

# Stiletto<sup>®</sup> Scanning-Laser Particle Detector

## REAL-TIME *IN SITU* PARTICLE MONITORING FOR MAXIMUM YIELD

Stiletto is a breakthrough vacuum *in situ* particle detector that finds yield-limiting contamination in real time on every wafer with scanning-laser sensitivity and accuracy. An easy-to-use interface with the INFICON FabGuard<sup>®</sup> Sensor Integration and Analysis System enables synchronized data collection and diagnostics for real-time Advanced Process Control, wafer yield improvement, and increased tool productivity for the most demanding semiconductor applications.

### SCANNING FOR GREATER SENSITIVITY

Stiletto's resonant scanning-laser continuously monitors a large volume of the process chamber or vacuum pumping line and is able to provide statistically significant count rates for process control. Superior noise rejection and fast signal processing speed provide Stiletto with unprecedented accuracy and count rate for demanding processes. This combination of cutting-edge technologies delivers submicron sensitivity that detects "killer particles" while avoiding nuisance events. So you get reliable fault detection for every wafer, every run, every time.

### ACCURATE TIME RESOLUTION SPEEDS RECOVERY

Stiletto is the first particle monitoring system to be fully integrated with the process tool and its data. When combined with FabGuard, the particle counts can be overlaid with equipment parameters to allow engineers to identify the exact timing and cause of particle formation (Fig. 1). This reduces tool downtime and improves productivity.

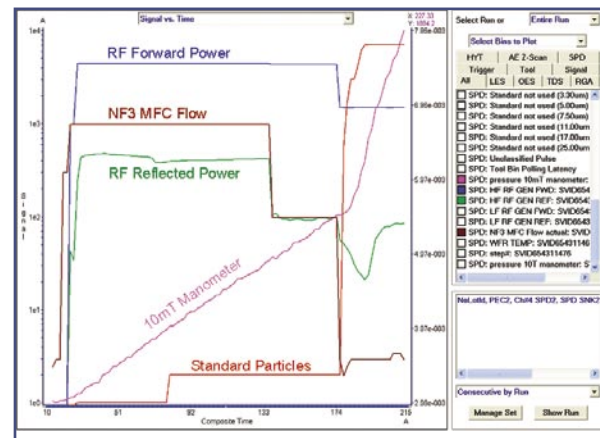


Figure 1 - FabGuard screenshot shows Stiletto particle counts versus gas flows in an HDP CVD clean process.

### MINIMIZE YIELD EXCURSIONS

Stiletto's ability to detect particles during every run of every wafer provides unprecedented protection against defect-induced yield loss. Alarm levels can be set within FabGuard to provide a shutdown limit for the tool (Fig. 2). This prevents further wafer processing when high levels of particles are present.



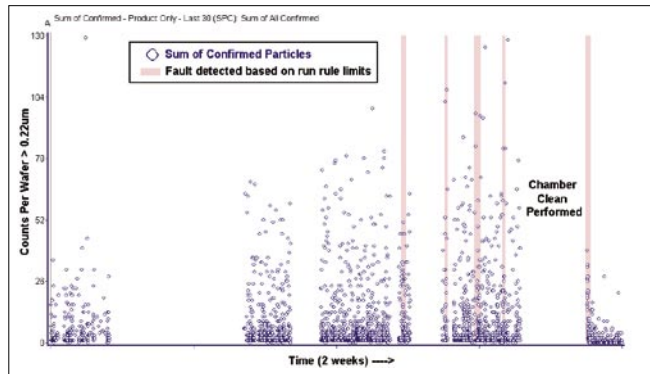


Figure 2 - FabGuard analysis shows Stiletto particle counts over time for a pre-sputter oxide etch process. Increasing counts indicate a chamber clean is needed. High counts following the chamber clean indicates additional conditioning wafers are necessary to bring particle levels back to baseline. Control limits can be implemented to alarm and shutdown the system when high count levels are detected.

### FEATURES AT A GLANCE

- resonant scanning-laser for increased detection area and accurate particle sizing
- reduces costs by improving yield and reducing test wafer usage
- improves productivity and tool availability by predicting maintenance events and isolating particle sources
- fully compatible with FabGuard Sensor Integration and Analysis System
- sensor bus communication is compliant with existing AEC/APC systems
- available for pump line applications in process chambers, transfer chambers and loadlocks

### APPLICATIONS

- process/equipment/component optimization
- process fingerprinting
- PM prediction and recovery
- fault detection and classification for maximum yield

## SPECIFICATIONS

### Performance

Minimum detectable size	> 0.22µm*
Maximum detection area	970mm <sup>2</sup>
Velocity range	0.1-75 m/s

### Communications

Communications interface	10BaseT Ethernet®
Communications protocol	Modbus/TCP

### Physical

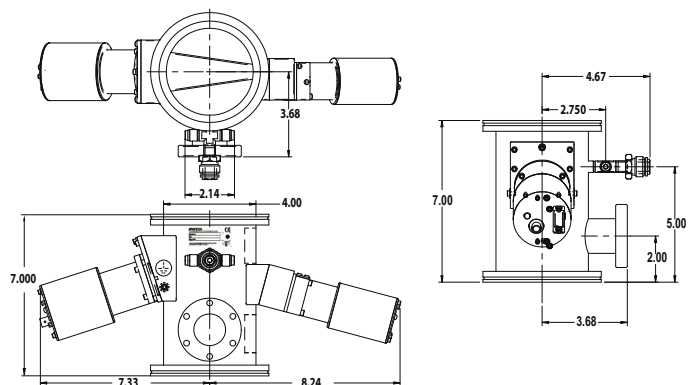
Pump line sizes	KF25, KF40, KF50, LF80, LF100
Pressure range	10 <sup>-8</sup> Torr to 50 psia
Whetted surfaces	
Window	magnesium fluoride
Manifold	aluminum or stainless steel
O-ring	Chemraz® or VITON®
Laser power	50mW
Laser wavelength	658nm
Process temperature compatibility	5-150°C
Ambient temperature range	10-40°C
Relative humidity	limit 95% noncondensing
Power requirement	24 V(dc) (internal) World Ready V(ac)
Power consumption	40A @ 24 V(dc)
Regulatory compliance	CDRH Class 1**

\*Minimum detectable size can vary due to installation constraints.

\*\*Proper installation of interlocks required.



### Custom LF100 manifold for preclean chamber.



#### GLOBAL HEADQUARTERS:

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