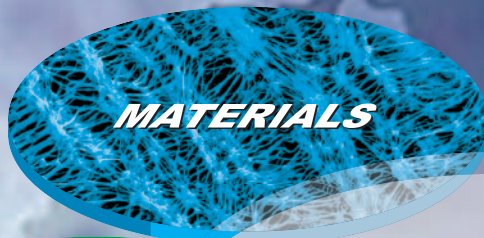




Microelectronics

Total Fluid Management for Microelectronics Customers

Meeting the Challenges of Fluid Management



CUSTOMERS



Filtration. Separation. Solution.SM

Total Fluid Management for Microelectronics Customers

Meeting the Challenges of Fluid Management

In the microelectronics industry, manufacturing processes are cumulative: each process in a facility is affected by the output of the previous process. When particles and other impurities are present in the chemicals, water and gases used in the process, product yield is reduced. Carefully planned filtration and purification optimizes the output of each process, resulting in improved yields and manufacturing cost reductions.

At the end of a process, wastewater and chemicals must be disposed of in a manner that meets environmental health and safety requirements. By effectively filtering contaminants out of the effluent, waste disposal costs can be significantly reduced. Clean permeate can be reused, resulting in additional savings.

To conquer the challenges of fluid management and thereby control costs and increase yield, knowledgeable filtration experts must manage all the fluids in a manufacturing process.

What is Total Fluid Management?

Total Fluid Management (TFM) is Pall Corporation's program by which we synergistically combine our filtration, separation and service offerings to provide efficient and cost-effective fluid management. By controlling the overall operation as though it were a single system, in addition to addressing the filtration, separation and purification needs at specific points, you'll experience greater consistency in your manufacturing processes. Greater consistency translates into higher yields, reliable product quality, and less waste. Customers can realize a return on investment in as little as six months after deploying a Pall TFM solution.

What Can Pall Do for You?

Pall Corporation is the largest and most diverse filtration, separation and purification company in the world. For nearly 60 years, our extensive product portfolio has enabled us to deliver a range of fluid management capabilities that is unmatched by any competitor.

In addition to our filtration, separation and purification products, Pall offers you another resource that is unmatched in the industry: our Scientific and Laboratory Services group. Comprised of hundreds of scientists in laboratories around the world, this elite group is experienced with processes ranging from microelectronics manufacturing to water processing. They apply their knowledge and expertise to deliver Total Fluid Management for microelectronics customers.



Pall Products and Services for Your Application

You may be familiar with Pall filters, but you may not be aware of the many other ways we can help streamline your manufacturing process. With your customized TFM program, our systems, technologies, materials, and services will be expertly combined to benefit you and your business. The following is an overview of our capabilities.

Systems

Pall Corporation is a major manufacturer of complete engineered systems for the treatment of incoming water, gases and chemicals, as well as outgoing waste streams. We manufacture (or source through our alliance partners) products and components to deliver the following types of systems:



Pall Aria™ system

Type	Description
Aerobic biological treatment	Usually used after anaerobic digestion, a treatment that may also be used in conjunction with membranes to enhance the biological process and improve the quality of effluent.
Anaerobic biological treatment	A treatment that uses bacteria to break down biological material in wastewater from manufacturing processes. Can be used before aerobic treatment.
Backwash	A self-cleaning system that filters the solids from the fluids in a manufacturing process.
Blowback	A self-cleaning system that filters the solids out of the gases in a manufacturing process.
Electrodeionization (EDI)	A system for producing high-purity water using ion exchange membranes, resins and electricity. When used with reverse osmosis, EDI strips away more than 99.9 percent of feedwater ions.
Filter press	A system that removes suspended solids by feeding a liquid through a channel in the center of plates with a filter cloth stretched over the surface. Studs or corrugations on the plate surface enable the filtrate to be discharged.
Ion exchange	A system that uses resin beads for producing high-purity water. Also used to remove contaminants from surface water, ground water and leachate. The process yields a secondary waste stream that requires further treatment and disposal.
Microfiltration	A low-pressure membrane filtration system that removes suspended solids and colloids larger than 0.1 microns.
Reverse osmosis (RO)	A system that separates water from dissolved salts by passing feedwater through a semi-permeable membrane at a pressure greater than the osmotic pressure caused by the dissolved salts.
Ultrafiltration	A low-pressure membrane filtration system that removes suspended solutes and colloids in the 20-1000 angstrom (up to 0.1 micron) size range. Also used in diafiltration mode to provide purification and product washing.
Water softener	An ion exchange system that removes calcium and magnesium ions or soluble iron from hard water.

Greater consistency in the manufacturing process translates into higher yields, reliable product quality and reduced production costs.

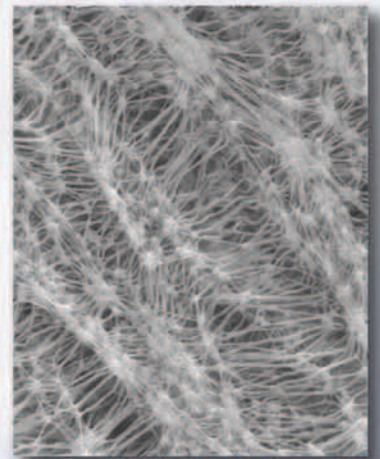
Coalescers

Coalescers are used to remove entrained liquids from gases or to separate immiscible liquids. Pall Corporation offers proven technologies for both types of applications: removing liquids from gases and removing liquids from liquids.

Materials

Pall Corporation manufactures a wide variety of engineered materials for use in its own products and for integration into customer OEM assemblies. These materials must meet strict specifications and tolerances. Pall's scientists have the technology to modify materials to fit your specific requirements. The following are examples of materials that suit a variety of functions, ranging from filtration and purification to venting and wicking.

- Polymeric
 - Nylon
 - PES (polyethersulfone)
 - Polypropylene
 - PS (polysulfone)
 - PTFE (polytetrafluoroethylene)
 - PVDF (polyvinylidene fluoride)
 - High density polyethylene
- Ceramic
 - Alumina
 - Alumina/titania
 - Alumina/zirconia
- Metallic
 - Porous stainless steel
 - Fiber
 - Powder
 - Other alloys
- Purification
 - AresKleen™ carbon/ reactive metal



PTFE membrane

Direct Flow Filters

Pall delivers the widest variety of filtration products in the world. We supply filters that are designed in many configurations and comprised of materials with pore sizes that meet virtually any customer need. Some examples of the types of filters that we offer are as follows.

- Ceramic
- Membrane
 - Nylon
 - PES (polyethersulfone)
 - PS (polysulfone)
 - PTFE (polytetrafluoroethylene)
 - PVDF (polyvinylidene fluoride)
 - High density polyethylene
- Depth
 - Nylon
 - Polyphenylene sulfide
 - Polypropylene
- Cleanable
 - Stainless steel
 - Other alloys



Emflon®-PF filter



Crossflow Filters

Pall's portfolio of crossflow microfiltration and ultrafiltration filters ranges from hollow fiber and cassette to tubular designs. The filters are available in ratings from 1kD to 1 micron. Some of the types of crossflow solutions that we offer are:

- **Polymeric**
 - Cellulose
 - Polyacrylonitrile
 - Polyethylene
 - PS (polysulfone)
 - PVDF (polyvinylidene fluoride)
- **Ceramic**
 - Alumina
 - Alumina/titania
 - Alumina/zirconia
- **Metallic**
 - Nickel
 - Stainless steel

Surface Treatments

Pall Corporation has developed surface treatment processes for its own filtration media that can be applied to your products or components. Ask us about solutions for your specific surface treatment application.



GasKleen® TM purifier

Purifiers

Pall manufactures materials and membranes to help meet the critical purification needs of our microelectronics customers. For example:

AnionKleen purifier	An ion exchange membrane that removes anions from ultrapure water and solvents in final cleaning processes.
AresKleen™ purification media	A reactive gas purification material that removes contamination from process gases while providing 0.003- μm filtration when installed in purification devices. Controls and reduces impurities such as O_2 , H_2O , CO_2 , CO , NMHC, $\text{Ni}(\text{CO})_4$ and $\text{Fe}(\text{CO})_5$.
Gaskleen® PPT purification medium	A unique combination of all-metal filtration and reactive purification technology that removes gaseous impurities down to ppt (parts per trillion) levels and solid contaminants down to 0.003 micron from gases in extremely critical applications
IonKleen™ purifier	A membrane that immediately removes cations from ultrapure water (AQ version) and solvents (SL version) in final cleaning processes. Used in the manufacture of photoresists and for ultra high purity solvent and water applications.

Chromatography

Pall manufactures both column and membrane-based chromatography technologies to separate molecules based on differences in their properties. Example products include Mustang® and Resolute™, which are chromatography columns that remove contaminants from downstream processes.

Scientific Services

Pall delivers consulting and analytical services to assist with your filtration, separation and purification requirements.

Our services include:

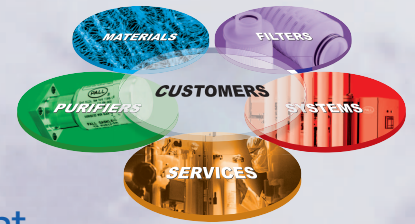
- Contamination control solutions involving state-of-the-art analytical methodologies and filtration/purification expertise
- Bulk gas area distribution surveys
- Design support, including consultation and engineering
- Facilities, process and system audits
- Training for your staff on the basic principles of filtration, contamination control, or fluid sampling and monitoring
- Waste stream consultation to improve recovery of water and chemicals and reduce waste volume
- Water system surveys



System Services

Pall's System Services team delivers a complete range of system repair and upgrade services in support of our systems technologies. Your service agreement will provide the level of support that is right for your system, process application and budget. For example, you can choose:

- Corrective maintenance to troubleshoot, adjust, repair and/or replace system components
- Inspections of the system, controls, instrumentation, and filter media
- Operation services for full-time or periodic oversight of your system
- Process audits and consulting
- Remote monitoring to track, report and/or adjust the system via modem
- Scheduled maintenance, including clean-in-place, integrity testing, and preventative maintenance
- Startup services to commission the system and ensure operability
- Support hotline, 24/7
- Training for your staff on system operations or maintenance



Source Water and Wastewater Treatment

Like other manufacturers, you may be contending with the need for consistent high purity source water for your manufacturing processes. At the same time, your water distribution system may be outdated. Your water supplier may be passing on additional expenses while it struggles to meet the increasing demand for safe, clean water. If you're using surface or groundwater as your intake source, it must be treated to remove particles, corrosive metals and salts. Now more than ever, Pall Corporation is qualified to deliver a total solution for water management in your manufacturing process. Our strategic alliance with GE Infrastructure, Water & Process Technologies enables us to draw on each other's strengths in materials development and applications and process engineering to provide an even broader array of capabilities.

Let Pall Solve Your Fluid Management Challenges

To meet your filtration, purification and separation challenges, Pall delivers Total Fluid Management—a synergistic, expertly planned program comprised of products, systems and services. We'll bring the strengths of Pall's Scientific Laboratory Services team, our Microelectronics team and strategic allies such as GE to streamline fluid management at your facility. If you're interested in reducing the total cost of production and increasing yield, consider partnering with global filtration leader Pall Corporation. Total Fluid Management is the answer to all your fluid management challenges.

**Sound intriguing? Contact us to get started:
1.800.360.7255 toll free in the US or 1.516.484.5400.**



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