

Seeing the effect

For the last four to five years metal detector manufacturers have been concentrating much of their effort on providing answers to finding stainless steel – the most likely contaminant from the production process – more effectively in wet products and inside ever more popular metallised film wraps.

This trend continues, but is now being joined by further efforts to make the machines themselves more user friendly, the idea being that easier set-up and operation goes a long way to helping make a machine more consistently effective.

One principal solution to uncovering stainless has been variable frequency but, more recently, changes in coil configuration, electronics and software have come along to provide higher processing speed and the means of allowing a finer distinction to be made between product effect, caused by moisture or salinity in the food, and stainless contamination.

Until five years ago the operating frequency, and therefore sensitivity of a metal detector was usually fixed at the level required for the largest or most difficult product to be handled in terms of product effect. There had to be a trade-off, since the higher the frequency and the higher the sensitivity, so the machine becomes more susceptible to interference and risk of false rejects.

Therefore a detector set at a medium frequency, for example to check multipacks wrapped in metallised film without reacting to the thin layer of aluminium with a false alarm, would be forced to remain operating at that frequency, and lower sensitivity, even when monitoring smaller size, non-metallised packs or items with a low product effect.

However, if the machine could be switched to a higher frequency for these packs, then they at least would benefit from a greatly improved detection sensitivity.

Safeline was first on the market with a variable frequency machine, the Signature, introduced in 1996 and claimed to be twice as effective as other detection systems at picking up tiny slivers of metal and wire.

Then the company launched its Signature 2 range which includes a wide frequency detector, able to switch between an increased number of different frequency levels operating at optimum



Sensitivity in sight: Willett MD7600 shows product effect within a box that can be tightened or loosened

Improved user friendliness for metal detectors – largely in showing the operator what's going on – is the latest in a series of developments aimed at better search performance for stainless steel.

sensitivity for both metallised and non-metallised wraps.

One of the latest applications is at Evesham Foods where a Signature 2 head forms part of a twin-head system installed to monitor a range of chilled pastry products.

The Signature 2 head was selected to handle a wide range of products, including pies, sausage rolls and quiches, of different sizes and in varying packaging materials, including metallised film. The second head, a Safeline ferrous-in-foil detector, is used to check products in foil trays.

Vibration immunity

According to Safeline, the Signature 2 is able to maintain high sensitivities because of enhanced vibration immunity: an internal structure and coil system which prevents unwanted vibration signals affecting the detector's electronic balance. The detector also employs dynamic filtering and a new enhanced noise immunity system to prevent airborne electrical interference affecting the equipment.

However, says Safeline sales manager Mike Bradley, one of the main benefits is the flexibility

the Signature 2 offers through multi-frequency operation.

“The operating frequency of the coil system of a conventional metal detector is fixed by the manufacturer to allow the inspection of the customer's most challenging product which, on a line like that at Evesham Foods, would be the largest product wrapped in metallised film.

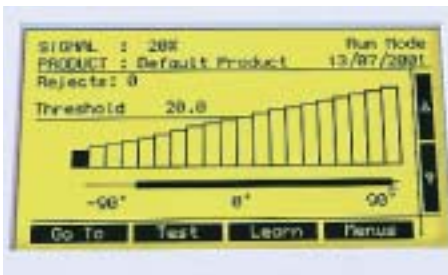
“Unfortunately, in the past this would have meant that any product wrapped in non-metallised material on the same line would have to be inspected at the same low frequency, thereby losing some ability to detect metal.

“The Signature 2 is able to switch between the low frequency required for inspecting the metallised film wrapped product and a far higher frequency and, more importantly, a more sensitive frequency when inspecting the conventional wrapped product, ensuring detection standards are maintained.”

Constant Instruments' multi-frequency metal detector is the CEIA-THS/3F Trio, which is able to auto-learn the frequency as well as any product parameters required, by passing a sample product through the inspection aperture. This data is



Twin heads: *Evesham Foods is using a two-bead metal detector from Safeline*



Touch screen: *Controls on the Cintex Sentry show what is happening and offer simple-to-follow menus*

held in memory for press-button recall

“In this way, products wrapped in metallised film can be inspected by the same metal detector as products in polyethylene wrap, with different frequency settings, which obviously provides improved sensitivity for all products being inspected,” says Constant Instruments.

An additional feature of the Trio allows the detector to be biased towards detection of stainless steel as part of the product learn facility.

At September’s PPMA Show, the company also introduced the THS/FB machine which is able to cater readily for different products, wrapping materials and process requirements that may demand different scanning speeds.

Identified by bar code

Individual products are identified either via the keypad or barcode scanning and, using parameters stored in the detector product memory, the machine automatically adjusts the throughput speed. A manual ramping facility is also provided to allow authorised personnel to adjust speeds if appropriate.

Willett has now launched a new design of

metal detector following beta-site trials in which, says the company, the machine demonstrated 40 per cent higher sensitivity levels than traditional metal detectors when monitoring wet food for stainless steel contaminants.

“During live production trials at UK food factories the new Willett MD7600 metal detector was able, typically, to find a 2.5mm diameter stainless steel ball in fresh chicken and similar products, against the 3.5mm of traditional machines,” explains product manager David Fielding.

“The MD7600 also breaks new ground in metal detection by providing an on-screen image to show the operator or line supervisor what is happening in terms of sensitivity.”

Difficult to detect

Although stainless steel is the most likely metal contaminant from the food production process, it remains the most difficult to detect, particularly in wet or saline products points out David Fielding. This, he explains is because the signal generated by stainless steel – its phase angle – is often very close to that of the product, making differentiation difficult.

To overcome these difficulties, and the risk of false rejects, the Willett MD7600 incorporates three principal innovations.

First, the traditional three-coil configuration employed by metal detectors for 50 years has been modified, providing a patented design which, says Willett, gives higher powers of discrimination between metal and product effect.

Second, new software has been developed to analyse the signals more intelligently for an

accept/reject decision to be made.

Third, the control panel screen gives an image created from the product’s own signals – the product effect – sitting inside a box. This box is drawn automatically by the patented Interactive Visual Learn (IVL) system to show the operator which signals will be ignored by the metal detector as product effect.

However, the operator can tighten or loosen the box around the image, optimising sensitivity for the product involved, and then record the settings in memory for a repeat run.

Improved sensitivity

“The new search coil configuration and interpretative software alone give the Willett MD7600 very much improved sensitivity,” says David Fielding. “However, the visual element in the controls allows users to have a much better understanding of what is going on and so apply the machine more accurately.”

Willett has also replaced the traditional four or five button control employed on most metal detectors with a full qwerty keyboard. This, says the company, provides additional security by encouraging full product descriptions, rather than codes, to be entered quickly into memory for future recall.

Cintex has taken a three-pronged approach to improving the performance of its metal detectors, seen particularly in its latest machine, the Sentry, introduced at September’s PPMA Show.

For a start, the machine features a new user friendly touch screen control panel. Then there is improved background noise suppression and a new method of creating a finer distinction between product effect and contaminant.

The new control screen, believed to be the first of its type available on a metal detector, offers a large back-lit 150 x 100mm area on which a number of simple-to-follow menus can be clearly displayed to guide the operator through the set-up routine.

To further simplify set-up, the new system has a product menu library that can be selected using an optional scanner to read a product’s bar code. This means that previously stored parameters are then automatically reloaded, eliminating all keystrokes, so reducing risk of operator error.

The screen also shows the operator what is going on, for example displaying graphic information on background noise levels, the thresholds that have been selected and, in the event of a contaminant, immediately identifying it on screen as ferrous, non-ferrous or stainless, to help trace its source quickly.

The noise suppression system adds to sensitivity by learning the level of background noise from the machine's own conveyor or adjacent machinery and filtering it out.

Like most modern metal detectors the Sentry learns product effect initially via a fully automatic system and has a tracking feature to enable the machine to follow variations in product effect automatically and adjust sensitivity, ensuring peak efficiency and eliminating false rejects.

Automatic test function

However the difference, which is fundamental to the performance of the Sentry explains Cintex, is a new method of distinguishing more precisely between stainless steel and product effect in moist or salty food.

The Sentry is also equipped with automatic multi-test functions to ensure that tests with sample contaminants are carried out at pre-determined intervals. After a prompt has been given visually via the touch-screen, a warning light, beacon or audible alarm can raise awareness that the test is required. If the test is not carried out within an allotted time, the conveyor can then be stopped.

Existing Cintex Autosearch metal detectors, on which the new Sentry is largely based, can now also be upgraded to the electronic standards of the Sentry.

Japanese manufacturer Anritsu has continued to develop its new KW800 range of multi-frequency metal detectors by increasing the aperture sizes and sensitivity of the detection heads. UK agent Skerman Promac points out that the automatic multi frequency feature allows different types of product container or films including aluminium, non metallic, co-extruded, metallised or plastic to be handled without manual adjustment while still maintaining high levels of accuracy.

The latest digital signal processing technology is used which, combined with electronic filters, is said to give a sensitivity increase of up to 25 per cent over previous models. In addition, for hygiene and minimal changeover times, the entire machine including the conveyor section is built to IP66 standards, with quick action tool-free conveyor belt removal allowing all parts to be washed separately.

Anritsu is, incidentally, also now supplying reverse action metal detectors to check that a metallic object is present in a package or container, such as a very light foil sachet in pharmaceutical test kits, batteries or a metal component in a plastic moulding.

Meanwhile, with the introduction of its modular IQ2 conveyor based metal detector, Loma Systems has reduced lead times from order to delivery by more than 40 per cent.

"Our research shows that metal detector heads and conveyors are often the final elements to be ordered on the line," explains Tony Symes, Loma product manager for metal detection. "So Loma's solution is to provide metal detection equipment in the shortest possible lead time, world-wide."

Loma has designed the new series of machines to be capable of future upgrades via fully accessible electronics and plug-ins as technology advances and customers' needs evolve. The range starts with the entry level option of a basic metal detector head with the facility for low cost upgrades to full MIS capability.

Improved reliability has also come about. For example, IT advances have led to an instruction set that includes more efficient software where, for example, one chip does the work previously performed by seven, drastically reducing the component count.

A reduction in the number of board interconnections by integrating the power supply unit into the control board also improves reliability. "Unlike many competing products on the market which still have separate power supply units, hard wiring in the IQ2 has been eliminated," says Loma.

Icon driven display

The redesigned control panel for the IQ2 replaces text with an easily understandable icon-driven display for use in any language which, Loma points out, will suit multinational companies which move equipment around the world.

Lock Inspection Systems' latest series of metal detection equipment – the MET 30+ range – includes a unit designed specifically for the food industry. It is said to eliminate the difficulties traditionally associated with 'wet' applications which often result in reduced sensitivity and downgraded performance.

"The combination of a selectable range of stable frequency oscillators, with a new linear phase detector circuitry, delivers a high quality, stable signal down each channel," says the company. "This enables the twin 16-bit Analogue to Digital Converters (ADC) to accelerate the sampling rate and provides a major increase in detection reliability."

Lock has also incorporated processing enhancements which, it says, set new standards in the detection of real life contaminants such as swarf and wire. The upgraded, 32-bit processor in the MET 30+ increases processing speed by 500 per cent and accelerates interrogation of the processing signal to over 60,000 events a minute.

Metallised film operation

The unit's on-board memory has been doubled and Lock's standard software now offers a full range of detection algorithms which may be selected according to different applications. The software also incorporates an automatic facility for switching to metallised film operation to accommodate products packed in this material.

Lock's pharmaceutical unit, also part of the new series, is the most sensitive system in the MET 30+ range and will operate at speeds of up to 30,000 tablets a minute.

The latest machine from Lock, launched at September's PPMA Show, is the Compact Wafertin throat metal detector for vertical form-

Analogue detectors monitor dressings

Wound dressings manufacturer Convatec has installed two Thermo Goring Kerr TEK21 metal detector search heads at its Rhymney, Monmouthshire, factory to provide automatic detection of any broken needle barbs in the product.

The analogue machines are located at the end of two textiling lines which contain traditional textile carding machines to convert wound dressing fibres manufactured by wet processing and spinning.

In the manufacturing process, needles are used to punch minute holes through the non-woven product to give it inherent strength by pulling the individual filaments together.

However, the needles are designed so that their barbs break off should they get caught in the product, rather than bring the line to a halt.

"Although our operators are extremely proficient at removing any needle fragments from the surface, we've installed the TEK21 units as a fail safe system to make absolutely sure that none are overlooked," explains Ian Davies, Convatec's engineering and site manager.

The metal detectors are hardwired into the production lines' emergency circuits so that, if a metal fragment be discovered, the line is automatically shut down for the suspect strip to be removed.

More information - enter 180

fill-seal machinery. Taking up 25 per cent less space than its predecessor, the unit is available in a range of tube sizes and can be face mounted, suspended or mounted in a sliding frame for ease of access.

Linked in a network

Finally, a new network system – designed to link up to 32 metal detectors to a remote PC, with optional expansion to 64 machines – has been developed by Thermo Goring Kerr. Called DSPnet, the system enables customers to keep a central log of information on all Thermo Goring Kerr metal detectors in their factory.

As well as providing automatic retrieval of quality control records into one area and remote diagnostic checks, the system also gives users the option of setting up and controlling the metal detectors from a central point.

In addition, DSPnet allows its host PC to emulate the control panel on each metal detector exactly, so that each detector can be operated as though the operator is physically present at the machine. In the same way, an on-line service check can be made remotely, via modem, by Thermo Goring Kerr itself.

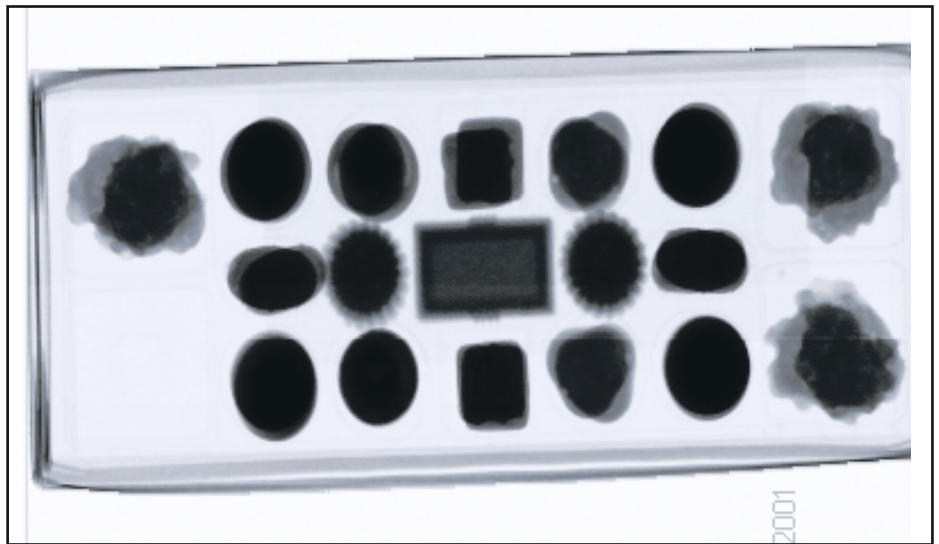
Management information collected on or set at the central PC can include interval monitoring, advance warning of trends, metal detector parameters, reject counts, reject timings, fault conditions, sensitivity and phase data. DSPnet can be retrofitted in any installation employing any combination of Thermo Goring Kerr digital signal processing metal detectors, including DSP1, DSP2, DSP2S and DSP3 models.

No complicated reinstallation or costly rewiring is needed, explains the company.

“All that is necessary is Thermo Goring Kerr’s CD-ROM holding the necessary software, the hard-copy operator’s manual provided and TKG’s special adapter for converting the PC’s standard COMs port to an RS485 multi-drop system. This supports a simple and inexpensive ‘daisy chain’ wiring system consisting of only one cable.” ■

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Counting by X-ray: Missing chocolates identified by a Safeline AVS machine in a two tier pack

Seeing inside now counts

Although initially introduced principally to find non-metallic contaminants, X-ray machines can now provide a single answer to a much broader range of quality control duties. Counting the items in a closed pack is just one.

Glass, bone and stone were the main targets of the early X-ray contaminant detection systems launched in the late 1980s, although the capacity to find stainless steel in aluminium foil reliably was a further benefit that would come into its own as the use of this type of packaging increased.

Twelve years later, X-ray inspection technology has moved on and now, with the capacity to check the presence and condition of products in a closed pack, can provide a number of quality control functions from a single machine. And the use of foil packaging has grown.

Looked at in that light, the issue of cost begins to fade, although prices have anyway fallen substantially from the £80,000 or so of the mid-1990s to standard machines which, today, can be had for less than £30,000.

One of the principal manufacturers, Loma Systems, puts it this way: “X-ray machines not only detect metal and many other potentially hazardous contaminants, but can inspect for defective product too. They have to work hard to justify the significant capital outlay and for many Loma customers it’s the ‘added value’ factor,

such as their ability to count product, that swings the decision.”

Indeed, when Loma initially researched the market for X-ray machines, the company found that users gave the three main reasons for using the technology as: minimised recall and reclaim cost, increased or maintained market share through enhancement or preservation of product quality, and reduced exposure to liability or litigation with enhanced due diligence.

Protecting the brand

This, suggests Loma sales and marketing director Chris Williams, shows that X-ray inspection is being regarded as a technique “not just to comply with HACCP procedures and prove due diligence, but to protect the integrity of the brand.”

Initially, X-ray machines were seen principally as a means of finding non-metallic contaminants that would naturally pass unseen through a metal detector, particularly in certain market sectors where other foreign bodies are just as likely.

So the poultry industry has become a major user of X-ray systems to detect calcified bone inclusions, driven also by insistence on this form

of protection from at least two of the major supermarket chains. Products such as dried fruit or peas, naturally prone to stone contamination, are another prime area.

Even glass from beverage and soft drinks bottles has been found to be a problem in potatoes harvested in certain parts of Continental Europe, prompting one food manufacturer to screen hash browns via X-rays.

Meanwhile, the growth in barrier packaging that relies in total, or in part, on aluminium foil laminates has opened up a much wider market for X-ray systems. This is because most metal contamination coming from the production process is likely to be stainless steel which, inside foil, such as a sachet of instant soup, or a snack pot with a foil lid, is virtually invisible to a conventional metal detector.

But X-ray systems are able also do more than find foreign bodies. They also provide a non-invasive method of identifying missing, under-filled or misplaced product, as well as its condition, such as uncooked dough in a burger bun. X-ray monitoring is also unaffected by changes in moisture level, which can make the metal detection process considerably more difficult.

Counting by X-ray to ensure that a pack contains the right number of products also overcomes the tolerance problem inherent in using a checkweigher: that overweight pieces can compensate for a missing piece or that process variability is too great for a single missing item to be detected.

Confirm a density

While searching for foreign bodies, the X-ray system is able to confirm a certain density at a pre-determined number of points, while also looking inside products such as pies or tarts, confirming they are filled. In applications such as chocolate boxes or chewing gum packs, the units can scan several layers of product simultaneously, to detect missing pieces as well as broken product or other anomalies.

Checkweighing by X-ray offers a number of advantages although the method – which is essentially using the product of volume and density to provide a weight – has yet to gain acceptance in terms of legal metrology.

Conventional checkweighers use a gravimetric technique in which the products pass over a section of conveyor, mounted on load cells. As weight is a function of gravity, which is an acceleration, the accuracy of the check weigher is affected by changes in the velocity of the product. This means that the accuracy of a conven-

Is it detectable by X-ray?

It is not true that X-ray inspection systems can detect any type of contaminant. Contaminants that are close to and below the density of the product will not be rejected. This is because, in practice, the system can only measure a positive density change where the area in question is small. If the area is large and the density is significantly lower the event can be classified as a missing product or underfill.

Detectable

Metal: excellent stainless steel performance
Non-ferrous metals in foil, including stainless steel
Glass and stones
Bones: only calcified
PVC and PTFE (Teflon)
Ceramic or cement
Undissolved flavour and sugar clumps
Missing products

Not detectable

Low density plastics
Thin glass such as fluorescent tubes
Low density stones
Insects
Wood
Hair
Cardboard
Paper

tional checkweigher will be reduced at elevated throughputs.

However, as machinery manufacturer Safeline AVS points out, an X-ray system is unaffected by velocity or throughput rate. "Product mass can be measured to an accuracy (at 2 sigma) within 1 per cent of the nominal weight of the product," claims the company.

Checking pie filling

In one application Safeline AVS equipment is checking flow-wrapped bars at over 500 a minute for under or over-weight, while also checking for contaminants. Another application involves scanning pies, to ensure the correct amount of filling has been put in the pie case, while in the pharmaceutical industry a further application involves checking that the correct amount of powder has been dosed into blisters, on a line running at up to 3000 blisters a minute.

"The combination of the contaminant detection and checkweighing functions within a single machine makes economic sense, as the cost of the combined machines is very similar to that of the X-ray system," says Safeline AVS. "There are additional engineering and housekeeping benefits, such as space saving and a low maintenance requirement, all of which adds to the competitiveness of an X-ray system."

The company goes on to point out that ready meals and snacks can be inspected to ensure that all the components in a multicavity container are present and correct while, in the infant food market, teething biscuits are scanned to determine if any are broken. This is regarded as a zero tolerance condition, as broken sections of the biscuit can give rise to pieces which can cause the infant to choke.

In the early days of X-ray detectors, largely based on security systems the machines were, to quote one manufacturer, "as large as a house and

prone to give a high level of false rejects".

Simple density threshold points were generally used to distinguish between contaminant and product, which basically meant that for a contaminant to be detected, it had to be above the maximum X-ray absorption of the product, its most dense part, before it could be detected.

This raised a number of problems. First, with products of varying thickness and hence density, such as cuts of meat, contaminant lodged in the thinnest parts of the product could go undetected – total density at that point was below threshold – while attempts to improve detection levels by lowering the threshold merely led to products being rejected because of their thickness.

Just the same problem was presented by flexible packs, in which powdered products tend to settle towards one end, giving a variable density along the length of the pack.

So the answer from X-ray system manufacturers has been to adopt image processing techniques that, essentially, allow much closer analysis of varying densities to be achieved.

Processing the data more intelligently means for example that, rather than identify densities above a certain threshold, the modern X-ray machine is able to monitor the rate of density change within the product, with only any unexpected rate of change indicating a contaminant.

Cost of machines has fallen

Most important, the cost of X-ray machines, relative to metal detectors, has fallen. For example, at last year's PPMA show Cintex launched its new low cost Insight Compact X-ray machine.

"We believe that many food manufacturers have been restrained from entering X-ray inspection by the high capital costs of putting machines on individual production lines," says the company. "By a process of value engineering and standardisation we have been able to reduce the cost

of the system which allows us to offer it at £26,500 in the UK market.”

The new Insight Compact is targeted solely at the packaged food market and is capable of inspecting products up to 360mm wide by 125mm high. It incorporates a colour touch screen control, a ‘Set-Up Wizard’ to help set the machine up for new products, an inbuilt modem for remote diagnostics, and the facility to select product inspection parameters from memory via its bar code, read in by an optional scanner.

Meanwhile, at this year’s PPMA Show, Loma Systems introduced its new Axis Rapid X-ray machine designed for high speed applications – up to 800 a minute – such as flow-wrapping lines. In particular, Loma says its has focused on developing software that is easy to set up and use with the result that set-up time for a typical application is 10-20 minutes and requires no special staff training.

Two detector heads

X-ray inspection equipment is also now available from metal detector supplier Constant Instruments which has just become UK agent for the Dyxim range of machines built in Italy by Dylog. There are three principal systems: the FB flat-bed detector for inspecting products in bags, metallised pouches, trays and cartons, and the Series D and Series S machines which will handle bottles, jars, cans and other rigid containers at rates up to 300 a minute.

In fact, the Series D has two detector heads set at 90deg to each other which, says Constant Instruments, maximises safety and reliability. The X-ray intensity can be adjusted at vertical intervals to provide greater power at the top and bottom of a jar or bottle, where the glass is thickest.

Thermo Goring Kerr has recently supplied what is probably the smallest X-ray contaminant detector in the world. Built to fit into an existing low-level production line at a South Korean food company, the VXS 350 measures 1200mm long with an infeed height of 885mm.

It is being used to inspect ‘Manju’, a frozen meat product at speeds up to 55 metres a minute although the 350 x 120mm scanning aperture makes the VXS 350 suitable for a wide range of applications. ■

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COGNEX

Single camera inspects labels, caps and seals

A recent application of the Cognex In-Sight vision system at an American spice packer has shown how the low cost, single camera set-up is able to carry out a number of inspection tasks simultaneously.

Spice Hunter, which packs some 45,000 bottles of spice a day, has adopted the In-Sight system to automate inspection of the label, cap and freshness seal, replacing the previous manual operation carried out on a random sample basis.

“We had never used machine vision in the plant before, and wanted to get our feet wet with the technology at a relatively low price,” says Spice Hunter manufacturing engineer Peter Priebe. “So we looked at products in the \$5000 range and discovered the In-Sight vision sensor from Cognex. It seemed to have the right tools for the job, and at the right price.”

On the production line, the vision sensor’s digital camera is mounted perpendicular to the jars at a camera-to-subject distance of about 450mm. The camera connects to an industrial vision processor which links directly to a standard VGA monitor. The vision processor is a standalone unit, so a PC is not required.

Completed jars are taken past the camera some 60mm apart at a speed of 200 a minute. To achieve the highest image contrast, a bright white board is placed directly behind the inspection point, and basic front-lighting is used to illuminate each jar as it comes into view for its image to be captured.

The image is then processed and analysed using a variety of vision software tools.

Two features common to all jars were selected as reference points from which all measurements are made: the leading edge of the jar and the cap. In-Sight’s PatFind pattern matching tool is used to verify that the cap and seal are present, and that the cap is properly seated on the jar.

Labels are then checked for skew, which involves the use of edge detection tools to measure the distance between the leading edge of the jar and closest vertical label edge. If a jar fails any of the inspections, a pneumatic gate diverts it to a reject bin.

In addition to performing the inspections at required line speeds, the vision sensor helps improve process control, says Cognex. “If sever-



Inspecting spice jars: *The Cognex system in operation at US packer Spice Hunter*

al label or cap problems in a row are detected, for example, this alerts the line operators that the labeller or capping machine needs to be adjusted.”

The sensor also records pass/fail data for each jar inspected, including data on the types of defects found, providing quality engineers with more information about the process.

Ultimately, Peter Priebe anticipates that the vision sensor will be able to link with other equipment when problems occur.

“If the vision sensor sees a trend in labels that are drifting too far to the right or left, we want it to be able to tell the labeller to move things in the other direction automatically without operator intervention,” he explains.

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RADIX SYSTEMS

Sorter gives fast payback via higher quality

Defects can be removed from lightweight foods such as potato flake and dehydrated herbs by a new sorter from Radix, improving quality to the point where a rapid payback can be achieved. Radix has also recently launched the AS326 for removing defective biscuits or formed snacks from a line.

The Radix Autosort machine for lightweight products was developed to remove defects such as pieces of skin, rot or burned bits from potato flake as well as discoloured pieces from spices.

Systems have been installed by potato processors in the UK, Belgium, Germany and France to improve their B and C grade flake to the top value A grade which, points out Radix, has in some instances given a payback period as short as four months.

The standard Autosort configuration uses high

speed fine-scan cameras to detect defects as small as 1mm with reject rates of over 20,000 defects a minute. The new design delivers the lightweight product in a consistent airstream to the inspection area, and a twin nozzle ejector ensures efficient removal of defects.

The Autosort AS326 is designed to fit over new or existing biscuit or formed snack lines, not only seeking out the traditional problems in continuous processes – such as burned, over-fried or even pale pieces – but also incorrect shape. Typical examples are partially formed biscuits, doubles created by chocolate enrobing, and sandwich biscuits that may have further problems as a result of either incorrect assembly or broken shells.

All product passing under the system's cameras is inspected to an accuracy of 1mm and, if a defect is found, that particular piece is individually removed from the line. Up to 10,000 items a minute can be handled.

Radix has now also introduced a laboratory version of its Qualisizer colour and size analyser which, in the same way as the on-line machine, will classify each particle by size and colour.

In this way defect counts, size distribution, percentage broken, and so forth, can be easily monitored, eliminating the subjective assessment of visual quality while also providing trend information.

For French fry producers, the Qualisizer FFC Classifier performs a similar function directly on the production line. It monitors the fry length distribution, categorises dark defects into minor, major or critical, and classifies short and narrow slivers. Automatic SQC reports and alarms warn of any problems.

More information - enter I89

GEI INSIGHT SYSTEMS

Heineken installs glass in glass detector

Heineken has installed the first commercial versions of the FBI filled bottle inspection system from GEI Insight Systems, designed to identify small particles of glass and other foreign bodies in semi-transparent liquids.

"For the first time, small fragments of glass can be detected in liquid on a real time basis, reducing the potential risk to consumers and avoiding costly product recalls and wastage," says Insight Systems sales director Stan Lamb. "It creates

peace of mind for brand owners and an ultimate tool in quality control."

In operation, bottles enter a large rotating carousel and are positioned on spin tables. After each bottle has been given time to settle, it is then spun for a short period of time at 1500rpm, which dislodges any glass particles from the base of the container and makes them spin round the outside edge.

The bottle is then brought to a halt, but any contaminant continues to rotate and can be detected via the cameras and image processing equipment.

Throughput is up to 60,000 bottles an hour

More information - enter I90

HEUFT

Check on bottle appearance and integrity

Heuft has announced a complete container inspection system called FinalView.

The system inspects the label and closure for position, alignment, damage, raised corners and tightness, putting together a 360deg view of the container so that the alignment of labels can be checked in relation to each other or the closure. There is also a check on fill level.

Also introduced by the company is the Squeezer which, as its name suggests, detects leaks in plastic bottles by subjecting them to pressure via a belt.

If the container leaks, gas or liquid will escape changing the fill level, which can be detected with a comparative fill level check taken with and without pressure.

Alternatively, the Heuft Exciter for finding leaks in glass or plastic bottles of carbonated drinks uses ultrasound to produce a higher pressure inside the container. Leaking bottles lose product which is identified via fill level checks.

More information - enter I91

INEX VISION SYSTEMS

Vision system is 'affordable' for range of duties

The InSpect family of vision systems has been launched by beverage container inspection specialist Inex to provide 'affordable' inspection for

a much wider range of general packaging applications.

Typical inspection tasks include: incomplete case packing, faulty printing, omission of batch number and/or sell-by date, wrinkled labels, and damaged cartons. The system accommodates as many inspection cameras as required and will also shortly be available to detect out-of-specification colour variations.

Inex has struck up a relationship with Cognex Corp, a major supplier of automated visual inspection systems, to produce InSpect. As a result, it employs the Cognex In-Sight camera, which is programmed through an intuitive, custom graphical user interface designed and developed by Inex.

"This eliminates the set-up complexity typical of other vision inspection systems," says Inex. "Through the flexibility of the Ethernet network feature, the system can be configured to address almost any inspection requirement. In addition, it is easy to switch from one inspection task to another: ideal for lines handling a number of different products and packaging."

More information - enter I92

UHLMANN

Vision system meets FDA requirements

A vision system for pharmaceutical inspection that meets FDA 21 CFR part 11 criteria for electronic records has been announced by Uhlmann VisioTec.

VisioChrom is said to be one of the first colour systems of its type to comply with the FDA requirements and is able to detect product colour, presence, shape and dimensions while also monitoring product integrity, looking for chips or splinters. Applications include tablets, syringes, bottles and so forth.

Uhlmann VisioTec points out that the development allows the pharmaceutical production process to be documented without manual paperwork, supporting a much faster and easier batch release.

More information - enter I93

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