



saes[®]
getters

HIGHLIGHTS

FEATURES

- ❑ Total flexibility in size and configuration
- ❑ Flow rates to 1,000 slpm
- ❑ Can be configured to include valves and/or 0.003 μm particle filter

GASES PURIFIED

GSZ

N_2 , Ar, He, Xe, Ne, Kr, H_2 , SiH_4

NH_3 , DMHz

SF_6 , CH_4 , C_2H_6 , C_3H_8 , C_4H_{10} , CF_4 , C_2F_6 ,
 CHF_3 , C_3F_8 , C_4F_8 , $\text{C}_2\text{F}_4\text{H}_2$, CCl_4

AsH_3 , PH_3 (Available only in - PG1 configuration)

GSZ OXIDE

O_2 , NO, N_2O , CO_2 , SO_2 , CDA

GSZ CORROSIVE

BCl_3 , Cl_2 , SiH_2Cl_2 (DCS), SiHCl_3 (TCS),
HBr, HCl, SiCl_4 , H_2Se , H_2S , SiF_4 , B_2H_6 ,
 BF_3 , GeCl_4 , CClH_3

New gases added regularly

MICRO TORR[®]

FEATURES

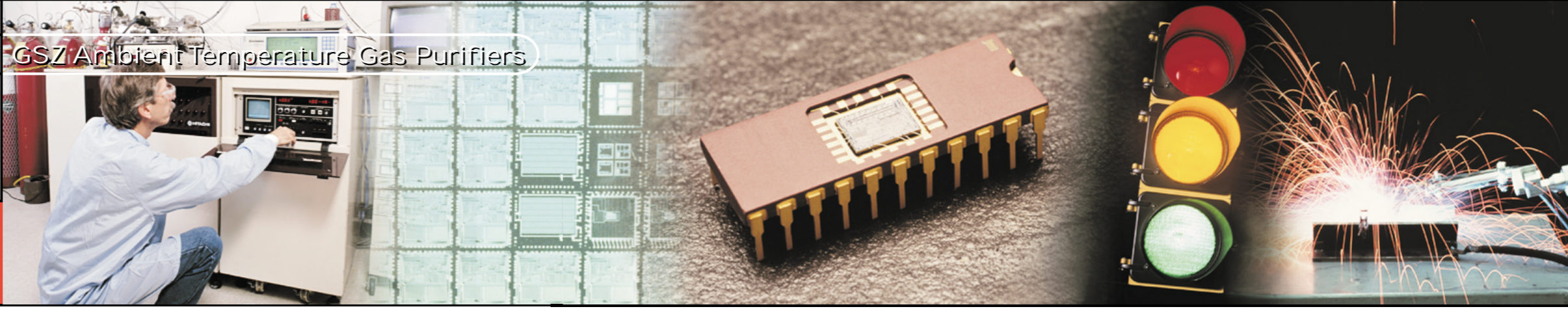
The MicroTorr[®] purifier series is offered for most gases in a wide range of sizes to meet individual flow and purity requirements. Each purifier uses a gas-specific purification media to remove impurities to < 1 ppb. The MicroTorr line was designed with total application flexibility in mind. In addition to sizes based on flow rate, a wide variety of valve and filter configurations is also available.

MicroTorr purifiers are manufactured with the same superior quality you have grown to expect from all SAES products. Analytical testing is performed utilizing APIMS technology to certify maximum performance.

APPLICATIONS

- ❑ Direct replacement of existing in-line particle filter
- ❑ Purification and filtration at the tool
- ❑ Specialty gas purification for low-flow process applications
- ❑ Analytical zero gas applications
- ❑ Weld gas purification
- ❑ Drydown purge for construction phase piping certification
- ❑ Purge gas purification for gas cabinet applications
- ❑ MOCVD
- ❑ Fiber Optics
- ❑ CVD
- ❑ PVD
- ❑ Photolithography

PS11 SERIES GSZ Ambient Temperature Gas Purifiers



MicroTorr® GSZ Performance

Gases Purified	Impurities Removed	Outlet Performance
N ₂ , Ar, He, Xe, Ne, Kr, H ₂ , SiH ₄	H ₂ O, O ₂ , H ₂ , CO, CO ₂	< 1 ppb
NH ₃ , DMHz	H ₂ O, O ₂ , CO ₂	< 1 ppb
SF ₆ , CH ₄ , C ₂ H ₆ , C ₃ H ₈ , C ₄ H ₁₀ , CF ₄ , C ₂ F ₆ , CHF ₃ , C ₃ F ₈ , C ₄ F ₈ , C ₂ F ₄ H ₂ , CCl ₄	H ₂ O, O ₂ , CO ₂	< 1 ppb
AsH ₃ , PH ₃	H ₂ O, O ₂	< 1 ppb

MicroTorr GSZ Specifications

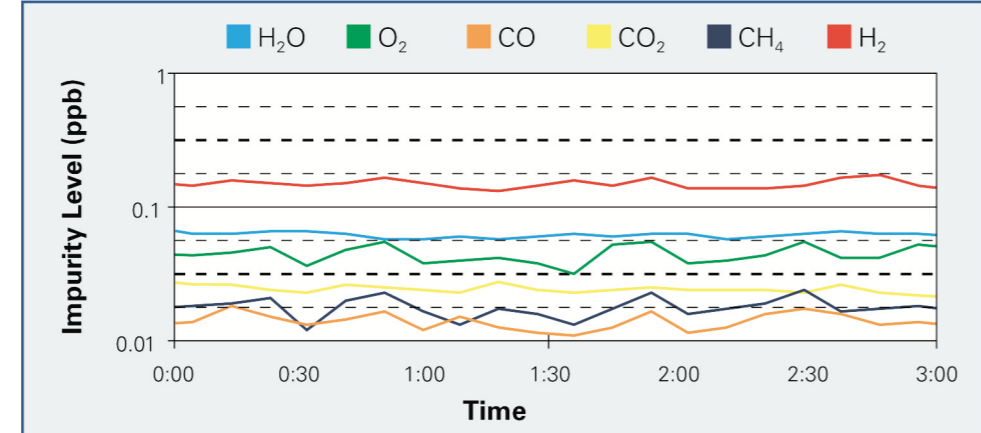
- **Lifetime**
1 year @ nominal flow & 1 ppm H₂O, O₂
- **Max Pressure**
150 psig (higher pressures optional)
- **Max Temperature**
40°C
- **Tubing**
316L Stainless Steel, EP
- **Manufacturing**
Class 100 clean room



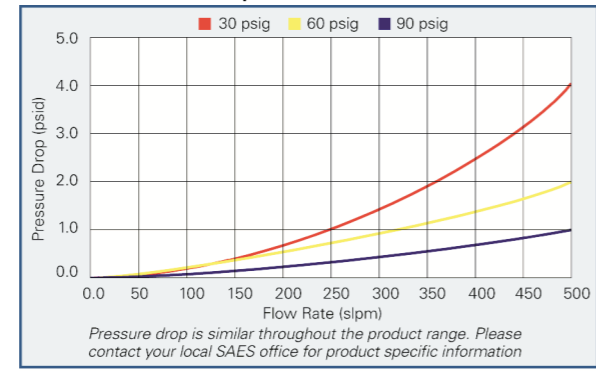
GSZ PROPRIETARY TECHNOLOGY

SAES Pure Gas, the leader in getter technology, developed the GSZ purifying media specifically to operate at ambient temperature for the purification of specialty as well as bulk gases. The large surface area design provides high flow capability and high capacities for long lifetimes. Continued R&D efforts have produced improved capabilities in existing materials and the creation of new patented materials for various gas applications.

APIMS Analysis PS11-MC1-R

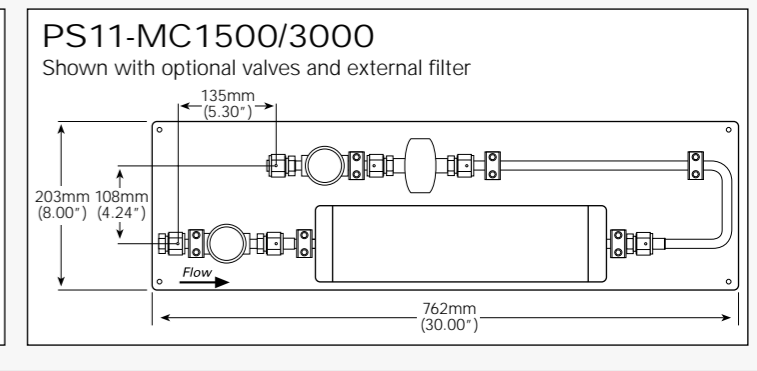
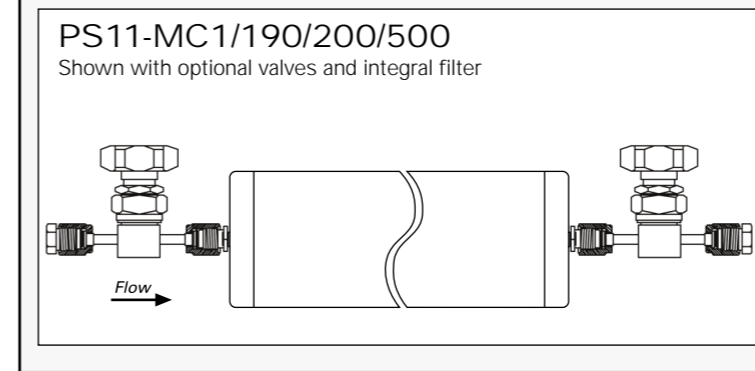


Pressure Drop PS11-MC3000



PURIFIER DIMENSIONS

Model	Flow Rating		Filter	Valves	Fitting Type		Nominal Dimensions	
	Maximum	Nominal			Inlet	Outlet	Face to Face	Diameter
PS11-MC1	5 slpm	500 sccm	0.003µm	Optional	1/4" MVCR	1/4" MVCR	84mm (3.31")	38mm (1.5")
PS11-MC200	50 slpm	5 slpm	Optional	Optional	1/4" MVCR	1/4" MVCR	160mm (6.30")	51mm (2.0")
PS11-MC500	100 slpm	12 slpm	Optional	Optional	1/4" MVCR	1/4" MVCR	318mm (12.50")	51mm (2.0")
PS11-MC1500	250 slpm	40 slpm	Optional	Optional	1/2" FVCR	1/2" MVCR	462mm (18.20")	76mm (3.0")
PS11-MC3000	500 slpm	80 slpm	Optional	Optional	1/2" FVCR	1/2" MVCR	508mm (20.00")	102mm (4.0")
PS11-MC190-F	50 slpm	5 slpm	0.003µm	Optional	1/4" MVCR	1/4" MVCR	208mm (8.20")	51mm (2.0")
PS11-MC500-F	100 slpm	12 slpm	0.003µm	Optional	1/4" MVCR	1/4" MVCR	356mm (14.00")	51mm (2.0")
PS11-MC1500-F	150 slpm	40 slpm	0.003µm	Optional	1/2" FVCR	1/2" MVCR	636mm (25.05")	76mm (3.0")
PS11-MC3000-F	300 slpm	80 slpm	0.003µm	Optional	1/2" FVCR	1/2" MVCR	684mm (26.91")	102mm (4.0")
PS11-MC1-V	5 slpm	500 sccm	Optional	1/4" manual	1/4" FVCR	1/4" FVCR	227mm (8.93")	38mm (1.5")
PS11-MC200-V	50 slpm	5 slpm	Optional	1/4" manual	1/4" FVCR	1/4" FVCR	302mm (11.90")	51mm (2.0")
PS11-MC500-V	100 slpm	12 slpm	Optional	1/4" manual	1/4" FVCR	1/4" FVCR	460mm (18.10")	51mm (2.0")
PS11-MC1500-V	250 slpm	40 slpm	Optional	1/2" manual	1/2" FVCR	1/2" MVCR	732mm (28.80")	76mm (3.0")
PS11-MC3000-V	500 slpm	80 slpm	Optional	1/2" manual	1/2" FVCR	1/2" MVCR	779mm (30.66")	102mm (4.0")
PS11-MC190-F-V	50 slpm	5 slpm	0.003µm	1/4" manual	1/4" FVCR	1/4" FVCR	351mm (13.80")	51mm (2.0")
PS11-MC200-F-V	50 slpm	5 slpm	0.003µm	1/4" manual	1/4" FVCR	1/4" FVCR	366mm (14.40")	51mm (2.0")
PS11-MC500-F-V	100 slpm	12 slpm	0.003µm	1/4" manual	1/4" FVCR	1/4" FVCR	498mm (19.60")	51mm (2.0")
PS11-MC1500-F-V	150 slpm	40 slpm	0.003µm	1/2" manual	1/2" FVCR	1/2" MVCR	See Drawing	76mm (3.0")
PS11-MC3000-F-V	300 slpm	80 slpm	0.003µm	1/2" manual	1/2" FVCR	1/2" MVCR	See Drawing	102mm (4.0")
PS11-MC9000-V	1000 slpm	300 slpm	Optional	1/2" manual	1/2" MVCR	1/2" MVCR	1560mm (61.43")	140mm (5.5")
PS11-PG1	15 slpm	2 slpm	0.003µm	1/4" manual	1/4" FVCR	1/4" MVCR	Consult Factory	51mm (2.0")



Part Numbering System GSZ

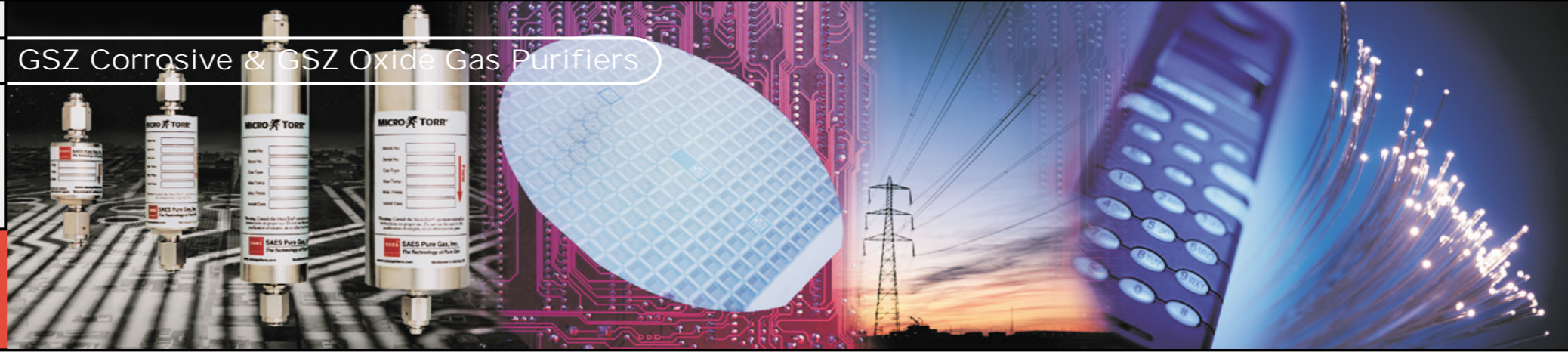
PS11 - MCxxxx - xx - x - x

Purifier Series	PS11 MicroTorr
Model	- MC1 - MC190 - MC200 - MC500 - MC1500 - MC3000 - MC9000
Flow	5 slpm 50 slpm 50 slpm 100 slpm 250 slpm 500 slpm 1000 slpm
Application Gas	- R Rare Gases (Ar, He, Xe, Ne, Kr) - N N ₂ - H H ₂ - SI SiH ₄ - SF SF ₆ - CH CH ₄ - NH NH ₃ - CF CF ₄ , CHF ₃ , C ₂ F ₆ , C ₃ F ₈ , C ₄ F ₈ , C ₂ F ₄ H ₂
Additional Suffix	- F Filter Option - V Valve Option - F - V Filter and Valve Options

* - MC1 includes filter, suffix not required
** - MC190 comes standard as - F filter option
*** - MC200 is not available with filter option

Purifiers are gas-specific and should only be used for the gas indicated

PS11 SERIES GSZ Corrosive & GSZ Oxide Gas Purifiers



PS11-MC9000
For flow rates to 1,000 slpm
Now available for Oxygen

Model	Maximum Flow	Nominal Flow	Face-to-Face Dimension	Vessel Diameter
PS11-MC1 PS11-HP1	5 slpm	500 sccm	84mm (3.31")	38mm (1.5")
PS11-MC50-x-F PS11-HP50-x-F	10 slpm	1.5 slpm	127mm (5.00")	38mm (1.5")
PS11-MC190-x-F PS11-HP190-x-F	30 slpm	4.5 slpm	208mm (8.20")	51mm (2.0")
PS11-MC400-x-F PS11-HP400-x-F	60 slpm	9 slpm	208mm (8.20")	76mm (3.0")

GSZ Corrosive Performance

- Gases Purified: BCl_3 , Cl_2 , SiH_2Cl_2 (DCS), SiHCl_3 (TCS), HBr , HCl , SiCl_4 , H_2Se , H_2S , SiF_4 , B_2H_6 , BF_3 , GeCl_4 , CClH_3

- Outlet Purity: < 1 ppb H_2O

GSZ Oxide Performance

- Gases Purified: O_2 , NO , N_2O , CO_2 , SO_2 , CDA

- Outlet Purity: < 1 ppb H_2O

MicroTorr GSZ Corrosive and GSZ Oxide Specifications

- Lifetime: 1 year @ nominal flow & 1 ppm H_2O
- Particle Filter: 0.003 μm integral metal
- Max Pressure (Low pressure model): 150 psig
- Max Pressure (High pressure model): 1,000 psig
- Max Temperature: 40°C
- Tubing: 316L Stainless Steel, EP
- Interface: 1/4" male face seal
- Manufacturing: Class 100 clean room

CORROSION PREVENTION

Moisture in corrosive gas lines induces corrosion and destroys costly system components. The SAES MicroTorr GSZ Corrosive gas purifier eliminates all moisture, protecting MFC's, pressure regulators, valves and other costly components. The High Pressure MicroTorr is designed with the specific intent of being mounted upstream of pressure regulators, providing a safeguard for these components which traditionally have a high susceptibility to corrosion-related failure.

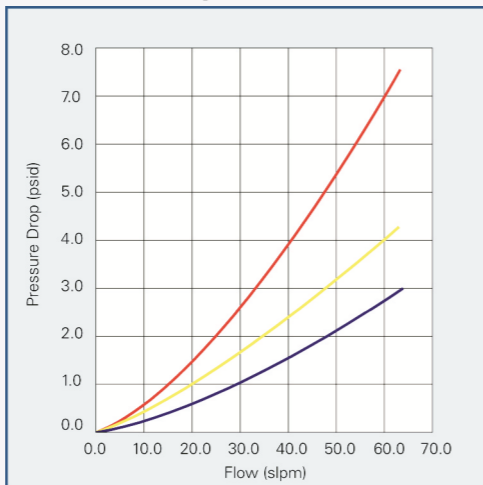
IMPROVED PROCESS

Consistent gas quality improves yield and ensures reproducible process results. Applications such as etch, epi, and CVD benefit greatly from corrosive gas that is free of moisture. Wafer analysis indicates that SAES purifiers improved surface morphology and reduced particle and metal contaminants.

GSZ OXIDE

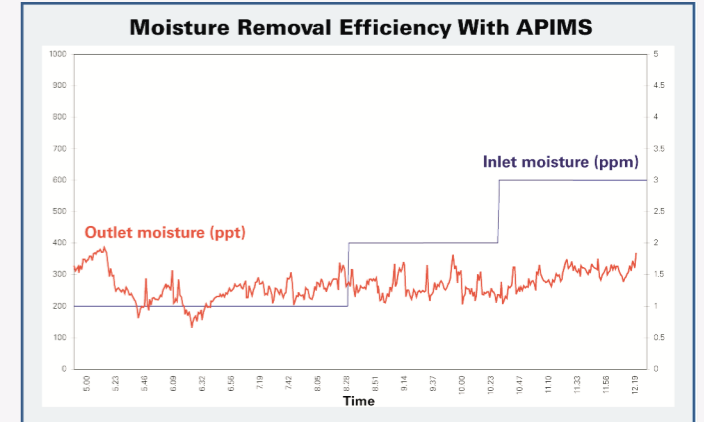
Moisture removed to < 1 ppb. Recommended for diffusion, etch & photolithography processes.

Pressure Drop PS11-MC400

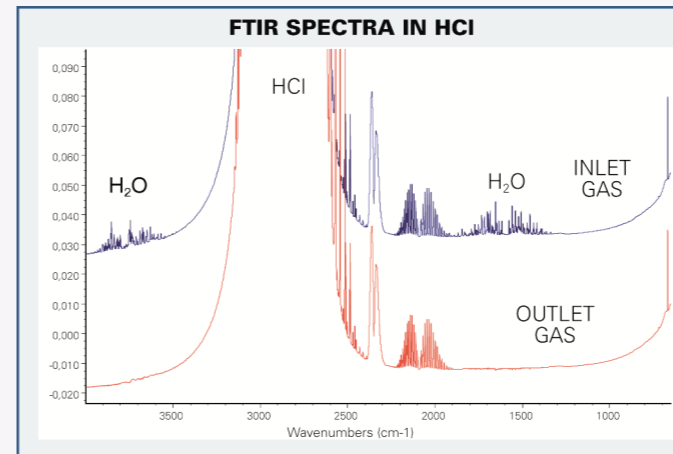


Competitive Advantages

- Available for low pressure or high (cylinder) pressure applications
- Non-hazardous shipping classification
- Post-installation conditioning is not required
- Will not generate side reactions, even at high pressure
- FTIR and ICP-MS testing confirm that volatile metal compounds are not released
- Liquefaction testing demonstrates that the purifier performs to specification, even after exposure to liquefied source gas



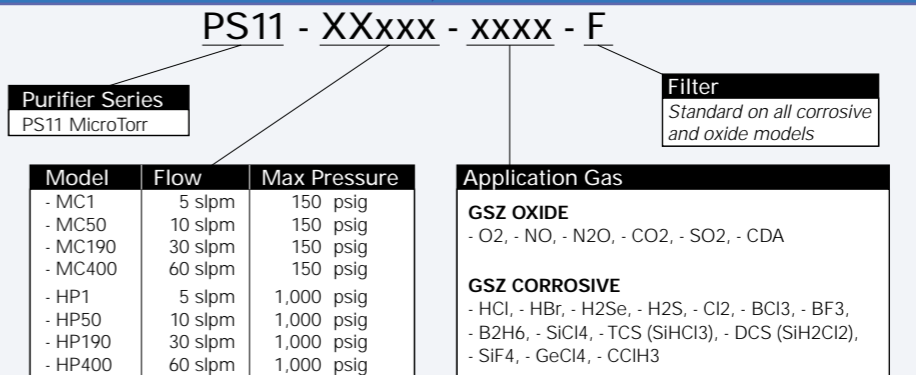
APIMS data demonstrating H_2O removal to < 500 ppt



FTIR data demonstrating H_2O removal to LDL (<30 ppb) with no unwanted side reactions

The MicroTorr line of corrosive & oxide gas purifiers include a proprietary, patent pending material with superior lifetime. Moisture removal is verified to less than 1 ppb per APIMS tests in N_2 . Tests performed in HCl indicate moisture removal below the lower detection limit (30 ppb) of FTIR.

Part Numbering System GSZ Corrosive & GSZ Oxide



Purifiers are gas-specific and should only be used for the gas indicated

SAES PURE GAS

SAES is the worldwide leader in gas purification technology. We offer a complete line of gas purifiers, analyzers, and analytical systems for virtually all bulk and specialty gases.

Extensive experience in the interaction of gases and materials, combined with an uncompromised dedication to quality and service, has made SAES the world's leading supplier of gas purifiers. Our fully vertical "in-house" approach to manufacturing - from purification processing through installation at customer facilities - ensures not only the best product, but also unparalleled service and support throughout the world.

PRODUCTS

FaciliTorr® Purification of weld and purge gases

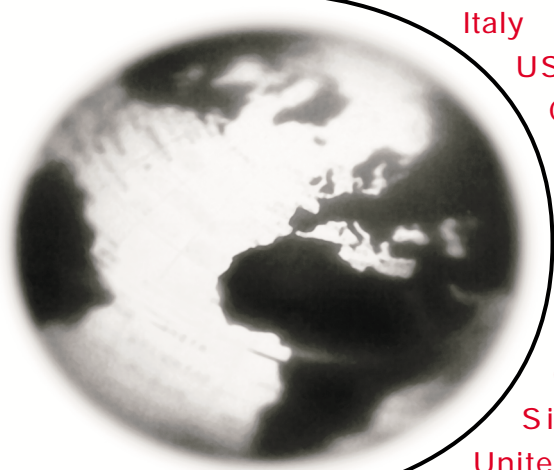
MicroTorr® POU ambient purifiers for inert, specialty, & corrosive gases

MonoTorr® Heated getter purifiers for house gases

MegaTorr® High-flow purifiers for bulk gases

Gemini Mobile Analytical Carts Portable monitoring systems for analysis anywhere in the semiconductor facility

Multi-Gas Monitoring Systems Customized analytical racks for continuous on-line gas impurity monitoring



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Korea
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