

For Industrial Process Fluids



LAKOS
Liquid • Solids Separation Systems®

Effective, Comprehensive Separation Solutions

You can remove solids from liquids with a variety of products. You know the drawbacks of traditional filtration. You have the opportunity to make a much better choice. LAKOS Separators employ centrifugal action to remove troublesome solids from liquids. To extend the effective life of process liquids. To protect process equipment from abrasive wear and fouling. To control or eliminate waste liquid/solids. To reduce downtime and maintenance. To keep your fluid systems operating at optimum efficiency.

What Makes LAKOS Different Is What Makes LAKOS Better

Not just solids removal, but also the concentration and transfer of separated solids (with little or no liquid loss) to your choice of solids-handling device. Reduced liquid waste. Reduced solids waste handling...and costs. Reduced space, processing and maintenance. Proven payback value.

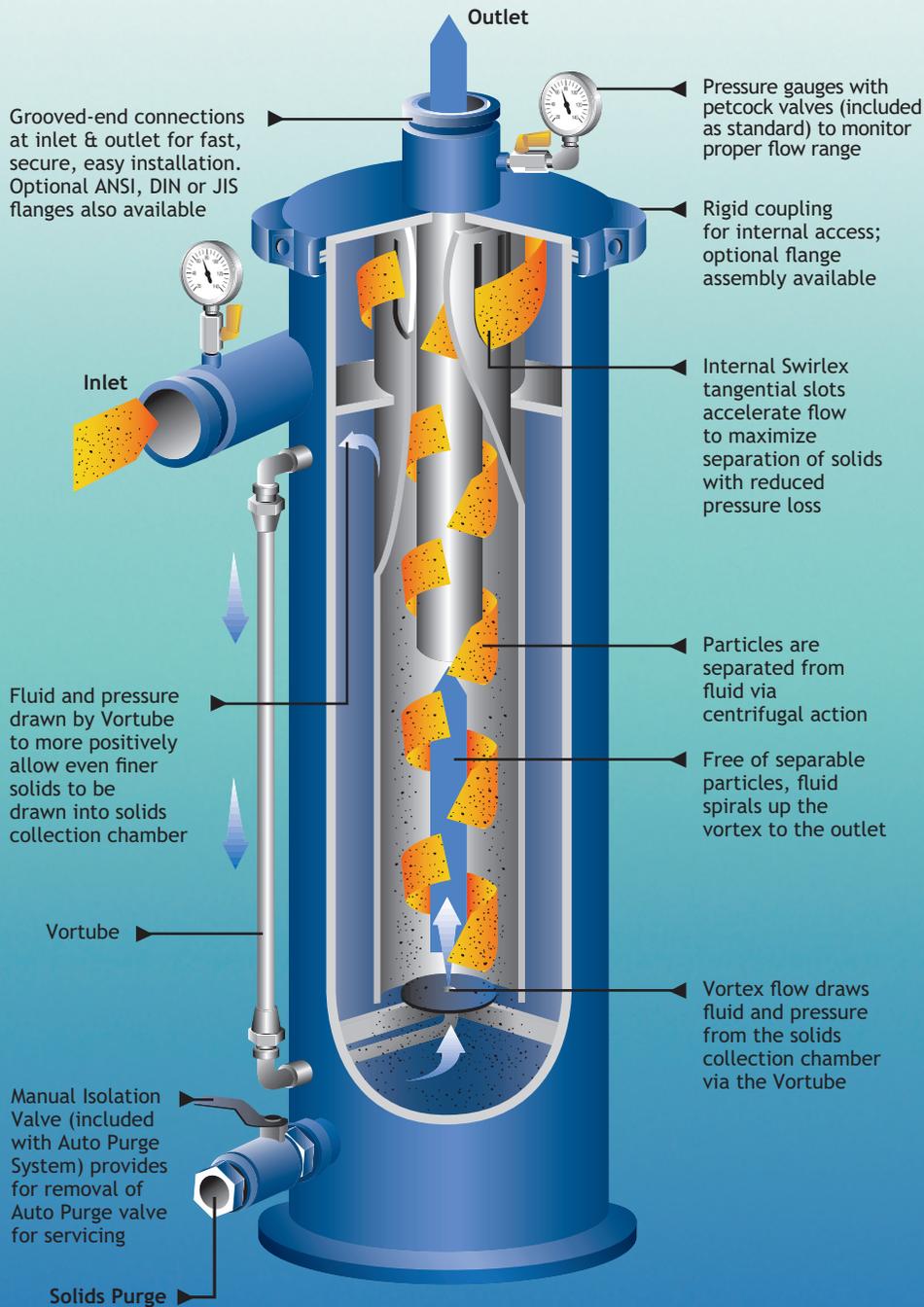
Effective solids removal performance is engineered into every model series. Matched with your choice of purging and solids-handling systems, LAKOS

assembles specific solutions for your specific problems. Complete systems. Engineered compatibility. Simplified, one-source purchasing. Easy installation. Reliable start-up and operation. Dependability you can trust.

LAKOS has been providing innovative and adaptable solutions for over twenty-five years throughout the world. Experienced and systems-oriented, LAKOS welcomes your application challenges.



How It Works



- ▶ No moving parts to wear out.
- ▶ No screens, cartridges, cones or filter elements to clean or replace.
- ▶ No backwashing.
- ▶ No routine maintenance or downtime requirements.
- ▶ No standby equipment needs.
- ▶ Low and steady pressure loss.
- ▶ Easily automated.
- ▶ Compact, space-saving profiles.
- ▶ Little or no liquid loss.
- ▶ Effective solids concentration for easy disposal/recovery.

LAKOS By Comparison

Use this simple criteria to effectively compare LAKOS Separators to any other filtration/separation technology:

Particle size removal

See page 4 for LAKOS details.

Pressure loss

LAKOS Separators operate at a steady low of only 3-12 psi (0.2-0.8 bar).

Liquid loss and solids handling

See page 6 for LAKOS details.

Replacement parts

LAKOS requires no replacement parts.

Maintenance requirements

Easily automated; no system shutdowns. See page 6 for more details.

Space requirements

Lowest space requirements of any filtration/separation technology.

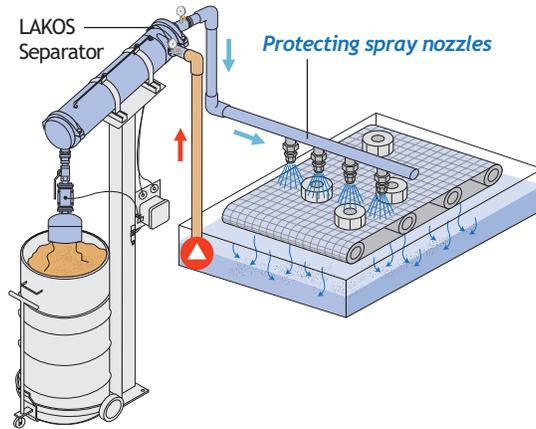
Protect Your Fluid System Applications With The Performance of LAKOS

The potential for LAKOS Separators exists in virtually all fluid flow systems, particularly in the applications noted.

Put our experience to work solving your toughest problems.

Compare your operating costs to the payback value LAKOS offers in these areas. Call us for immediate and specific application assistance.

Typical Applications

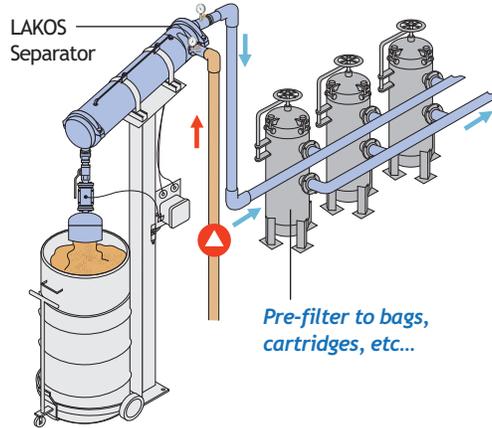


Spray nozzle and small orifice protection

Avoid fouling, clogging and/or abrasive wear. Eliminate excessive downtime, maintenance and/or parts replacements.

Extend the life of finer filtration and water treatment systems

Reduce fine-micron cartridge or bag filter consumption with the pre-removal of larger solids (see performance at right). Extend the operating cycles of filter elements and water treatment processes. Reduce maintenance, downtime and filter media replacement costs.

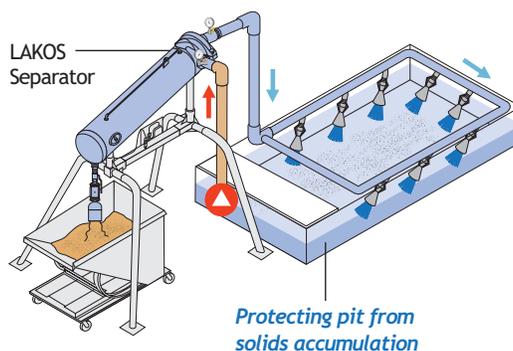


Heat exchanger protection

Control solids fouling. Remove precipitated grit and scale. Maintain optimum system efficiencies and avoid excessive energy loss.

Prevent excessive solids accumulation in pits, sumps and tanks

Cooling tower basins. Quench pits. Parts washing tanks. Eliminate solids build-up and the inevitable shutdowns, shoveling and maintenance routines. Avoid solids-induced bacteria growth and premature liquid disposal.



Waste minimization

Extend the life of process liquids by removing troublesome solids. Concentrate separated solids for easy disposal or recovery/re-use. Reduce your EPA-regulated waste status for significant process-related savings.

Fluid System

Performance

LAKOS: Successfully applied in all industries:

- ▶ **Automotive**
Pre-wash and pre-paint stations, deluge processes, coolant filtration.
- ▶ **Food Processing**
Bulk pre-washing, process liquid recycling, fry oil reclamation.
- ▶ **Primary Metals**
Quench systems, spray nozzles and descaling operations, hot strip mills, rolling mills, scrap recovery.
- ▶ **Process Cooling**
Heat exchanger protection, compressor jackets, pump seals, open and closed loop recirculation, heat pumps.
- ▶ **Chemical Processing**
Liquid recycling, pre-filtration, waste minimization.
- ▶ **Municipal Services**
Source water sand and grit removal, wastewater pre-treatment, water conditioning systems.
- ▶ **Metalworking Fluids**
Coolant recycling, parts washing, wire processing, pit/sump scavenging, scrap recovery.
- ▶ **Vehicle Wash Systems**
Cars, busses, trucks, trains. Pit/sump scavenging, wash water re-use without detergent/chemical stripping.
- ▶ **Mining Operations**
Recycling, solids recovery, leach processes.
- ▶ **Pulp and Paper Mills**
Plant intake water, black liquor, process recycling.
- ▶ **HVAC Comfort Cooling Systems**
Spray nozzle protection, basin scavenging, bacteria control through reduced solids accumulation, heat exchangers, reduced blowdown and chemical usage, energy savings.
- ▶ **Fuel Distribution Systems**
Jet fuel, kerosene, gasoline, pipeline, pre-filtration.
- ▶ **Oil and Gas**
Pump protection, primary and secondary produced water, brine filtration, frac water, disposal wells, secondary recovery, offshore platforms.

Also - Powerplants, industrial laundries, glass and plastics, fire protection systems, wet scrubbers, pump intake screening, water well pump protection and more.

Particle size vs. particle weight

Centrifugal separation employs the principles of velocity and gravity to achieve performance. Essentially, heavier particles (indicated by higher specific gravity ratings, see chart at right) can be removed more easily and at predictably smaller particle sizes (see graph below).

Improved performance when recirculating liquids

The continuous recirculation of a given liquid through a LAKOS Separator will predictably and noticeably remove an increasingly greater percentage of even finer solids (see graph below). Field and laboratory proven, this attribute can also be enhanced with two stage "super separators" and is especially valuable where liquids and chemicals are expensive or where solids-contaminated liquid disposal is costly or regulated.

Fibrous solids and larger particles

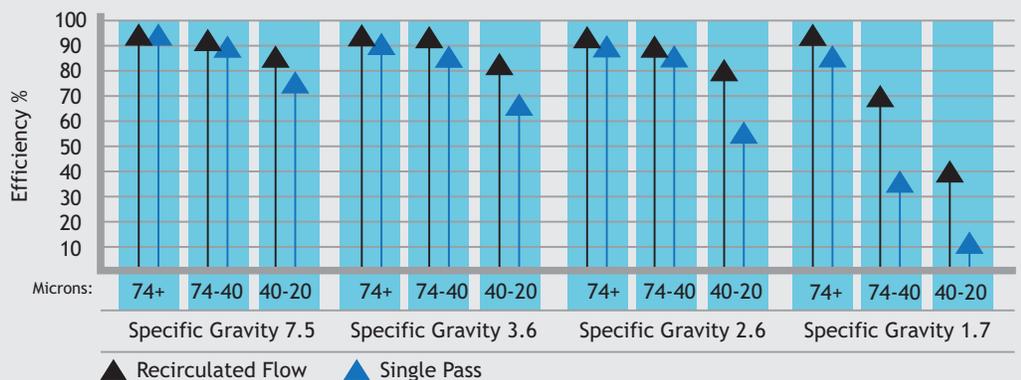
Anticipating the need to remove large and fibrous solids as well as (or even instead of) very fine solids clearly reinforces the versatility and value of LAKOS Separators. Limited only by the clearance of the separator's internal tangential slots or annular transfer ring, LAKOS Separators can remove solids from as large as 1/4 inch (6 mm) up to 2 inches (51 mm). Consult your LAKOS representative for specific details.

Typically Separable Materials

Specific Gravity

Aluminum	2.7
Ashes (Coal)	2.0
Brass	9.0
Bronze; Copper	8.9
Carbon; Concrete; Lava	1.8-2.5
Coal (Anthracite)	1.3-1.9
Earth (Silt; Soil)	1.2-2.0
Glass (Crystal)	3.0
Granite; Gravel	2.5-3.0
Graphite	2.3
Iron	7.8
Lead	11.3
Limestone	2.8
Manganese	7.4
Nickel	8.9
Sand; Silica; Shale	2.6-2.8
Steel	7.8
Tin Ore	6.4-7.0

Solids Removal Chart



Separator Models

The actual flow rate of your system is key to proper model selection. Internal accessibility enables the removal of unusually large or difficult solids and provides for internal coatings to protect against corrosive/aggressive liquids/solids. Satisfying all the material and manufacturing requirements of the American Society of Mechanical Engineers, LAKOS also offers A.S.M.E. Code construction.



▶ **Flow Range:**

Models available for flow rates of 3 US gpm to 12,750 US gpm (0.5 - 2895 m³/hr). Flow rate (not pipe size) is key to proper model selection.

▶ **Maximum Pressure Rating:**

150 psi (10.3 bar); higher pressures also available.

▶ **Pressure Loss Range:**

3-12 psi (0.2 - 1.0 bar)

▶ **Inlet/Outlet Connections:**

Standard grooved-end pipe. May also be specified with ANSI, DIN or JIS flanges. Smaller models available in NPT, JIS and other threaded connections.

▶ **Special Coatings:**

Epoxy, Scotchkote™, Kanigen™, nickel.

▶ **Process Treatments:**

Electropolished, electroplated, heat-treated, sand-blasted (unpainted), primer only.

▶ **Other Options:**

Low or vertical profiles, exterior modifications, high pressure construction, packaged/multi-stage/skid systems and more.

▶ **Material Specifications:**

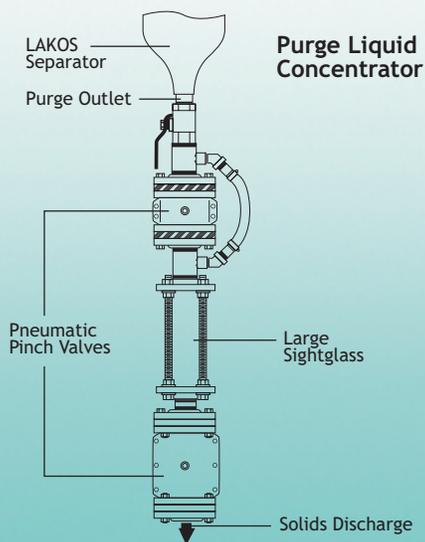
Standard carbon steel; also available in stainless steel, fiberglass-reinforced polyester (FRP), Monel™ clad steel, AR steel (abrasion-resistant), low-alloy steel, industrial-grade PVC plastic (KXL Series) and U.S.D.A. approved materials. Consult factory for special requirements.

Prep Systems: For A Total Filtration Solution



**Out of the fluid.
Out of the filter.
Out of your facility.**

Your complete and exclusive LAKOS solution includes not only the removal of unwanted solids from your process liquid flows, but also the concentration, collection and placement of those separated solids where desired and in the condition desired. Automatic purging and other devices provide efficient means for effective solids transfer from any LAKOS Separator. Specially designed solids-collection systems offer a range of handling options to satisfy the toughest requirements.



Purge Transfer/Control Options

LAKOS Automatic Purge Valves

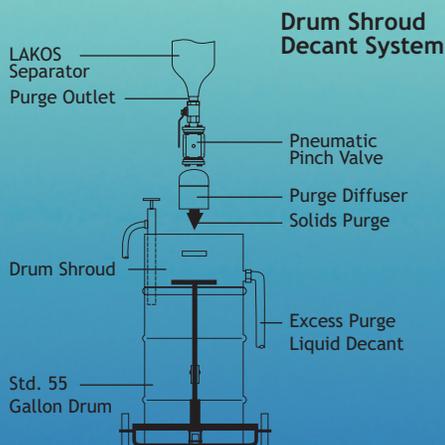
Choice of standard motorized ball, pneumatic pinch and fail-safe pneumatic ball; specialty valves also available.

LAKOS Purge Diffusers

Controls splashing and turbulence when purging into open vessels.

LAKOS Purge Liquid Concentrators

Automatically reduces purge liquid loss by as much as 98% compared to open purging.



Solids Handling Options

LAKOS Drum Shroud Decant System

Utilizes the full solids-collection capacity of a standard 55 gallon drum, allowing excess purged liquid to decant/return to system use or to a suitable drain (see illustration at left). Capacity: 12,700 cubic inches (208 liters).

LAKOS Rollaway Hopper

High capacity solids collection, internal weir for cleaner liquid decant and convenient rollers for easy handling.

Capacity: 41,472 cubic inches (680 liters).



A Tradition. A Heritage.

Since the mid-1940's, Claude Laval Jr.'s inventions have been solving problems. A miniature camera that takes pictures deep into water wells. A well casing repair device that restores the effective use of a water well. And, the first sand separators, which protected submersible and turbine irrigation pumps. Today, the LAKOS Separator is a proven solution for process industries, public water systems, heat transfer systems and more. Complete and engineered solutions for the removal and concentration of troublesome solids. Total liquid recycling. More and more problems solved.

The LAVAL history features more than 150 U.S. and foreign patents. Its focus is clearly filtration. Its complete line of products includes separators, sand filters, self-cleaning screen filters and pump intake screens for a broad range of industries. Experience, quality, performance and integrity. Satisfying real problems with value-oriented solutions. It is our heritage. It is exclusively what we do best. From the 100,000 + square foot manufacturing, sales, marketing and engineering headquarters in California and strategic secondary manufacturing and warehousing, Claude Laval Corporation directs its operations with a worldwide network of technically-trained distributors.

We welcome your technical/application inquiries. We encourage you to tour our facilities. We are your reliable source for experienced application expertise.

LAKOS

Liquid • Solids Separation Systems®

A Division of Claude Laval Corporation
Not Connected With The DeLaval Separator Company

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LAKOS products are manufactured and sold under one or more of the following U.S. Patents: 3,289,608; 3,512,651; 3,568,837; 3,701,425; 3,947,364; 3,963,073; 4,027,481; 4,120,795; 4,123,800; 4,140,638; 4,147,630; 4,148,735; 4,305,825; 4,555,333; 5,320,747; 5,338,341; 5,368,735; 5,425,876; 5,571,416; 5,578,203; 5,622,545; 5,653,874; 5,894,995; 6,090,276; 6,143,175; 6,167,960; 6,202,543; Des. 327,693 and corresponding foreign patents. Other U.S. and foreign patents pending.