

GasShield® PENTA® Filters.  
The performance of Mott  
metal with the flow of *Teflon*®.





# Mott GasShield® PENTA® Filters.

## ΔP and size.

All-metal filters. You know they're great for strength and filtration efficiency. But the pressure drop may have put you off. Well, it's time to give metal another look, because Mott has improved its performance – again.

GasShield PENTA point-of-use filters offer the high flow and low ΔP of *Teflon*®, but with a 100% nickel filter element. This design has also reduced filter element surface area, which results in lower levels of moisture and hydrocarbons. So now you can get flows over 450 slpm with a ΔP of 2 psid at system pressures of 90 psig without having to worry about media migration or the annual change-outs associated with *Teflon*®.

Space consumption carries a high price in a gas panel. And chances are, you have some designs that just won't accommodate larger filters – no matter how well they perform, or how long they last. The good news is, GasShield PENTA filters are offered in industry-standard sizes as short as 3.31". Our PENTA Hiflow™ filters offer the highest flow per footprint of any metal filter in the industry.

So now you can make the switch from *Teflon*® to Mott metal without having to move lines or make other adjustments. Simply out with the old, and in with Mott all-metal filters.



## Cost of ownership.

If all filters were created equal, finding the best deal would be easy. You'd just look at the price tag. But all filters aren't created equal. Some last longer than others. And some perform better than others in normal and abnormal conditions.

*Teflon*® filters, though attractively priced, are short-lived. Their manufacturers recommend changing them out every year. GasShield PENTA filters, on the other hand, are guaranteed to last for five years. So when it comes to total cost of ownership, PENTA filters should cost no more – and in most cases, will cost less – than the competition.

And that's just when you consider product costs. Factor in the savings in labor by eliminating a few filter change-outs and reduced process downtime, and PENTA filters offer an even better value. Plus, you're buying a new level of reassurance. With PENTA filters installed, you have a point-of-use filtration system that can tolerate an unusually high pressure pulse, and still keep particles from reaching downstream process components and product. The best insurance available.

### Cumulative 5-Year Cost Comparison *Teflon*® Filter vs. Mott PENTA Filter

Approximate Product Costs		
	<i>Teflon</i> ® filter	Mott PENTA filter
1st year	\$180	\$300
5th year	\$540* (based on bi-annual change-outs)	\$300

\*Represents approximate 5-year per-filter product cost based on bi-annual change-out. Note that *Teflon*® filter manufacturers recommend annual replacement. Estimates do not take into account additional costs of unplanned downtime, which may far exceed product costs.

### Consistent operation under challenging conditions.

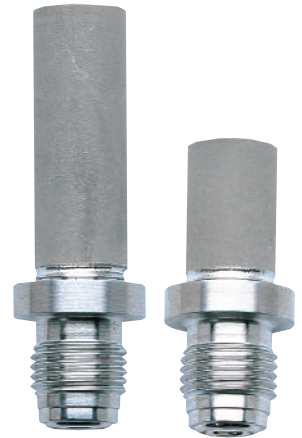
- **9 log reduction value** – Greater than 99.9999999% removal of all particles down to  $0.003\mu\text{m}$ ; confirmed at the most penetrating particle size of  $0.08\mu\text{m}$ .
- **Unsurpassed strength** – Mott porous metal gives GasShield filters the strength to withstand temperatures to  $450^{\circ}\text{C}$ , and pressures to 3750 psig – offering resistance to harsh conditions, and the greatest peace of mind against disaster.
- **No media migration** – Mott media is held together by solid-state diffusion bonding, a type of molecular adhesion that prevents particles from breaking loose from the media and entering the gas stream.

### Rugged, high-quality construction.

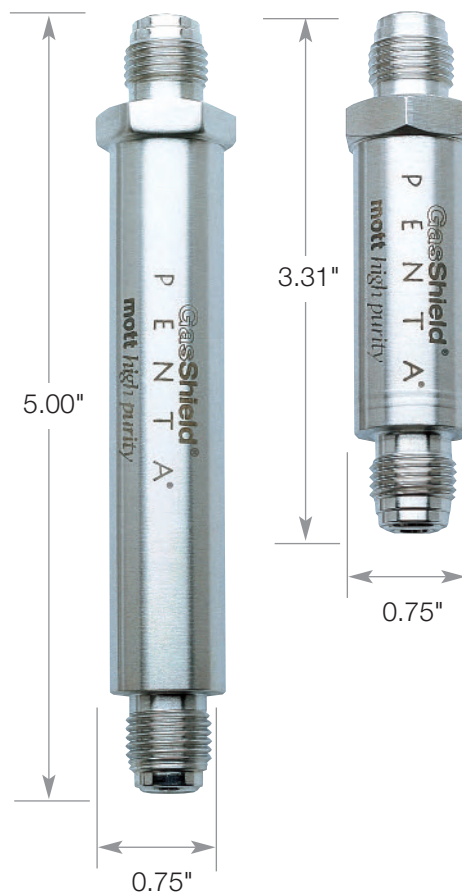
- 5 Ra surface finish on all internal hardware components.
- Our nickel media is sintered with no binders or slurry so “the only material of construction of the media is the media.”
- Filter element is designed to provide required flow at minimal pressure drop while minimizing surface area to provide virtually zero out-gassing.
- All-welded construction eliminates out-gassing which accompanies polymeric filters.
- Housings of 316L VAR/electropolished stainless steel.

### Clean start-to-finish packaging.

- Preconditioned with clean dry nitrogen.
- Class 100 clean room manufactured and packaged. Multiple bags to ensure dryness.
- Packaging is designed to maintain the purity of the filter prior to installation.



*PENTA filter elements constructed of 100% high flow nickel media contain less surface area, which minimizes levels of moisture and hydrocarbons while maximizing flow.*



# GasShield® PENTA®-MV.

This all-metal filter design has the industry's smallest interior volume, minimizing purge-down time by removing any dead space within the device which might entrap moisture, particles or other contaminants.

More durable than polymer-membrane products, the PENTA-MV employs a nickel filter element that ensures durable performance for equipment – including gas cabinets, valve manifold boxes and process tools. The filter housing is manufactured from a single, solid piece of bar stock, eliminating weld-area leaks and corrosion, resulting in the cleanest housing of any available filter product. The single-element weld also yields the smallest weld surface in the industry and makes the PENTA-MV cost-competitive with *Teflon*®-type filters.

## Features.

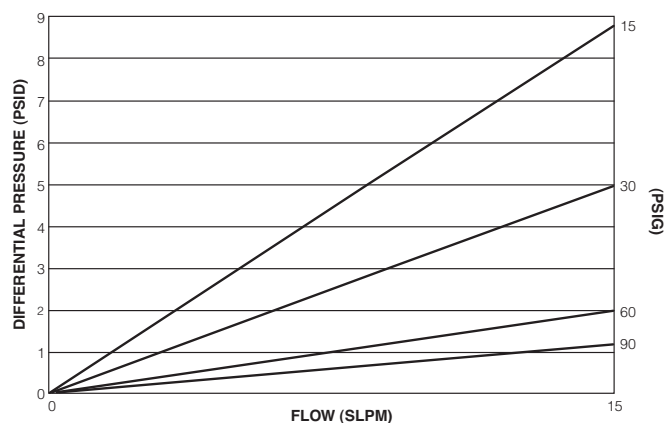
- Hiflow nickel filter media.
- Fast drydown and purge time.
- Flow rates up to 15 slpm @ 9 LRV.
- No housing welds.

## Specifications

Retention	Greater than 99.9999999% removal of all particles down to 0.003µm; confirmed at the most penetrating particle size of 0.08µm
Operating Temperature	Up to 450°C for inert gases
Maximum Forward and Reverse Differential Pressure	1000 psid
Leak Rating	1 x 10 <sup>-9</sup> atm cc/sec
Particle Shedding	<1 particle/ft <sup>3</sup> in accordance with SEMI F43
Rated Flow @ 9 LRV	15 slpm
Maximum Recommended Flow Rate	30 slpm
Total Hydrocarbon Emissions	Below detectable limits in SEMASPEC 90120396B compliance testing
Moisture Contribution	<10 ppb after 1 hour at low-flow ambient purge per SEMI F27 testing
Materials of Construction	316L SS VAR housing/ Nickel porous media



**TYPICAL DIFFERENTIAL PRESSURE vs. FLOW**



# GasShield® PENTA® Point-of-Use Gas Filters.

## Ordering Information.

Mott GasShield PENTA filters are available in the following standard configurations. Other configurations may be available on special order. Consult the factory.

Commonly Stocked Product Catalog Number	Computer Part Number (CPN*)	Maximum Rated Flow (slpm)	Filter Element Material	Housing Material	Standard Inlet/Outlet Connection**	Maximum Inlet Pressure (psig/bar) at 20°C	Maximum Differential Pressure (psid/bar)	Overall Length Inches/mm
GSP 3752 FF11	6812001	20	Nickel	316L SS/VAR	1/4" Male Face Seal	3750/258.6	750/51.7	3.31/84
GSP 3753 FF11	6812002	50	Nickel	316L SS/VAR	1/4" Male Face Seal	3750/258.6	500/34.5	3.31/84
GSP 5754 FF11	6812005	75	Nickel	316L SS/VAR	1/4" Male Face Seal	3750/258.6	750/51.7	5.0/127

\* Order by CPN.

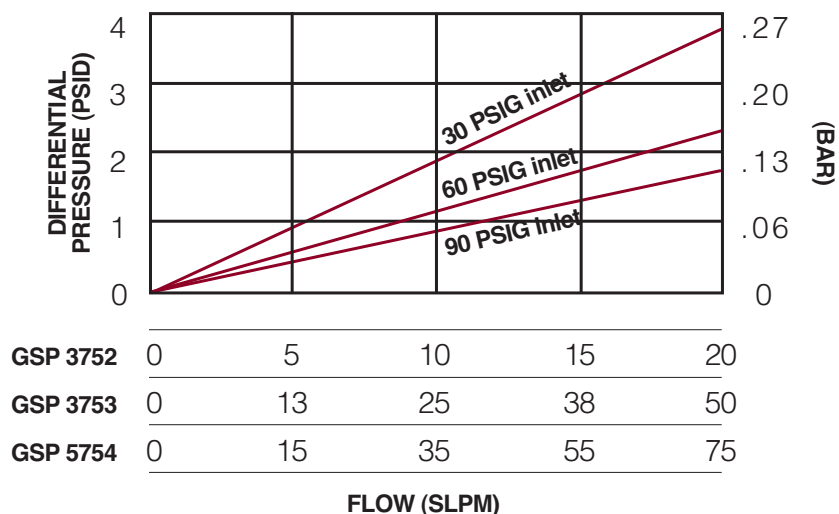
\*\* Optional end connections are available on request.

## Features.

- High-strength nickel filter media.
- High flow rates – small footprint.
- Flow rates up to 75 slpm @ 9 LRV.
- Reliable performance.



TYPICAL DIFFERENTIAL PRESSURE vs. FLOW



# GasShield® PENTA® Hiflow™ Gas Filters.

## Ordering Information.

Mott PENTA Hiflow filters are available in the following standard configurations. Other configurations may be available on special order. Consult the factory.

Commonly Stocked Product Catalog Number	Computer Part Number (CPN*)	Maximum Rated Flow (slpm)	Filter Element Material	Standard Inlet/Outlet Connection**	Maximum Inlet Pressure (psig/bar) at 20°C	Maximum Differential Pressure (psid/bar)	Overall Length Inches/mm
GSP315H1FF11	6812035	80	Nickel	1/4" Male Face Seal	2500/172.4	500/34.5	3.31/84
GSP315H3FF11	6812037	120	Nickel	1/4" Male Face Seal	2500/172.4	500/34.5	3.31/84
GSP515H1FF11	6812038	150	Nickel	1/4" Male Face Seal	2500/172.4	500/34.5	5.0/127
GSP515H3FF11	6812039	250	Nickel	1/4" Male Face Seal	2500/172.4	500/34.5	5.0/127
GSP11215H1FF33	6812042	400	Nickel	1/2" Male Face Seal	2500/172.4	500/34.5	11.2/284.5
GSP11215H3FF33	6812043	600	Nickel	1/2" Male Face Seal	2500/172.4	500/34.5	11.2/284.5

\* Order by CPN.

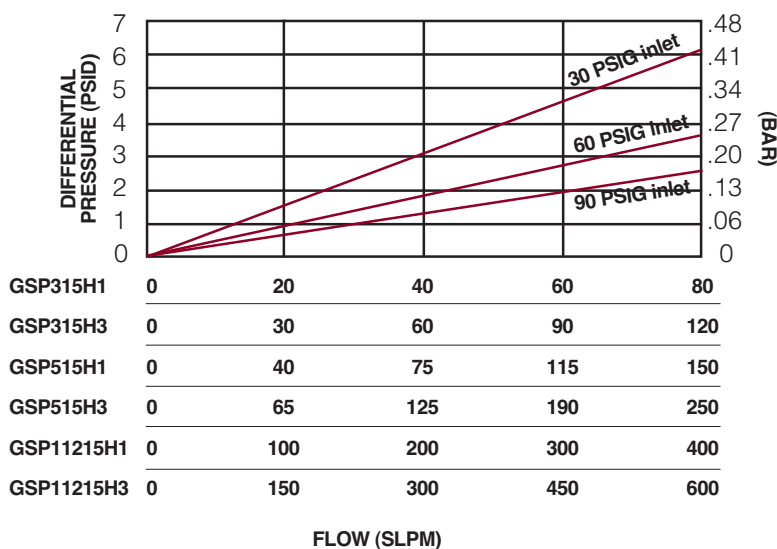
\*\* Optional end connections are available on request.

## Features.

- Next generation in nickel media.
- More open structure with higher mechanical strength.
- Flow rates up to 600 slpm @ 9 LRV.
- Small diameters simplify panel designs.



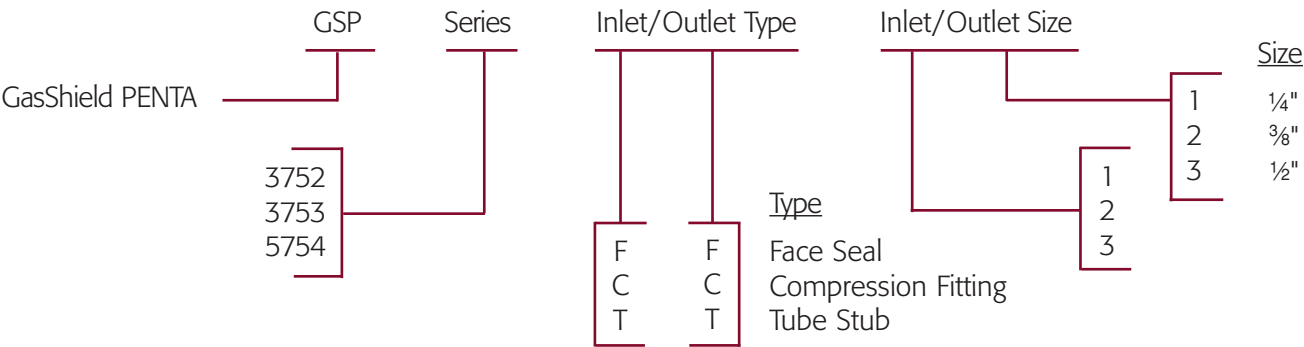
TYPICAL DIFFERENTIAL PRESSURE vs. FLOW





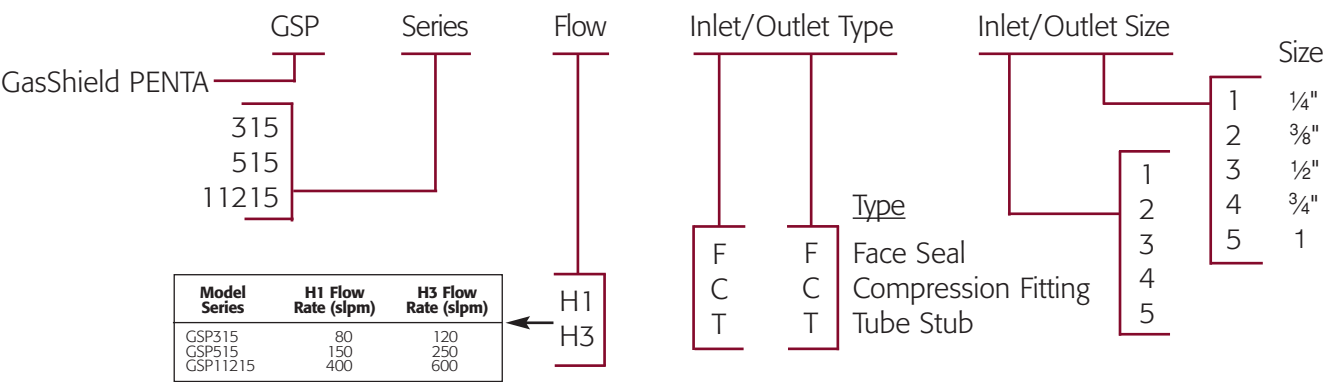
# GasShield® PENTA® Point-of-Use Gas Filters.

## Mott Catalog Number Configuration



# GasShield® PENTA® Hiflow™ Gas Filters.

## Mott Catalog Number Configuration



## Limited Warranty

Mott Corporation ("Mott") warrants its GasShield® gas filter will meet the specified retention and media integrity standards for a period of five years from the date of purchase, providing the filter is properly installed and used in accordance with the specified flow, pressure, temperature, and chemical compatibility as published by Mott. Mott will replace or grant a purchase price refund for any GasShield filter which proves defective under the terms of this Limited Warranty. No other remedies apply. Mott disclaims all other warranties, either expressed or implied, including any warranty of merchantability or fitness for a particular purpose. Mott shall have no liability for consequential, incidental, special or punitive damages, lost profits or savings, or damages from lost production or damage to other materials.

**mott corporation**

84 Spring Lane, Farmington, CT 06032-3159  
www.mottcorp.com, email: quest@mottcorp.com  
860-747-6333 Fax 860-747-6739



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