

All-round inspection of chocolate bars

A traditional field of application for vision systems is the sweets industry. Here, many quality features or product characteristics can only be checked visually. A varying appearance of the products and different error classes are the norm. Precisely for these reasons, image processing solutions for this area pose a particular challenge.

Vision system task

In this example chocolate bars are produced by a leading German manufacturer. They are filled, cut, coated with chocolate glaze and dark decorative strips and then individually wrapped. Before the packaging, a final visual inspection must take place. This ensures that the product meets the high aesthetic quality requirements of the consumer. Since disturbances in the production process – even short-term – can occur at any time, random sampling is not sufficient. **Required is a 100% inspection** during the movement. The corresponding vision system recognizes the following types of errors:

- coating completely or partially missing, holes in the coating
- filling showing through
- bars broken, stuck-together or superimposed
- decorative strips missing, too few or irregularly distributed

20 bars – 1 second – 8 cameras

A system with 8 cameras was developed and implemented in the production process: 4 cameras each looking from the left and 4 from the right side. With this system each bar can be checked from 2 sides, also including the edge surfaces.

A bar is classified as good only if no error is not found in either view. The image processing software finds the bars in the camera image, calculates their physical coordinates on the belt and checks the required quality characteristics in various processing steps. The system works

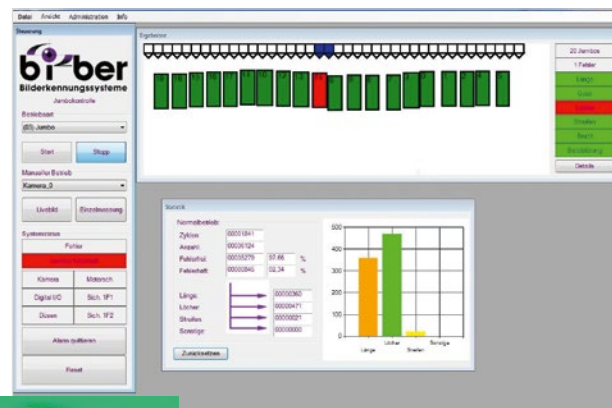
fully automatically and controls a nozzle array to blow out bad bars.

In order to ensure transparency and documentation of the checking procedure the system offers various logging functions that can be optionally activated by the user. Thus, the individual results of all checks, the associated error images or overall statistical data can be logged. Moreover, basic features of all Bi-Ber PC systems are a multi-level user management and a remote maintenance package.

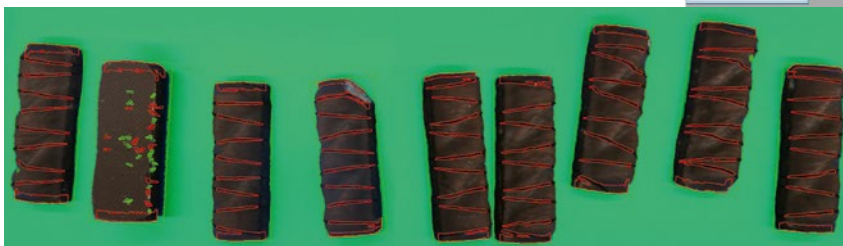
Future-proof after retrofit

After 15 years of industrial use, the system has undergone an extensive renewal to make it future-proof. New standard cameras with CMOS sensors and GigE interfaces were used for this. The sensors have a higher resolution and a colour sensor, so that bright products can also be optically distinguished from the belt surface and checked in the future.

Instead of fluorescent lamps, white LED lights are used, which have a significantly higher illuminance and lifetime. As an image processing PC now an industrial PC with multiple processor cores is sufficient. The image analysis was converted to the VisionPro library by Cognex and prepared for future extensions to other types of bars.



Grafical user interface with schematic view of a row (1 bar NOK)



Result image of some bars with overlay

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