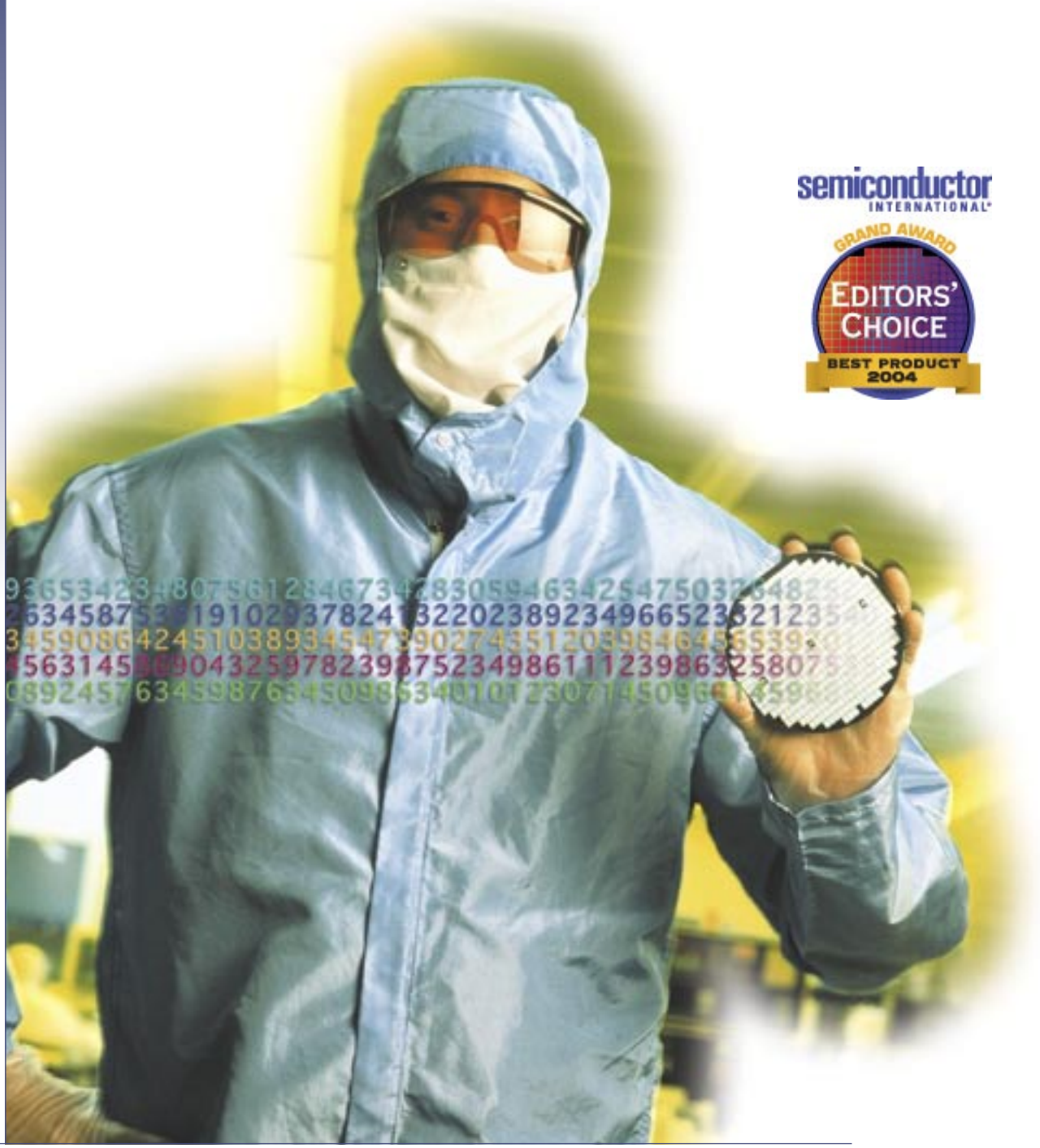


semiconductor INTERNATIONAL

GRAND AWARD

EDITORS' CHOICE

BEST PRODUCT 2004

FABGUARD™

Sensor Integration and Analysis System

POWERFUL DATA MANAGEMENT FOR ENHANCED PRODUCTIVITY

INFICON

Make your fab's data work for you.

The shift to larger, more expensive wafers and smaller geometries makes precise process control more vital to profitability than ever before. These cost pressures make it critical to maximize fab productivity, both by reducing the number of ruined wafers and by maximizing equipment utilization.

FABGUARD FEATURES AT A GLANCE

- run-by-run and real-time analysis for process control and fault finding reduces scrap and improves process control
- automated data collection and storage of historical files to enhance SPC
- data combined from multiple sensors reduces hardware redundancy while allowing all data from an entire tool, process or fab to be integrated for convenient access and analysis
- single user interface for all tool data reduces learning curve
- classification of faults for quicker response to problems, minimizing downtime
- overall impression of tool/process health to aid preventive maintenance personnel

FabGuard™ Sensor Integration and Analysis System helps semiconductor manufacturers meet these challenges by enhancing tool productivity, providing process control, and reducing losses from process drift, contamination, tool malfunction, or unnecessary test wafers. It accomplishes this by tapping into a rich, underutilized resource—the vast amount of data generated by tools and process sensors—and using that data in more innovative and comprehensive ways than previously possible.

FABGUARD CONTINUOUSLY MONITORS AND CONTROLS YOUR PROCESS

FabGuard starts by automatically collecting all available data, both from INFICON sensors and the built-in sensors the tool uses for proper operation. Data is archived and analysis results are stored in an SQL-searchable database. Operators can view all information through a single, easy-to-use interface. Presenting data from all types of sensors in a consistent format improves the learning curve, while reducing hardware redundancy by doing the work of multiple equipment from multiple vendors. Remote monitoring is also possible, either from a central location in the fab or from off-site.

FabGuard's sophisticated data analyses yield new insights into tool and process performance.

FabGuard then analyzes the data using sophisticated physical models and statistical techniques, looking for correlations across multiple parameters and comparing the process second-by-second to models known to be good from previous runs. These robust techniques allow FabGuard to reliably detect process events that can then be used for process control and to quickly detect process excursions with far fewer false alarms.

HOW FABGUARD WORKS

FabGuard Sensor Integration and Analysis System's architecture is organized into several sections:

Communication Engine — Receives information related to tool events (e.g., wafer ID) and sends information to the tool controller. Also interfaces through drivers with INFICON sensors and the tool's own sensors.

Analysis Engine — Complex statistical analyses are performed using a variety of techniques. In essence, "good" data is used to create a model to which data from successive runs can be compared. Historical data is used to re-train the engine to correct for sensor drift, thereby improving the robustness of the analysis and reducing the likelihood of false positives.

Decision/Control Engine — Determines which commands should be sent to the tool to control wafer processing.

Fault Engine — Determines the source of out-of-spec conditions, whether in the wafer, the process or the tool. It classifies faults, tracks process trends and creates a library of faults for each tool or process.

User Interface — Consistent for all sensors and processes, simplifying the learning process. Screens can be viewed at the local workstation or a remote site.

Results Database — All data, both current and historical, can be easily located through SQL searches.

MANAGE A PROCESS, A TOOL, OR YOUR ENTIRE FAB

FabGuard Sensor Integration and Analysis System's advanced data analysis creates reliable information that can be used to advance process controls from event-based (e.g., endpoint detection), go/no go and statistical process control (SPC) techniques to run-by-run control and even real-time fault detection. As a result, processes become more stable and problems are detected sooner without the need for extensive test wafer usage or process setup time, so yields increase.

By simultaneously looking at all the data, FabGuard is able to provide new insights—an advantage for fine-tuning or troubleshooting tools or processes. Its information and integration capabilities can also be extended to the entire fab. By combining analysis results from multiple FabGuard systems, the status of every tool can be shown on a single screen. More sophisticated applications could include comparing tools to assist in tool matching and promoting consistent processing, and tracking process performance across multiple tools. Transferring recipes and models between fabs is also possible, insuring better control on similar processes.

PINPOINTING PROBLEMS TO MINIMIZE WAFER WASTE AND TOOL DOWNTIME

If a process excursion does occur, FabGuard can immediately activate an alarm or alert the appropriate person, then shut down the tool before additional wafers are spoiled. FabGuard also classifies the fault by labeling the analysis, thereby creating a tool- or process-specific library of faults. This minimizes downtime by helping maintenance personnel locate and correct the problem faster. FabGuard System's comprehensive database also provides an overview of the health of the tool and the process, keeping preventive maintenance personnel in tune with tool performance and reducing unscheduled tool downtime.

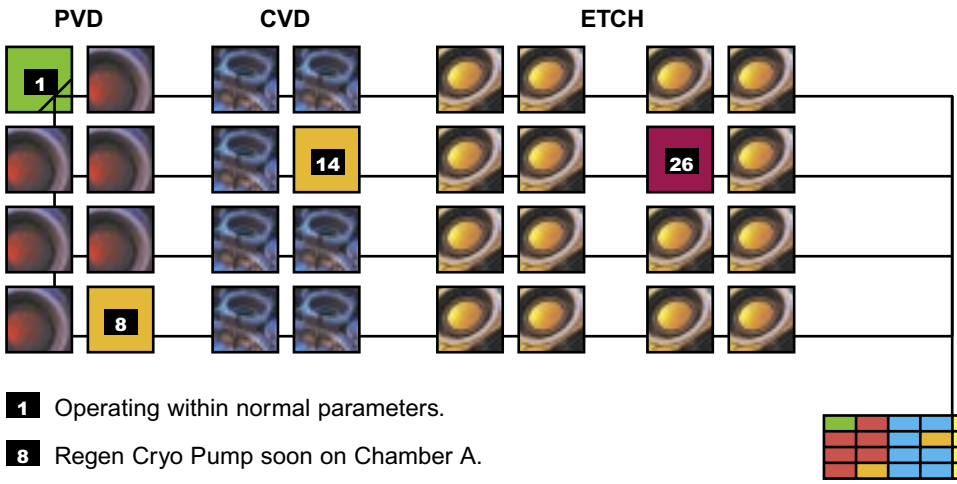
UNMATCHED EXPERIENCE AND SUPPORT MAKE INFICON THE RIGHT CHOICE

INFICON residual gas analyzers, optical sensors, thin film monitors/controllers, vacuum gauges and helium leak detectors are used in fabs throughout the world to make processes more precise, productive and reliable. Our experience in developing both leading-edge sensors and software puts us in a strong position

to integrate various data sources and use the data in much more powerful ways than can be achieved by handling the data from each source separately.

The highly trained people in our global network of sales and service offices will be with you at each step, from helping you determine how the FabGuard system can best meet your needs, through installation, to providing responsive, ongoing support.

FABGUARD CAN MONITOR PRODUCTION AT THE PROCESS, TOOL AND FAB LEVEL.



1 Operating within normal parameters.

8 Regen Cryo Pump soon on Chamber A.

14 Particle Count reaching maximum tolerance (chamber clean required).

26 Endpoint outside of specification. Check flow rate MFC2.

CE

INFICON The Instrumental Difference®

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