



## APPLICATION STORY

# Ensuring consumer safety and operational efficiency in the food and beverage industry

**Compressed air, industrial gases, and conveyor systems are used in almost every production process in the food and beverage industry. Undetected leaks and mechanical faults can lead to serious consequences, such as contamination of products, reduced efficiency, increased downtime, and safety risks, which makes using effective predictive maintenance methods and tools critical.**

Compressed air and industrial gases are widely used in the food and beverage industry for various purposes, such as in production chains, packaging, and cleaning. Most production phases also involve the use of conveyor systems, which are critical for the process but prone to hidden wear and tear. Undetected leaks and mechanical faults can cause significant problems in food and beverage manufacturing facilities, making regular inspection and maintenance essential to ensure the quality and safety of food and beverage products, as well as the continuity and efficiency of the operations.

### Industry-specific Challenges from Costs to Contamination

The food and beverage industry is heavily regulated to ensure public safety

and protect consumers from potential health hazards. This also means that leaks cause certain industry-specific challenges. Firstly, vacuum leaks can contaminate food and beverage products. The air in a manufacturing facility can contain particles and contaminants that can be harmful to food and beverage products. When vacuum leaks occur, they can introduce these contaminants into the products, leading to spoilage, quality issues, and even health risks for consumers. Secondly, compressed air leaks can reduce efficiency and increase operating costs. Compressed air systems are energy-intensive and require significant amounts of electricity to operate. When there are leaks in the system, the compressed air pressure drops, and the system has to work harder to maintain the required pressure, resulting



*The FLIR Si2-LD acoustic camera for pressurized gas leak and mechanical fault detection.*

in increased energy consumption and higher operating costs. As 24/7 operations are not uncommon in the food and beverage industry, these additional costs can quickly accumulate into significant amounts. Thirdly, compressed air leaks can also affect the performance of pneumatic tools and equipment, reducing their effectiveness and leading to downtime for repairs and maintenance.

Food and beverage manufacturers also use other industrial gases for various purposes. Carbon Dioxide (CO<sub>2</sub>) is used for beverage carbonation and modified atmosphere packaging (MAP). Oxygen (O<sub>2</sub>) is used for modified atmosphere packaging (MAP) and fermentation. Argon (Ar) is also used for modified atmosphere packaging (MAP) and beverage dispensing systems. Helium (He) is used for leak testing and beverage dispensing systems. Leaks not only cause issues like reduced performance, equipment malfunction, and decreased product quality but also lead to significant additional costs.

### Mechanical Faults Affecting the Food and Beverage Industry

Conveyor systems are used to transport raw materials, ingredients, and finished products throughout the production process, and mechanical faults can cause equipment downtime, decreased productivity, and increased maintenance costs. Bearings play a crucial role in conveyor systems, as they are used in conveyor rollers, pulleys, shafts, and other components to facilitate smooth movement and reduce friction. Common issues with rolling bearings in conveyor systems include contamination, corrosion, lubrication problems, temperature changes,

hygiene requirements, overloading, shock and impact loads, misalignment, vibration, and material handling issues. To prevent these problems, it is important to regularly inspect and maintain the bearings and adhere to hygiene standards.

### An Acoustic Solution that Meets the Needs

To avoid problems like impaired product quality, increased operating costs, and consumer safety risks, food and beverage manufacturers need to regularly inspect compressed air and conveyor systems to ensure that they are functioning correctly and free from leaks and mechanical faults. Using an acoustic camera helps identify even very small leaks and faults promptly, improving efficiency, reducing operating costs, and ensuring the quality and safety of food and beverage products. An acoustic camera also allows for accurate leak and gas detection from a long distance even in a noisy environment typical for the industry, without having to halt operations. Further benefits include the AI-driven automated distance, leak size, and cost estimates, which greatly facilitate predictive maintenance decision-making. Delivering a complete solution for the food and beverage industry needs, the Si2 acoustic camera features the Mechanical Mode, which makes it easy to locate mechanical faults in conveyor systems, enabling proactive maintenance and preventing unplanned stoppages in production.

### Benefits of using the Si2 for pressurized leak and mechanical fault detection

- Saves time, energy, and costs by locating hidden compressed air leaks in time.
- Provides leak detection, leak rate, and cost quantification for compressed air, hydrocarbons (methane, natural gas), ammonia, helium, and argon to find and prioritize repairs, and maximize return on investment.
- Allows for quick detection and measurement of bearing & other mechanical issues that can lead to costly production disruption or safety hazards.
- Increases operational efficiency by preventing unplanned downtime through early detection of air and gas leaks.
- Scans large areas and pinpoints critical problems accurately, even from a distance and in noisy environments.
- Ensures product quality and compliance with the regulation and controls the production facilities and equipment are subject to.
- Requires minimal training and is easy to incorporate into the maintenance cycle.
- Allows for inspections to be carried out without halting operations.
- Provides real-time results and actionable data for maintenance and repair plans through machine-learning-driven analytics.



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FOR MORE INFORMATION ABOUT ACOUSTIC IMAGING CAMERAS OR ABOUT THIS APPLICATION PLEASE VISIT: [WWW.FLIR.COM/PRODUCTS/SI2-LD/](http://WWW.FLIR.COM/PRODUCTS/SI2-LD/)

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