

# Food safety

## Why metal is still the biggest and most likely contaminant

by Fortress Technology, UK



Right: Rapid automation uptake can increase the risk of metal contaminants entering the food chain

**M**etal remains the biggest and most likely contaminant risk within food processing and packing plants today. But why is that? In the raw ingredient phase, food is exposed to different processes - from cutting meat, filleting fish, grinding spice or mixing dry and wet baking ingredients. Later down the line, you may be cutting larger quantities into more convenient single serve portions or preparing ready-cut vegetables - again introducing a possible metal contaminant into the food supply chain.

As industrial metal detector specialists, Fortress Technology answers some of the most common questions pitched to them by food factories:

### How has the rapid uptake of automation impacted food safety on food processing lines?

Using equipment to improve efficiencies, and product costs in some situations, the need for sufficient checks and preventative maintenance practices becomes mandatory. Previously, a team of manual operators would visually inspect wear of machine parts and wire mesh from sieves for example, yet with fewer manual workers on a line, the risk of metal contaminants increases.

Installing a metal detection system is the first line of defense. However, it is equally important to use metal detection in conjunction with a quality assurance program, ensuring proper procedures are in place for controlling rejects, and as a fool-proof process to determine the source of any contaminants picked up. Equipped with this information, appropriate actions can be taken to protect against costly product recalls and damage to brand reputation.

### How have retailer requirements changed and what's the impact on food safety standards?

In recent years, retailers have become more risk-averse when it comes to food safety and quality, imposing their own – increasingly stringent – protocols and standards on suppliers. Food processors can feel overwhelmed by the sheer extent of choices, food safety initiatives and third-party audits that they must contend with.

Companies need to ensure that the required form of inspection and necessary specifications are in place. A retailer 'safety net' will also often include assurances about regular system checks to ensure that all QA systems – including metal detection – are functioning correctly.

Some retailers may put pressure on suppliers, or potential suppliers, to invest in x-ray contaminant detection. Being able to demonstrate the reliability and improved sensitivity of installed metal detectors (with FM software, for example) may be one way to resist this sort of pressure.

### Why choose metal detectors over x-ray?

Cost is usually a major reason why processors choose metal detectors over x-ray. X-ray remains far more expensive, both in terms of capital cost and running costs. Expect to pay in the region of US\$50,000-US\$57,000 to install an entry-level x-ray machine, compared to between US\$5,500 and US\$25,000 for metal detection, depending on the size and complexity of the application.

Before selecting the type of inspection equipment, buyers should first determine the potential sources of contamination on the particular product line and manufacturing process. If the most common contaminant is metal, or mostly metal, it makes sense to consider metal detection as a first option.

If a processor needs to detect physical contaminants on free-falling products, they should use metal detectors rather than

X-ray due to the inconsistent density within the falling product stream. For manufacturers constrained by limited line space, the larger size of x-ray units may also be a decisive factor.

### **Does in-foil packaging rule out metal detectors?**

Not necessarily. In the past, the issue of detecting metal in foil-laminate packaging was more challenging. Now, metal detectors can phase out and run products packaged in laminate foils with a good level of sensitivity. However, pure aluminum foil (i.e. an oven ready tray) may be too challenging, and that's when a ferrous in foil detector would then be recommended.

Another potential disadvantage with x-ray is even the latest systems tend not to tolerate difficult or extreme environments quite as well as metal detection. Also, an x-ray machine may have trouble detecting smaller particles and low-density metals – such as aluminum – that metal detectors will easily pick up.

### **Are false rejects a big problem?**

Factory food waste is a large and continually growing issue for manufacturers and one where choices about production equipment (including metal detection and other quality control) can have a surprisingly significant impact on outcomes. Reliable industry experts put the annual cost of false rejects per line at around US\$20,000, depending on the scale of the problem.

False rejections occur when perfectly good product is identified as containing a contaminant. It's more common on lines handling 'wet' items. While this way of categorizing products does include literally wet or moist consistencies (in anything from dairy products to baked bread, dips to meat) it also refers to any food matrix containing high levels of salt or other mineral fortification.

The common element is a strong 'product effect', which registers relatively high conductivity and magnetic permeability, mimicking the signal picked



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up from metal and making the distinction between the two hard to establish. Fortress Technology's most recent innovation in this area, the Interceptor metal detector, applies both high and low frequency ranges to isolate the product signal and more readily identifies any contaminant signature.

### **How can I act more sustainably and future-proof my equipment investment?**

Although today's inspection and detection systems are good, it's equally important to ensure they are suited to the environment you are operating in.

Do you, for example, require a certified washdown system to meet retailer's hygiene standards?

Unsurprisingly, food processors can feel overwhelmed by the sheer extent of choices and food safety initiatives they have to contend with, let alone anticipating future food safety requirements.

The Fortress 'Never Obsolete Commitment' is one way the company helps customers stay ahead of the curve. This backward-compatibility program enables customers to upgrade any existing Fortress detector (even those built 17 years ago)



Sensor and software upgrades usually take minutes to complete, saving thousands of dollars and eliminating downtime in busy food production plants.

helping food processors stay compliant.

For example, a retailer Codes of Practice update; An upgrade will only set a manufacturer back several hundred rather than thousands of dollars and the cost can be offset through the maintenance budget instead of eating into capital expenditure. What's more, manufacturers can achieve instant compliance without having to wait for a new machine to be built and installed.

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