



Pall Corporation

Contamination Control for the Primary Metals Industry

Filtration. Separation. Solution.SM

Your Partner in Contamination Control

Pall Corporation is the global leader in filtration, separation, and purification. With a broad range of products and services, Pall continually demonstrates its ability to solve contamination issues, improve fluid quality, and increase customers' profitability by optimizing the performance and reliability of their plant's equipment and enhancing their processes.

Metals Producers and OEMs Trust Pall as Their Solution Provider

Solid, liquid, and dissolved contaminants present in hydraulic, lube, and aqueous solutions can cause operating problems and increased maintenance in hydraulic, lubricant, coolant, and other fluid systems that are a part of primary metals processing. Left unchecked, these contaminants can increase operation and maintenance costs, decrease equipment availability, and affect the quality of finished products. Such issues can be resolved by the use of highly effective, reliable, and correctly applied filtration and separation technologies.

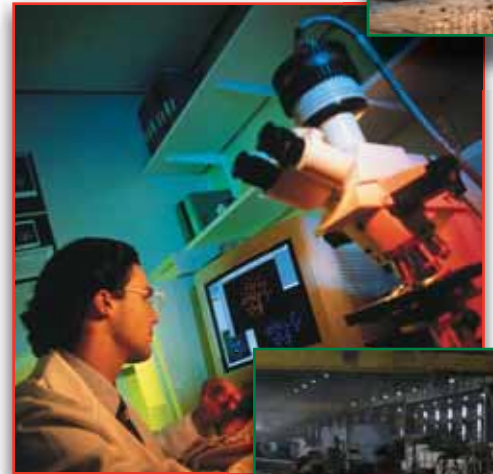
Process Improvement and Equipment Reliability

Metal producers are under constant pressure to reduce costs and improve operations and profits. To accomplish this, manufacturers must regularly seek new ways to improve efficiency while continuing to produce high-quality products at profitable prices. Pall can play a key role in this continuous improvement process by implementing a program of Total Cleanliness Management (TCM). Through TCM, Pall can help you improve your processes and gain a stronger competitive edge.

What is Total Cleanliness Management?

TCM is a program developed by Pall to help customers maintain specified fluid cleanliness levels throughout their manufacturing process. TCM is the integration of products and services that optimize productivity, reliability, quality, safety, and environmental protection to reduce overall operating costs and improve efficiencies.

Pall delivers unmatched value to the primary metals industry through its superior products and services.





Scientific and Laboratory Services (SLS)

Pall has built a global organization of over 150 scientists and engineers who are experts in their fields to supply specialized services to our customers around the globe. Our laboratories are equipped with the latest analytical equipment to support complex contamination and filtration concerns. Our SLS team constantly evaluates new separation technologies and products using industry-accepted standards.

Fluid Analysis Services

Pall offers scheduled oil analysis programs that are typically used by predictive maintenance departments. Our specialists will work with you to establish sampling frequency, cleanliness targets, and fundamental oil analysis requirements. Fluid analysis can be the single most effective tool to monitor the health of lube and hydraulic systems.

Equipment Surveys & Consultation

Pall routinely conducts plant surveys to understand the performance of existing equipment and to identify opportunities for process or equipment improvements. Our experienced personnel will document existing equipment, operating conditions, performance, and other relative data to determine if improvements or upgrades are needed. A technical report will be issued documenting our findings and recommendations for improvement.

Contamination Control Seminars

Pall can help improve plant personnel's knowledge of contamination control and filtration through cost-effective, on-site seminars. In these sessions, Pall provides detailed descriptions of the impact of contaminants on system performance and reliability and supports its findings through data obtained by independent studies. Seminars can be customized to meet specific customer needs.

Process Audits

The purpose of a process audit is to understand the performance of existing equipment and analyze the ingress of contamination and its effect on the product or process. In today's business climate, product quality and resource management is of vital importance. Plants are increasingly moving towards zero discharge and efficient utilization of natural resources is critical.

Commissioning and Flushing

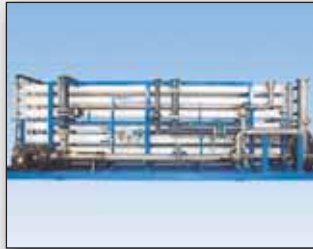
Pall has an extensive network of distributors and customer service centers located throughout the world to offer customers support as needed. Pall provides flushing, monitoring, and consulting services during plant overhauls and system flushes on a regular basis. With Pall's products, monitoring equipment, and field expertise, customers are able to get back online faster and more efficiently, saving valuable time and money. The result is greater output and operating profits.

Pall Products Used in the Primary Metals Industry

Pall Aria™ AP-2 microfiltration system operating on surface water to produce potable water



Reverse osmosis filtration system for process make-up water



Centralized lube system for hot mill drive system



High pressure filters used on automatic gauge control system



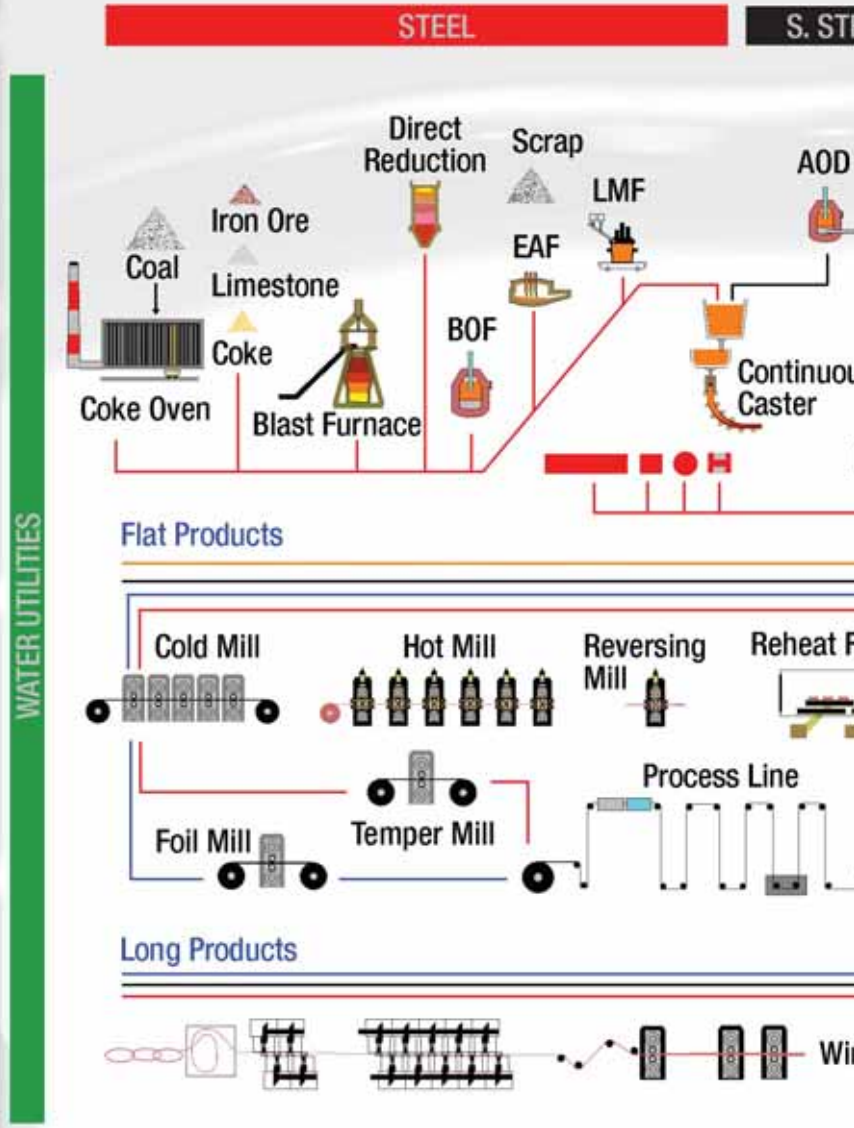
Hydraulic system filtration on hot strip rolling mill



High volume oil purifier used on 2000 mm plate mill lubricating system



Continuous caster hydraulic system



Duplex filter assembly used to protect high pressure hydrostatic lift pump



Kidney loop filtration on cold mill back-up roll lubrication system



Ceramic membrane system used for caustic degreasing solution on cold galvanizing line

Oil purifier used for hydraulic and lube systems

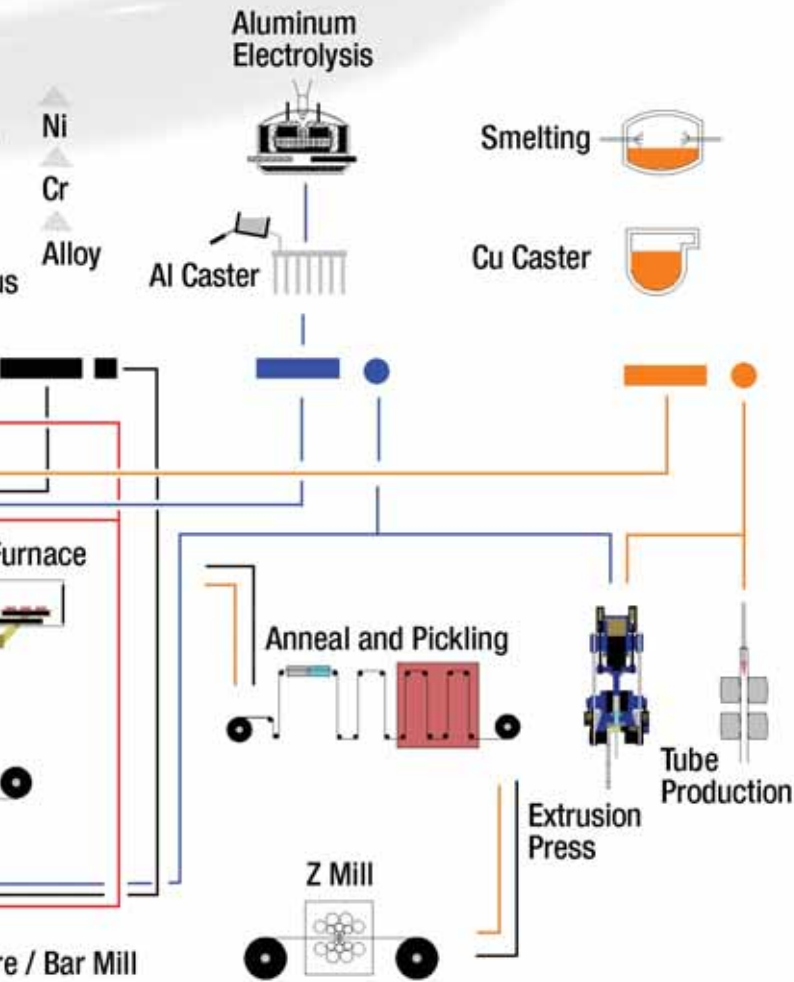


Utiplateat® high flow filters for non-contact water



Ceramic membrane system used to treat emulsion wastewater from cold rolling operation

STEEL ALUMINUM COPPER



Last chance filtration for copper cold rolling mill, coolant, and lubricating system



Backwash filters used for stainless steel rolling mill. Five hundred elements used for secondary treatment of backwash waste



Kidney loop filtration used for aluminum extrusion press



Customized air breather for extrusion and carbon anode press



Membrane to treat passing continuous line



Bank of filters used on return line for auxiliary hydraulic power unit



Multi-round filter housing used for wire/bar mill lubricating system



Water sensor used to detect the amount of water in hydraulic and lube systems

Pall designs and supplies a wide range of products to remove contaminants from liquids and gases. Our products, along with our services and technical expertise, enable us to fulfill diverse fluid purification requirements throughout all major primary metals operations.

Contamination Control Products

1 Hydraulic and Lube Filtration Ultipleat SRT Filters

Ultipleat SRT filters offer revolutionary filtration technology for hydraulic and lube applications. Features include smaller size, increased resistance to system stresses, high flow capability, and an ISO code cleanliness rating based on SAE ARP4205. Customer benefits include improved cleanliness control and increased equipment protection and reliability.

2 Water Removal from Hydraulic and Lube Oils Vacuum Dehydration Purifiers

Water, gas and solid contaminants in hydraulic and lubricating fluids have a detrimental affect on system performance. In order to maintain the health of these systems, free and dissolved water and gases should be removed.

Pall's vacuum dehydration purifiers are designed to remove 100% of the free gases and water (under steady state conditions), and up to 80% of the dissolved gases and water. Our purifiers are also designed to remove solid contaminants, utilizing high efficiency filters with a particle removal efficiency rating of 99.9% at the 3 micron size range.

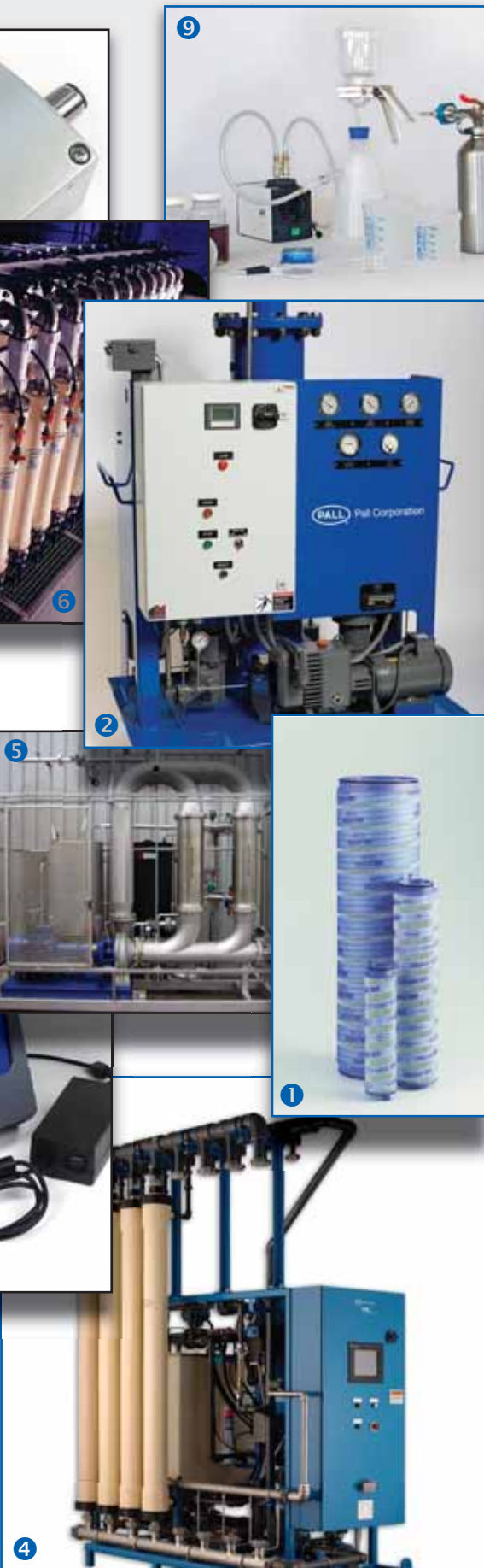
3 Coolant and Process Applications Melt Blown Filter Elements

Recognizing that different applications have different contamination loading and debris profiles, Pall offers a broad range of melt blown filter products to meet varying process requirements in lubrication, coolant, and other process applications. Pall's family of melt blown filter elements are made using continuously extruded fine fibers to form a highly porous, high strength filter matrix with superior on-stream service life, low pressure drops, and consistent contamination removal performance.

4 Incoming Water Pall Aria Membrane Systems

Pall Aria water treatment systems are specifically designed to produce potable drinking water that meets today's stringent quality standards. Pall Aria systems use uniquely designed hollow fiber membrane modules to remove turbidity, bacteria, cysts and oocysts, iron, and manganese from ground and surface waters, as well as secondary wastewater effluent streams.





5 Wastewater & Alkali Solutions Ceramic Membrane Systems

Pall's ceramic membrane systems are used to treat spent oil emulsions and have proven to be effective in caustic degreasing in the metals industry. With this novel approach to treatment, fewer chemicals are used and discharge waste and sludge are minimized. Pall's ceramic membranes and systems offer superior resistance to thermal and chemical degradation when facing water with extremes in pH and temperature. The membranes can easily be cleaned and regenerated providing superior service life and economy for the customer.

6 Rolling Mill Coolant Systems Microfiltration (MF) Systems

Pall offers a range of microfiltration systems which are used to remove suspended solids from highly contaminated fluid streams. The robust nature of our hollow fiber membrane technology allows these systems to manage highly contaminated feed streams. This technology offers a new approach for treating many process coolant streams found in aluminum, stainless steel, and copper rolling mills.

Contamination Monitoring

7 Particulate Contamination Monitors

Obtaining accurate and reliable fluid cleanliness data quickly in order to detect abnormal contamination levels is a key factor in ensuring the required cleanliness for fluid systems. Pall provides portable devices that give plant operators the ability to measure the cleanliness of fluids simply, quickly, and reliably. Pall offers two types of cleanliness monitors — mesh blockage for emulsions and aqueous fluids and laser light particle counters for mineral, synthetic- and hydrocarbon-based fluids.

8 Water Sensors

Hydraulic or lube systems should be operated with minimal concentrations of water. Pall's water sensors detect water in solution within the fluid, displayed as a percentage of the fluid saturation level at the measurement temperature, or expressed as parts per million (PPM), specific to each brand of fluid. Options include a handheld unit for a 'point-in-time' reading or a permanent unit which can provide continuous or timed monitoring.

9 Pall Fluid Analysis Services

Pall offers multiple levels of fluid analysis services to meet the varying needs of our customers. Level I fluid analysis uses Pall's portable fluid contamination analysis kit and fluid contamination comparator tool to provide rapid, on-site, real-time assessment of the health of lubricating and hydraulic systems. With this service, we provide approximate fluid contamination levels as well as particle size distribution and contaminant identification. Level II services provide quantitative fluid contamination analysis and can be custom tailored to meet individual plant requirements. Pall fluid analysis programs* can be a highly effective tool to monitor the health of lubricating and hydraulic systems.

* Not available in all regions. Contact your local Pall representative.



For more than 60 years, Pall Corporation has been solving complex filtration, separation, purification, and contamination control problems for diverse customers around the world. In the metals industry, Pall has developed separation solutions that reduce contamination and improve performance.

Worldwide, 88% of Pall's manufacturing facilities have achieved ISO 14001 certification (international standard for environmental management systems) to date. The program has helped Pall minimize environmental impact, improve compliance, and reduce costs. Pall's manufacturing facilities are also ISO 9001 certified and follow a strict world-class manufacturing philosophy.

Pall's approach to environmental stewardship is proactive and is anchored in a culture of continuous improvement. Pall helps customers to minimize their environmental impact, while simultaneously working to reduce its own. To see how Pall is helping enable a greener and more sustainable future, visit www.pall.com/green.

We invite you to learn more about Pall's wide array of products and services. For more information, contact your local Pall representative or visit us on the web at: www.pall.com.



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