
 - Clothes Washing Machines  
 - High-Quality Drinking Water

**Commercial & Industrial:**  
 - Grocery Store Mistifiers  
 - Mist Cooling Systems  
 - Small Boiler Feed

**Spot-Free Rinse:**  
 - Dishwashers  
 - Solar Panels  
 - Vehicles

- past their service life
- Reduced downtime for descaling of coffee machines, ice machines and dishwashers

DiUse  
Front View



Meet Erhan Dizbay, our favorite champion barista!

According to Mr. Dizbay, "Most consumers don't realize the importance of high-quality water in coffee beverages."

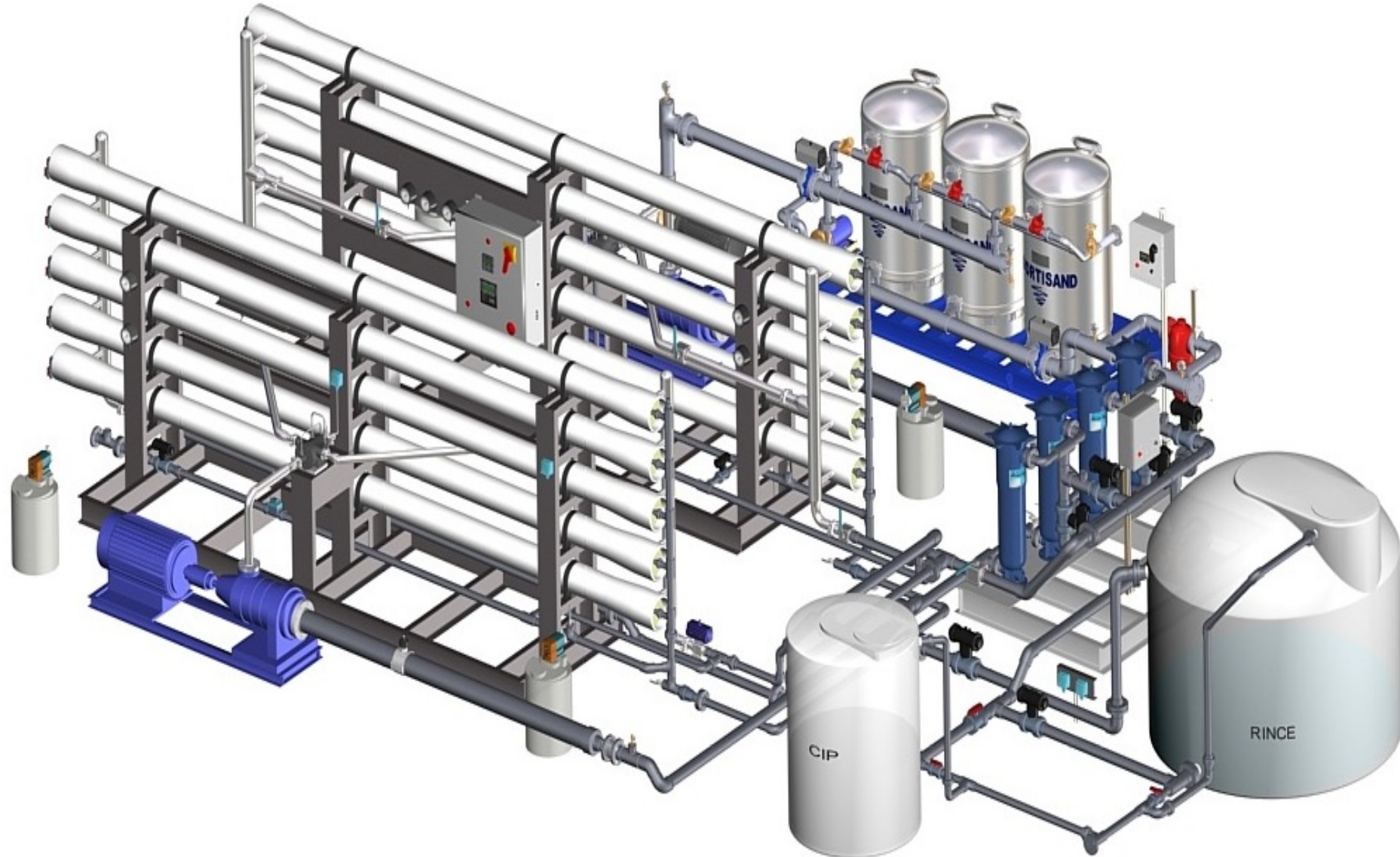
He continued, "When about 98% of a cup of coffee is water, it only makes sense that a controlled, consistent salt removal technology is used where you can tunably choose the desired mineral level, without having to add other salts back to the water. CapDI does exactly this function!"

You will find Mr. Dizbay at global trade shows and events serving coffee beverages using our CapDI technology!  
[www.erhandizbay.com](http://www.erhandizbay.com)



# Reverse Osmosis Technologies

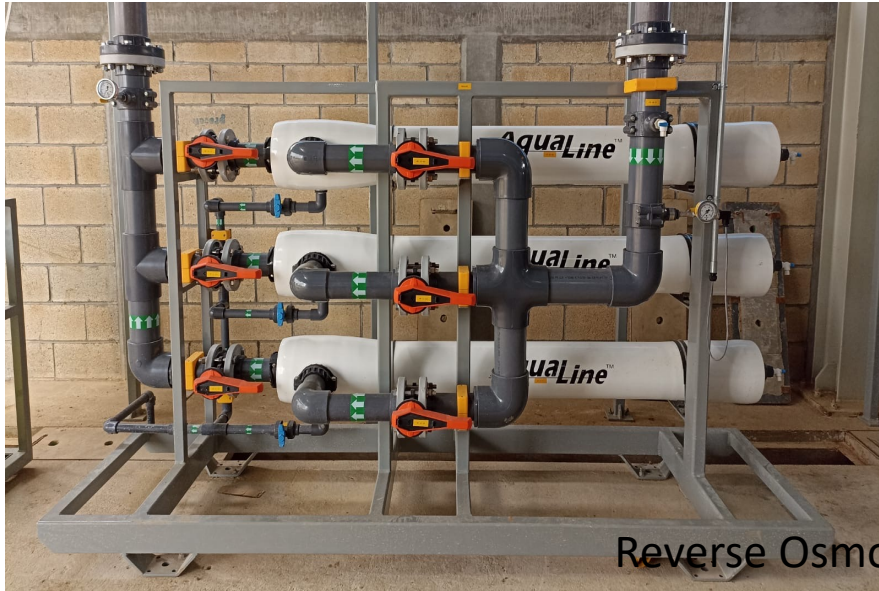
Deep well water, Surface water, Brackish water and sea water Up 4,000  $\mu$ Siemens/cm





# REDUCTION OF DISSOLVED SOLIDS AND SEAWATER DESALINATION

Reverse Osmosis Brackish Water and Seawater



Reverse Osmosis Brackish Water and Seawater





# REDUCTION OF DISSOLVED SOLIDS AND SEAWATER DESALINATION

Reverse Osmosis Brackish Water and Seawater





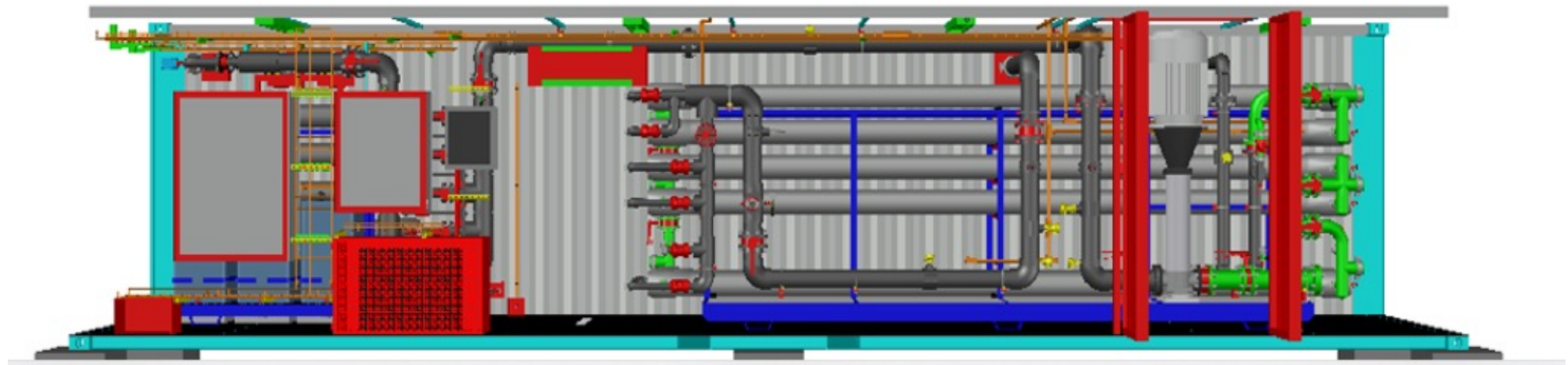
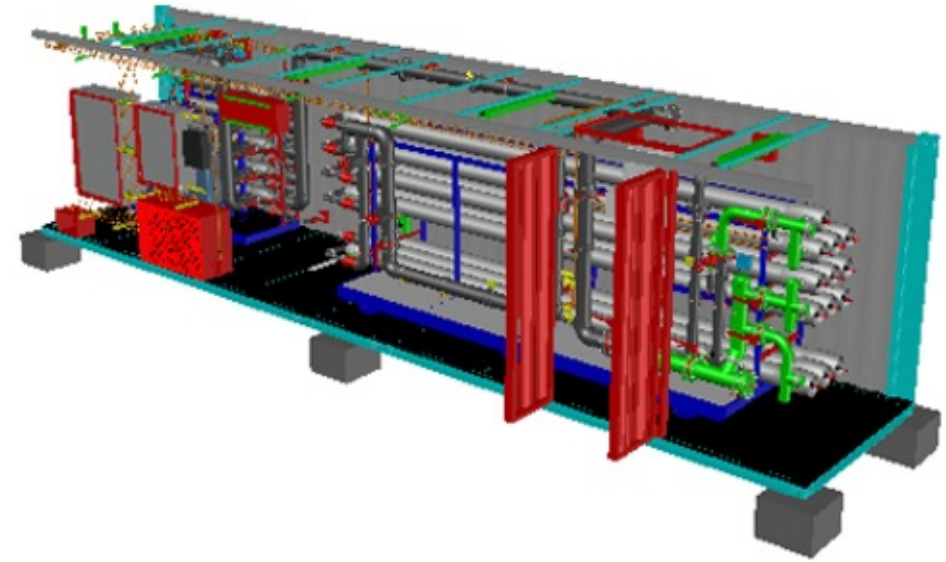
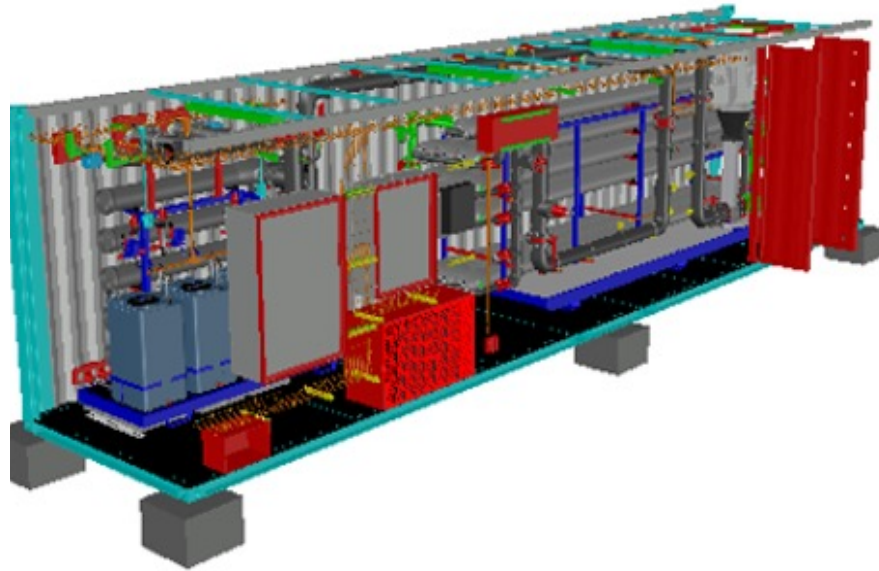
Sea water Desalination Beach deep well and open in take source





# REDUCTION OF DISSOLVED SOLIDS AND SEAWATER DESALINATION

Reverse Osmosis Brackish Water and Seawater





# REDUCTION OF DISSOLVED SOLIDS AND SEAWATER DESALINATION

Reverse Osmosis Brackish Water and Seawater IN CONTAINER





# History - Horizontal UV Disinfection

- 1986 USEPA published a design manual for Municipal Wastewater Disinfection.
- 1992 USEPA reports on UV growth. Shows open channel being majority.
- Our founders installed some of the earliest open channels.

TABLE 2-2. STATUS OF UV APPLICATIONS TO WASTEWATER

Year	1984	1990
Number of Plants	50 to 60	500 to 600
Flows < 1.0 mgd	80%	50%
1-20 mgd	20%	47%
> 20	-	3%
Closed Shell	49%	25%
Teflon	35%	7%
Open Channel	8%	66%
Horizontal	(100%)	(85%)
Vertical	-	(15%)
Other	8%	2%

In 1990, with a ten-fold increase in plants, there were more larger plants. Approximately half have design flows greater than 1 mgd, with several greater than 20 mgd. No new Teflon systems are being installed; these represent only approximately seven percent of the operating plants. Closed-shell systems are being installed at a low rate, with very few being considered for new applications. Approximately, 25 percent of operating systems are closed shell configurations. A small number of plants (two percent) comprise other designs, including the older fixed open-channel units and the new medium pressure (four systems) or alternate lamp systems.

1992 US EPA Survey



The following results can be used by engineers when designing systems requiring a 30 mJ dosage at end of lamp life with quartz sleeve fouling. These systems are most typically associated with permit levels of 126/100 ml – 200/100 ml.

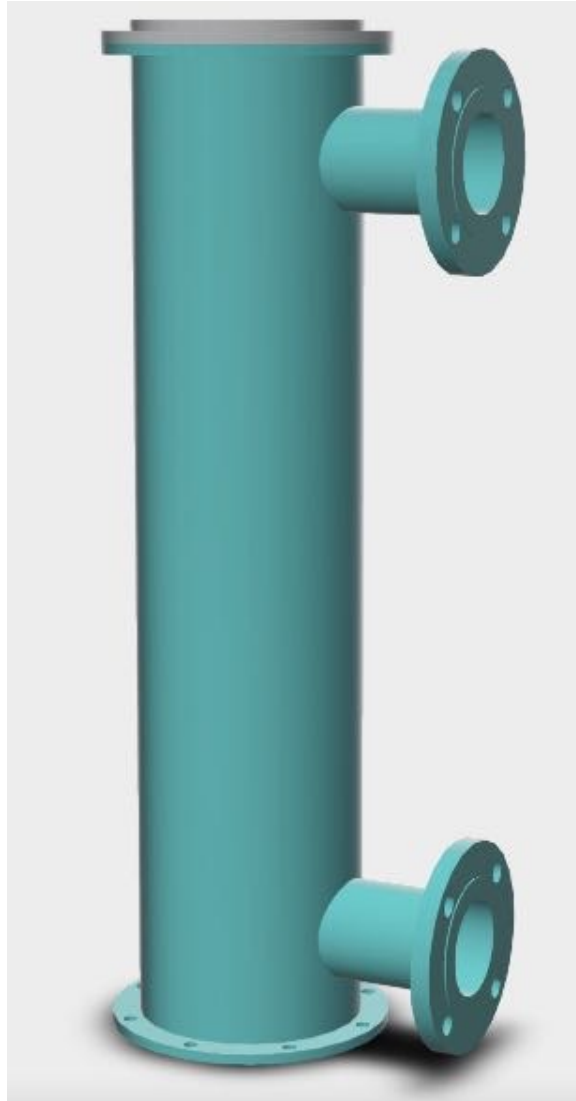
UV Transmission %	Gallons per Minute per Lamp	Gallons per Day per Lamp	Dosage (mJ) end of lamp life and quartz fouled
50%	21.5	30,960	30 mJ
55%	30	43,200	30 mJ
60%	40	57,600	30 mJ
65%	54	77,750	30 mJ

Validation used MS-2, T1 and QB coliphage.

**EXAMPLE:**

1.0 MGD	65% UVT	=	13 lamps	30 mJ
1.0 MGD	60% UVT	=	18 lamps	30 mJ
1.0 MGD	55% UVT	=	24 lamps	30 mJ
1.0 MGD	50% UVT	=	33 lamps	30 mJ





## IVM SERIES

### Chambered

Our earliest systems were chambered. In the 1980s, we introduced a vessel system with automatic quartz cleaning for wastewater.

UV lamps are lowered or slid into quartz sleeves, which are sealed within the chamber.

A sensor probe reads UV output and is displayed to operators.

Systems have quartz wiping.

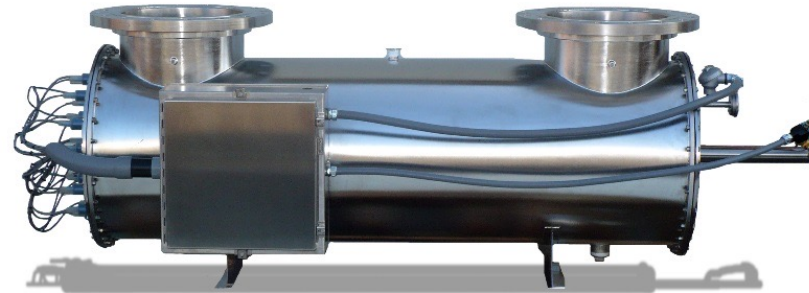




## Aqua Azul – Engineered for Performance and Durability

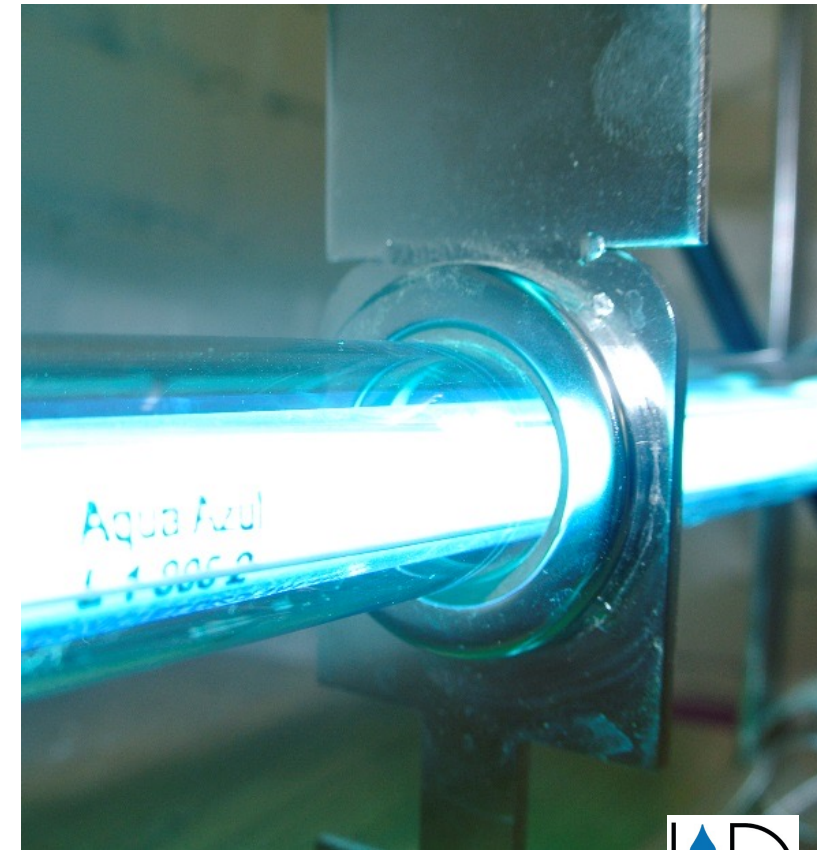
### Equipment Options:

- Running Time Meter
- UV Intensity Meter
- Flow Control
- Temperature Overheat Sensor
- Shutoff Solenoid Valve
- Audible Alarm
- Time Delay
- 316 Stainless Steel Upgrade
- Custom Design
- Quartz Wiping System Automatic



## Aqua Azul – Quality

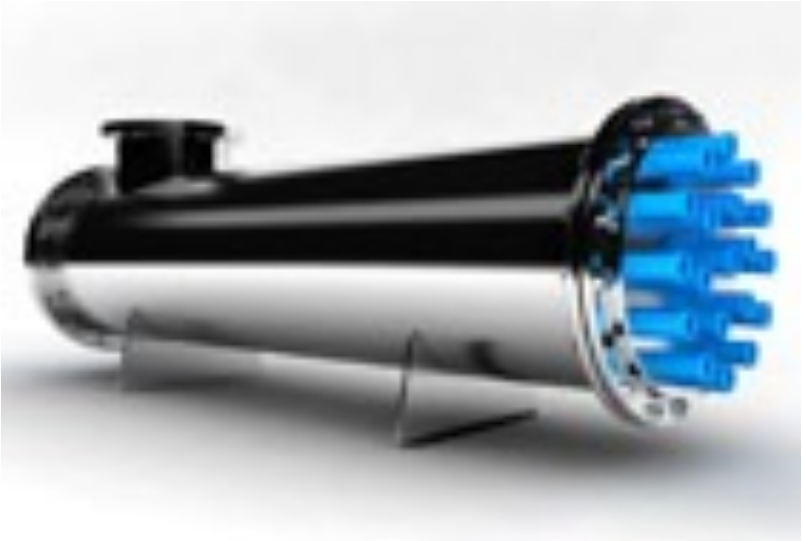
- USA Designed products that High performance with exceptional longevity
- Made in the USA
- Minimum maintenance
- Technology you can rely on
- Direct access to a U.S. based team of UV sterilization specialists.
- Time Delay
- 316 Stainless Steel Upgrade
- Custom Design
- Quartz Wiping System
- Energy Efficient
- Lamps high output, and amalgam
- 12,000 Hour Lamp Life/ 1 YR+
- Matching Power Supply
- 304 Polished Stainless Steel





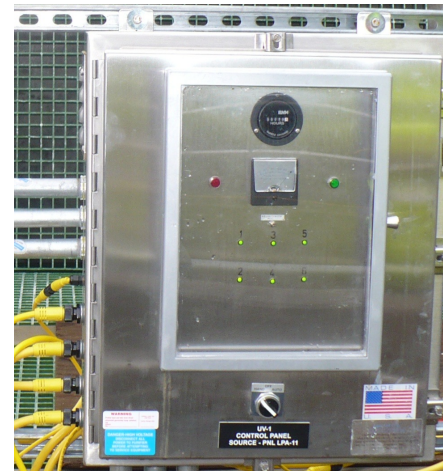


## Aqua Azul – Construction



- PRECISION-MACHINED REMOVABLE FLANGE HEADS
- THE WELDED STERILIZER CHAMBER MATERIAL IS 304L or 316S
- STAINLESS STEEL IS ELECTRO-POLISHED AND PASSIVATED
- TO MIL SPEC S-5002 ON BOTH THE INTERIOR AND EXTERIOR.





 Allen-Bradley • Rockwell Software

**Rockwell**  
**Automation**

- **Chambered**
- Our earliest systems were chambered. In the 1980s, we introduced a vessel system with automatic quartz cleaning for wastewater.







802 Hallmark Dr. Laredo,  
Texas – USA 78045  
Office Phone USA:  
956 568 4188

[www.hdaquasolutions.com](http://www.hdaquasolutions.com)

Website: under construction



**Ing. Joaquin Herrera Olavid**  
**Comercial Manager**

(Cell phone MX: +51 81) 1531 8392  
[jherrera@hdaquasolutions.com](mailto:jherrera@hdaquasolutions.com)