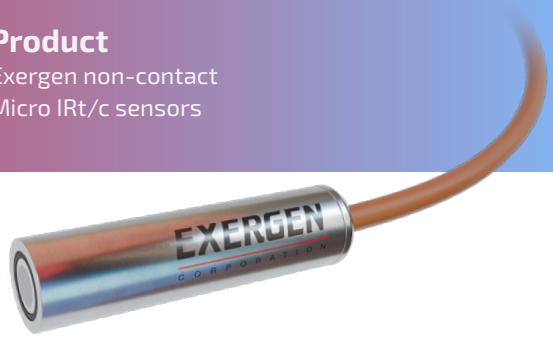
Application note

Ensuring reliable food packaging through precise seal temperature control

Sector
Food packaging

Application
Vacuum-seal temperature monitoring

Product
Exergen non-contact Micro IRt/c sensors



Vacuum-sealed packaging extends the shelf life of food products by preventing exposure to the atmosphere and slowing microbial deterioration. The vacuum also fixes the product within the pack, providing protection and reducing packaging volume. For the seal to be effective, it must be completely airtight – any breach means the product cannot be sold. A reliable, precisely controlled sealing process is therefore essential to maintaining product quality and production efficiency.

Challenges

After vacuuming, a heated resistance wire fuses both sides of the plastic bag together to create the seal. However, the temperature of the plastic and the machine varies throughout the day. Cold conditions in the early morning can produce failed seals, while higher temperatures later in the day risk burning the plastic. Contact sensors are not viable – they would be damaged by melting plastic and react too slowly to track the fusing point accurately.

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Solutions

Exergen Micro IRt/c sensors from CleverIR provide fast, non-contact measurement of the seal temperature, enabling a precise feedback loop to the resistance wire. With a response time of 50 milliseconds and repeatability of 0.01°C (0.02°F), they detect the ideal fusing temperature reliably. Their compact 6.3 mm (0.25") form factor fits easily within the sealing bar of vacuum processing machines, requiring no physical contact with the hot plastic at any point during the process.

Benefits

Non-contact measurement eliminates the risk of sensor damage from melting plastic while delivering the speed needed for real-time process control. Self-powered and intrinsically safe, the sensors require no programming, calibration or maintenance throughout their operational life. With repeatability error of just 0.01°C (0.02°F) and interchangeability error of ±1%, any replacement sensor installs as a simple drop-in unit with no reconfiguration needed. Patented ambient temperature compensation ensures accurate readings even as machine conditions change throughout the day.

Exergen Micro IRt/c sensors ensure consistent, airtight seals by providing precise, real-time temperature control of the vacuum-sealing process.

Results

Integrating Exergen sensors delivers consistent seal quality regardless of ambient temperature fluctuations throughout the day. Precise feedback control eliminates failed seals caused by cold morning starts and prevents plastic burning during warmer periods. The result is a fully automated, reliable process that reduces scrap, minimizes production downtime and increases overall throughput. With no sensor maintenance or calibration required, operational costs remain low. These improvements translate directly into better product quality and increased profitability for food packaging operations.

Conclusion

Reliable vacuum-sealed packaging depends on precise, consistent temperature control during the sealing process. Exergen Micro IRt/c infrared sensors provide the speed, accuracy and compact design needed to maintain seal quality under varying ambient conditions. Self-powered with no calibration or maintenance required, they deliver long-term reliability without adding to operational costs. Their patented ambient compensation and easy integration make them ideal for food packaging environments where product integrity and production efficiency are paramount.

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