Safeguarding pumped products with the use of X-ray inspection

Refined and processed food products are part of most shopping lists these days and they are increasing in quality as consumers become more and more aware of the processes and ingredients that go into their manufacture.

by Daniela Verhaeg, Marketing Manager, Mettler-Toledo Safeline X-ray. mt.com

As such, manufacturers are under growing scrutiny both of what materials they use in their products and how they handle them during production to uphold the highest levels of food safety and to help consumer's lead healthier lifestyles.

At the same time though, manufacturers are under pressure to produce more for less, streamlining operating costs to protect profit margins and remain competitive in a globalised market place.

Optimum food safety

In order to provide high quality products, manufacturers need to ensure optimum food safety for their pumped foods through the use of X-ray inspection technology.

Traditionally, such machines are installed at the end of the production line to inspect finished products for contamination before they leave the factory. This allows producers to comply with the food safety legislation in effect in their respective markets, while also enabling them to meet consumer and retailer demands for optimum food quality.

However, there are many benefits to inspecting pumped products earlier in the production process at the pumping stage. This is because the product in question is more homogenous in texture and density, making foreign bodies easier to detect. It also means that contaminated product is removed from the production line before further value is added through processing and packaging, reducing manufacturing costs and cutting waste.

At the same time, manufacturers face a number of challenges in order to ensure optimum food safety for pumped products. There are a host of factors that need to be taken into account to optimise foreign body detection rates; one factor is the density of the product.

In order to be detectable by X-ray inspection, a foreign body has to be denser than the surrounding product. The less dense the contaminant compared to the product, the harder it will be to detect.

Manufacturers also have to consider product homogeneity i.e. the texture and consistency of the food to be inspected. A product with differing density, such as minced meat, can present a more complex and varied greyscale image than a homogenous product.

Products with varying densities can make it more challenging to detect contaminants without the use of specialist software developed specifically for the inspection of pumped products.

In addition to these issues of detection precision, manufacturers have to consider the impact on line productivity of their chosen product inspection machine.

Whatever solution they choose, it must not only be suitable for the product application in question, it must also be capable of accurate inspection even at high flow rates.

At the same time, it must also support rigorous cleaning regimes, product changeovers, and regular testing procedures with minimal downtime to maximise efficiency for operatives and the business.

In order to overcome these challenges, manufacturers can rely on advanced X-ray inspection technology, such as Mettler-Toledo Safeline X-ray's X38 for pumped food product applications, including liquids, slurries and pastes. The system's single vertical X-ray beam optimises detection capabilities for contaminants such as calcified bone, glass shards and metal filings within a range of common pumped foods, such as processed meat and poultry, at a flow rate of up to 14 tonnes per hour.

The timely and accurate opening of the rejection mechanism ensures precise removal of the contaminated product with minimal product waste. Designed according to the principles of the European Hygienic Engineering and Design Group (EHEDG), with an IP69 rated stainless steel casing, as well as sloping surfaces and rounded edges to reduce bacteria traps and allow water to run off more easily, the X38 facilitates even the harshest wash-down regimes. This minimises cleaning downtime for operatives, enhancing line efficiency.

Streamlined system

Systems such as the X38 offer features developed to streamline maintenance and calibration downtime. Its generator and detector sit on a moveable carriage that allows it to be rolled backwards to calibrate for a quick product changeover without the need to disconnect and reconnect pipework. It also features an automatic calibration function that allows the system to be set up in less than 20 seconds without the need for operatives to intervene.

In addition, manufacturers need to look for X-ray technology which has an automatic testing facility option; this is where a mechanism within the pipe moves a small contaminant sample into the path of the X-ray beam. This eliminates the need to manually insert a test piece into the pipework, thereby simplifying testing procedures and reducing downtime. All of these innovations help to maximise production uptime, enhancing productivity for manufacturers.

Using such state-of-the-art technology solutions with outstanding detection capabilities can help meat manufacturers optimise safety for their pumped products, enabling them to provide retailers with high quality foods and to meet the growing demand for processed food. ■