Choosing The Right Metal Detector

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Today's industrial metal detectors — with better technology and numerous features — now make it possible to consider using them at several stages along a production line, not just near the end before the product is stored or shipped.

In fact, metal detectors should be used wherever there is the chance that ferrous or nonferrous metal particles may contaminate a product stream. This is especially true when the product is one that may be consumed by humans or animals (whether intentionally or not), when product purity is a safety consideration or when contaminant particles may be of a size and type that could damage downstream processing equipment.

Metal detectors can also be used to verify that desired metal objects are present in packaged products--such as novelties in breakfast food boxes. Here again, it is important to monitor the product both before and after the process step in which the metal item is to be inserted. This assures that the detected metal at the output point is the desired object and does not include contamination carried from the input.

Detecting contamination is especially vital in the food processing industry, where today, big-box food retailers are driving suppliers to incorporate metal detection — and x-ray technology — into processing streams before the product reaches store shelves.

Because every metal contamination problem is unique in some way, the appropriate

equipment for detection (and rejection) is not always apparent, particularly to plant operators and inspectors who may not be aware of all the possible options when choosing a metal detector. Understanding the differences between standard or conventional metal detection systems, and those that can be customized, is particularly helpful before purchasing and installing such a system in your processing plant.

Standard systems fit most plant applications

Metal detection systems with Digital Signal Processing (DSP) can handle the majority of plant applications and provide products with a high level of protection against ferrous and nonferrous metal contamination.

A standard metal detector conveyor system from Eriez® includes an E-Z Tec® DSP Metal Detector, a continuously welded 304 stainless steel frame, wash-down drive, variable speed control, ultra-high molecular weight slider bed, food grade polypropylene (plastic chain) belt, stop-belt reject, reject reset button and combination beacon and horn.

Belt widths determine the size of aperture openings, which accommodate various sizes of products to be inspected. Most standard metal detection systems come in one of three belt width sizes and lengths with complementary aperture openings:

- 12-inch wide belt conveyors are 60 inches in length and accommodate an aperture opening of 6, 8, 10, 12 or 14 inches tall x 14 inches wide; this system can handle individual packages up to 100 pounds.
- 18-inch wide belt conveyors are 72 inches in length and accommodate an aperture opening of 10, 12, 14, 16 or 18 inches tall x 20 inches wide; this system can handle individual packages up to 125 pounds.
- 24-inch wide belt conveyors are 84 inches in length and accommodate an aperture opening of 12, 14, 16, 18 or 20 inches tall x 26 inches wide; this system can handle individual packages up to 175 pounds.

All three of these standard systems have a belt height of 34 inches from the floor, with adjustability of plus or minus two inches. These conventional belt widths, lengths and heights allow most plant operators to easily install a metal detection system right into an existing processing line with minimal downtime. Another standard feature is a Touch Screen (1/4 VGA) interface with a back-lit screen. The operator can quickly make changes to the metal detector without having to scroll through different menus. Numeric data and value entries are made through the on-screen keypad.

Once installed, these metal detection conveyor systems operate reliably for long periods of time, frequently in adverse environments, with little attention or maintenance. The power needed to operate both the metal detector and reject device is minimal, even if a special conveyor (discussed below) is needed to pass the product through the aperture.

If a process cannot be stopped to handle detected metal contamination, standard metal detection systems can be configured to reject the contaminated product automatically, even if the possible rejection point is some distance from the detector. The detector can also be set up to keep detailed records of detected metal, including estimated size and type, so that suspect product can be isolated after the fact, based on time of processing.

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