Think of the Possibilities.

Did You Know...

Mott can withstand the most corrosive gases?

Semiconductor Industry – Gas Filtration Update

Corrosive gases are easily handled with all Hastelloy® gas filters from Mott. Today, Mott is the premier supplier of Hastelloy-based filters to the semiconductor industry, allowing chemical compatibility with virtually any process gas. Constructed of Hastelloy® C-22®, Mott filters deliver the same 9-log filtration as our nickel and stainless products with remarkable resistance to corrosion.

Semicon Gas Filtration Update

Mott GasShield® Filters made with Hastelloy® C-22® alloy

For unsurpassed strength and resistance to corrosion

Versatility made tough

Hastelloy C-22 is *the most versatile nickel-chromium-molybdenum-tungsten alloy available today, with improved resistance to both uniform and localized corrosion as well as to a variety of mixed industrial chemicals.*

Small wonder it's the alloy chosen by Mott to deliver maximum filtration performance in the face of today's most corrosive gases. Mott GasShield filters made with Hastelloy filter elements and housings offer:

- Outstanding resistance to pitting, crevice corrosion, and stress corrosion cracking.
- Optimum resistance to environments where reducing and oxidizing conditions are encountered in process streams.

Corrosive gas and associated applications

So where might you want to use Mott filters made with Hastelloy? Here are some typical semiconductor manufacturing applications:

Gas	Application
Boron Trichloride BCl_3	Etch (P-type diffusion in silicon; ion implantation; plasma etching of metals)
Boron Trifluoride BF_3	Implant (P-type diffusion in silicon; ion implantation)
Chlorine Cl_2	Etch (Plasma etching of aluminum and other metal layers)
Chlorine Trifluoride ClF_3	Etch (In-Situ Process Tool Cleaning)
Dichlorosilane SiH_2Cl_2	CVD (Growth of epitaxial and polycrystalline silicon; chemical vapor deposition of silicon dioxide and nitride, and tungsten silicide. Higher purities of dichlorosilane can be especially useful for high-purity depositions such as epi for CMOS, which requires very low carbon and metallic impurities)
Fluorine F_2	Etch
Hydrogen Bromide Hbr	Etch (Plasma etching of polysilicon)
Hydrogen Chloride HCl	Etch, CVD (Etching of native oxide prior to epitaxial deposition; CVD reactor cleaning, moisture getter in CVD oxides)
Hydrogen Fluoride HF	Etch (Native oxide etch from silicon wafers)
Nitrogen Trifluoride NF_3	CVD (Plasma and thermal cleaning of CVD reactors)
Silicon Tetrachloride $SiCl_4$	Etch, CVD (Applications of epitaxial silicon; plasma etching of metals)
Silicon Tetrafluoride SiF_4	Etch (Ion implantation and in conjunction with silane for the plasma deposition of fluorinated silica. Sometimes used as a silicon etch rate moderator in plasma etching)
Trichlorosilane $SiHCl_3$	CVD (Epitaxial deposition of silicon; especially for thicker (>5 microns) layers where an abrupt transition profile and tight process control for film thickness are not critical)
Tungsten Hexafluoride WF_6	CVD (Low pressure or plasma enhanced CVD of tungsten and tungsten silicides)

Point-of-use solutions

Mott POU filters set the standard in high-strength, high-efficiency performance, with 9-log reduction that removes more than 99.9999999% of all particles down to 0.003µm, confirmed at the most penetrating particle size of 0.08µm. Additional features include:

- All units are He leak-tested to a maximum 1 x 10^{-9} atm cc/sec.
- Parts per trillion dry down achievable.
- >1 trillion particles retained at the rated flow with zero particles detected downstream of tested filters.
- Particle shedding of <1 particle/ft^3 in accordance with SEMASPEC 93021511A-STD.
- 5 Ra surface finish on all internal hardware components.
- Class 100 clean room packaged.

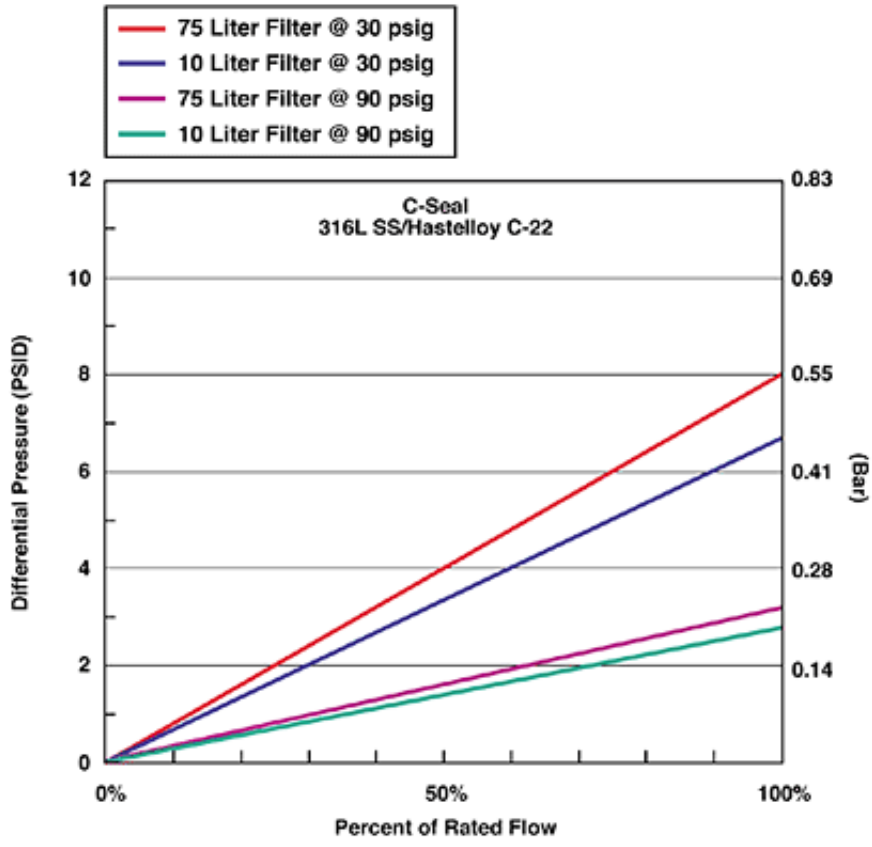
Hastelloy C-22 POU (Point of Use) Filters				
Overall Length	**Max. Rated Flow**	**Inlet/Outlet Connection**	**Max. Inlet Pressure (psig/bar) at 20°C**	**Max. Diff. Pressure (psig/bar)**
3.31"	8 slpm	1/4" Male Face Seal	3750/258.6	1000/69
3.31"	45 slpm	1/4" Male Face Seal	3750/258.6	1000/69
5.00"	100 slpm	1/4" Male Face Seal	3750/258.6	1000/69

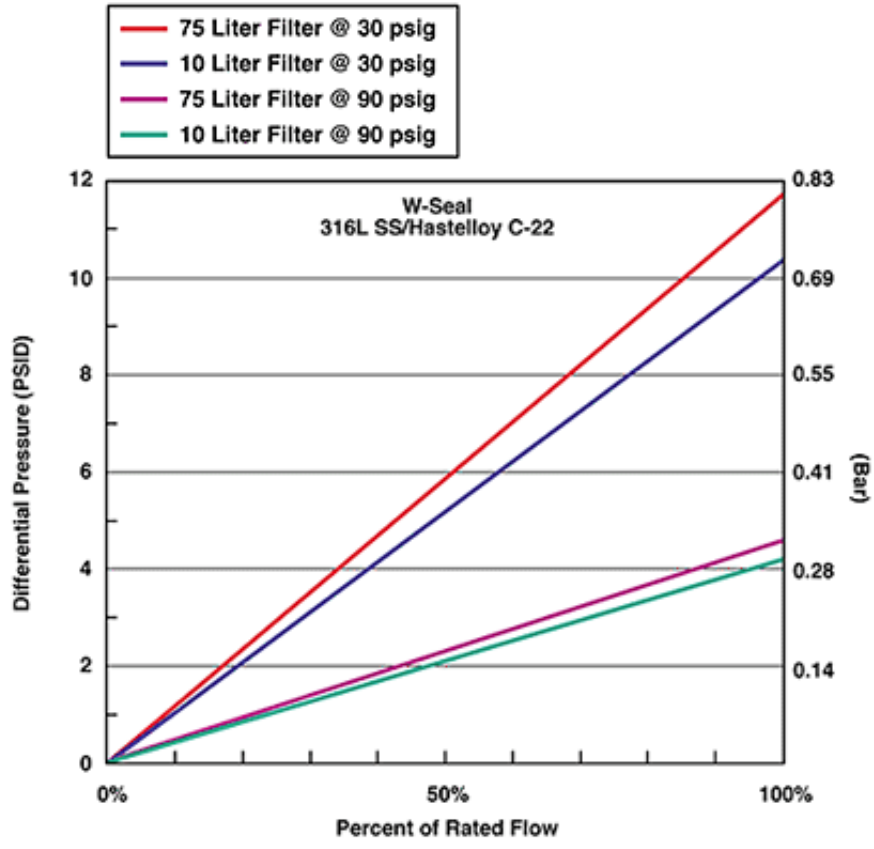
Surface-mount solutions

Mott also offers Hastelloy C-22 construction in a full line of IGS filters designed for compatibility with the gas system interfaces currently being specified on process tools, gas cabinets, and valve manifold box installations per SEMI 2787. So now you can combine ease of installation, stick component accessibility, ease of maintenance, reduced assembly time and compatibility between components that are typical of IGS, with the selection and performance benefits offered exclusively by Mott.

Hastelloy C-22 IGS (Integrated Gas Systems) Filters			
Filter Footprint	**Max. Rated Flow**	**Overall Height**	**Seal Configuration**
1.125"	10 slpm	2.4"	C-Seal
1.125"	30 slpm	4.9"	C-Seal
1.125"	10 slpm	2.5"	W-Seal
1.125"	30 slpm	5.0"	W-Seal
1.5"	10 slpm	2.2"	C-Seal
1.5"	20 slpm	3.2"	C-Seal
1.5"	75 slpm	6.1"	C-Seal
1.5"	10 slpm	2.2"	W-Seal
1.5"	20 slpm	3.2"	W-Seal
1.5"	75 slpm	6.1"	W-Seal

Typical Differential Pressure vs. Flow





About Mott High Purity

Mott Corporation was established in 1959 and became the first company to offer all-metal, high-purity filtration to semiconductor manufacturers. Mott's High Purity Division manufactures all-metal gas filters and systems in configurations ranging from 1 slpm to 200,000 slpm. Materials of construction include nickel, 316LSS and Hastelloy® which provide highly efficient filtration for processes used in the production of integrated circuits.

Mott Corporation manufactures components for the semiconductor market in state-of-the-art manufacturing facilities located in Farmington, Connecticut. The facilities provide Class 100 environments for the assembly and testing of an entire range of products produced specifically for high purity applications. Mott has full CNC capability for hardware manufacture as well as state-of-the-art automated test equipment for 100% integrity testing of all components. Welding operations are computer controlled ensuring repeatable precision welds. Visitors are always welcome for tours of our facilities. Contact us at quest@mottcorp.com to schedule a visit.

For more information

Click on the images below to download our 4-page GasShield® POU filter brochure or our 8-page IGS filter and flow restrictor brochure. You may also contact us at High Purity Sales, Mott Corporation, 84 Spring Lane, Farmington, CT 06032, 1-860-747-6333 or Toll-Free 1-800-BUY-MOTT.
E-mail: quest@mottcorp.com.