MAJ Enterprises Presents from Cognex

Defect-Free Packaging for Distribution

Cognex vision satisfies a sweet tooth

When you are responsible for getting a popular chocolate product to its fans, you have a responsibility to ensure that all sweet tooths are satisfied! Even more so when it concerns a 100 year old chocolate wafer treat known as the 'Mannerschnitte" or "Neapolitaner". Only products that are in perfect condition and feature a uniform level of quality can ensure market success. Thanks to the Cognex In-Sight® machine vision system, the company is now able to ensure that all Mannerschnitt wafers are thoroughly inspected before they leave the plant for distribution.

The worlds largest oven

With an annual capacity of 8000 tonnes of flat wafers and biscuits, the world's largest wafer oven is located at Perg, near Linz. Enormous quantities of product are processed by almost 100 employees, who ensure that the portions are packed individually and put into cardboard boxes. The issue of hygiene is critical in the food industry. Products must be packed in the correct packaging and must be completely airtight.

Tough customers

Consumers of chocolate are not to be toyed with. If the expected hazelnut taste were impaired by packaging defects, the company could lose customers. Complaints mean consequences, including financial repercussions and bad publicity. Products supplied to the end customer must be 100% free of defects. This applies not only to its own branded products, but also to the products being produced on behalf of other large customers - an important market segment.

100% defect free – how?

The company needed a new solution to cope with the increased quality demands. It was decided that a vision system would provide the answer but it was clear that this vision system would have to meet the challenge and cope with the following requirements :

- reliable inspection of all packaging at production speeds of up to 400 packages per minute
- flexibility to cope with many different product variants
- easy operation and programming
- the aim was to use the new checking station to make the whole production process smoother

Many different characteristics to be inspected simultaneously and these need to be easily taught to the system:

- 25 different packaging colour variants
- 100 texts in different languages printed on the packaging
- inspection of label positioning
- ensure there are no dents or defects in the packaging
- verify presence of picture and text

Integrating the solution in record time

Schmachtl Gmbh from Linz, a Partner System Integrator (PSI) of Cognex impressed Manner with the results of their feasibility study done for the Perg plant. The solution took advantage of the In-Sight® vision sensor from Cognex to keep the design of the inspection station simple allowing the mechanical set-up and installation to

be done internally by Manner's own engineering/maintenance team. The inspection station checks whether the label is equally positioned from the left and right edge of the packaging, whether there are dents or defects in the packaging, which picture and text is on the packaging and much more.
The order was placed at the end of April 2006 and the quality control station was already put in place by the end of May. To ensure operator and production efficiency right from the start, the Linz-based company, which is, had already performed the programming of the customer-specific vision tasks for a wide range of packaging variants. The extent of the different component characteristics meant it was important for operators to be able to easily manipulate the inspection station.

Product location regardless of orientation and position
The high-performance In-Sight vision sensor combined with the capabilities of PatMax® vision software allows many different characteristics to be checked simultaneously and quickly. The key advantage of Patmax in this application is that the individual packages of Mannerschnitt wafers can flow through the inspection station on the conveyor belt without needing to be fixed in a particular position. The vision system also detects any faults in the packaging supplied by external suppliers and this has allowed the company to eliminate the occurrence of rejected product.

12 "windows" ensure no defect is left unseen
In order to take advantage of the processing power of the In-Sight to achieve the high levels of production output that the company is aiming for, Schmachtl divided the entire image area for packaging into 12 individual PatMax windows in order to detect packaging characteristics more quickly, more flexibly and more efficiently. When combined, the characteristics indicate whether the product is free of defects. For example, two windows are used solely to determine whether the packaging is centred properly. Another field is used for pattern matching. It could mean determining whether the picture of the hazelnut is present or checking the corners for dents and tears.

5% production increase and no more complaints
Simple to use and easy to operate, Manner employees are able to easily train various characteristics on the vision system for the entire range of packaging. This enables the staff to react quickly to various types of fault. For example, if a package is dented it may become jammed further down the production line resulting in additional unnecessary product rejects. Now incidents such as this are at a minimum and the company is able to guarantee that the packaging is airtight and flawless in appearance The most noticeable effect of this improvement is that the company no longer receives any complaints which in turn eliminates the cost that would have been incurred finding the problem. By keeping interruptions in the production flow to a minimum, productivity has increased by around 5%.
Reinhard Gassner, plant manager at Perg, said "If the conveyor belt is operating at a speed of, for example, 270 packages per minute, then just a few seconds of defective production means several dozen rejected packages. This is not just a question of cost, it also has a negative effect on the production flow. Problems like this are now in the past."

Visionary production
Based on the success of the first inspection stations, the company is now looking at whether other areas of production could benefit from a vision system. The 100% quality checking of each package has also helped guarantee large customer orders and improved quality certification. The Perg plant has become recognized as a centre of competence for all types of technology within Manner AG for its expertise in combining the best engineering with effective vision technology.