



Power Generation

Pall Water Treatment Solutions for Power Generation



Filtration. Separation. Solution.SM

Pall Power Generation is a worldwide leader in fluid purification technologies for the power generation industry.

Pall advanced filtration and separation science and high quality manufacturing are applied on all fluids throughout the power plant to improve reliability and ensure clean, available, and profitable power.

With stringent water treatment regulations and a growing demand for safer water, treatment systems must ensure strict compliance with purity standards. Filtration is critical to the success of your water treatment system in meeting purity goals, and traditional filtration methods such as sand and granular mixed media are often inefficient, labor intensive, and costly.

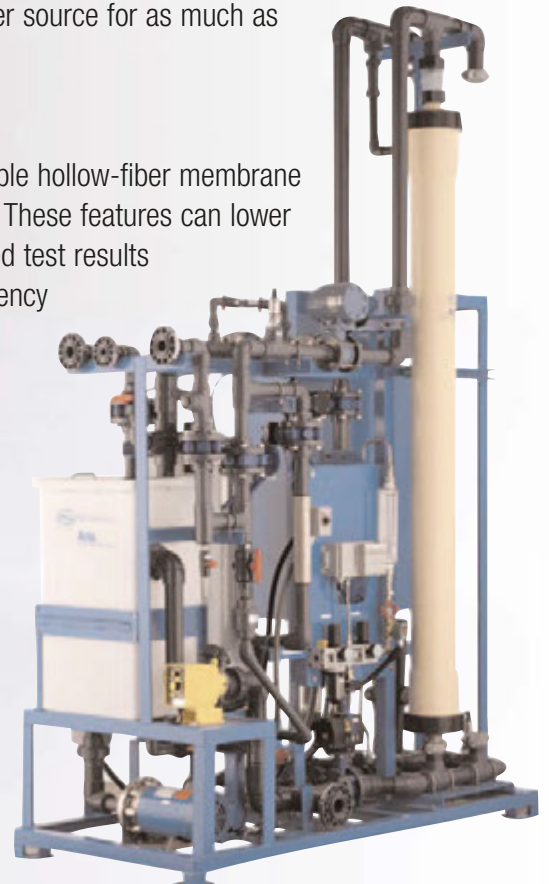
If you need an additional supply of pure water for critical and utility operations, you could benefit from a Pall Aria™ Integrated MF/RO system. The Pall Aria line of water treatment systems uses hollow-fiber microfiltration or ultrafiltration membrane technology to produce pure water from any water source, delivering a consistent, high-quality water source for as much as 50% less than the cost of purchased water.

Cost-effective, efficient, and flexible

At the heart of the Pall Aria system is a highly permeable hollow-fiber membrane with high flow-per-unit area and a high recovery rate. These features can lower the cost of each gallon of water you treat. Documented test results and actual system performance demonstrate the efficiency of the membrane-based Pall Aria filtration system.

You can purchase the Pall Aria system for stand-alone use or for integration with your existing equipment. It's modular design offers flexibility and allows you to customize your system for your unique process application and integration requirements.

The Pall Aria system is offered as both a hollow-fiber MF system for pre-RO, or combined with Pall RO for a complete Pall Aria MF/RO package.





Pall Aria Water Treatment Systems for Plant Water Supply

Water – the most critical component for cost-effective power production

As water becomes increasingly scarce, the biggest issue facing power production is to secure high quality water supply in adequate quantity. New power technologies face an ever-increasing demand for ultra-pure water from alternative sources.

Conventional water treatment systems may not accommodate the strict quality requirements for peak operation of delicate RO membranes, nor are these systems flexible or scalable. Should water quality vary, conventional systems may take a long time to adjust. A pre-treatment system may look like the solution, but the majority of these systems require a lot of space and maintenance.

The Pall Aria System – Safe, reliable, economical, and efficient

The Pall Aria water treatment system is the best way to manage every aspect of water usage. Pall Aria systems are revolutionary turnkey systems designed to provide high-quality water exceeding even the most stringent requirements, from any water source, including: surface water, groundwater, reclaimed water, or secondary effluent.

The Pall Aria water treatment system purifies water for use in steam plant make-up water, gas turbine water supply, drinking water, and cooling tower blow-down. It has a small footprint and is so reliable it significantly reduces water supply costs.

Pall Aria water treatment systems are super-efficient, versatile, and tough:

- Influent Flexible – Pall Aria systems handle variations in water quality/flow rates without interruption
- Consistently provides maximum water quality with minimum intervention
- Reduces the need for chemical treatment prior to RO
- Reduces water supply costs through low chemical usage, low maintenance and small footprint
- Pall Aria systems can be monitored and controlled remotely

Designed to meet water management challenges in power generation, Pall Aria water treatment systems are an economical, flexible, and reliable solution for all your plant water needs.



Pall Aria for Make-Up Water

Pall Aria microfiltration (MF) systems provide consistent high purity water for plant make-up and feed to RO systems for a wide range of influent water sources and water quality. Used extensively around the world, Pall Aria Systems satisfy any and all water requirements including the ability to produce boiler quality feedwater as well as drinking water that meets today's stringent standards.

Pall Aria systems are influent flexible, meaning they can take influent of up to 500 NTUs and higher and consistently produce effluent of less than 0.05 NTUs in a single pass. Pall Aria systems use uniquely designed filtration modules in a hollow fiber configuration to remove fine particulates, bacteria, cysts and oocysts. Iron and manganese can be removed by pre-oxidation, and total organic carbon can be reduced by direct coagulation. The hollow fibers are highly permeable membranes resulting in high water flux rates.

Metals, biological contaminants and bacteria in RO feedwater can quickly escalate operating and maintenance costs. Designed for ease of operation, Pall Aria systems consistently provide a reliable quality feed to RO systems. The systems are complete turnkey solutions to treat water flows from 75 to 875 GPM. They can be easily installed and require little space and maintenance. When real estate is of concern, Pall Aria systems handle more than three times the flow of conventional systems per square foot of floor space. Additionally, the capitalized water treatment cost with a Pall Aria system is less than 50% per one thousand gallon basis of a typical clarifier.

Pall Aria Integrated MF/RO Systems

If you need an additional supply of pure water for critical and utility operations, you could benefit from a Pall Aria Integrated MF/RO system. Not only can the Pall Aria MF/RO system reduce your cost for purchased water, it can provide water that consistently meets critical water quality requirements while effectively protecting the environment.

Value

- Acquire a consistent, high-quality water source for as much as 50% less than the cost of purchased water.
- Decrease dependency on purchased water.
- Reduce wastewater discharge by as much as 80%.
- Reclaim a scarce water resource by using industrial clarified effluent.
- Increase operating profit by reusing an existing resource.
- Obtain a source of high-quality water for critical plant and utility use.

Is This an Opportunity for You?

- Do regulations require you to reuse water before your plant can undergo expansion?
- Do you have more than 100 gpm (23m³/hr) of waste effluent that can be reclaimed?
- Do you need high-quality water for boilers and utility operations?
- Are you interested in significant operating cost savings?
- Is your present total water cost more than \$4.00 per 1000 gals (\$1.00/m³)?
- Does your effluent have the following characteristics: TSS <100 mg/l, BOD <100 mg/l, FOG <20 mg/l, and TDS < 2,500 mg/l?

Why the Pall Aria Integrated MF/RO System?

- Assures consistent production of high quality water from a reclaimed source.
- Provides an integrity testable, positive barrier to TSS and microbial contaminants.
- Protects downstream processes such as electrodeionization (EDI).
- Delivers highly purified, low TDS water.

Features

- Standard designs for trouble-free operation.
- Touch-screen controls for simple operation.
- Modular design for rapid integration.
- Multiple membrane barriers for process protection.

Why Pall?

- Flexible water management: outsource operations, service contract, or service on-demand.
- Flexible project financing: capital purchase, lease-to-own, rent, or purchase treated water.
- Streamlined system design and operation using our experience of over 60 years in the field of water treatment.


- Lifetime system support from filtration experts with excellent track records for customer satisfaction.

Pall Mobile Water Solutions

When facing source water problems, downtime from equipment malfunctions or emergencies, seasonal surges in consumption, or increased demand that exceeds system capacity, municipal and industrial water providers need a solution to rapidly increase production. If they're in the process of building a new facility, they might need a water treatment system to ensure a smooth transition while the old plant is being decommissioned. Pall Corporation offers a solution that supplements or replaces your system on a permanent or temporary basis – “water treatment on wheels.”

The Pall mobile water treatment system comprises a complete, automated, packaged Pall Aria micro-filtration membrane system mounted in a 48' or 53' box trailer. With appropriate site preparation and minimal labor, the system can be operational within hours. All that is required is to supply the source water, connect the effluent pipe, and add 460 VAC 3-phase power.





Using the same state-of-the-art hollow fiber membranes as hundreds of installed Pall Aria systems worldwide, the mobile system transforms ground water, surface water, or secondary effluent into water that is free from harmful bacteria, cysts, and particles. More than one million gallons of water a day can be filtered, to 0.1µm at 90-97% efficiency, for drinking or industrial use.

The Pall Aria system's redundant racks are mounted on skids inside the trailer. Up to 40 microfiltration membrane modules are contained in each rack. The system has a flexible configuration and can be engineered to operate in tandem with other water treatment technologies, such as Pall mobile RO systems.

In addition to housing the system components, the trailer holds equipment to monitor system operation and ensure that the water meets the required quality specifications. Safety features include two exits with platforms and stairs, an eyewash station, interior and emergency lighting, and a glow-in-the-dark walkway.



Membrane Filtration for Safe Drinking Water

Pall Aria water treatment systems are specifically designed to produce drinking water that meets today's stringent standards. The systems use uniquely designed filtration modules in a hollow fiber configuration to remove the following contaminants from surface and ground water sources.

- Suspended Solids/Turbidity
- Viruses
- Bacteria
- Cysts and Oocysts
- Iron and Manganese
- Organics

The Microza* hollow fiber membranes are highly permeable resulting in high water production rates. Each hollow-fiber module provides high active surface area of up to 538 ft². Pall's dedication to a simplified process and control design has produced a family of systems that are characterized by:

- Tough, long-service hollow-fiber membranes
- Operator-friendly controls
- Simple surface water treatment without coagulation
- Easily integrity tested modules
- Unique air scrub and flush operation
- High efficiency, low waste
- Excellent compatibility with chlorine and common treatment chemicals
- Minimal cost of operation
- Easy installation using modular skids
- Compact system footprint
- Full system NSF 61 listing
- ISO 9001-certified manufacturing
- ETV-certified for surface water treatment rule

* Microza is a trademark of Asahi Kasei Corporation

Site testing has confirmed that Pall Aria systems meet or exceed EPA standards for safe drinking water. The system is also the first to receive “full system” certification in accordance with ANSI/NSF 61 specifications.

From 20 million gallons a day for the City of Pittsburgh to local drinking water systems at power plants, Microza MF hollow fibers and Pall Aria systems deliver a safe, automated, and flexible drinking water supply.



***Pall Corporation offers a broad range of financing and rental programs.
Please contact your Pall representative for details.***



Pall Corporation

USA

2200 Northern Blvd.
East Hills, NY 11548
800.645.6532 toll free
516.484.5400 phone
516.484.52284 fax

Beijing

Pall Filter (Beijing) Co., Ltd.
No. 12 Hongda Nanlu
Beijing Economic-Technological
Development Area (BDA)
Beijing 100176, P.R.China
86 10 6780 2288 Phone
86 10 6780 2329 Fax

Canada

Pall Canada Ltd.
7205 Millcreek Drive
Mississauga
Ontario, L5N 3R3
905 542 0330 Phone
905 542 0331 Fax

France

Pall Filtration Industrielle
3, rue des Gaudines
BP 5253
78175 St-Germain-en-Laye
Cedex
33 1 30 61 38 00 Phone
33 1 30 61 57 08 Fax

Germany

Pall GmbH
Philipp-Reis Strasse 6
D-63303 Dreieich, Germany
49 6103 3070 Phone
49 6103 34037 Fax

Japan

Nihon Pall Ltd.
6-8-1 Nishishinjuku
Shinjyuku, Tokyo 163-6017
81 3 6901 5770 Phone
81 3 5322 2126 Fax

Korea

Il-dong Bldg. 4F. 968-5
Daechi-3Dong,
Gangnamgu, Seoul, 135-736, Korea
82 2 560 7800 Phone
82 2 569 9092 Fax

Russia


Commonwealth of Independent
States, Pall GmbH
Mosow Representative Office
Vyatskaya Street 27
Building 13-14
127015 Moscow, Russia
077 95 787 7614 Phone
077 95 787 7615 Fax

United Kingdom

Europa House, Havant Street
Portsmouth PO1 3PD
Hampshire, England
44 23 9 230 3303 Phone
44 23 9 230 2509 Fax

Visit us on the Web at www.pall.com/power

Pall Corporation has offices and plants throughout the world.

© Copyright 2007, Pall Corporation. Pall, , are trademarks of Pall Corporation. Ultipor, Hydro-Guard, Ultipleat, PMM, and Rigimesh, are registered trademarks of Pall Corporation. Pall Aria is a trademark of Pall Corporation. *Filtration. Separation. Solution.SM* is a service mark of Pall Corporation.