X-ray inspection improves safety of pumped poultry applications

The need to equip poultry processing lines with top quality contamination detection equipment is more pressing than ever. Tightened regulatory standards and heightened consumer awareness require that poultry processors take all necessary measures to protect customers and their brand reputations.

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The difficulties and complexities of poultry inspection can be overcome with the right product inspection solution.

X-ray pipeline inspection systems can offer much better levels of physical contamination detection than traditional conveyor belt x-ray systems when inspecting poultry trim, such as breast fillets and thigh meat, since the product is well presented for inspection. However, despite this, poultry inspection can prove challenging for four main reasons.

This article shows how a product inspection programme which incorporates market-leading x-ray pipeline inspection equipment can help poultry manufacturers to overcome these challenges.

Contamination detection

Chicken bones are the most common contaminants in poultry applications, but because they are less dense than red meat bones they can prove harder to detect using standard x-ray systems. The density of chicken bone tends to be closer to that of the chicken meat in which it lies. On a greyscale x-ray image, the difference between the grey of the meat and the grey of the bone is less marked, meaning chicken bones can be quite challenging to detect.

X-ray inspection equipment is available with brand-new software algorithms that have been specially developed for pumped poultry applications.

In addition to offering optimum contamination detection capabilities for physical contaminants such as mineral stone, glass shards and metal filings, bespoke software algorithms allow systems to achieve maximum detection capabilities for poultry bones, enhancing product safety and protecting brand reputations.

Cleaning

Pumped production lines have traditionally presented a challenge to poultry processors when it comes to cleaning, since x-ray systems are in direct contact with the product.

Advanced x-ray pipeline inspection systems feature a uniquely robust, Ingress Protection (IP) 69 rated design that supports and facilitates the rigorous hygiene regimes required by poultry processors, maximising uptime and optimising productivity.

X-ray systems are also available with air conditioners that have an IP69 rating too, making them capable of withstanding the high-pressure and high-temperature cleaning applications inherent in poultry factories. What is more, x-ray inspection equipment should be built according to the principles of the European Hygienic Engineering and Design Group (EHEDG) and feature a number of design enhancements to support poultry manufacturers' harsh wash-down procedures.

For example, pneumatic components have their own sealed enclosure to protect them from water and cleaning chemical ingress.

Additionally, systems' casing boasts sloping surfaces and curved edges to allow water to run off quickly and easily, reducing the need to wipe the machine dry after cleaning and eliminating bacteria traps. Such design improvements allow the frequency of downtime for cleaning to be reduced.

Furthermore, the robustness of market-leading x-ray pipeline inspection systems means higher reliability of performance. Both of these have the potential to significantly increase Overall Equipment Effectiveness (OEE) and reduce the Total Cost of Ownership (TCO).

Calibration

In order to calibrate an x-ray system, a signal from the detector, whilst no product is in the path of the x-ray beam, needs to be detected, which can prove problematic for pumped applications as the x-ray inspection equipment and pipe can still contain product. What is more, introducing a test piece into the pipe can also prove difficult.

Modern x-ray pipeline inspection systems have a number of features to simplify maintenance and testing procedures for manufacturers, enhancing OEE and Return on Investment (ROI).

For example, x-ray inspection equipment can automatically calibrate x-ray settings. To avoid unnecessary downtime by emptying product from the pipe, systems are available where the x-ray generator and detector simultaneously move away from the pipe manifold (inspection window), calibrate and then move back to the inspection point, in less than 20 seconds, maximising uptime and reducing labour costs on the line.

Some x-ray system manufacturers supply an optional infeed pipe with a test piece insertion port, which allows machine operators to perform regular testing.

Additionally, an auto test facility can also be added, which consists of a test sphere, automatically fed through the x-ray beam while product is moving. This enables the sensitivity of contamination detection to be checked, without interrupting production, maximising uptime and reducing waste.

Product waste

Reject portion sizes tend to be larger using pipeline x-ray systems, than for conveyorised x-ray systems. This is because standard pipeline reject mechanisms can not isolate a single item such as a chicken breast fillet.

Innovative x-ray pipeline inspection systems are available with a range of fully-integrated reject valves, including a three-way ball valve. All valves can be synchronised to the pump, minimising rejected portions and saving costs.

Conclusion

Poultry inspection has traditionally proved challenging for several reasons outlined in this article, but these difficulties and complexities can be overcome with the right product inspection solution.

Hygienically-designed x-ray inspection equipment offers poultry processors many benefits. As well as guaranteeing maximum bone detection sensitivity, robust and reliable x-ray pipeline inspection systems facilitate efficient, easy cleaning and maintenance, helping manufacturers protect their customers and their brand reputations, whilst simultaneously saving costs by maximising uptime and minimising product waste. ■