



Power Generation

Power
Generation
Condensate
Polishing
Systems



Pall Condensate Polishing Systems for Power Plants

MOST RELIABLE, COST EFFECTIVE CONDENSATE FILTRATION SOLUTION

The power industry is installing **hundreds of new condensate polishing systems** as a result of **increasingly stringent boiler feed water requirements**, the need for **greater power production reliability**, and the demand for **higher efficiency power plants**. Pall Power Generation is the industry leader in **providing filtration systems for power plant condensate**.

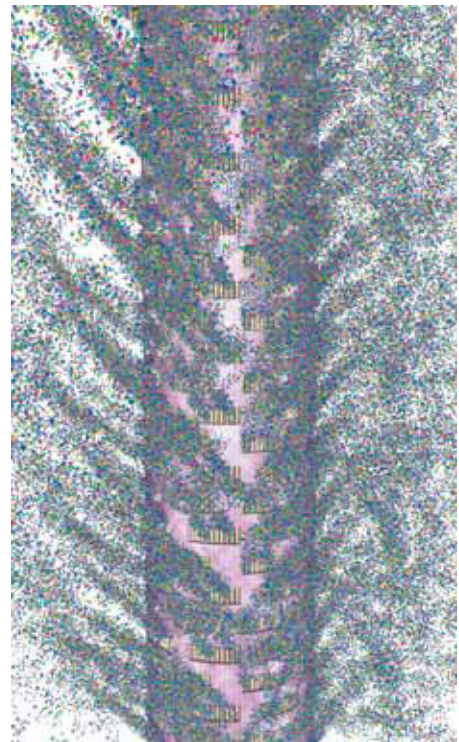
Our combination of **cutting edge filtration products** and a **wide range of system components**, backed by **extensive experience and expertise**, enables Pall to **offer you the optimum condensate polishing system**.

If you need to **retrofit an existing system**, implementing one of our **advanced solutions** can result in **significant process improvements**.

The following pages guide you on selecting the ideal system for your application. Each of **Pall's four condensate polishing systems** is **engineered to address specific application requirements in a particular type of power plant**.

Pall Power Generation Field Engineers, in conjunction with **Pall's Design Engineers**, outline the **system advantages** and recommend the **most performance appropriate, cost effective, condensate polishing system**.

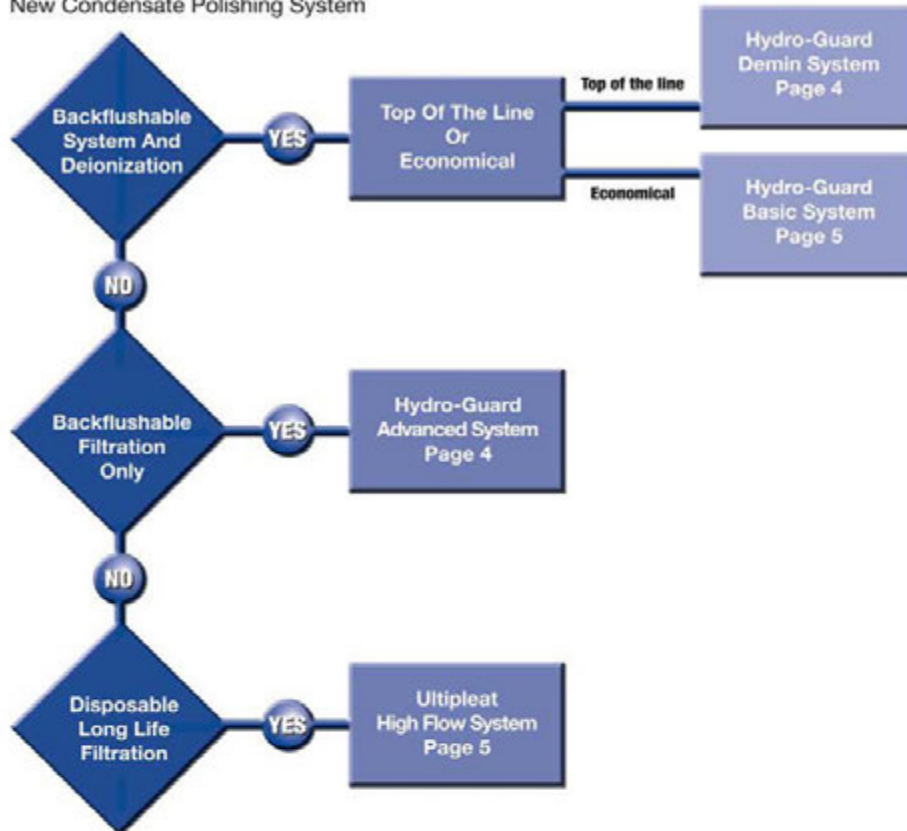
High energy backflush blasts contaminant from the surface of the filter.





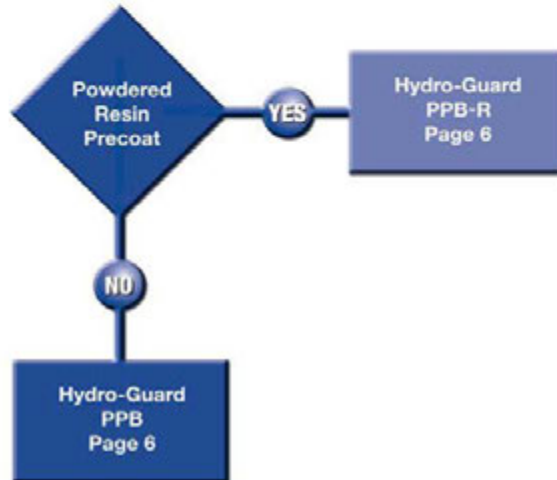
Pall System Selection

New Condensate Polishing System

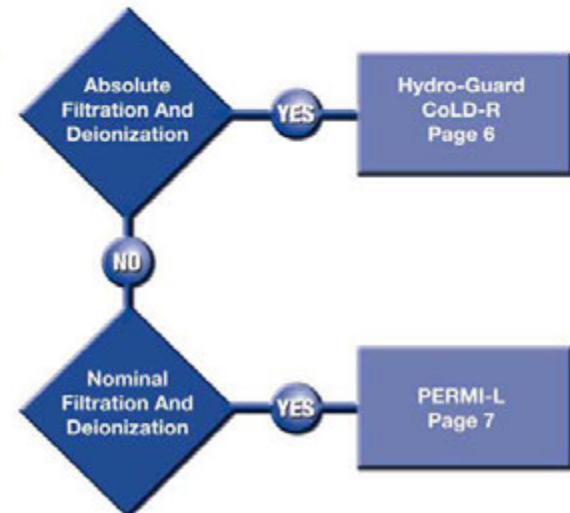


Filter Element Selection (new or existing systems)

High surface area + absolute filtration



Cylindrical filter element (Septa)



Pall Offers a Complete Line of Full Systems

PALL HYDRO-GUARD® DEMIN SYSTEM

Description

The Pall Hydro-Guard Demin System is the highest quality backflushable filtration and deionization system using absolute, high surface area Hydro-Guard PPB-R filters.



Performance

- Delivers excellent condensate deionization combined with absolute iron oxide filtration.
- Solves dissolved and suspended copper, silica and sulfate concerns.
- Cleans resin and captured suspended contaminants from the filters for long filter service life and uniform precoating by using Pall's proprietary backflush protocol effectively.

Features and benefits

- High energy backflush
- Simple operation
- High quality valves
- Uniform precoating
- Operator friendly controls and components
- Easy installation

Filter recommendations

- Hydro-Guard PPB-R filter element
- Hydro-Guard CoLD R or Permi-L filter elements

Applications

- Full flow condensate for air cooled condensers
- Combined cycle condensate
- Once through super critical boilers

PALL HYDRO-GUARD ADVANCED (NON-PRECOAT) SYSTEM

Description

Advanced backflushing protocol, absolute filtration, and the highest quality components make the Hydro-Guard Advanced System the first choice for critical condensate applications.

Performance

- Designed for absolute removal of suspended iron oxide, copper, and other particulate without powdered resin precoating or other filter aids.
- Particle removal efficiencies in excess of 98% can be expected.
- Effectively removes captured particulate from the filter surface thus insuring long filter service life, high condensate throughput between backflushes and low-pressure drops.



Features and benefits

- No expensive and labor-intensive powdered resin precoating
- No hazardous waste disposal
- Reduced power plant start-up time
- Reduced or eliminated copper deposition on turbine blades
- Reduced down stream deep bed cleanings and regenerations

Filter recommendations

- Hydro-Guard PPB filter element

Applications

- Excellent for both fossil and nuclear applications.
- Full flow recommended for once-through super critical boilers.
- Partial flow or start-up only usage may be adequate for drum boiler power plants.



PALL ULTIPLEAT® HIGH FLOW SYSTEM



Description

This proprietary, large diameter, disposable filter system features long filter life and easy filter change outs.

Performance

- Delivers excellent condensate filtration combined with absolute iron oxide removal.
- Captures suspended copper, silica, and sulfate contaminants effectively.
- Captures suspended contaminants inside the filter cylinder for clean and simple filter element removal and disposal via Pall's unique filter construction that uses an inside-out flow design.

Features and benefits

- Patented "Laid Over Pleat Design" permits high flow rates within a given filter envelope.
- Up to 50% smaller filter systems possible.
- Dramatic reduction in number of filter elements to handle.
- All plastic, coreless construction minimizes waste disposal.
- Standard vessels capable of flow rates from 250 to 5000GPM.

Filter recommendations

- Ultipleat High Flow filter cartridge

Applications

- Condensate filtration during plant start-up
- Combined cycle condensate
- Small coal fired plants

PALL HYDRO-GUARD BASIC (BACKFLUSHABLE) SYSTEM

Description

This deionization and backflushable filtration system features a capital cost conserving alternative to the Hydro-Guard Demin System.

Performance

The Hydro-Guard Basic System is an economical system for applications that do not require the critical performance offered by the Hydro-Guard Demin System. This is the basic workhorse of condensate particulate filtration and is ideal for start-up use or full flow use on a tight budget.

Features and benefits

- Effective backflushing saves filter replacement costs
- Absolute iron oxide retention
- Effective deionization
- Basic, reliable valves, controls, and piping designs

Filter recommendations

- Hydro-Guard CoLD R filter element

Applications

- Predominantly used in drum boiler and combined cycle power plants for start-up, partial flow, or full flow condensate polishing.



PALL SYSTEM RETROFITS

Performance

Outdated components on older systems could be hurting your facility's productivity. You can replace outdated control panels, tube sheet assemblies, filter sealing hardware, valves, pumps, precoating systems and filter vessels with quality Pall retrofits. Also, upgrade obsolete string wound filters in existing vessels with high performance elements such as the HGCoLD R Melt Blown backflushable filter.



Features and benefits

- Ensure fewer system breakdowns and repairs with new valves, pumps and filter sealing hardware.
- Achieve longer runs between backflushes, better filtration efficiency, and more productive use of powdered resin precoat with Pall's advanced filter technologies.
- Replace unreliable, irreparable analog systems at reasonable cost with state of the art digital control systems.

Applications

- All 15-year or older powdered resin precoat systems
- Any system using string wound filters
- Any existing backflushable system with analog controls
- Systems using springs to seal filter cartridges

Pall's Advanced Filtration Technology Completes the System

PALL HYDRO-GUARD PPB AND PPB-R BACKFLUSHABLE FILTER CARTRIDGES

Performance

- Absolute iron oxide and insoluble copper retention plus long life and robust construction are reasons that the Hydro-Guard PPB is the most extensively used backflushable pleated filter in power plant condensate worldwide.
- HGPPB filter cartridges are designed for filtration use without powdered resins.
- HGPPB-R filter cartridges, with reduced pleat height, are designed for use with powdered deionization resin for filtration and deionization in one step.

Features and benefits

- Backflushable filter element
- Highly efficient particle removal
- All polypropylene construction
- Low pressure drop
- High surface area
- No fillers, talcs, TiO_2 , or surfactants

Applications

- HGPPB Series filter cartridges perform best when used with the Hydro-Guard Advanced Backflush System.
- HGPPB-R Series filter cartridges are included with the Hydro-Guard Demin Backflush System.



PALL HYDRO-GUARD CoLD R FILTER ELEMENTS

Performance

- Hydro-Guard CoLD R filters are specifically designed for use in backflushable, resin pre-coated power plant applications. The powdered resin removes dissolved and suspended copper, silica, and sulfate contaminants.
- The HGCoLD R filter provides a rigid, low-pressure drop surface to hold the resin in a consistently even layer from top to bottom.



Features and benefits

- CoLD fiber construction resists media compression common to conventional string wound filters.
- Melt bonded connections prevent bypass, common to string wound filters.
- No surfactants, binders, or adhesives that can be extracted into the process.
- Proprietary construction traps resin at the filter medium surface.

Applications

- Full flow condensate for air cooled condensers
- Combined cycle condensate
- Once through super critical boilers

PALL PERMI-L FILTER ELEMENTS

Performance

Replacement of conventional string or metal filters in existing vessels with high performance PERMI-L filter elements results in improved filtration, resin life, and dissolved contaminant removal efficiency.



Features and benefits

- Used with conventional backflush systems.
- Retrofits into existing hardware or can be custom designed for the application.
- Made with continuous filament yarn for added durability. No fiber deterioration or migration.
- Uniquely designed and processed filament minimizes extractables and eliminates start-up rinse.

Applications

- Used in both Fossil and Nuclear applications.
- Is currently used in many conventional systems.
- Designed for removal of ionic contaminants and iron oxides.
- Can also be supplied for high temperature (300°F/150°C) use.

PALL FILTER SEALING HARDWARE

Performance

For installations using spring type sealing devices, consider upgrading to a higher integrity sealing system. The Power Seal Pak is cutting edge technology and is ideal for retrofitting bottom tube sheet condensate filter demineralizers or for new vessel construction. The new Power Seal Pak stainless steel hardware attaches directly to the standing tubes on the bottom tube sheet after removal of the 'old' hardware.

Features and benefits

- One-piece construction
- Reusable full flow center core
- Patented pressure energized sealing from gasket to core
- Manufactured according to ISO standards
- Operator friendly installation
- Use with any Hydro-Guard filter

Applications

- Full flow condensate for air cooled condensers
- Combined cycle condensate
- Once through super critical boilers, drum boilers, BWR condensate, and PWR condensate



PALL SCIENTIFIC LABORATORIES & QUALITY CONTROL

Pall's Manufacturing Expertise

Highly trained manufacturing personnel melt blow polymeric filter media and assemble condensate filters in a clean, controlled environment. Modern techniques and cutting edge equipment, applied according to ISO9001-2000 standards, result in the highest quality filters for the customer. Condensate customers rely on Pall manufacturing's consistency, dependability and on-time delivery.

Proprietary manufacturing equipment, patented filter products, and rigorous quality control measures make Pall's condensate filter offering unique and highly desired around the world.



Efficiency testing lab



Extractables testing lab



Pleated manufacturing area



Melt blown area

Pall's Scientific and Laboratory Services

Pall's Scientific and Laboratory Services (SLS) team consists of hundreds of scientists and engineers, most with advanced degrees working in 41 labs around the world. These filtration experts can apply their years of experience investigating and solving the often complex problems surrounding fluid clarification and membrane-based separation processes to provide you with the best solution for your particular application.

Working jointly with customers, SLS team members evaluate filters, employing post-use, state-of-the-art particle counting and other advanced techniques in order to establish optimum filter life. Should a standard product not meet your needs, custom solutions can also be developed. SLS support and service are available to all Pall customers, worldwide.

Whether pushing the envelope to develop cutting edge solutions or assisting with routine, day-to-day operations, Pall customers can count on SLS for a proactive response that is fast and particularly tuned in to the unique filtration requirements in their specific applications.



Power Generation

2200 Northern Boulevard
East Hills, New York 11548-1289

888.873.7255 toll free
516.484.5400 phone
516.484.0364 fax
www.pall.com/powerflow

Visit us on the Web at www.pall.com

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