

The pilot used EPC Gen 2 UHF tags and readers to track the movements of cartons of goods into and out of an Auchan distribution center, to a store, and then to that store's trash compactor.

By Claire Swedberg

Mar. 27, 2012—Preliminary analysis of the results of a pilot project carried out in Italy shows that the use of EPC Gen 2 passive ultrahigh-frequency (UHF) RFID tags on product cartons can reduce the rate of supermarket out-of-stocks, and improve product freshness.

The project is supported by a consortium of eight Italian businesses, under the leadership of the University of Parma's [RFID Lab](#). The group consists of retailers [Auchan](#), [Coop Italia](#) and [Conad](#), as well as goods manufacturers [Danone](#), [Lavazza](#), [Nestlé](#) (Buitoni and Purina), [Parmacotto](#) and [Parmalat](#).



Antonio Rizzi, head and founder of the University of Parma's RFID Lab

The pilot, completed in September 2011, was designed to assess the value of radio frequency identification within the retail supply chain. Auchan was the only company that played an active role, by testing the technology at its distribution center and stores, while the other participants funded the project, provided consultation and observed the process.

Although specific statistics are not yet available, the University of Parma's researchers concluded that the use of RFID could improve product freshness by reducing the need to overstock shelves. The Parma RFID Lab intends to complete a review of the results, and to then calculate the amount by which out-of-stocks were reduced through the use of RFID, with the goal of publishing its findings later this year. In addition, the group plans to launch another phase of the project with other retailers in the future, in order to compare results against those of the project's recently completed phase.

In 2007, the Parma RFID Lab began working on a project designed to prove the feasibility of using RFID technology and capturing relevant data via readers in the supply chain. The resulting logistics pilot, carried out during the spring and summer of 2008, involved the tracking of 12,000 cases and 800 pallets of sliced ham, sandwiches and other fresh food as the goods moved from production to the retail sales floor. That pilot found a 68 percent drop in the amount of time that workers spent checking inventory as products were shipped from a manufacturer's warehouse, as well as an 80 percent reduction in time required to receive the goods at a retailer's DCs (see [Italian Retail Pilot Quantifies RFID's Many Benefits](#)).

In 2010, the RFID Lab launched phase two (see [RFID News Roundup: European Consumer Goods Companies Test RFID to Improve Stock Turnover](#)), which focused on testing how the technology could be utilized to improve on-shelf availability. Auchan applied RFID tags to cardboard cases of fresh

products received from these suppliers, and the Parma researchers applied tags to cases of dry goods. Auchan used Electronic Product Code Information Services (EPCIS)-based software—obtaining its read data from middleware developed for the RFID Lab by [ID-Solutions](#)—to view the movements of goods to the store shelf.

The pilot aimed to track the movements of cartons filled with products into and out of an Auchan DC, and to the dock doors of two of its stores. Once the goods were removed from the tagged cardboard boxes in which they were shipped and stored, the tags were read a final time at a store's trash compactor as the cartons were destroyed, thereby indicating that the products previously packed within must be located on shelves at the front of the store.

During the project, readers were installed at the dock doors of Auchan's DC in Calcinate (Bergamo), Italy, as well as in the receiving area at two Auchan stores, in Curno and Roncadelle. Auchan's staff attached EPC Gen 2 RFID labels to approximately 30,000 cases of goods during the course of the study, including fresh pasta and sauces, cheeses, hams and other perishable goods, along with 14 different types of canned or boxed dry goods, such as coffee and pet food.

"We started this new project to see, in a real environment, what the benefits of adopting RFID would be to optimize store activities," says Antonio Rizzi, the head and founder of the University of Parma's RFID Lab. "We called it a shared approach," he adds, since it included collaboration with the retailer and consumer goods companies. ID-Solutions integrated the RFID implementation into Auchan's existing enterprise resource planning (ERP) system, and also provided its RFID System Administrator (RSA) middleware, to interpret and collect read data on Auchan's data-center server in Milan. EPCIS-based software was employed to manage that data, and to share it with the pilot's participants. What's more, [Impinj](#) and [Motorola Solutions](#) provided fixed and handheld readers, while [UPM RFID](#) supplied RFID labels and [Zebra Technologies](#) and [Toshiba](#) contributed RFID label printer-encoders for use at the distribution center as goods were received and tagged.

Auchan receives dry and fresh goods from manufacturers at its distribution center in Calcinate. Fresh goods are moved directly from the DC to one of about 20 hypermarkets within the region, while dry products are stored on shelves at the DC until needed at stores. Shipments usually leave the facility during the evening, with retailers receiving those products early the next morning. At the store, some of the products are moved to the sales floor for replenishment beginning at around 5 a.m. The remaining goods are stored in the back room until required to restock the sales floor. Once the products are unpacked from the cardboard cases and placed on the shelves, the boxes are then destroyed in a trash compactor.

At the DC, staff members printed and encoded RFID labels and applied them to cases of dry goods as they were placed on warehouse shelves, using a fixed Toshiba printer centrally located within that storage area. The product's stock-keeping unit (SKU) number was then linked to the EPC tag's ID. In the case of fresh products that move quickly through the DC, workers utilized a mobile Zebra printer while walking through the staging area, and then attached tags to cartons of product, again containing

the SKU number associated with that specific tag ID in the back-end software.

When shipped to a participating store, the goods first passed through one of several fixed Impinj and Motorola RFID reader portals on their way through the dock doors. The data was then forwarded to an Auchan server, where the EPCIS-based software made that information available to pilot participants, thereby indicating that the product had left the DC. When the goods were received at the stores, [CAEN RFID](#) and Motorola fixed readers captured the carton tags' ID numbers, updating the software to indicate the products had been received. Once the goods were placed on the shelf, employees moved the empty cartons to the trash compactor, where yet another interrogator captured the IDs and again updated the records to show that the products were now on the shelves.

Auchan's own point-of-sale and shrinkage-management software was integrated with the RFID system as well. Every 15 minutes, the EPCIS software updated the products' status, so that it could determine which items had been sold and which had been discarded because of shrinkage (either due to a broken container, an expired product or spoilage). Auchan's ERP software was consequently updated to indicate which products were no longer on the shelf, and which were at risk of becoming out of stock. Auchan's staff could then view that data to manage shelf stocking, as well as reordering for the back room.

The system, Rizzi says, "is straightforward in theory, but it's easy to mess things up." For example, if a DC employee forgets to apply RFID tags to boxes, or if a worker fails to discard a box by means of the compactor, or places entire cartons of product on store shelves (instead of placing the goods themselves on the shelves and then taking the empty cartons to the compactor), no data regarding the products will be recorded.

This was not the first time that Auchan has implemented RFID. Last year, the retailer began utilizing the technology at seven of its fruit and vegetable DCs located in France and Spain, in order to manage 1.8 million reusable plastic produce crates moving from grower to DC to store, and then through the washing process (see [Auchan Tracks Produce Containers Via RFID](#)).

According to Rizzi, Auchan has a strong record of efficiency within its supply chain, making the retailer a good choice for this pilot. It was unlikely, he notes, that Auchan's employees would make many of the mistakes that could disrupt the flow of RFID data. However, he says, in the future, he would like to pilot the system at another store without that high level of efficiency, in order to better understand how RFID could be used to reduce out-of-stock events.

Not only would Rizzi like to see RFID used to reduce the "holes" on a shelf where a product has gone out of stock, but he'd also like to see the technology employed to reduce the need for product overstocking. In this case, he says, stores may place an excessive amount of goods on shelves to ensure they do not end up out of stock—a practice that could lead to expired products, or less-than-desirable freshness.

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During future pilots, Rizzi hopes to include additional product manufacturers, engage them further in the process by having them tag the cartons, and then launch a full deployment of an RFID system for a retailer, such as Auchan. "The big news about it could be that instead of being a research project, it could become a real deployment," he states. "In other words, we are negotiating with participants how to keep it up and running and possibly scale it once results were satisfactory."

Rizzi will present the details of the phase-two project on Apr. 4, 2012 at this year's [RFID Journal LIVE!](#) conference and exhibition, being held next week in Orlando, Fla.