

Apex Gas Mixing System

The Complete Solution for Precision Point-of-Use Gas Mixing



- Optimized for applications requiring low concentration, high precision and cost sensitive gas mixtures
- Improves repeatability by 10x or more when compared to individual gas cylinders
- Increases system up-time by eliminating excursions and re-qualifications, and reducing test time
- Immediately reduces gas purchase costs by as much as 60%
- Seamlessly integrates with existing installed base for a wide range of applications including solar, semiconductor and more
- The only gas mixing system that uses Veeco's Piezocon® Gas Concentration Sensor for ppm-level control

Veeco

Innovation. Performance. Brilliant.

Veeco's Apex™ Gas Mixing System addresses critical issues facing semiconductor manufacturers and foundries – material costs, process repeatability and system up-time.

- Apex allows manufacturers to reduce costs by purchasing lower-cost, higher-concentration gases and then diluting at the point of use. Depending on the concentrations and quantities needed, this can translate to a material cost savings of up to \$40,000 per month.
- Built around Veeco's Piezocon Gas Concentration Sensor, Apex provides real-time process repeatability unmatched in the industry. For example, Apex can deliver GeH₄ at a concentration of 1.0% in H₂, with a repeatability of <0.003% at up to 8 SLPM. This exceptionally stable output drives higher yields, enabling manufacturers to increase both throughput and profitability.
- Exceptionally stable output and precise control of the gas concentration allows Apex to drive greater tool up-time by eliminating the need to re-qualify the tool after every gas cylinder change, reducing – and in some cases eliminating – tool down-time due to routine cylinder changes.

For real-time control, high precision and repeatability, and lower cost of ownership, count on the Apex Gas Mixing System from Veeco.

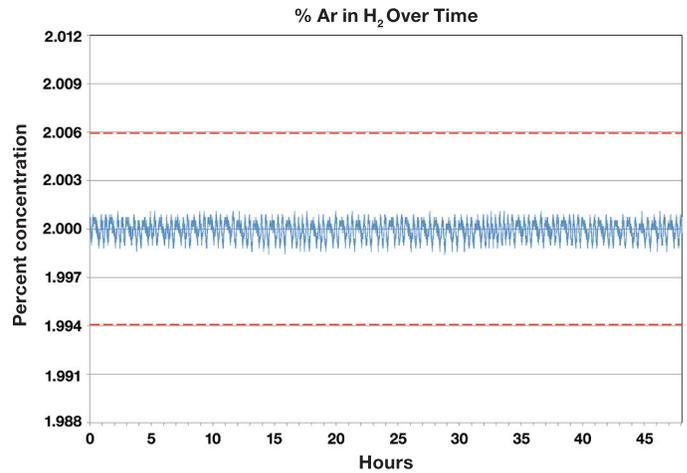
Specifications

Apex Ge-1%-8	
Description	Specification
Input Gas #1	10-100% GeH ₄ / H ₂
Input Gas #2	UHP Hydrogen 5.0 Grade
Overall dimensions (width x depth x height)	34" x 28.2" x 93.8"
Accumulator tank	Electropolished—100 L
Enclosure	Painted enclosure for indoor application
Output gas concentration range	1-10% (typical)
Output gas concentration repeatability	± 0.003% (absolute range)
Output flow rate (average)	0-8 SLPM
Output pressure	55-65 psig
Inlet to supply pressure drop	40-45 psig
Operating voltage	100/240 VAC, 6 AMPS, 50/60Hz, 1 Phase
2nd Sensor to validate output gas	Standard
Capability to Match to current process cylinder	Automated routine for matching to reference cylinder
PLC and HMI	Touchscreen interface with P&ID layout
Automated Maintenance routines	Automated pump/purge routines
Wafer Fab Communications Connectivity	Modbus TCP
Toxic Gas Monitor	Standard (GeH ₄ 0.2 ppm TLV)
Certifications	SEMI-S2, S6, S8
Options	
Trace contaminant analysis	<10 ppb O ₂ , H ₂ O
Light Tower	3 light configuration (R,Y,G)



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Unmatched Repeatability



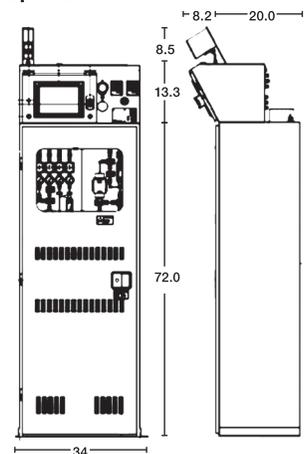
Reduce Cost of Ownership

Apex GMS Cost of Ownership – ROI Example for 1% GeH ₄			
	1% GeH ₄	10% GeH ₄	20% GeH ₄
	Without Apex	With Apex	With Apex
Approx Cost per Bottle	\$4,000	\$14,000	\$19,500
1% Equivalent Bottles	1	5.5	12
# Bottles Req'd per Month	20.0	3.6	1.7
Material + Depreciation per Month	\$80,000	\$56,700	\$38,300
Savings per Month	\$0	\$23,300	\$41,700
Apex GMS Payback (Months)	NA	14 - 16	8 - 10
ROI for 1-Year Period	NA	70 - 85%	130 - 150%

Typical Apex Configuration

Small Footprint Maximizes Fab Space

Facilities Requirements	
Input gas temperature consistency	± 5°C
Input gas pressure consistency	± 10 psig
Input gas connection	Open or closed coax (customer defined)
Input source pressure	110-120 psig
Controlled environment for mixer	22°C ± 5°C
Maximum range of change for temperature	<2°C/hour



Veeco Instruments Inc.
 Gas & Vapor Delivery Control Systems
 41 Page Park Drive
 Poughkeepsie, NY 12603
 Tel: 845.471.7740

Find out more at www.veeco.com
 or call 1.888.24.VEECO