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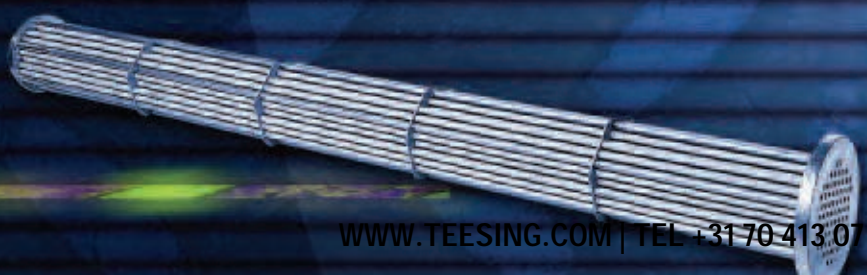
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► **mott corporation**
Process Systems



Unique porous media.
Process filtration expertise.
Limitless possibilities.



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High-strength, high-performance filtration of liquids and gases.

What makes Mott Corporation the company of choice for process filtration.

When it comes to developing efficient, long-lasting process filtration systems, no other company has more experience, and as much to offer, as Mott Corporation. For decades, users of bag, plate-and-frame, and leaf filters have switched over to Mott for the distinct advantages that Mott systems provide.

Giving you more than you need, but not more than you want – the optimal balance.

At Mott, we never rely on “just enough” engineering. Products are routinely designed and tested to perform at the specified flows and differential pressures in pilot tests on-site or in our applications laboratory. Which is why each Mott system is designed for maximum process results, extended service life and optimum return on investment. Mott provides complete filter systems modularized to include all valves, instruments, controls, piping and gauges.

- **Uniform, high-precision porosity** – Pore size and pore distribution are controlled to create filtration media with distinct porosity characteristics.
- **High-strength media** – Sintering bonds filter media together at the molecular level, eliminating the tear, fatigue and breakthrough problems typical of other media.
- **Reduced spare parts expense** – Porous metal filter elements seldom need replacing, unlike disposable cartridges and bags.
- **Ease of cleaning** – Mott filters are easily freed of particulate by using blowback (gas) or backwash (liquid) cleaning methods – without scraping, scrubbing, or rotating filter elements. Contaminants may also be removed with water, steam, air, solvents, caustic or acid washing, or with ultrasonic cleaning.
- **Totally enclosed** – Backwashing filter elements reduce operator exposure to hazardous chemicals.
- **Waste minimization** – Cleanable filter media eliminates incineration or landfill costs associated with disposable filters.
- **Minimal maintenance** – Mott filters have no moving parts, resulting in simpler and less frequent maintenance procedures.
- **Single-stage filtration** – An entire train of process filtration steps may often be replaced with a single Mott filter system.
- **Wide selection of media** – Mott offers the widest selection of filter media, more than 20 in all, ranging from standard 316L stainless steel to corrosive-resistant nickel and Hastelloy®.



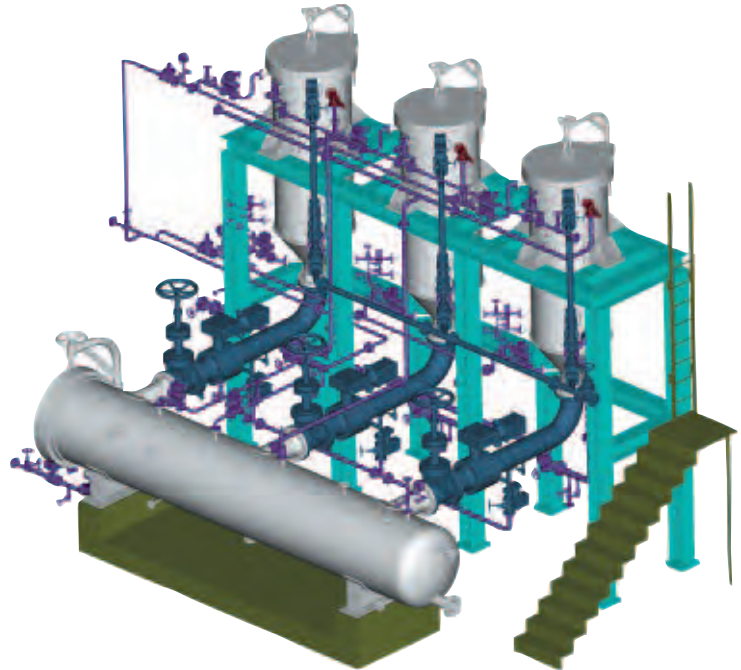
One simple choice, for all kinds of systems.

Mott lets you take the best course for your process filtration.

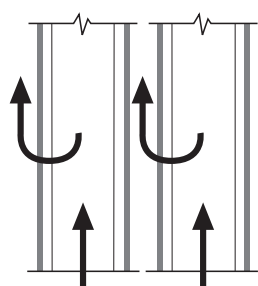
There are many ways to approach process filtration. Some companies offer the traditional outside-in method. And a few can incorporate the benefits of all-metal filter elements. But only Mott offers six porous metal filtration designs.

An infinite number of ways to design a Mott solution for you.

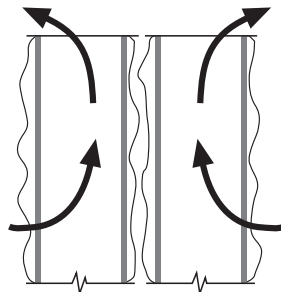
These pages merely provide an overview of the methods of process filtration available from Mott. Once we establish which method is best suited to your application, then we can begin creating your unique solution. Selecting the proper materials. Determining the media grade. Customizing the design. Evaluating performance – first in the Mott laboratory, then on-site at your facility. All of which ensures that your completed Mott system will be fully engineered to the specific parameters of your process.



Inside-out Filtration



Outside-in Filtration



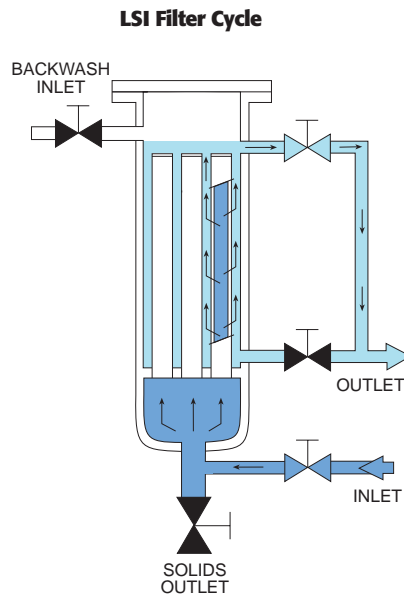
Inside-out filtration used in Mott HyPulse® LSI and LSM filters results in more uniform deposition, and more secure retention of solids, while eliminating the problem of cake bridging between elements often associated with outside-in filtration. See details on LSI and LSM filters on the following page.

Four ways to separate solids from liquids.

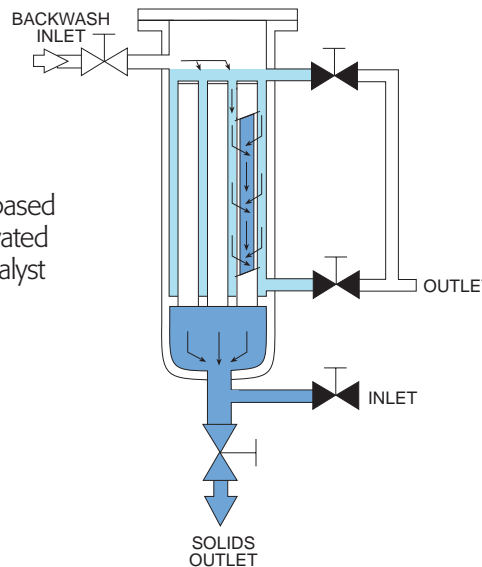
HyPulse® LSI filters incorporate inside-out filtration, a method and design unique to Mott Corporation. At the end of each filter cycle, solids are backwashed off the inside of the elements and discharged as a concentrated slurry or wet cake.

Distinct LSI benefits include:

- Eliminates cake bridging and associated problems
- Higher surface area to volume ratio
- Allows for cake washing
- Minimizes heel
- High solids discharge capability
- Rapid turnaround between cycles maximizes on-stream service
- Can be used without filter aids for filtration applications
- Positive cake retention and control
- Ideal for recovery of carbon-based precious metal catalysts, activated carbon, organic salts, FCC catalyst from slurry oil, and pre-coat filtration applications



LSI Filter Cycle

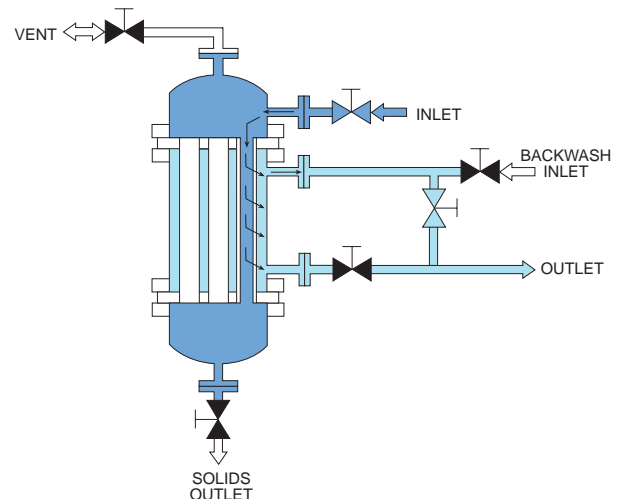


Inherently more efficient than traditional outside-in liquid-solids filters, Mott HyPulse LSI filters pass the slurry through the elements from the bottom-up and inside-out, resulting in less heel, minimal loss of filtrate, and easier discharge of solids.

Other unique Mott alternatives, **HyPulse LSM filters** place inside-out filtration within a double open-ended design. High-density solids are allowed to settle directly into the discharge hopper. LSM filters may be operated on a filter/backwash cycle schedule, or can be used as concentrators in a recirculating system.

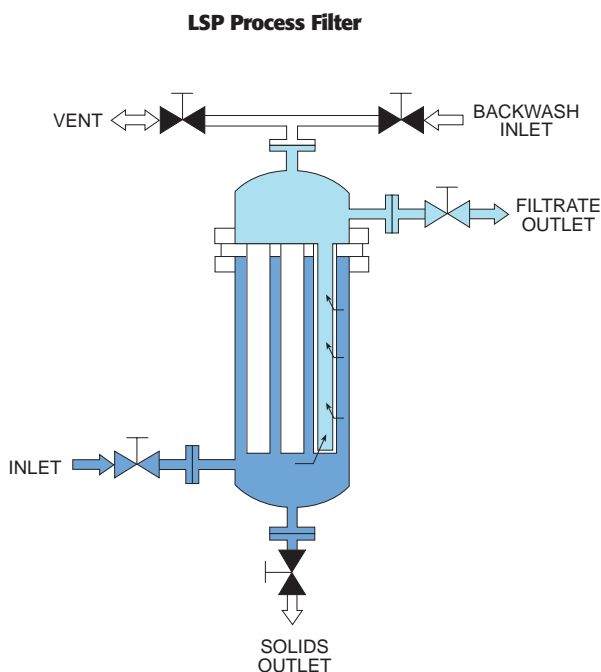
- Feed can be introduced at the top of the filter, the bottom or both
- Allows longer cycles
- Keeps high-density solids from clogging elements
- Achieves higher solids concentration
- Can be used as a crossflow concentrator or a continuous-loop reactor filter
- Incorporates efficiencies of inside-out filtration
- Ideal for RANEY® nickel catalyst recovery, and for steady-state continuous operation in critical process applications

LSM Process Filter



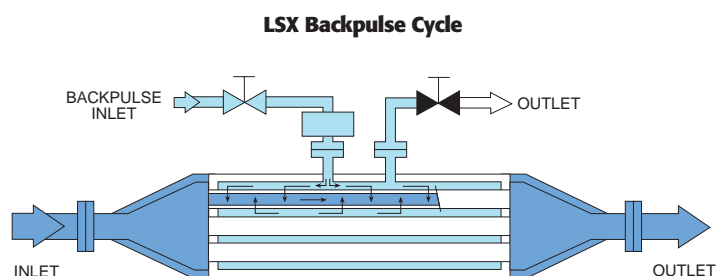
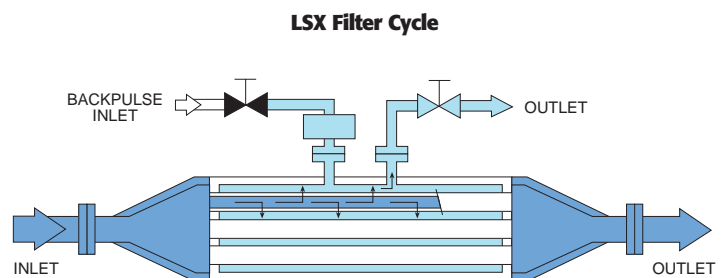
HyPulse LSP filters offer conventional outside-in filtration for polishing low solid streams with solids concentration under 100 ppm. Easy to use and maintain, LSP filters provide reliable, permanent filtration that outperforms other types of media in a number of ways:

- Easy access to elements from top
- Element bundle is removable as an assembly
- Dense element spacing for compact, economical designs
- Filter areas up to 2200 ft², withstands differential pressure up to 500 psi
- Ideal for polishing filter applications, inorganic bromide salts, and ion exchange filtration applications



HyPulse LSX Process filters provide uninterrupted filter cycle performance through crossflow filtration. Slurries flow through the open-ended filter elements, allowing filtrate to exit the system on a continuous basis while particulate remains in the circulating stream. This is the ideal filtration method for slurries with unique particulate characteristics, or for achieving maximum retention of valuable particulate such as expensive catalysts.

- High solids concentration factor
- High crossflow velocities (5-20 ft/s) keeps solids in suspension and the filter surface clean
- Filters out finer particulate
- Ideal for operation with continuous loop reactors, concentration of radwaste, and very fine particle separation
- Applicable for batch concentrations or continuous-stage operation



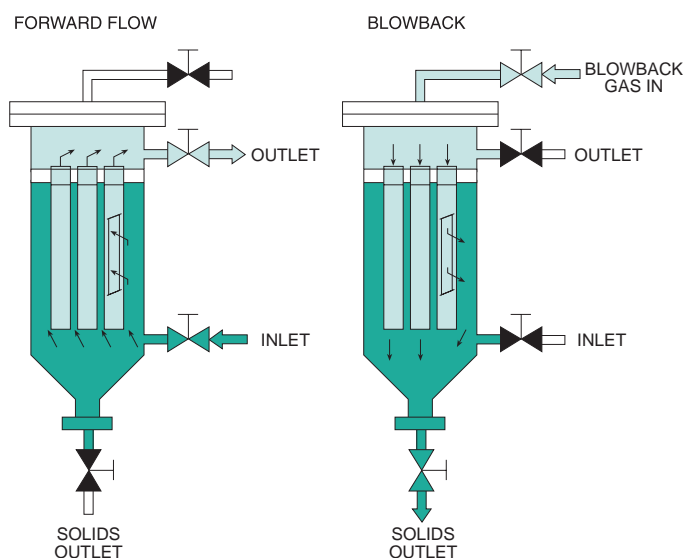
The tangential flow in Mott HyPulse LSX filters makes them especially well-suited to filtering out fine particulate, which tend to be held in suspension. LSX elements can be easily cleaned by backpulsing the filter while it remains on-line.

Two ways to remove particulate from gas streams.

HyPulse GSP Process filters offer traditional filtration of process gases and steam, for applications where process conditions preclude the use of conventional particulate control devices, cyclones and bag houses. Upon reaching a given differential pressure or cycle time, the feed is discontinued and the backflow cycle is engaged. A flexible, all-purpose method of gas filtration.

- Simple design, easy operation
- Cost-effective high-efficiency particulate removal
- Filter areas up to 1000 ft²
- Operating pressures >1000 psi
- Temperatures up to 1800°F
- Elements can be cleaned by reverse flow, or by removal and external cleaning
- Ideal for removing contaminants from high-temperature gases, and for rust and pipe scale removal from steam

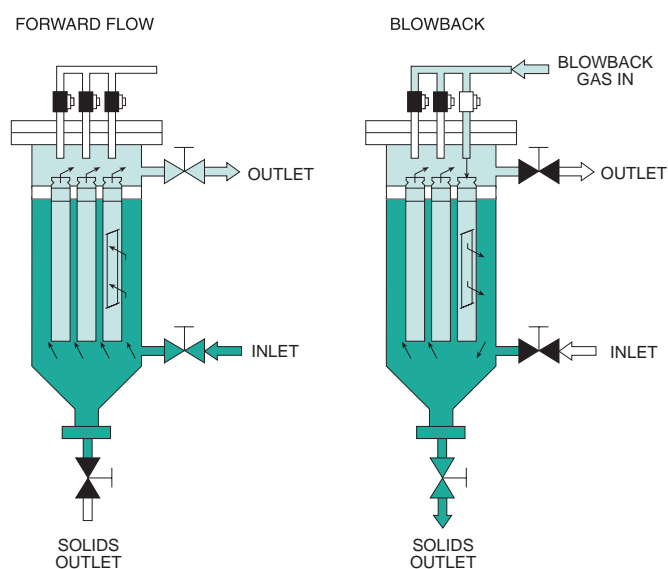
GSP Plenum Blowback Filter



HyPulse GSV filters are the ideal alternative for applications requiring continuous filter operation. Porous elements, which are manifolded together, are sequentially pulsed and cleaned while the unit remains on-line. GSV filtration flows outside-in, as in the GSP design, but introduces several distinct benefits:

- Continuous operation
- High throughput with minimal backpulse requirements
- Filter areas >1000 ft²
- Operating pressures up to 500 psi
- Temperatures up to 1800°F
- Ideal for recovery of polyethylene solids, magnesium oxide solids, and catalyst recovery from fluid bed reactors

GSV Venturi Pulse Blowback Filter



Proven performance, real-world effectiveness.



Skid-mounted Mott HyPulse LSM system used for catalyst recovery.

High-quality filtrate, maintenance-free operation.

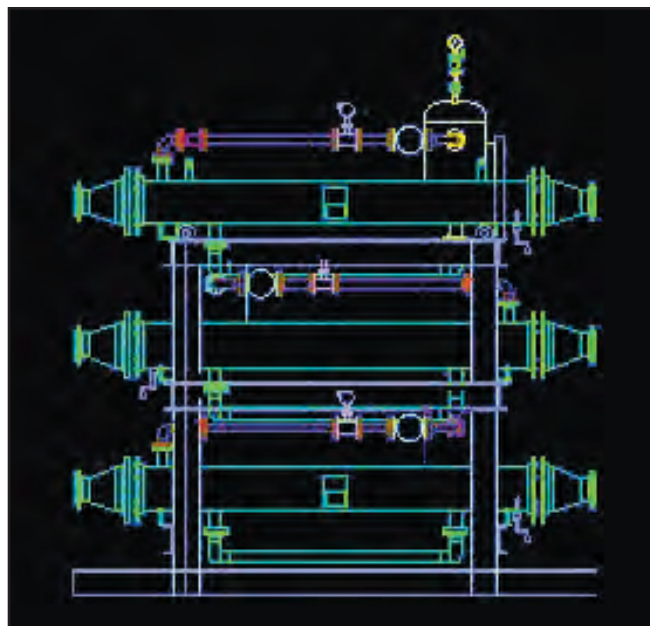
A major United States gulf coast chemical producer required continuous, clear filtrate in conjunction with the removal of RANEY nickel catalyst from a butanol solvent. The Mott HyPulse LSM design was chosen for its ability to remove catalyst particulate efficiently. And, because the open-ended LSM allows concentration of solids in a hopper, the particle loading on the filter elements is significantly reduced, resulting in longer cycles.

This particular LSM was fully automated and skid mounted, and has provided clear filtrate quality along with maintenance-free operation. In addition, the Mott LSM's multiple operation modes afford flexibility in how particulate is removed.

Recovering precious-metal catalyst safely, easily, without interruption.

One of Europe's leading chemical manufacturers required the removal of platinum-on-carbon catalyst from a continuous catalytic oxidation reaction. The high cost of the precious-metal catalyst made high-efficiency capture essential. And to enhance productivity further, cleaning operations had to be performed without interruption of process workflow.

Mott provided a total of 6 Mott HyPulse LSX crossflow modules arranged in three parallel trains. Each module was engineered to perform individual backpulse cleaning, enabling the system as a whole to deliver uninterrupted filtration – thereby eliminating the operator exposure and costly downtime caused by having to replace disposable filter elements.



Multiple Mott HyPulse LSX crossflow systems can be arranged to optimize uptime and facilitate maintenance.

Handling the most rigorous industrial conditions.

While applications including high temperatures and corrosive environments are Mott's specialty, any pressure-driven filtration process with high operating costs is a potential opportunity for applying our products. We provide each customer with the best solution to their process specifications, improving efficiency as well as protecting their investment in equipment.



Refinery.

Mott filter systems can be designed to handle high flow rates in continuous operations typical in refinery applications. Hot hydrocarbon streams such as FCCU slurry oil, often require removal of catalysts and other particulate.

Removal of catalyst fines and other particulate not only improve the oil product, it also improves downstream operating equipment by preventing fouling and reducing maintenance.



Chemical/Petrochemical.

Extreme temperatures, harsh elements and other factors that contribute to hostile environments make Mott porous metal the ideal media for chemical/petrochemical filtration applications. Elements sintered from 100% stainless steel, nickel, or Hastelloy offer unsurpassed chemical compatibility, and the ability to withstand years of continuous use under the worst conditions. Typical applications include:

- Polishing of corrosive liquids and gases
- Process steam filtration
- Catalyst retention, fluid bed reactors
- Catalyst recovery, slurry phase reactors
- High-temperature liquids and gases
- Cryogenic fluids
- Solvents, ketones, esters, amines, liquid hydrocarbons, polymers
- Guard filtration for fixed bed reactors

And the strictest processing standards.

Food and Beverage.

Stainless steel, our standard material of construction, is also the material of choice in food processing. So we're very much at home in designing systems for the food and beverage industry. Our ability to create fully automated systems that withstand high temperatures and support frequent and thorough cleaning has been applied to a variety of applications, such as:

- Process steam filtration
- Catalyst recovery from hydrogenation reactors
- Polishing of syrups, liquors and other liquids
- Catalyst removal from flavor ingredients and other food specialties
- Activated carbon removal, decolorization



Pharmaceutical.

As in food processing, Mott is helping pharmaceutical companies maximize productivity. Mott products are used in decolorization, steam filtration and catalyst recovery.

Laboratory and design capabilities.

Microscopic evaluation in the lab – macroscopic evaluation in the field.

For thorough evaluation of new applications, Mott maintains a Development and Testing Laboratory. Both scanning electron and optical microscopes, along with computer-controlled porometers, are used to inspect pore size, shape, and distribution. Particle counters, particle-size analyzers and a fully instrumented test stand are used to evaluate filter performance.

- Feedstock profiling
- Filtration feasibility
- Solids characterization
- Material compatibility and selection

Often our laboratory evaluations provide a suitable basis for filter designs. If additional evaluations are recommended, Mott offers portable HyPulse filter systems that are fitted with the filter elements to be tested, and configured for the customer’s application. After the system is transported to the testing site and installed, Mott engineers assist with start-up and data acquisition followed by scale-up.

A proven path to production.



Lab development – Filter system design usually begins at the Mott laboratories, where our engineers analyze the results of small-scale runs, using actual samples provided by customers.



Pilot scale test – The next step is a pilot-scale filter at the customer’s site to ensure compatibility with actual process conditions.



Final product – Once final operating conditions are determined, the full-scale production system is shipped and installed, after which Mott audits on-line performance to ensure that all operational specifications are fully met.

Designs by request – creating new Mott solutions.

Developing new products has been the cornerstone of Mott's growth and success. So if the precise solution you require doesn't yet exist, what may seem a problem could well be an opportunity. If you think of the possibilities, with Mott.



Working side-by-side with customers, often applying porous metal where it's never been applied before, has led to major advancements in controlling costs and increasing manufacturing efficiency.



Mott's HyPulse LSX laboratory filter, in addition to being a small-scale filtration solution in itself, is also used to perform crossflow feasibility studies during process-scale application development.



Among Mott's research and development assets is a scanning electron microscope (SEM), which enables Mott engineers to evaluate the physical properties of Mott media – right down to the size and shape of every pore.



Mott's 70mm disc test filter is ideal for initial laboratory evaluations.