Process Water Treatment Solutions
for Industrial and Power Generation Applications

Looking for innovative ways to filter, purify, discharge, recapture, recondition or reuse industrial and process water? Whether you need to address difficult-to-treat produced and process waters, meet regulations, or maximize recovery due to scarcity of source water, Parker delivers. Our proven industrial and customized membrane and filtration systems blend superior performance with full compliance to deliver optimum reliability in pretested, packaged skids or turnkey containerized industrial grade solutions.

Vertically integrated for lower total cost of ownership

Forty years of membrane desalination technology leadership has taught us the value of vertical integration. By utilizing Parker components and controlling every step in the manufacturing process – from mandating the quality of raw materials to construction and performance testing – we can meet your exact water quality requirements, delivering the level of expertise and control needed to optimize applications for lower total cost of ownership.

Unparalleled engineering and manufacturing capabilities

Parker Water Purification is equipped to design, build, test, and certify water purification systems robust enough to carry the Parker name. We offer:
- 130,000 square feet of manufacturing space
- 15 design engineers
- 5 CAD designers
- 3 quality engineers
- 2 manufacturing engineers
- 32 CNC machining centers
- Membrane rolling machine
- Membrane test station
- Fiberglass vessel assembly cell
- Steel vessel weld/assembly shop
- Electrical panel shop
- Tool and fixture shop
- Steel weld shop
- Pump assembly shop
- AquaPro® pump test station
- 7 system assembly flow lines
- 3 system wet test facilities
- Air/structure/fluid borne noise measuring equipment
- Engineering test lab
- Full wet-test area, each system is tested prior to shipment

Proven tough and dependable by the Navy and Coast Guard

We’ve been the leading supplier of Mil-Spec RO desalination and purification equipment to the US Navy and Coast Guard for 35+ years.

Global and local

No matter where your plants are, Parker is there. With approximately 60,000 employees in almost 58 countries, 13,000 distribution and maintenance/repair outlets, and over 1,500 ParkerStores, we offer the global connections and local support you need.
Value-added right from the start

As the global leader in motion and control technologies, you can rely on Parker Hannifin’s engineering expertise for total water solutions that work together seamlessly worldwide to minimize life cycle costs and your environmental footprint. Our team of professional application engineers has extensive membrane purification and filtration experience and understands your water quality issues. Working together, we collaborate to increase your productivity and profitability with:

- Process design, engineering expertise and installation
- Testing and certification
- Around-the-clock technical and field service and support
- Audit and consultative services, training, and field support
- Continuous monitoring to ensure performance to your specifications
- Preventive diagnostics
- Validation services
- Laboratory services

Process Water Expertise

Parker offers significant advantages for process water filtration. From intake to outflow, we have your water quality needs covered. Talk to us about our expertise:

- Pre-RO condensate filtration
- Intake water filtration
- Reverse osmosis systems and ultrafiltration for cooling tower
- Blowdown, boiler makeup and feedwater filtration
- High-purity water treatment for NO\textsubscript{x} reduction and turbine injection
- High-purity turbine wash water
- EDI pre-treatment
- Zero Liquid Discharge management
- High turbidity surface waters with fine silt and clay material
- Tertiary treatment of biologically treated water
- Seawater pretreatment for red tide and algae blooms
- Locations with strict wastewater TDS restrictions
- Replacement of caustic chemical injection systems

Our Commitment to Environmentally Sustainable Solutions

Still using DI trailers?

Parker offers an alternative solution to DI trailers. Our RO-EDI System eliminates the need for toxic chemicals and the high maintenance costs associated with DI trailers.

Optimize Your Operations
email us at waterpurification@parker.com
INDUSTRIAL AND POWER GENERATION APPLICATIONS

PRETREATMENT
- AUTO Filtration System (10 microns)
- High Turbidity Automated Pre-filtration (20 microns and 20,000 mg/L TSS): AUTO filter replaces conventional clarifiers.
- Ultrafiltration (UF) Membrane Treatment
- Bag Filtration
- Large Diameter Cartridge Filters and Multi-Cartridge Vessels
- Media Filtration
  - Multi-media high rate filtration
  - Activated carbon filters
  - Iron media filtration
  - Ion exchange softening and specialty resin filters
- Hydrocyclones
- Chemical Injection and Mixing Systems: chlorine, coagulant, biocide, anti-scalant and acid

MEMBRANE DEMINERALIZATION & DEGASIFICATION
- Brackish Water Reverse Osmosis (BWRO)
- Sea Water Reverse Osmosis (SWRO)
- Electrodeionization (EDI)
- RO-EDI System
- Nanofiltration (NF)
- Membrane Contactors (MC) aka Gas Transfer Membrane (GTM): for CO₂ and oxygen removal

WATER SOURCE
- Natural lake / river water intake
- Seawater beach well / open sea
- Brackish ground water well

WATER REUSE & RECLAMATION
- Multi-barrier packaged filtration and demineralization system
- High suspended solids treatment filtration system
- Ultra High Recovery (UHR) Concentrate Elimination System (CES): Membrane-based

Optimize Your Operations
email us at waterpurification@parker.com
PARKER OFFERS:

- Turnkey solutions arrive fully operational after a thorough 100% factory performance test
- Parker manufactured membranes optimized for specific applications
- Parker automation packages with Parker variable frequency drives for high efficiency and low OPEX
- Parker membrane treatment solutions incorporating Parker engineered quality components

GLOBAL CERTIFICATION
Parker systems and components certified to:

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ANCILLARY EQUIPMENT

- Permeate Booster Pumping Systems with automated control
- Clean-In-Place Membrane Cleaning System
- Storage tanks
- Automation packages with VFD control

SERVICES
- Maintenance contracts
- Remote Monitoring and Control
- Mobile Membrane Water Treatment Containers: rental program
- Spare and replacement parts
  - RO Membrane Cartridges
  - Melt-Blown Polypropylene Cartridge Filters
  - High Capacity Pleated Cartridge Filters
  - String Wound Depth Cartridge Filters

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Combined Cycle Power Generating Station

RO-EDI mobile rental option for high purity boiler feed

High pressure demineralized water injection systems

Demineralized water storage

Ultra-high recovery/ZLD advanced membrane treatment systems

ZLD evaporation ponds and sludge drying
Providing water in some of the world’s most challenging environments is a task that requires specialized experience and technology. Parker Water Filtration Systems excels in this area, bringing integrated solutions to our customers around the globe.

PRETREATMENT

**UHF Series Ultrafiltration (UF) Systems**
Parker Water Purification is specialized in providing ultrafiltration (UF) pretreatment and drinking water UF systems using a variety of natural source waters. UF hollow fiber membranes are provided in two configurations, outside-in (O/I) PVDF or inside-out (I/O) multi-bore MPES configurations. Both types of UF membranes are proven to be durable and reliable with high membrane integrity.

- 220 GPM (50 m³/hr) capacity skids (can be combined in parallel for larger flows)
- Low-fouling UF membrane technology
- Filtration to 0.02 microns
- High removal efficiency of bacteria and viruses
- Automated membrane backwashing and chemical cleaning

donnick hunter ParMax™ Select Large Diameter Filter Cartridges
ParMax™ Select Filter Cartridges outperform in high flow, critical process applications like pre-condensate filtration. Unique layered construction together with staged pleating provide an additional 25% surface area and up to 40% more life across a wide range of flux rates. Inside/out flow pattern design ensures positive capture of contaminants. Available in polypropylene depth media and micro-fiberglass media in absolute (99.98%) ratings from 1 to 90 microns. One six-inch diameter cartridge can handle up to 500 GPM (1,892 LPM) per 60” length.

**Fulflo® Filter Bags Provide High Quality, Consistent Filtration Performance**
Fulflo® filter bags are ideal for virtually any process filtration application requiring the removal of solids. Parker’s Fulflo filter bags are manufactured and tested under the strictest quality control standards to assure consistent performance. Parker’s Fulflo filter bags perform at high flow rates and viscosities to 10,000 cps or higher.

- Each bag is incinerable (with Quik-Seal™ option or polypropylene ring), reducing filter disposal costs
- XLH high efficiency filter bags perform at efficiencies similar to depth cartridges. XLH bags are available in 0.5 μm, 1 μm, 2.5 μm, 10 μm and 25 μm particle retention ratings.
- Standard Fulflo filter bags are available in 1 μm to 800 μm particle retention ratings.

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Fulflo® GB Bag Filter Vessels

Designed to handle flow rates of up to 4,200 GPM (15,900 LPM), the Fulflo® GB Series bag and strainer filter vessels provide excellent filtration in a wide range of industrial and chemical applications. All details of design, materials, construction and workmanship of the GB Vessel Series conform to ASME code. Available in carbon steel, 304L and 316L stainless steel.

Multi-Media Filtration Systems

Parker Water Purification Multi-media Filtration Systems offer high performance and are specifically engineered with media layers that are optimized to remove particulate matter from the feed stream ahead of the cartridge filtration system. A proprietary mix of media targets particulate matter such as turbidity and suspended solids that will otherwise overload the micron filtration array of an RO system. In addition, the advanced media design reduces iron, manganese and organics in the feed stream.

Activated Carbon Filters

Parker Water Purification granular activated carbon (GAC) filters are effective in a wide range of applications. GAC filters are used to reduce chlorine and byproducts such as THMs, organics, color, tannin, tastes and odor, DBP, VOC and TOCs from municipal and industrial water supplies. Systems are available in single and multi-vessel configurations for 24/7 operation and include automatic backwash to remove trapped contaminants within the filter bed.

Greensand Media Filters

Parker Water Purification greensand filters effectively reduce soluble iron, manganese, hydrogen sulfide, arsenic and radium from water through oxidation and filtration utilizing a Manganese Greensand media. The Manganese Greensand bed is automatically regenerated on a continuous basis with an oxidation solution. Systems are available in single or multi-vessel configurations for 24/7 operation and include automatic backwash to remove trapped contaminants within the filter bed.

Ion Exchange Softening and Specialty Resin

Parker Water Purification durable high volume water softeners utilize industrial quality cation resin for reduction of hardness in RO pretreatment, cooling tower make-up and boiler feed water to increase thermal efficiency and reduce maintenance costs. Systems include automatic regeneration and backwash to ensure optimal water softening performance. Systems are available in single or multi-vessel configurations for 24/7 operation. Specialty ion exchange systems are also available which utilize resins that have a specific affinity for various contaminants. Some examples of specific contaminant removal are: nitrates, perchlorate, arsenic, fluoride, lead and boron.

Chemical Injection Systems

A complete range of skid mounted chemical dosing systems are available from Parker Water Purification. These systems include dosing pump, tank and skid and are electrically and mechanically assembled and ready to connect to your process. Chemicals are dosed into membrane treatment systems at the optimum and most efficient rate to achieve long-term system performance.

Common dosing applications and chemicals used:
- Disinfection: chlorine
- pH adjustment: acid and caustic
- De-chlorination: sodium bisulfite
- Scale/fouling control: antiscalant
- Filtration aid: coagulant
- Microorganism control: biocide

Monitoring Condition of System

Utilizing Parker state-of-the-art instrumentation and electronic communications technology, customized monitoring systems are developed to provide 24/7/365 system monitoring, operational analysis and alarm notification.

Remote monitoring can also allow for trending and preventative maintenance. In the event a problem does occur the system provides immediate operator notification and response and documentation of the trouble event. Systems can also provide customized reporting and data logging/analysis.
ENGINEERING YOUR WATER QUALITY

MEMBRANE DEMINERALIZATION & DEGASIFICATION

**BW Series Brackish Water Reverse Osmosis (BWRO) Systems**

Parker Water Purification BWRO systems incorporate the latest RO technology to purify water and remove salts and other impurities from brackish water. Standard packaged units have a capacity range from 20 to 250 GPM (3 - 60 m3/hr) which can be combined in parallel for larger flows. Our design can treat brackish water up to 3,000 mS/cm conductivity (EC) and a maximum of 10,000 EC. The BW series RO desalination systems are pre-engineered, pre-assembled and ISO factory tested in the USA to minimize installation and start-up time. Custom engineered BWRO solutions are also available for higher TDS source waters or for larger flow capacities.

**Water Purification SR Series – Seawater Reverse Osmosis (SWRO) Desalination System**

Parker Water Purification SWRO desalination systems are engineered utilizing the latest technology for low pressure operation. Each system is designed for high salt rejection with integrated energy recovery. Systems designed with energy recovery have a nominal capacity of 40 GPM to 150 GPM (9 - 35 m3/hr). Multiple skids/units can be combined in parallel for larger capacity systems and for reliability. Systems include 500 gallon CIP and permeate flush.

**RO-EDI Ultrapure Demineralized Water System**

Parker Water Purification DM series reverse osmosis electrodeionization systems provide ultrapure demineralized water from brackish water sources. Combining the benefits of reverse osmosis and electrodeionization polishing the DM Series provides the latest technology for producing up to 18 megohm ultrapure water. This makes the DM series the ideal solution to replace high-maintenance DI beds.

Standard packaged units offer a capacity range from 25 - 140 GPM, (6 -32 m3/hr) utilizing 1 to 6 membranes.

**Electrodeionization (EDI) Treatment**

Parker Water Purification EDI systems remove trace ionic salts and silica from the RO permeate resulting in ultrapure water. EDI systems are designed for continuous operation to produce greater than 10 megohm resistivity with a high rejection of soluble ionic load up to 98%. Our continuous and chemical-free design provides an economical treatment solution that can eliminate the expensive and hazardous chemicals used in traditional ion exchange resin regeneration. Flow rates up to 140 GPM (32 m3/hr) for packaged systems and 1,000 GPM (225 m3/hr) for custom engineered solutions. Water recovery up to 99%.

- Continuous and chemical-free process
- Water recovery up to 99%
- High rejection of soluble ionic load up to 98%

**Water Purification Nano Series – Nanofiltration (NF) Membrane Water Treatment Systems**

Parker Water Purification utilizes nanofiltration (NF) membrane water treatment for desalination of brackish sourced waters. Nanofiltration membranes are manufactured by Parker to provide ultra-low pressure while rejecting high levels of dissolved contaminants such as silica, organics, TDS, calcium and nitrates. Systems have a nominal capacity of 40 GPM to 150 GPM (9 - 35 m3/hr). Multiple skids/units can be combined in parallel for larger capacity systems and for reliability.
Membrane Contactors / Gas Transfer
Membrane for Degasification
Membrane Contactors (MC) are used around the world to remove dissolved gases from water. They are capable of achieving <1 ppb of O₂ and <1 ppm CO₂. Removing the oxygen and carbon dioxide can reduce deterioration of boilers and piping due to corrosion. Chemical usage may also be reduced which can decrease the blowdown frequency due to scaling from chemical deposits. Carbon dioxide removal can improve efficiency and reduces chemical consumption in mixed bed or EDI technologies. Deoxygenating HRSG feed water during layup and start-up can prevent costly maintenance and downtime.

Ultra-High Recovery (UHR) Systems for ZLD
Parker Water Purification provides Ultra-High Recovery (UHR) membrane water treatment systems that are simple, compact, and reliable. Our zero liquid discharge (ZLD) membrane treatment solutions are designed to operate with recoveries up to 95% versus conventional BWRO systems operating at 70-75% recovery or less. Parker UHR systems economically provide reduced liquid waste-to-drain with simple system operation. Our membrane-based systems provide treatment of RO concentrate from conventional BWRO systems. Membrane technology is utilized in ZLD systems for reduced CAPEX and OPEX relative to expensive thermal alternatives.

COMPLETE RANGE OF SPARE PARTS & CONSUMABLES
Parker offers a complete line of replacement and spare parts including melt-blown, pleated and string wound cartridge filters, pumps/motors, seals, pipes, valves, etc.

AquaPro® Reverse Osmosis Membranes
Parker Water Purification AquaPro® RO, seawater and nanofiltration membranes, 3", 6", and 8", and membrane housings.

Media
Resin, GAC carbon, multi-media and greensand

domnick hunter Fulflo® Honeycomb HFT String Wound Depth Filter Cartridges
Wound cartridges provide true depth filtration by utilizing hundreds of tapered filtering passages of controlled size and shape. Their irregular outer layer reduces surface blinding, assuring both longer cartridge life and full utilization. Parker’s Fulflo® Honeycomb Cartridges demonstrate effective removal ratings at nominal 90% efficiency from 0.5 μm to 150 μm.

Parker Twin Filter TH Series Absolute Rated Filter Cartridges (0.5, 1, 2, 5, 10, 20, 25, 30 and 40 micron)
Parker Twin Filter TH Series Absolute Rated Cartridges utilize a fully thermal welded construction to ensure usage in filtration applications with high temperature fluids, acids, and oily water. The three-layer, 2.5" (63.5 mm) O.D. pleated design incorporates glass fiber between polyester filter layers, including a firm outer-guard, for maximum removal performance, strength, and stability.

- All TH pleated cartridges are Beta 5000 rated (efficiency 99.98%)
- Cartridge lengths: 10", 20", 30", and 40"

Avasan™ High Purity Melt-Blown Depth Filter Cartridges
Avasan™ (AVS) cartridges are an excellent choice for pre-filtration on reverse osmosis systems, and are produced with a proprietary melt blown manufacturing process using a specially formulated polypropylene polymer. This formulation provides a uniquely graded density filter cartridge designed for high purity applications. The fiber matrix of the cartridge has been engineered to provide structural integrity throughout the long service life of the cartridge and the finish-free construction provides optimum fluid purity and eliminates foaming.

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ANCILLARY EQUIPMENT

Clean-In-Place Membrane Cleaning System
Membranes in UF and RO systems can become fouled by suspended solids, microorganisms, and mineral scale. These deposits build up during operation and cause loss in water output, salt rejection, or both. Regular cleaning of the membrane elements minimizes the loss of performance and extends membrane life.

Parker Water Purification Membrane cleaning systems are designed to be used in place without the need to remove membranes from the system. Systems are provided with full drain CIP tank, pumping, automatic heater, hoses and quick disconnect fittings to allow easy connection to the membrane system.

Low Voltage Variable Frequency Drives
Parker designed the new AC10 to be a simple, cost-effective variable speed drive for basic open loop v/f or sensorless vector control for induction and PMAC motors.

InteractX HMI
Ideal for steam pressure control, HRSG/boiler control parameters. The unique interaction between Parker’s InteractX Software and InteractX PowerStations reduces the time, effort, and cost of SCADA application development.

SERVICES & MAINTENANCE
With our network of 500+ distributors and service providers, Parker Water Filtration and Purification Systems offers a full range of partnering options to ensure a lifetime of value for your Parker equipment.

Our services include:
- Installation and start-up
- Preventative maintenance contracts
- Remote monitoring and supervision
- Transportation / logistics
- Mobile membrane water treatment containers – rental and purchase
- Retrofits and upgrades
- On-site training and technical support
- On-site repair
- Design and consultancy
- Workshop repair

CUSTOM ENGINEERED SOLUTIONS
Parker’s advanced water systems can be customized to the special needs of individual customers. We work closely with you to meet all requirements, whether it’s for customized parts, specific production capacities, or a complete system redesign. Systems can be delivered and commissioned anywhere in the world.

Designed and built to the highest standards.
Parker Water Purification’s experienced engineers collaborate with customers to design a water system that meets performance objectives. We then build your system using quality, proven materials and components, incorporating advanced electronics and modern user interfaces that allow ease of operation and maintenance. Parker’s development process also includes extensive testing to ensure flawless operation and adherence to safety standards.

Delivered, commissioned and supported globally.
Our network of local sales representatives work closely with customers to ensure their system is delivered and commissioned promptly and properly. With service specialists located in every part of the world, Parker support is exactly where you need it to be.

Custom system types include:
- Specialty ultrafiltration (UF) and (RO) wastewater treatment and recovery
- Ultra High Recovery (UHF) Concentrate Reduction System: Membrane-based
- Multi-barrier packaged filtration and demineralized system
- High suspended solids treatment filtration system
- Chemical precipitation systems
- Multi-stage pH neutralization systems
Parker Mobile Containerized Membrane Water Treatment Solutions

Parker Water Purification specializes in manufacturing a variety of reliable ISO containerized systems for almost any mobile water treatment application. They are pre-tested and ready to deploy, for rent or purchase.

Seawater or brackish water RO equipment is provided in combination with all needed building blocks to make a complete water treatment package. Including; pre-filtration, chemical feed tanks, booster pumps, automated backwashing and distribution pumps. RO permeate can be further polished with EDI to provide ultrapure quality.

ISO 20 and 40 foot high-cube containers include many fine details such as heavy duty internal and external painting, insulated walls with water resistant sheathing, heat, air conditioning, corrosion resistant flooring, interconnecting piping, wiring, internal lighting and receptacles.

Applications:
- Ultrapure demineralized water
- High pressure boiler feed
- Power augmentation
- NOx emissions reduction
- Cooling tower make-up water
- Emergency relief
- Oil platforms and drilling
- Military
- Remote work camp sites
- Food and beverage production
- Agriculture

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