

# Piezocon Gas Concentration Sensor and Delivery Control System

The Industry Standard for Reproducible Vapor Delivery Control



- Production-proven with over 2,800 installations worldwide
- Provides improved process reproducibility and increased yield by tightly controlling the delivery of process gases and of precursor chemical vapors
- Lowers cost-of-operation by allowing more effective use of precursor chemicals, extending the use of precursor chemical sources and reducing the duration of flow to vent
- Easier tool-to-tool matching with quantitative information directly meaningful to equipment and process engineers
- Comprehensive diagnostic abilities provide higher tool productivity



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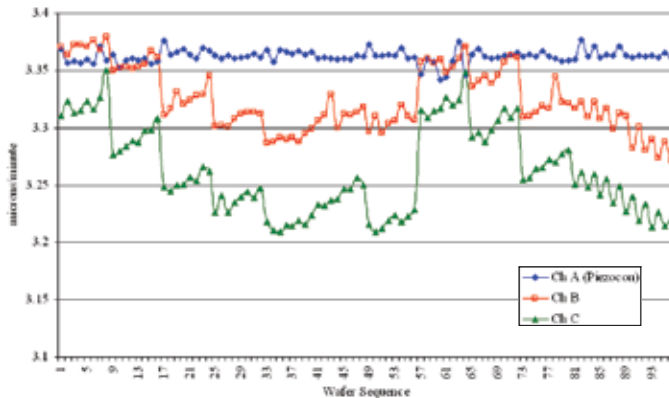
## Piezocon Gas Concentration Sensor and Delivery Control System

The Piezocon® Gas Concentration Sensor/Delivery Control System has become a standard within the semiconductor equipment industry for accurate monitoring and reproducible delivery control of chemical precursor vapors and of dopant gases to CVD and MOCVD process tools.

With over 2,800 installations worldwide, the Piezocon system is widely used by silicon and compound semiconductor wafer and device manufacturers due to its unique ability to provide highly accurate and reproducible gas delivery monitoring. It also ensures improved process control, and can be used with a broad range of gas:gas or vapor:gas mixtures for many diverse applications.

### IMPROVES PROCESS REPRODUCIBILITY AND INCREASES YIELD

**Growth Rate Control with Piezocon Sensor Installed on Chamber A Only**  
*(MFC flow rates for Chambers B and C were manually readjusted after each run, based on measured thickness data)*



### LOWERS COST-OF-OPERATION

The Piezocon system lowers the tool's cost-of-operation by extending the use of precursor bubbler or sublimator sources, reducing the frequency of precursor source exchange or refilling and minimizing the need for tool re-qualification.

### EASIER TOOL-TO-TOOL MATCHING

Tool-to-tool matching is facilitated by the Piezocon system's ability to provide relevant quantitative information on the ratio of precursor vapor to carrier gas concentration; and precursor delivery rate (g/min or mole/min) to the process chamber.

### COMPREHENSIVE DIAGNOSTIC CAPABILITIES

The Piezocon system generates log data files with information such as vapor:carrier gas concentration, precursor delivery rate, and MFC set-point, allowing optimization of the delivery system and identification of any malfunction, such as bubbler temperature or pressure, MFC, pressure controller, etc.



Piezocon Heater Jacket and Heater Controller



Piezocon Single Sensor Controller



Piezocon Multi-Sensor Controller



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