

# At Metro's New Future Store, RFID Helps Assure Meat Quality

The company's Real Future Store is using EPC Gen 2 tags to track individual packages of meat, ensuring its display cases are well stocked, and that no one buys expired products.

By Claire Swedberg

June 3, 2008—The Metro Group's new Real Future Store, which the retailer opened last week in Toenisvorst, Germany, is piloting RFID technology to help track fresh meat in its "Master Butchery" department, and at checkout counters.

The RFID system employs Avery Dennison UHF EPC Gen 2 tags, as well as Impinj RFID interrogators and interrogator antennas. This setup enables the store to manage the stocking of its "Smart Freezers"—the term Metro has dubbed the refrigerated display cases it uses for fresh meat—in real time, as well as ensure that items that have reached their expiration dates are not purchased.

The RFID tags are attached to the plastic foam trays the store utilizes to display fresh meat, says Marcos Fernández, Metro's communications and public affairs director. The trays for all meat products in the coolers are fitted with RFID labels containing a unique Electronic Product Code (EPC) number.

That number links to data about the product, such as expiration dates, in the company's internal EPC Information Services (EPCIS) database. Whenever a customer removes an item, an integrated RFID interrogator automatically reads its tag. "This allows exact planning of in-store fresh meat production," Fernández says, "and helps further optimize quality assurance."

After butchers at the Future Store cut meat into consumable portions, that meat is placed on the foam trays and wrapped in plastic. The trays come with RFID tags pre-attached by the tray manufacturer. The tags are read and linked to data about the meat, such as the type of meat and its expiration date, which is also printed on a paper label, and is input and linked to that ID number in the EPCIS database. The package can then be placed in a cooler in the storefront.

Altogether, the store's Smart Freezers comprise 50 compartments, totaling about 30 to 40 meters (98 to 131 feet) in length, 1.5 meters (5 feet) in depth and 1.5 meters (5 feet) in width, with three or four rows of meat stacked within each freezer. The store has installed 50 readers and 200 antennas within the coolers. Each compartment comes with an Impinj reader and four antennas that capture the trays' ID numbers in real time and send that information to the back-end system via a cabled connection.

If someone removes a particular tray of meat, the system is updated to show that item is gone. In this way, employees can be alerted when the cooler becomes low on a specific product, and can then restock it in a timely manner. What's more, if an item in the cooler nears its expiration date, the butcher shop's staff receives an automatic alert and removes it.

Avery Dennison and Impinj first began working with Metro in October 2007, and both went through a series of tests to determine the best hardware to employ and the best arrangement of that hardware. After several months of testing at its Ireland facility, Avery Dennison selected its AD-222 inlays, which would be attached to meat packaging trays.

"Meat is inherently difficult to tag," says Robert Cornick, general manager of Avery Dennison's RFID division. The two challenges for RFID in meat packaging, he explains, are ensuring a hygienic environment in which the product does not come in contact with the RFID tag's electronics, and making sure the tags can be read when meat-filled trays are stacked three deep in a refrigerator or freezer.

"We had to overcome both challenges," says Ian Forster, Avery Dennison's RFID technical director. The resulting 4- by 1.5-half inch tag wraps around the corner of the foam tray, and includes an adhesive and a clear plastic laminate over the tag itself that provides a barrier between the meat and the electronics. [Fasson Roll Materials Europe](#), a division of Avery Dennison, provided the adhesive, which complies with the German government's recommendations for use with food.

The intention, Forster says, is to protect the electronics from damage by the food, and to shield the meat from contamination by the tag. Although the tags do not touch the meat specifically, the trays are stacked on top of each other until they are loaded with meat, at which time one tray's tag could make contact with the inside of another tray stacked beneath it.

"We found the AD-222 was very suitable," Forster says. "It had all the right characteristics" to render it readable from a variety of angles by both fixed and handheld interrogators. In testing the tags, he adds, Avery Dennison tried "jumbling the meat up, and we still got very good read performance."

Impinj undertook its own testing in its Seattle site, says Ramone Hecker, Impinj's senior director of RFID solutions, and worked closely with Avery Dennison to design a reader and antenna array that worked best with the AD-222 in the meat environment. Impinj is providing its Speedway readers, as well as antennas. "This project follows on the heels of another RFID deployment at a [Metro] Cash and Carry store with a similar footprint," Hecker says.

In the case of the Future Store deployment, Impinj researchers developed a mechanical mockup to mimic the cooler environment in which the meat tags needed to be read. Based on that mockup, they opted to embed the reader antennas in all four corners of the racks on which the meat is stacked, focused up toward the center of the coolers. Because the antennas are sealed into the racks, they are protected from water damage when the racks are washed.

**RELATED\_ARTICLES** When a consumer purchases an item, an Impinj reader at the point of sale captures the tray tag's EPC number one more time, which is stored in the EPCIS database, indicating the meat was purchased—and when. Metro is using hundreds of thousands of tags for the pilot, Cornick says, adding that the performance has been "very impressive" thus far.

"The quality-assurance system within Metro Group has a very high standard," Fernández states. "The use of RFID supports our employees in guaranteeing quality assurance by reducing the need for manual checks and making the processes more efficient."