



Case Study



Automated Barcode-Driven System

Improved safety and traceability were key objectives during installation of an automated robotic palletizing system at Sandvik Rock Tools. A control network scans a barcode label on a case of mine bolt resin and the robot automatically transfers the case to the right location in the warehouse for shipping or put away.

The Sandvik Rock Tools case history is a compelling one with a 30 percent increase in productivity resulting from automation. Typical of American industry, Sandvik needed to update and computerize their processes to become ISO-9001 certified. Safety and traceability were paramount because Sandvik supplies products to the coal mining and construction industries.

Sandvik, located in Bristol, Virginia, employs 225 with sales of \$25 million. They service coal mines in the Appalachia region, from Pennsylvania to Alabama, as well as in Southern Illinois, Indiana and Western Kentucky, through direct sales, agents and distributors.

Sandvik's Chemical Products Division produces bolt resin



Efficiency Boosts 30% | Sandvik Rock Tools automates product labels with barcodes for product storage and usage

capsules—consisting of polymer-based grout that hardens quickly and develops high strength when installed in the roof and wall support systems in underground coal mines. Miners drill one-inch round holes four-foot deep in a grid pattern in the ceiling of the mine. Then they insert the Sandvik two-part resin bolt system—a resin component and a catalyst component, both encapsulated in a plastic film. After the miner installs the capsule, he uses the roof bolt to rupture the plastic film, causing the resin and catalyst components to mix and harden in a matter of seconds. The mixture and bolt stabilizes the mine roof, improving safety.

Barcode Driven System

"Our mission six years ago was to become ISO-9001 qualified," explained Ken Monyak, production manager. "Our motivation was to improve traceability and efficiency by using the automated product sort and stack capabilities of a robotics system in our shipping department. The robot in shipping reads the barcode on the product label, then sorts and stacks for immediate shipment or putaway. The new automated system is barcode driven. It has improved throughput and productivity by 30 percent. Our old system consisted of handwritten product labels that were incomplete and difficult to read. Customers appreciate the new legible label



containing all the technical data they need—product identification code, description, lot number, expiration date and contents—for product storage and usage.”

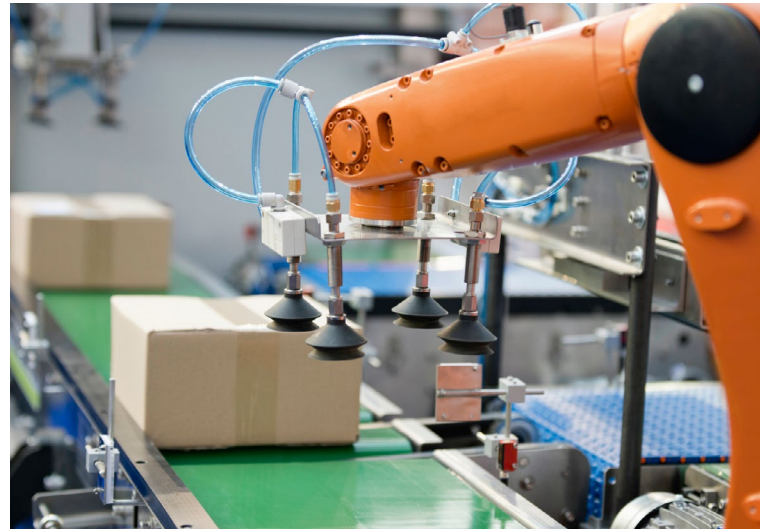
At the heart of the application are SATO CL408e thermal transfer printers that produce product ID barcode labels for the mine bolt resin boxes that account for the great majority of Sandvik’s business. The speed and reliability of the printers were key to the operation. With a RISC processor, easy plug-and-play installation, and a print speed of up to six inches per second, the SATO printer has no trouble keeping up with production load. Its crisp, clear barcodes provide high scanability. And, according to Monyak, “It has a heavy-duty, industrial design that makes it a dependable workhorse—we need that because we label up to 500,000 products a year.”

Once the capsules are filled, sealed and clipped, the operator makes up the mine bolt resin boxes. Then, he applies a 3” x 5” thermal transfer Code 39 barcode label to the box end. The label contains a product identification code, production lot number, use-by date, a product design description and a box contents description. A warning about the handling, storage and use of product is also included. The ISO-9001 data, such as lot number and date produced, is captured in the event that Sandvik ever needs to trace a shipment. “We can go back to the lot and where it fell in the run,” Monyak commented. “We make a good quality product, and have had no problems.”

Dust and Grime

The manufacturing environment is dusty because limestone and polyester resin are blended in large mixers by compressed air conducted into the mixer through pipes installed on the ceiling. Dust collects on each mixer and gets into the air and on the equipment. “It’s a harsh environment, and even though the SATO printer is in an enclosed case, it still gets caked with dust and grime, but continues to perform under tough conditions,” Monyak said. Surprisingly, printheads are replaced every 12-18 months—typical of any industrial application.

Monyak negotiated an interesting performance guarantee to assure production will continue when the SATO printer is out for service and maintenance. “My VAR, Alpha Systems, Midlothian, VA, solved my service concerns by offering the immediate delivery of a loaner printer when our printer is out for normal service and maintenance. “We needed assurance that production would continue even if the printer went down.”



Robot Star of Show

After labeling, the box moves down a conveyer line to a strapping machine that automatically straps them together, then ships them on an overhead conveyer to the finished goods inventory facility.

The boxes are then handled by the star of the show—a robot palletizer and scanner that reads the barcode label, then sorts, stacks and palletizes the cartons for shipping or putaway. The system’s control network tells the robot precisely where to place the case in one of six pallet positions. The robot can handle up to 5,000 cases a day.

“The robot lifts and stacks 40- to 65-pound cases onto pallets,” Monyak noted. “It helped us reduce worker’s injuries incurred by lifting the heavy boxes and it saved us over \$100,000 in labor costs. But one of the best parts—it doesn’t need a coffee break!”

Two-Year ROI

“We’re happy with the performance of the robot,” Monyak concluded. “We forecasted a two-year Return On Investment for the automated robotic system to cost-justify itself. The new system helped us increase productivity 30 percent and meet our need to increase worker safety, balance insurance concerns, reduce labor costs and increase operational throughput.”

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