

Ryerson Upgrades Its RFID System

To get the performance it needed, the metal products maker switched to EPC Gen 2 tags designed to work in an RF-unfriendly environment.

By Beth Bacheldor

Jan. 8, 2007—Metals processor and distributor Ryerson, looking to track inventory and make sure it delivers the right product to the proper customer, has turned to EPC Gen 2 RFID tags designed specifically for an RF-unfriendly environment.

The \$5.8-billion-a-year Chicago-based company is using RFID in one of its distribution warehouses in Montreal, Canada, which handles its excess inventory. The company attaches MetalCraft passive UHF (915 MHz) RFID tags to metal sheets, coils, plates, bars, tubing and other products. To make the tags, MetalCraft applies a layer of foam to EPC Gen 2 inlays from Texas Instruments (TI). According to Jeff Kohnle, TI's director of retail supply chain management activities, the foam is designed to lessen or eliminate RF interference generated by metal, and also works to amplify the RF signal.

Ryerson first started looking at RFID as a way to track inventory in 2005, when it enlisted the services of Ship2Save, a Montreal-based RFID services company specializing in the transportation, manufacturing, warehousing and sea-freight industries. The company's objective was to help employees in the distribution center identify the correct metal product when tracking inventory and fulfilling orders. Although many metal products looked identical, they were actually different in terms of hardness and density. Prior to implementing RFID, the workers had to manually check paper labels attached to the coils and slabs, a process that was time-consuming and prone to error.

To that end, Ryerson decided to reduce the number of employees required at its remote warehouse, as well as eliminate some of its paperwork, says Konrad Konarski, executive business analyst with Ship2Save. RFID tags and fixed readers installed at dock doors, Ryerson believed, would help automate process handling and automatically collect product numbers.

The tags were affixed to the sides of the coils holding the metal, stacked side by side in the warehouse, and to metal slabs stacked on top of each other. When the coils and slabs were brought into or shipped out of the warehouse, RFID readers manufactured by Symbol Technologies recorded each tag's unique ID number to document movement of inventory. The ID numbers were associated with specific products in Ship2Save's Operation Management System RFID middleware.

To verify that they were selecting the correct products for a particular order, employees could use handheld interrogators to read the products' RFID tags. In addition, employees at other locations could access product movement, history and other information via a Web application communicating with the Ship2Save middleware.

Ryerson, however, found that metal in its products interfered with the RF signals of the EPC Gen 1 RFID tags, reducing the rate of successful reads. To get the tags working properly, Konarski explains, Ship2Save

made adjustments to the readers' antennas, and repositioned the placement of the tags on the products to decrease interference and increase readability. Despite these efforts, Ryerson was dissatisfied with the performance of the EPC Gen 1 tags. Ten to 15 percent of the read attempts took longer than the allotted time, or required the forklift driver to back up and move the tagged goods through the portal again to get a read. In addition, the tags' maximum read range of 3 to 4 feet was insufficient.

RELATED_ARTICLES About six months ago, Ryerson decided to test MetalCraft's EPC Gen 2 tags. TI's Gen 2 chips are engineered to be highly sensitive to RF interrogation, through the use of a built-in Schottky diode, a specialized rectifier that quickly converts the RF energy received from the interrogator into DC voltage. This, TI claims, makes the chip 20 percent more energy-efficient than other Gen 2 tags, while allowing it to transmit data across a larger distance (see [Texas Instruments Rolling Out Its Gen 2 Chips](#)).

Ship2Save has since upgraded Ryerson's readers to Gen 2 by uploading new firmware in the devices. It has also replaced the tags installed in the warehouse to Gen 2. As a result, the company reports, bad reads have dropped to 1 percent, while the read range has increased to about 15 feet.

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