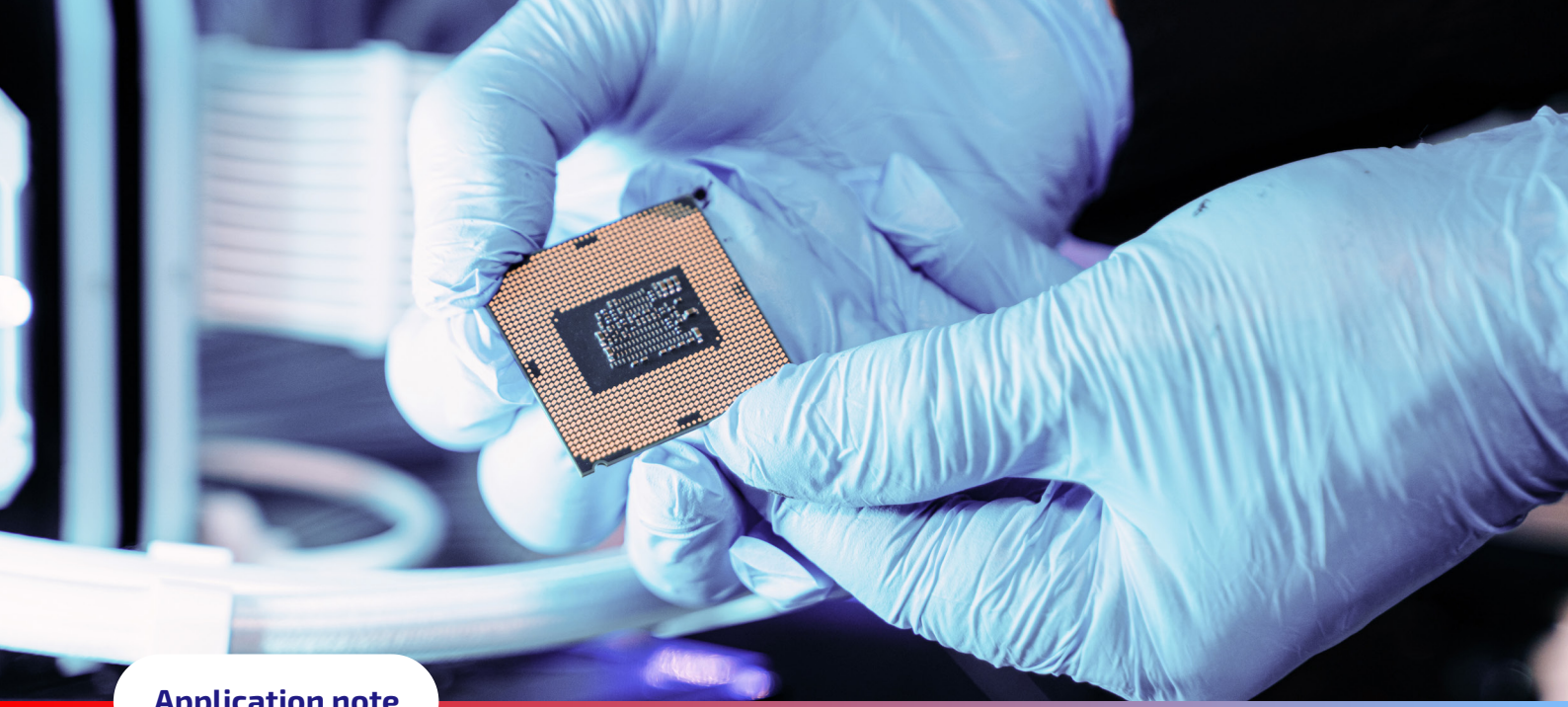

Application note

Preventing overheating in semiconductor exhaust gas abatement systems

Sector
Semiconductor manufacturing and industrial gas processing

Application
Absorber column temperature monitoring

Product
Exergen non-contact IRt/c sensors

Semiconductor wafer processing uses special gases that are often toxic, pyrophoric, or corrosive. Unused process gases and hazardous by-products must be removed safely from exhaust lines to ensure worker safety and regulatory compliance. These gases are chemically converted to safe, stable solids in absorber columns containing reactive beads. As the reaction progresses from bottom to top over several months, temperature monitoring reveals when columns need replacement and prevents dangerous overheating.

Challenges

Absorber columns are designed for specific gas compositions. If actual gases contain higher concentrations or unexpected components, exothermic reactions can cause rapid overheating, creating dangerously high pressures and potential gas leaks. System downtime is extremely costly, so sensors must require zero maintenance or recalibration. The application demands exceptional accuracy to maximize column lifetime while preventing overheating. Since sensors operate in potentially flammable environments, they must be intrinsically safe.

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Solutions

Exergen IRt/c sensors from CleverIR provide non-contact temperature monitoring and do not need to be replaced when columns are changed. Self-powered and passive, these sensors deliver fast, accurate readings while remaining intrinsically safe in hazardous environments. Their compact size allows easy mounting on any column size. The sensors detect temperature increases as the chemical reaction progresses upward through the column, signaling both replacement timing and potential overheating conditions before they become dangerous.

Benefits

Non-contact operation eliminates the need to replace or remount sensors during column changes, significantly reducing downtime. Zero field recalibration or maintenance requirements keep systems running with minimal interruption. Intrinsic safety certification ensures reliable operation in potentially flammable environments. Fast response and high accuracy enable operators to monitor both column lifetime and safety conditions precisely. The sensors provide reliable data on optimal replacement timing, preventing both premature changes and dangerous delays.

Exergen IRt/c sensors prevent column overheating while providing reliable replacement timing data, maximizing both safety and operational efficiency.

Results

Integrating Exergen sensors delivers precise temperature monitoring that prevents column overheating and optimizes safety. Operators can plan column replacements based on actual conditions rather than conservative estimates, maximizing column utilization. Early detection of abnormal temperature increases allows system shutdown before dangerous pressure buildup occurs. The maintenance-free design eliminates sensor-related downtime, while accurate monitoring reduces both premature replacements and safety risks. These capabilities help facilities maintain regulatory compliance while minimizing operational costs.

Conclusion

Exhaust gas abatement depends on reliable temperature monitoring. Exergen infrared sensors provide the accuracy, maintenance-free operation, and intrinsic safety needed to protect both equipment and personnel. Their non-contact design and passive operation make them ideal for demanding industrial environments where downtime and safety are critical concerns.

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