

Sweet Success

Ice cream label-checking system relies on off-the-shelf machine-vision components to ensure accurate packaging

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A major US manufacturer of ice cream wanted to limit its liability and protect its customers from surprise allergic reactions caused by the wrong ice cream going into the wrong tub or closed with the wrong lid. The food producer turned to machine-vision integrator Machine Vision Consulting, which developed a label-checking system that would check both the label on the side of the squared off/round (or "sqround") shaped container and the label on the top of the container, and compare those findings to a recipe selected by the production line operator.

The solution, which is now a turnkey system sold under the name of SureLabel, is based on a pair of Point Grey Research Flea2 cameras, a Cognex 8501 frame grabber with 24-VI/O daughter card, Smart Vision Lights bar lights, and Cognex VisionPro image-processing software in a PC. The PC sends fail signals to a nearby Allen Bradley Micrologix programmable logic controller (PLC) that controls a reject mechanism.

No allergic reaction

"The customer came to us and was nervous about its customers possibly having an allergic reaction to an ingredient in the ice cream because of improper labeling,"

explains Jeffrey Dannay, president of Machine Vision Consulting.

"So we designed a system that would look at the artwork on both the top and the side of the sqround with an easy-to-use recipe storage and retrieval system. They really liked the recipe system because it was very easy to train, which is important when you make hundreds of different flavors of ice cream, each with different labels and artwork."

He said that the recipe system also made it easy to choose the flavor and, therefore, the inspection routine using menus or a handheld barcode scanner. The operator can simply scan the barcode on the side of the sqround with a barcode or data matrix reader, and the software automatically loads the right inspection routine into the SureLabel system.

The ice cream label-inspection system was a retrofit to existing production equipment. Dannay designed the system to easily integrate with existing conveyors and networks as necessary but also to work in standalone mode, depending on the customer's needs.

For the ice cream inspection application, the customer wanted Dannay's company to install the label checker at a small facility near MVC's Boston-area headquarters.



Photo courtesy of the manufacturer.

Now that the system has proven itself, MVC plans to move the system to a larger ice cream manufacturing plant in Indiana as the first of 20 such installations for the customer.

Sqround imaging

The SureLabel system is designed in three parts: an enclosure for the camera, optics, lights, and photoeye trigger; followed by a rejector mechanism and accumulator; and concluding with the computer station, which also holds the Allen Bradley Micrologix PLC (see Fig. 1).

The conveyor that carries the ice cream sqrounds is only wide enough to allow the containers to pass length-wise through the camera enclosure for inspection. Because the sqrounds are all facing the same direction, system designers could inspect the containers using only two Point Grey Flea2 cameras: one for the top, the other for the side (or front) of the container.

"We chose the Flea2 because of its small size [29 × 29 × 30 mm] and the ability to fit with the Goyo 6-mm, 2/3-in. sensor lens in a compact Allison Park Group stainless-steel