

Inspection on the line: Quality control for packaging

The food and nutrition industry is facing increasingly stringent requirements relating to product quality and safety. Extensive regulations govern the legislative rules that manufacturers must currently meet. For instance, both the German Food and Feed Code (Lebensmittel- und Futtermittelgesetzbuch, LFGB) and the IFS Food Standard stipulate that food must be free of contaminants. These rules seek to protect consumers and guarantee product quality. Good manufacturing practice rules under Regulation (EC) No. 2023/2006 also stipulate that a self-monitoring or quality control system shall “monitor use of good manufacturing practice” as part of efforts to safeguard consumer protection. Hazard analysis and critical control points (HACCP) are another key point here. On this issue, the German Federation of Food Law and Food Science (Bund für Lebensmittelrecht und Lebensmittelkunde) writes that “hazard analyses falling under the scope of the food packer within the meaning of the HACCP concept requires a safety assessment relating to the entire packaging system, an evaluation of the influences on packaging and packaging components as well as their interaction.” Packaging lines use special sensors, scanners and inspection systems to guarantee the product safety required under national and international law, depending on their task. The latest trends in quality control will be showcased by exhibitors at FachPack 2018.

Quality control in the packaging process

Food packaging primarily serves to protect its contents against environmental impacts and damage during storage and transportation. This packaging ensures that food has a longer shelf life by gasifying it in a protective atmosphere. In modern production facilities, the packaging line can automatically check whether packaging reliably satisfies all requirements for this task. Quality is generally safeguarded at the packaging line using non-invasive systems. This term refers to inspection processes taking place at the line without individual pieces of packaging having to be removed for this purpose. These integrated control systems

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support the food industry's mostly high production cycle times while simultaneously ensuring implementation of all food safety requirements.

These systems allow damaged or rejected packaging units to be easily ejected without manual intervention by connecting them with upstream and downstream components in the packaging line. At the same time, these systems can provide feedback to upstream machines, such as filling robots, sealing machines and labellers, which can then directly respond to any identified deviations.

Reliable air-tight packaging for food

A variety of technologies are available to inspect different packaging materials and processes. One particular option for primary packaging is leakage tests. After all, if perishable goods, such as sausage and cheese, are not packaged in air-tight packaging, this can not only lead to the product spoiling, but also might even damage the manufacturer's reputation and lead to costly recalls. Inline leakage tests are carried out when packaging using protective gas, for instance employing devices that make use of test gas. They have sensitive gas sensors that detect even the smallest leaks. Carbon dioxide, helium and hydrogen are used as test gas.

In addition, sealed seams in packaging, such as trays and tubular bags, can also be checked using visual inspection systems. These devices also detect contaminations in the seams and check the position of labels. Visual inspection systems generally consist of cameras that compare certain parameters in combination with evaluation software. To this end, packaged products are guided past cameras during the packaging process. If the image recognition system detects a deviation from a previously defined condition, this information will be passed on in the system and defective packaging will be automatically ejected. The previously defined parameters include untight packaging and optical defects. The benefit of these systems is that they are suitable for especially high line speeds.

Detecting contamination

No manufacturers can fully rule out the possibility of contaminants finding their way into end packaging during comminution and processing of food. However, bone fragments in sausage, metal parts from broken-off blades or plastic pieces of packaging and transport cases are a worse-case scenario for any food producer. If this happens, entire batches have to be recalled to avert any detriment to customers. A recall also requires

inspecting the entire line until the source can be clearly identified. This scenario can be prevented in the first place by using metal detectors, for instance, which are fitted after the packaging process. Packaging goes through devices at the end of the process chain and is x-rayed. Metal contaminants are identified and defective units are ejected.

X-ray technology is used if other types of contaminants, such as stones, plastic or bone fragments are detected. X-ray inspection systems identify deviations in product density. X-ray systems can identify of all kinds of unwanted materials through predefined settings. Therefore, they are suitable for detecting contaminants and for carrying out other quality control tasks: clumps of salt can be identified, as can deviations in product composition. The x-ray device can even determine if the meat in a ready meal does not correspond to the recipe.

The product and required cycle speed determine which systems are best suited to perform quality assurance. Many exhibitors at FachPack 2018 offer stand-alone solutions for these tasks or integrate quality control into their lines.

About FachPack

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