



Detection ✓

Self-monitoring ✓

Why conformity testing processes for X-ray inspection systems and metal detectors need to be automated.

Content

1. Compliance processes for inspection lag automation processes
2. Automated vs. manual compliance testing
3. Exemplary solution of an integrated compliance monitoring
4. Conclusion

Food processors today must go to great lengths to ensure that the products they produce are of the highest quality and meet the latest food safety requirements. With the costs of quality defects or non-compliance adding up very quickly in a short period of time, inspection and quality control points need to be checked more frequently or even continuously as production lines speed up. This white paper explains why compliance testing processes for X-ray inspection systems and metal detectors need to be automated.

1. Compliance processes for inspection lag automation processes

Foreign object detection systems are the quality assurance tools of choice, with a high capital cost and little direct payback in terms of increased, throughput or productivity. It could be argued that X-ray inspection and metal detection systems contribute to reduced efficiency because they require direct labour for manual inspection and create waste when products are rejected from the line.

The detection performance and reliability of modern metal detection and X-ray systems have increased tenfold in recent years. However, manual standard operating procedures (SOPs) for compliance testing has not kept pace with the automated parts of the production line. Someone still must manually check the contaminate detection system every hour or two, rather than relying on a process control tool, through automation.

The results, which are only relevant at the time of testing, are recorded manually on a clipboard next to the machine, while the rest of the production line operates with confidence either semi or fully automatically with few people. The legacy practice of manual testing, up until now, has not been on the radar for continuous improvement and automation. Plant managers simply accept the costs and inefficiencies associated with this practice.

As production lines ramp up, staff is reduced, processes are modernized, and food safety standards raised; compliance testing on product inspection systems is the last vestige of labour-intensive, suboptimal practices.

2. Automated vs. manual compliance testing

The current practice of manually testing metal detectors and X-ray inspection systems every hour on all lines, which requires a full-time employee, quickly becomes very costly. In addition, any package that is rejected during testing must be reworked. This incurs significant costs in terms of labour packaging waste, product waste, production line interruption, and rework costs. As production rates increase across multiple lines, inspection intervals must reduce to maintain the same amount product between a test.

As a result, it becomes increasingly difficult and costly to run from line to line to manually inspect each metal detector or X-ray system with the same degree of confidence without increasing cost.

What if product inspection systems were smart enough to autonomously monitor their detection capabilities and compliance? The benefits of monitoring compliance in real time rather than at intervals are:

- Elimination of labour costs, product, and packaging waste.
- Every package is inspected by a compliant device.
- A much higher level of confidence that the contamination detection process is measured, tracked, and recorded to a compliant standard without the risk of human error.

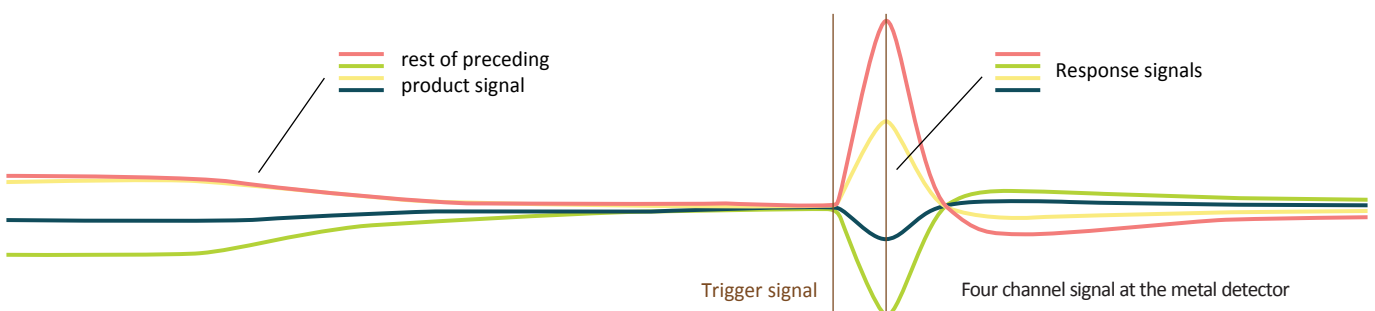
Manual testing of metal detection and X-ray equipment could be well on its way to becoming obsolete if automated systems with integrated compliance monitoring become common practice.

3. Exemplary solution of an integrated compliance monitoring

With Integrated Compliance Monitoring (ICM), Sesotec offers a solution for metal detectors and X-ray inspection systems.

Integrated Compliance Monitor controls the detection capability of the inspection system.

This continuous, internal control of detection requirements leads to immediate detection of deviations and increases the stability of the production process.



How ICM works with metal detectors

The metal detector generates a predicted detection sensitivity after the teach-in process is complete. The user enters the detection standard into the metal detector system, and ICM monitors the integrity of the detection prediction and sounds an alarm if a change on or in the metal detector

results in a situation where the standard can no longer be met. If this occurs, the device immediately issues an alert that triggers a call-to-action. The person in charge of the line knows immediately and can prevent non-compliant products from continuing to pass through the line.



How ICM works during X-ray inspection

Initial sensitivities are calculated and stored directly after the auto-train process.

The current sensitivity for stainless steel and glass is continuously and automatically checked after a time interval.

The sensitivity limits can be set manually.

If the limits are exceeded, an error or warning message is issued.

Once the ICM is validated, the cost and food safety benefits begin:

- frequent, repetitive testing becomes unnecessary
- Product and packaging waste are reduced
- Production line interruptions are reduced
- Labour Labor costs are reduced
- Food safety compliance is ensured because the detector always knows that the line is operating according to the detection standard, rather than just knowing the status at a test interval.



4. Conclusion

As profit margins continue to shrink due to rising costs, food manufacturers must automate compliance inspection processes in their safety programs. This automation in metal detection and X-ray inspection systems has several benefits, some of which are:

1. Efficiency: automated inspections can be performed faster and more accurately than manual inspections. This increases production efficiency, reduces downtime, and minimizes human error, resulting in higher product quality overall.

2. Consistency: Automation means that tests are performed consistently and in a standardized manner, regardless of individual skills, fluctuations in concentration or employee workloads. This ensures consistent and reliable results.

3. Documentation and compliance: automated systems can digitally record and manage test data, which facilitates traceability and control of processes. This is particularly important for meeting regulatory requirements and documenting compliance with standards.

4. Safety: In the food industry, metal particles or other foreign bodies can have serious consequences for the health of end consumers. Automated testing procedures increase the safety and quality of products, thus helping to protect consumers.

5. Cost savings: although the introduction of automation technology initially involves investment, it can lead to significant cost savings in the long term, as it requires less time-consuming manual testing and reduces the number of production stoppages caused by errors.

The future for inspection is with, automating compliance and testing processes with the use of tools such as (ICM) for metal detection and X-ray inspection systems. It is one of the last places on the production line where it is possible to make an easy significant contribution to reduce cost and improve efficiency while at the same time achieve higher levels of compliance and food safety.

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Sesotec - an overview

The Sesotec group is one of the leading manufacturers of machines and systems for contaminant detection and material sorting. Product sales primarily focus on the food, plastics, and recycling industries.

www.sesotec.com



Metal detection systems



X-ray inspection systems



Sorting systems



Magnet systems