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► *mott corporation*
Process Systems

Mott laboratory
testing products.

The versatile, high-precision
way to sample, determine
feasibility and scale up.



Mott laboratory equipment – solutions for new applications.

Mott laboratory equipment is available for pilot and feasibility studies to determine performance of cleanable filter media in new applications. The life of a filter can be considerably reduced by incorrect operation. It is important to know the limits of recommended operating rates to ensure an appropriate life and the associated economic return. Results from testing with Mott laboratory products can be directly scaled to a larger pilot unit or, in many cases, applied directly to the final product – a full-scale filter system installed at your facility. Such testing can be performed by a Mott applications engineer at our facility in Farmington, Connecticut, or directly at the customer's site.

The schematics provided within this brochure will take you step-by-step through the process, operation and flow schemes for various applications which utilize Mott laboratory products. Process conditions such as solids loading, terminal and backwash pressures, as well as effluent quality, can be quickly and easily determined.



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.

Mott HyPulse[®] LSX Laboratory Filters.

- Ideal for:**
- Crossflow microfiltration feasibility studies
 - Sampling applications
 - Laboratory or small-scale filtration

Mott Laboratory LSX crossflow filters are ideally suited for process testing and for low-flow applications such as liquid sampling. Accurate scale-up to production from a single element test model is possible, as each element acts independently.



Design advantages.

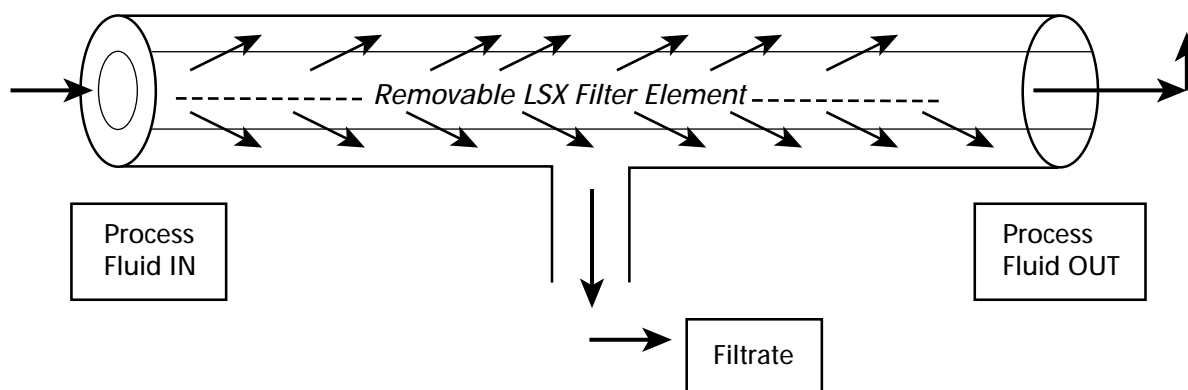
- High-efficiency separation of fine solids (0.1-5 μm)
- 316L SS construction
- Chemically resistant to process fluids
- Vessel and element available in other materials upon request
- Available in media grades from 0.1 to 20
- Filter elements can be cleaned-in-place or removed for cleaning externally
- Operates as a slurry concentrator by recirculating feed
- Produces steady flow of filtrate
- Accepts high concentration of feed solids
- Element can be backpulsed in place to restore filtrate flow

Flexibility (features/benefits).

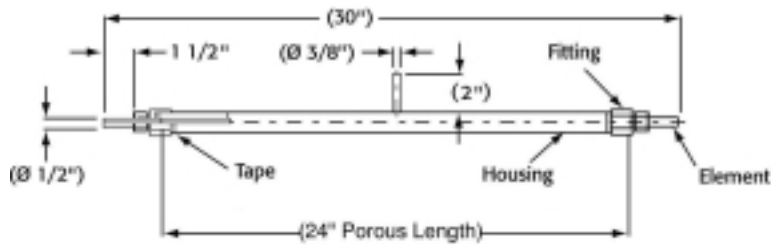
- Samples process fluids and protects analyzing equipment
- Small hold-up volume, reduces loss of valuable products

How it works.

The contaminated liquid feed stream is pumped through the inner diameter of the tube at a velocity ranging from 5-20 ft/sec. The differential pressure across the element will cause a portion of the flow to pass through the filter media and exit as clear filtrate, free of particulate. Fine particles are prevented from penetrating into the depth of the porous media and suspended within the contaminated feed stream. The crossflow velocity creates inertial forces on the solid particles that carry the particulate through the inner diameter of the porous element and out with the contaminated process fluid. This continuous crossflow velocity prevents premature fouling of the filter media.



Configuration.



Specifications.

Dimensions	
Standard porous element	1/2" OD x 3/8" ID x 24" L
Connections in/out	1/2" tubing connection
Sample port	3/8" tubing connection
Overall length	30"
Filtrate outlet	15" from end
Filtration area	0.19 ft ² (28.2 in ²)
Media grades	0.1, 0.2, 0.5, 1, 2, 5, 10, 20*

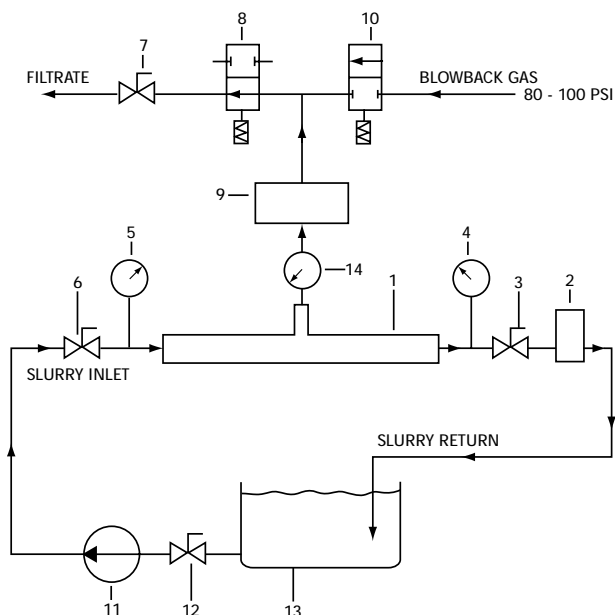
*Other media grades available upon request.

Suggested performance specifications.

Velocity/Volumetric flow rate	5 - 20 ft/sec / 1.7 - 6.9 GPM
Typical filtrate flow rates	Up to 5 GPH*
Differential across media	5 - 40 psid
Pressure required for blowback	10 - 20 psi above system pressure

*Actual filtrate flow rates are application specific depending on feed slurry properties.

Recommended flow scheme.



LEGEND	
1. Mott lab model inertial crossflow filter	8. Filtrate valve
2. Flow meter	9. Filtrate reservoir
3. Outlet control valve	10. Blowback valve
4. Outlet pressure gauge	11. Pump
5. Inlet pressure gauge	12. Pump shut-off valve
6. Inlet control valve	13. Holding tank
7. Filtrate control valve	14. Filtrate pressure gauge

Mott 70mm disc test filter.

- Perfect for:**
- Laboratory bench scale testing
 - Feasibility studies
 - Small-scale, batch-type processes

Mott's unique bench-top filter, our 70mm disc filter, is the simple, inexpensive way to effect liquid-solid and gas-solid separations with either vacuum or pressure. The first step to larger pilot and process systems, this filter offers an impressive array of benefits.



Design advantages.

- Accurate scale-up data for larger systems
- 316L SS porous metal and 316 SS housing
- Easy assembly
- Compact design
- Other porous metals available upon request

Flexibility (features/benefits).

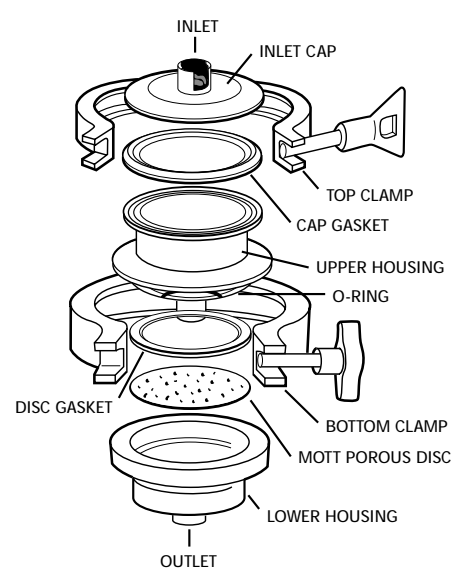
The Mott 70mm disc filter is capable of operating in a variety of modes depending upon separation requirements.

- Complete performance data capabilities
 - Flow vs. ΔP
 - Cake characteristics
 - Backflush ability
 - Washing efficiency
 - Solids capture rating
 - Body feed/precoat performance
 - Cycle time
- High-temperature operation – temperatures to 250°F
- High-pressure/vacuum operation
 - Pressures to 150 psig and vacuums to -14.7 psig realized with the same unit
- Compact design – disc area is 4.4 in²

How it works.

The 70mm disc test filter is a barrier type filter. The lab data can be used to scale up to LSI, LSM, or LSP filter systems. Contaminated product enters the test filter and particulate is trapped on the surface of the porous disc while clean fluid exits the unit. As contaminant builds on the filter media, fluid flow will decrease (under constant pressure) or pressure drop will increase (constant flow). At terminal conditions, flow is reversed to dislodge the filter cake and remove it from the housing.

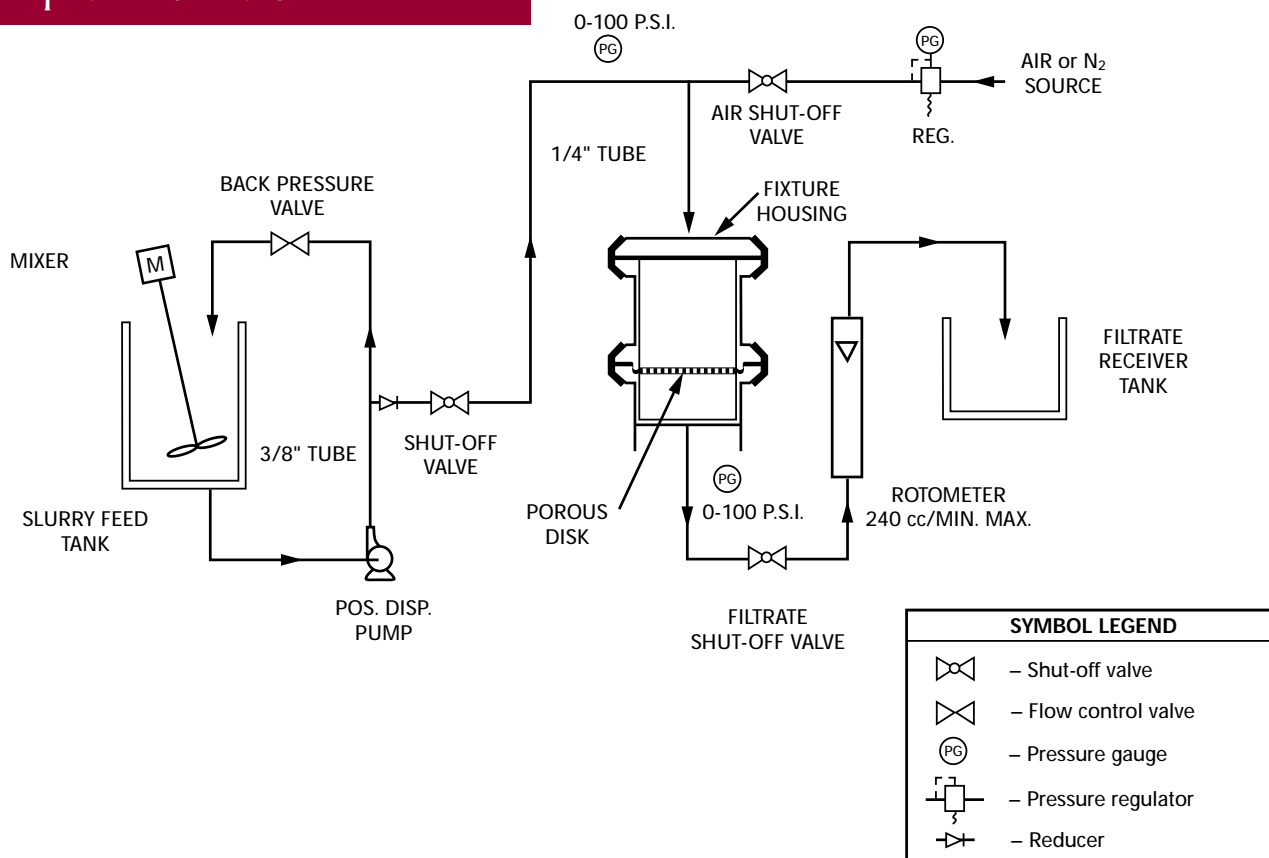
Configuration.



Specifications.

Ratings	
Pressure	150 PSIG (1034 KPa)
Vacuum	-14.7 PSIG (Full)
Temperature	250°F
Media grades	0.2, 0.5, 1, 2, 5, 10, 20, 40
Active disc diameter	2.37"
Active porous area	4.41 in ² ; 28.5 cm ² ; 0.031 ft ²
Reservoir capacity	Slurry – 140 cc Filtrate – 70 cc
Assembled weight	4.4 lbs
Overall height	3.9"
Inlet & Outlet connections	1/2" NPT
Flow rate	116 cc/min=0.031 GPM

Operation schematic.



HyPulse HyLine™ filters.

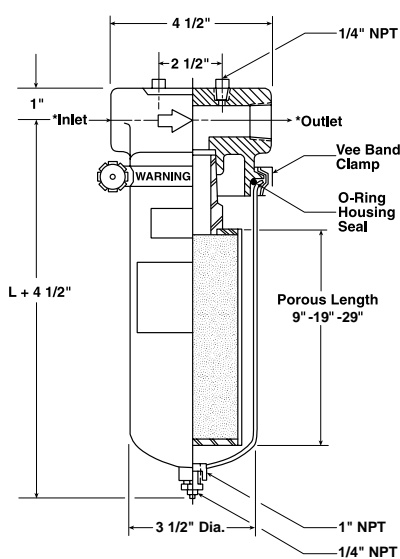
Application versatility.

The Mott HyPulse HyLine filter can separate solids from liquids and gases in a wide variety of applications. Uses include process filtration, sampling filters, polishing filters, and slipstream test filtration from which the data can be used to specify and/or design full-scale process filters.

Features and benefits.

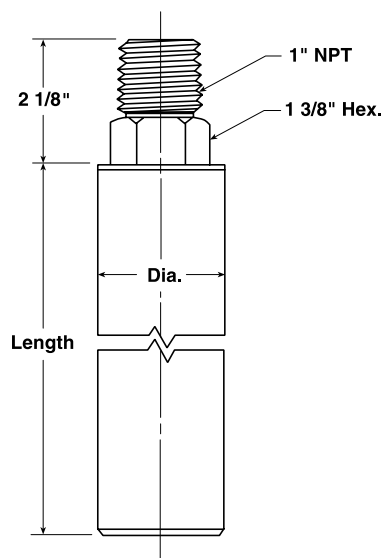
- Heavy-duty 316 stainless steel construction
- Threaded element connection
 - Eliminates gasket seals
 - Prevents gasket seal bypass
- Inline piping connection
 - Allows element removal without breaking inlet/outlet connections
- Large 1" NPT drain Includes 1/4" NPT plug
- Single O-ring housing seal
 - Wide material selection
 - Temperatures to 400°F
- Two pressure ranges – 250 psi, 1000 psi
- Three element lengths – 9 in, 19 in, 29 in
- Two element diameters – 1 1/2", 2 1/2"
 - Provides application flexibility
- Multitube elements available
 - Allows differential pressure to 1000 psi
- Operates in any position
- Differential pressure taps are standard
- Operating valve kits are available

HyLine filter.



*10" housing – 3/4" NPT inlet/outlet
 30" housing – 1" NPT inlet/outlet

Cylindrical element.



Applications.

- Liquids/Steam/Air/Gases
- Process filter
- Sampling filter
- Polishing filter
- Pilot or test filtration
 - Feasibility
 - Filterability
 - Flow vs. Delta P
 - Efficiency
 - Backwash capability
 - Cake characterization
 - Cake-holding capacity
 - Precoat performance
 - Optimize filter operation parameters