

- Products: Diagraph PA/5000
- Industry: Food

Bar code printers rise to the challenge

After rigorous testing, international baked goods and refrigerated dough manufacturer Earthgrains Co. selects a bar-code labeling solution for its shippers and harvests the benefits of improved product identification of its hundreds of skus.

Anne Marie Mohan, Senior Editor

Few things in life are 100-percent reliable, but a recently introduced bar-code labeling solution came close enough when it was put to the test by bakery and refrigerated dough products manufacturer Earthgrains Co. Seeking labeling equipment that could meet its extensive product identification needs, the company demanded more than a half-baked solution; it required a proven 99.9-percent bar-code reliability rating. After a three-month trial of two of Diagraph Corp.'s patent-pending PA/5000™ Label Printer/Applicators running 24 hours a day, Earthgrains signed on for 23 machines. The printers had achieved a 99.97 percent rating.

Offered in both U.S. and European markets, Earthgrains' products are split between fresh packaged bread and bakery products, and refrigerated dough. Wafting from the company's 64 U.S. plants and 11 European locations are the fresh-baked aromas of everything from bagels and brioche to croissants and croutons, in addition to bread, rolls and muffins. Refrigerated dough products are rolled out from two U.S. plants and four European facilities.

Earthgrains' two U.S. refrigerated dough plants—in Carrollton, TX, and Forest Park, GA—produce the only store-brand canned, refrigerated dough in the country and are one of the largest producers of store-brand toaster pastries. Products processed and packaged in these plants include biscuits, dinner rolls, cinnamon rolls, breadsticks and pizza crusts, along with toaster pastries, pie crusts and cookie dough. Items are marketed nationwide under more than 100 store brands for most major groceries in the U.S.

A "knead" for enhanced ID capabilities

Given the breadth of Earthgrains' refrigerated dough line—more than 110 skus are produced in the Carrollton plant alone—it's no wonder the company found it necessary to pursue advanced product identification



Earthgrains' two U.S. refrigerated dough plants produce store-brand refrigerated dough products and toaster pastries for most major U.S. grocery chains.

capabilities. Until 1998, Earthgrains had been using large-character, low-resolution ink-jet printers from another supplier to apply human-readable product ID and expiration date information directly on corrugated shippers filled with product. But, as bar coding became an industry-wide initiative used by many of Earthgrains' customers, and as the company's desire to implement an internal production/tracking system grew, a machine capable of printing bar codes became necessary. Explains Kent Swart, product manager of Automated Labeling Products for Diagraph, Earthgrains decided to investigate labeling solutions, rather than continuing to print directly on the cases, as labels would provide a higher contrast ratio between the bar code and its background, optimizing code verification.

Having made the initial cut by Earthgrains, Diagraph's PA/5000 Label Printer/Applicators were selected to

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Filled cases are conveyed past the PA/5000 Label Printer/Applicator (top) which applies bar-coded labels. Cases then move past a bar-code scanner (bottom) mounted in-line.

participate in a three-month trial, with one unit in the Carrollton plant and one in Forest Park. Earthgrains' 99.9-percent reliability requirement meant that 99.9 percent of the bar-coded labels printed and applied to the cases had to be able to be read by a scanner mounted directly after the machine. A bad read was the result of a poorly printed bar code or a missing label. Diagraph's printer/applicators achieved an official score of 99.97 percent.

Since conclusion of the test, Earthgrains has installed 17 PA/5000 printer/applicators in its refrigerated dough plants, with just over a Baker's Dozen in operation on its lines in Carrollton and four units at its Forest Park location, which also has a delivery schedule set for six additional units. Each system consists of the printer/

applicator, a Hytrol conveyor measuring from 4 to 11 foot long, an Allen-Bradley scanner, and thermal transfer labels and ribbons—all of which are provided by Diagraph. With a choice of print engines, Earthgrains chose engines from Sato due to their high throughput and reliability.

From packer to scanner

Diagraph's PA/5000 Label Printer/Applicators are positioned in-line on Earthgrains' packaging lines, applying labels to corrugated cases in up to 25 to 30 different sizes, supplied by Rock-Tenn, Georgia-Pacific and Willamette, among others. The coding process begins when filled cases exit a case packer and are conveyed via a Hytrol Model TA slider bed with a 3/4-hp motor. Cases are bump-turned so that the proper side, the long panel, is ready to receive a label. With the PA/5000 in the nose-down position, it prints and applies either a

5 x 2-1/2 or 5 x 4 inch label at a speed considerably below the printer's 100-ppm capability, depending upon the line. Label stock, supplied by Diagraph, is a 60# bright white, ultra-smooth, coated facestock with a 40# roll liner with high internal strength. Larger labels are used on only two of the Earthgrains' product lines: the cookie dough and the toaster pastry lines. Explains Ann Linkul, facilities planning manager, refrigerated dough, for Earthgrains, "We use the larger label on those products so that we can identify product flavors on the label, as well. For example, the label will read 'Chocolate Chip Cookie', 'Sugar Cookie', 'Blueberry Toaster Pastry', 'Strawberry Toaster Pastry', etc. With the other dough products, it's a biscuit or it's a piecrust; it's already self-explanatory."

Printing is done using direct thermal/thermal transfer technology that provides a resolution of 203 dpi. Five fields comprise the finished label and contain a wealth of information. Field one contains a Code 128 bar code with an embedded pull date and shift field, used for internal tracking. The second field provides a SCC-14 bar code, printed at a 50-percent magnification, along with a case UPC code. Field three contains the product code and label code, while the fourth offers the first 10 letters of the customer's name. The last field contains information on the day, month and year of the pull date,

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the plant code, the day of the week code and the shift code.

Immediately after labels are applied to the case, the bar code is inspected by a scanner mounted in-line. Earthgrains uses an Allen-Bradley single-head VLD (Visible Laser Diode) system, with a 2755-LD4B1 decoder, capable of 200 scans/sec. The scanner is mounted next to the conveyor in a picket-fence orientation and crosses every bar, space and quite zone on the symbol in one sweep as the case moves past its laser. The scanner's laser generates a small, concentrated light beam that exits the scan window. Light, reflected off the bar code symbol, passes back through the window and is detected by a light sensor. The signal is then sent to the decoder for further processing. If three bad reads occur, a signal is sent to the conveying system to shut down the line, so that operators may quickly address the issue.

Emphasizing the importance of properly applied, readable labels, Linkul says, "Accurate and legible labels are crucial to continuous and efficient operations because of the variety of products and store-brand labels produced."

To date, the only difficulties Linkul can recall

experiencing with the Diagraph systems occurred during the startup phase. "We did have some initial issues with the labels," she relates. "The cut of the label wasn't as deep as we needed, so it wasn't pulling away from the release liner." But, she quickly adds, Diagraph was very responsive and swiftly fixed the problem.

Enhanced inventory management

To link information on their hundreds of skus, Earthgrains connected the PA/5000 to their enterprise resource system, a software program from SAP used for product planning and production. To print bar-coded labels for any particular sku that is going to be run on that line, the operator takes an Epic MPT (Multi Purpose Terminal) scanner and scans the UPC bar code on the primary product—for example, a can of cinnamon rolls. That information is validated from an SAP-supported materials file. Once validated, the label format is confirmed by the operator and is sent to the PA/5000, which is then ready to print and apply that particular label.

Bar codes are used internally for inventory tracking and warehouse management. Explains Linkul, "The system allows us to put a case in a bin in our warehouse, and when we need to go and pick an order, we can scan that case out of our inventory, and put it onto a truck and send it to our customer."

During Earthgrains' busiest months for refrigerated dough—mid-September through December, corresponding with the holidays—some of the company's production lines yield up to 500,000 cases/month. The new Diagraph PA/5000 Label Printer/Applicators used in conjunction with the enterprise management system now make getting more dough out the door and keeping more dough in the company's pockets a cake walk.‡

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