

**The University of Parma facility is working with a number of clothing and accessory manufactures and retailers to stitch together the business benefits of RFID technology.**

By Mary Catherine O'Connor

Aug. 13, 2008—The [RFID Lab](#) at Italy's [University of Parma](#) has been attracting an haute couture crowd of late. In fact, a representative from [Dolce & Gabbana](#) has joined the lab's board of advisors—along with representatives from 12 other Italian clothing and accessory manufactures and retailers, who have convened with the lab to learn more about RFID technology, and to determine how it can be employed to streamline their supply chain processes and improve efficiencies.

Roberto Montanari, a professor of industrial plants at the university, will address the third annual [RFID in Fashion](#) conference in New York on Thursday, to discuss two projects the lab has been conducting. While the projects are focused on specific business processes, Montanari says, the lab and its fashion board members have seven overall goals. These goals, he explains, are to measure the impacts of item-level tagging on retail business processes; determine the most appropriate tag construction for specific needs; gauge the impact of item-level tagging on the perceptions and purchasing behavior of consumers who are the fashion companies' customers; test the tags' performance; determine the usefulness of RFID as a tool to deter the sale of counterfeit garments to the public; assess the environmental impacts of large-scale tagging; and ascertain whether RFID can be deployed to effectively reduce shoplifting.



*Roberto Montanari*

"The retail board of advisory is made of end users who participate in the projects of the lab and provide matching research funds," Montanari states. Its members work closely with the lab's staff of professors, Ph.D. candidates and undergraduate students who are focused on the use of radio frequency identification throughout the supply chain. Although many of the companies represented on the board compete with each other in the marketplace, they view the lab as a way to share the work and rewards of conducting RFID research.

"I think this is a powerful tool for the fashion industry," Montanari says. "The benefits that the members hope to gain by using RFID are strategic (reducing out-of-stocks and fighting counterfeit products, for example); operational (things like automating inventory, automating item counting for receive/shipping); and store-level benefits (such as improved stock replenishment, better customer service, better product availability, less shoplifting)."

One of the lab's recent pilots involved [Coccinelle](#), a manufacturer of high-end handbags and other accessories. According to Montanari, the pilot consisted of two separate tests: a technology test and a feasibility study.

The technology test utilized [UPM Raflatac](#)'s DogBone EPC Gen 2 tags to automate the receipt of a small shipment of tagged bags and shoes as they pass through a read zone on a conveyor belt moving at two speeds—0.192 meters (7.6 inches) per second, which is the speed at which products are commonly received at the Coccinelle distribution centers, and 0.086 meters (3.4 inches) per second. An [Impinj](#) RFID reader was mounted over the conveyor with four linked antennas.

The results were positive, Montanari says, with 100 percent read rates achieved for most shipments at the slower speed, with the exception of the largest shipment of shoes—18 pairs—and one large box of 53 purses, which saw respective read rates of 99.6 and 94.7 percent. For the tests with the conveyor at 0.192 meters per second, the purses were packed differently and able to achieve 100 percent reads. The footwear shipments were reduced to a maximum of 12 pairs to achieve full readability.

For the feasibility study, Coccinelle partnered with the lab to estimate the infrastructure investment, operating expenses and cost of consumables (tags) to put forth a company-wide tagging project, wherein goods are tagged at the point of manufacture. It then compared this information with the labor efficiency and other expected benefits of using the technology.

The study predicted Coccinelle's RFID deployment would yield a 9 percent return on investment (ROI) in less than four years, with an internal rate of return of more than 12 percent during the same time period. But this projection was just for the distribution centers, Montanari notes, and did not factor in the expected business process improvements the company would see at the store level and along its supply chain.

According to Montanari, Coccinelle is currently studying the results of the two tests and determining its next steps.

Another of the RFID Lab's pilot programs involves [Ley Tricot](#), a contract clothing manufacturer whose clients include [Calvin Klein](#) and [Trussardi](#). The lab worked with the company to test whether it could embed RFID tags into clothing labels—rather than merely attaching them to hangtags—to better track the items through production and its shipping process. The lab attached a UPM Raflatac EPC Gen 2 tag, called the Web, to a label that was then sewn onto knitwear and put through industrial laundering and ironing processes.

The laundry processes included submersion in detergent and fabric softener, as well as exposure to temperatures of up to 60 degrees Celsius (140 degrees Fahrenheit) for up to two hours. The ironing process exposed tags to 98 degree Celsius (208 degrees Fahrenheit) heat for up to 30 seconds at a time.

These tests, Montanari says, showed that the tags could still function after going through the manufacturing process. The next part of the Ley Tricot pilot test involved reading the tags in order to pick and ship orders. (The clothing manufacturer currently employs bar-coded labels for this process.)

The results of the tag readability tests, Montanari claims, were "excellent." The project's next phase, he says—which the lab plans to commence later this year—will be to utilize the tags to track the apparel items through production stages. Ley Tricot hopes this will improve its production-tracking process by reducing labor, since the production batches would be tracked automatically by an infrastructure of RFID readers, rather than manually, using handheld bar-code scanners.

In addition, the RFID Lab has already begun a number of pilot studies to explore the use of RFID in food and cold chain applications. These include one project in which pork products are being tracked and monitored in real time (see [Parma's RFID Lab Plans Pork Pilot](#)).