Positioned for the next challenge in ultra-pure filtration.
Before getting into products, let’s talk about possibilities.

Seems like a strange way to lead into a product brochure. Especially when there’s so much to say about Mott porous metal filters and flow restrictors. But identifying the goal first, and then either choosing or devising the best possible solution is how our High Purity product family began, and how it continues to grow.

What are your biggest needs? Is there a recurring challenge somewhere? While Mott porous metal can’t solve all the problems within a fab, it can do a lot more than people realize — often better than any other media, and sometimes replace altogether different technologies.

Making strides in, and beyond, high-purity filtration.

Semiconductor manufacturers are discovering many uses for Mott porous metal outside of the gas line. Current uses — either in production or at some stage of development — include:
- CMP (solid and liquid)
- Vacuum platens
- Heat transfer
- Media retention
- Wafer transport
- Gas and liquid dispersion

See how other industries benefit.

Outside of the high-purity arena, Mott products are used in countless applications, ranging from precious-metal catalyst recovery in petrochem to gas/liquid contacting in food processing facilities. And why is that important to someone producing wafers? Because Mott is a consummate problem solver. And it just so happens that our raw material — porous metal — lends itself to a multitude of solutions.

That’s been our mode of operation since 1959. A complete and exclusive dedication to the development, application, and refinement of one type of media, and one only — porous metal. In 1989, we brought that media for the first time to semiconductor manufacturing, originally for the purpose of filtration. Now we’re adding new uses. And each time, it begins with the same type of question: “Is there a way…?”
Mott Porous Metal.
The ultimate media for high-purity filtration. Guaranteed.

What makes Mott porous metal media the media of choice.

When it comes to strength, precision, efficiency and longevity, no filter media works more reliably than Mott porous metal media. This unique substance makes Mott filters highly efficient and virtually indestructible, offering semiconductor manufacturers a whole new level of comfort, coupled with the tremendous savings of eliminating annual change-outs. For years, users of alternative high-purity filtration media have switched over to Mott filters for the distinct advantages they provide:

- **Unique high-flow nickel media** – GasShield® PENTA® POU filters provide the high flow rates and low △P of Teflon® filters, with all the strength and performance benefits of Mott porous metal.

- **Uniform, high-precision porosity** – Strictly controlled pore sizes are the result of Mott’s patented NanoMetal® Media process.

- **Depth filtration** – The compacting and sintering process arranges pores randomly, creating a labyrinth of irregular paths which more effectively capture particles that enter the media.

- **No media migration** – “Solid-state diffusion bonding” holds filter media together at the molecular level, making it virtually inseparable, even under the harshest conditions.

- **High-temperature capabilities** – Mott all-metal construction withstands sustained temperatures as high as 450°C.

- **Corrosion resistance** – Mott filter elements constructed of corrosion-resistant alloys such as nickel and Hastelloy® C-22 withstand the harmful effects of corrosive gases like Hydrogen Bromide and Tungsten Hexafluoride.

- **Tolerance of high differential pressures** – Mott filters provide the highest level of protection, with point-of-use filters capable of enduring up to 5000 psig for special applications with a maximum △P of 1000 psid.

- **Wide selection of designs and materials** – Mott offers the widest selection of all-metal filters for high-purity applications. There’s 316L stainless steel, nickel and Hastelloy C-22 construction to ensure chemical compatibility. And you can choose from standard in-line point-of-use, bulk, utility, IGS, high-flow and low-volume filters, plus inline GasketFilters™ and flow restrictors. A full product offering, which means Mott is your best single source for obtaining the precise all-metal filter you require.
The industry’s largest selection of all-metal, high purity gas filters.

- **In-line point-of-use filters** – GasShield point-of-use filters are available in over 20 standard designs, constructed of 316L stainless steel, nickel, or Hastelloy C-22, and rated for flows up to 600 slpm and inlet pressures as high as 5000 psig.

- **IGS filters** – Mott offers a full line of filter and flow restrictor products in designs compatible with the gas system interfaces presently gaining acceptance in process tools, gas cabinets and valve manifold box installations. Our IGS filters are designed to provide greater system flexibility coupled with ease of change-out and reduced leadtimes. Filters are offered in 316L SS, nickel and Hastelloy C-22 for gas compatibility and range in flow rates from 10 to 100 liters per minute.

- **The high-flow metal alternative** – When high flow is a high priority, Mott offers the ideal solution – GasShield PENTA® point-of-use filters. PENTA filter elements are constructed from Mott’s unique high-flow nickel media that combines true 9-log filtration with a high flow and low ∆P – in compact housings as small as 3.31” long. PENTA filters offer the key benefits of Teflon® with the strength, long life and assurance that comes only from Mott.

- **Reliability, with room to spare** – Tests have shown that it would take a constant flow of 300,608 particles per liter at 10 slpm to reach full GasShield capacity in five years. Yet in the field, an actual contamination level in a very unclean system might be 10 particles per cubic ft., or 0.353 particles per liter – equating to a tremendous level of protection, even with years of continuous use.
• **Bulk and utility filters** – Like their point-of-use counterparts, GasShield bulk and utility filters are made to last, offering reliable main-line filtration for years. Designed to accommodate flows from 1000 slpm to 25,000 slpm, GasShield bulk filters are available with 316L stainless steel or nickel filter elements. Additional bulk designs can be provided for applications involving higher pressures or highly corrosive gases.

• **Where there’s a special need, expect a GasShield solution** – The GasShield filter line also includes products designed for highly specific purposes or positions in the gas line – such as the compact all-nickel GasketFilter that fits inside a 1/4” face seal fitting. And the POU Diffuser which reduces the velocity of purge gas to ensure a uniform and laminar flow of gas into the contaminated environment.

• **Flow restrictors** – Mott also offers High Purity Flow Restrictors, in which porous metal filter elements are designed into double-male face seal fittings to provide consistent, long-lasting, wear- and plug-resistant flow control – with a minimal footprint to conserve space.

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**GasShield Particle Capacity Test**

Filter Tested: GasShield POU-05-SV1  
Flow Rate: 10 slpm  
Filter Area: 2.2 in.²  
Total particle challenge:  
- $3.6 \times 10^{12}$ particles/in.²  
- $(7.9 \times 10^{12}$ particles)  
Downstream particles: 0  
Pressure drop increase: 1.38 psid  
Particulates required to reach challenge capacity, running at 10 slpm, 24 hours/day, for 5 years: **300,608 particles/liter**  
Particulates normally encountered in 5 years: **< 0.353 particles/liter**
A clean process from start to finish.

Ensuring the best performance, and maximum out-of-box cleanliness.

Every GasShield filter is manufactured, tested and packaged in a Class 100 clean room environment. Fully documented process steps are strictly followed under controlled conditions to keep out contaminants such as hydrocarbons, and reduce post-installation purge and dry-down times for increased productivity. Filters with as little as 10 ppb moisture are available.

The most stringent quality control.

We’ve always been Mott’s toughest customer.

A single Mott filter may be subjected to as many as 30 quality-control measures. And to meet today’s standards, computer-based documentation and scheduling are integrated with Mott’s manufacturing database to ensure process consistency and timely production.

Prior to shipment, GasShield filters are 100% pressure-burst tested and helium leak rate tested. Each filter is then pulsed with clean dry nitrogen.

For even greater assurance, independent testing laboratories evaluate the performance of GasShield filters, and submit their findings in detailed reports. Suffice it to say that by the time any GasShield filter arrives at your location, it will have proven its integrity several times over.
Think of the possibilities.

**Microscopic evaluation in the development lab.**

For thorough evaluation of new products, and periodic spot-checks of existing ones, 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. Bench tests can be run with inert and corrosive gases to verify gas/media compatibility, and to ensure corrosion resistance in the field. Particle counters, particle-size analyzers and a fully instrumented test stand are used to evaluate filter performance.

**A significant investment in R&D, year after year.**

Mott continuously supports Research and Development efforts to provide solutions based on best-available industry technologies. And because these technologies change frequently, we work hard to stay abreast of — and even drive — advancements. There is simply no other way to maintain our commitment to meeting customer requirements with the best means the industry has to offer.

**Designs by request – creating new Mott solutions.**

With dozens of GasShield configurations, there’s a very good chance Mott already has the solution you need. Yet it’s also possible that yours is an altogether new kind of challenge. If that’s the case, we’re more than happy to work with you.

Developing new products has been the cornerstone of Mott’s growth and success. 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 has, for example, worked with specific customer requirements to create load lock chamber diffusers for their individual tools. So, if you don’t see what you need here, or in one of our catalogs, ask us.

If anyone can customize a porous metal solution to the task at hand, it’s Mott.

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Mott’s state-of-the-art TIG welders, operated in a Class 100 clean room, join filter housings and elements with the utmost precision.

A dry-down box is used to produce filters with less than 10 ppb moisture.

Horiba laser-scattering particle size distribution analyzer.