Aquatech

HERO™

HIGH
EFFICIENCY
REVERSE
OSMOSIS

HERO™

HIGH EFFICIENCY REVERSE OSMOSIS

HERO is a reverse osmosis (RO) technology specifically designed to purify difficult-to-treat feed waters.
Constituents which often pose problems to conventional RO processes are handled with ease by HERO.
By effectively preventing these constituents from being a root cause to membrane fouling or scaling, the HERO process offers the end user higher recoveries as well as significant operational benefits.

The highly innovative and patented HERO technology delivers unmatched value for the treatment in a variety of industrial water and wastewater applications.
Using HERO directly translates into improved plant performance and reduced overall costs.

As the most hassle-free and robust process available today, HERO enables the treatment of waters that have historically been difficult and cost-prohibitive.

REVERSE OSMOSIS WITH UNLIMITED POSSIBILITIES

WHY USE HERO

- High Recovery (90%)
- High Salt Rejection
- High Flux
- Reduced Fouling
- Lower Operating Costs
- Reduced Maintenance

HERO IS PERFECT FOR

- High Silica Water
- Cooling Tower Blowdown
- Tertiary Treated Effluent (Sewage)
- High TOC / Biologically Active Water

From Innovation Flows Leadership

For over three decades, Aquatech has provided industry worldwide with proven water and wastewater treatment solutions.

By leveraging design and engineering, modular field-proven products, project management, turnkey installation, and industrial services, we develop Total Water Solutions that work together seamlessly.

Our wide range of products address everything from ultrapure water requirements for microelectronics and pharmaceutical industries, to industrial installations for steam generation in power and chemical processing plants, to the recycle and reuse of waste or cooling tower blowdown.

Innovative, integrated solutions translate into superior products and unmatched value for our customers. We are committed to maintaining technical leadership in our product categories:

- Raw Water Treatment
- Ion Exchange
- Membrane Systems
- Wastewater Recycle / Reuse
- Industrial Concentration

Aquatech's Technologies, coupled with our capabilities to provide specialty solutions, provide customers with a single source for all of their water and process needs.

Brazos HERO installation - USA

▶ Find out how Aquatech's HERO installation at Brazos cut costs and increased uptime.

aquatech.com/brazos

Ethydco HERO installation - Egypt

▶ Learn how Aquatech used HERO and ZLD to help Ethydco protect the Nile River.

aquatech.com/ethydco

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How HERO Works

In a HERO system, RO membranes operate in a high pH environment and therefore remain in a "continuous cleaning mode", eliminating potential foulants and substantially improving overall performance.

Historically, successfully operating installations and pilot & commercial testing have confirmed that a high pH environment is a "cleaning environment." Most constituents that normally foul the membrane are rejected due to the high pH.

HERO's high pH operating environment introduces advtanges never before available. It overcomes the limitations of conventional RO systems

Common RO Foulants	Cleaning Method	HERO Operation
Hardness related scaling	Low pH Solution	Scaling completely eliminated by maintaining negative LSI
Silica Scaling	High pH Solution	Silica solubility is enhanced substantially at high operating pH
Oil & Grease Fouling	High pH Solution	Saponification of lipids (fat) will happen as fatty acids and their corresponding glycerides will form soluble "soaps" at high operating pH
Bio/Organic Fouling	High pH Solution	Biological activity non-existant at high pH. Bacteria, virus, spores, endotoxins, etc., are either lysed or denatured
Particulate Fouling	High pH Solution	Zeta potential is reduced between the surface particles at high pH, this reducing the possibility of adhesion

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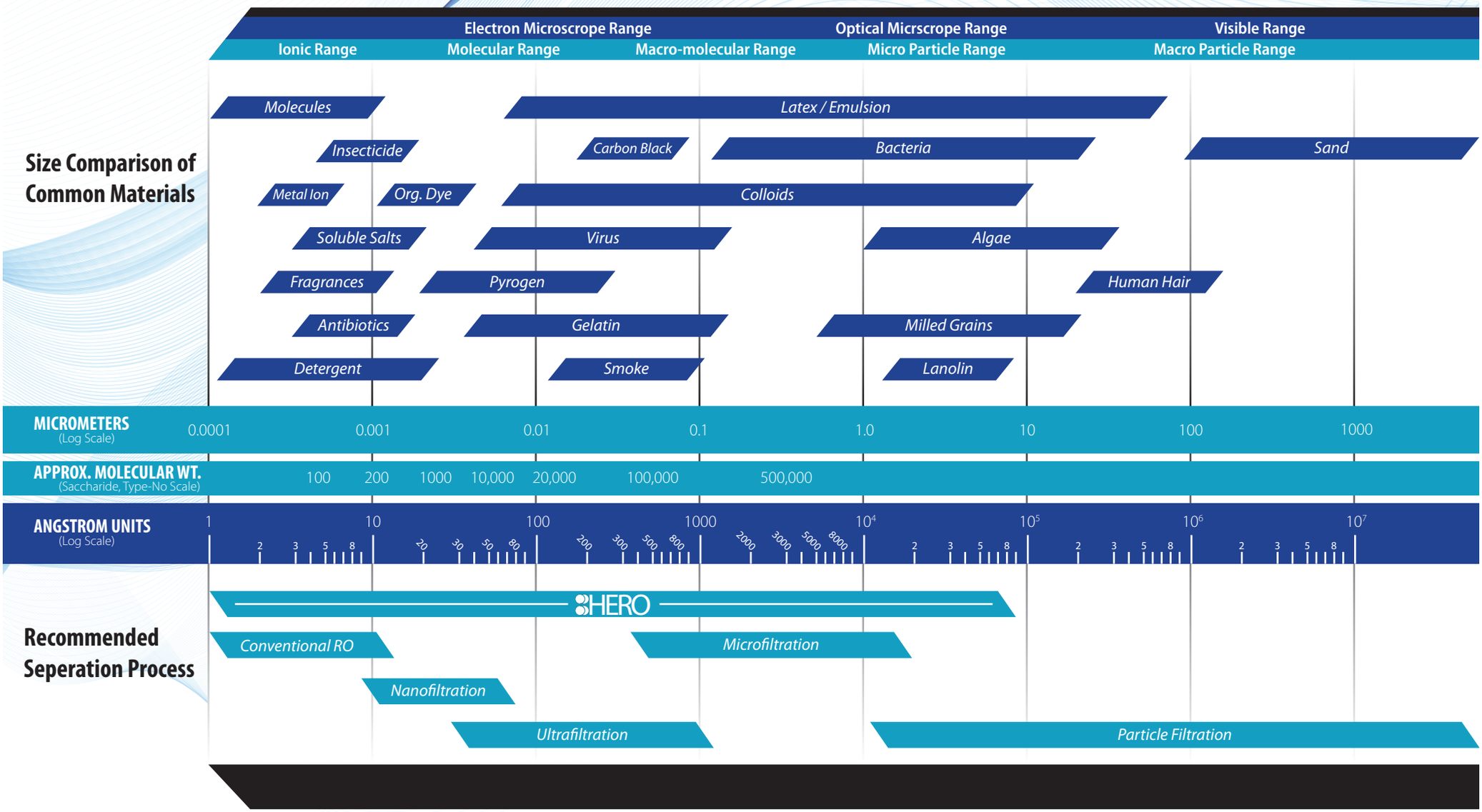
THE HERO™ ADVANTAGE



1 Angstrom Unit = 10^{-10} Meters = 10^{-4} Micrometers (Microns)

Economic Considerations

Besides having technical superiority over conventional RO, the HERO process offers significant economic advantage.

Higher Recovery

Since the HERO system allows increased water recovery, the cost per gallon for pure water production is reduced.

Minimal Offline Cleaning

Operating data shows a frequency requirement of once a year for HERO vs. twice to three times a year for conventional RO. Substantially reduce the time your system is off-line for membrane cleaning.

No Proprietary Chemicals

The HERO technology runs on common chemical feed requirements allowing you to cut the cost of expensive cleaning chemicals typically required.

Eliminate Redundancy

Due to HERO's high pH operating environment, it is in a "continuous cleaning mode" thus eliminating redundancies in capital equipment to compensate for cleaning downtime.

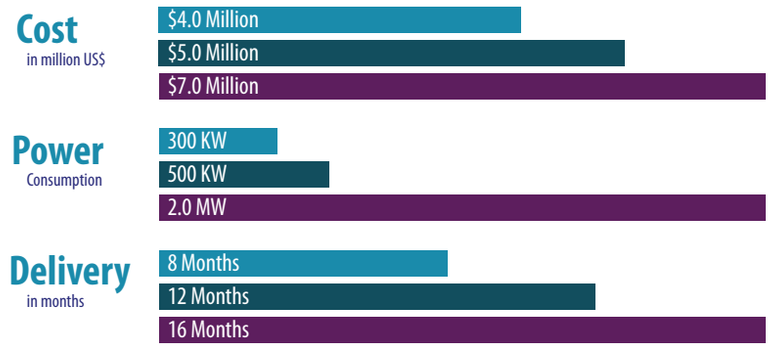
What About The Capital Cost?

HERO has proven to be competitive on a capital cost basis with conventional RO process. Call us or visit our website for a free evaluation.

Call us for a feasibility study for your application. HERO units are available for Pilot Testing.

HERO™ VS OTHER ZLD TECHNOLOGY

Treatment and Recycle of Cooling Tower Blowdown



- HERO, followed by evaporation pond
- HERO, followed by crystallizer
- Brine concentrator followed by crystallizer

Plant Capacity: 350 gpm (7.95m³/hr.)

Analysis of CTBD Water	
Ca	900mg/l CaCO3
Silica	150mg/l SiO2
Cl	1500mg/l Cl
PO4	30mg/l PO4

HERO™ starts where conventional RO stops

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