Company Makes Smart Cases, Pallets

An IT services firm says it is embedding tags in reusable cardboard cases and pallets that can be reused up to 100 times.

By Mary Catherine O'Connor

May 11, 2005—BeamFetch, an IT consulting services firm with offices in Taipei, Taiwan, in Beijing and in San Jose, Calif., is developing container products with rewritable passive RFID tags embedded in reusable corrugated cardboard. The products, which include variously sized boxes as well as pallets made of strong cardboard, are available now. BeamFetch says potential users of its RFID-embedded cardboard products are express delivery shippers, such as FedEx or UPS, and manufacturers and distributors for use in retail and the Department of Defense supply chain applications.

In Taiwan and China, BeamFetch has patented a process of embedding an RFID tag into paper products, including sheets of corrugated cardboard. It has filed the same patent in the U.S. and is looking to partner with companies that can manufacture the cardboard sheets into variously sized boxes as well as cardboard pallets using BeamFetch's design (currently, the products are assembled in Asia).

BeamFetch's director of product management, Cynthia Hsieh, says the company is experimenting with a range of materials, including plastic coatings, to make the cardboard containers and pallets as durable and moisture-resistant as possible. She says the boxes should last for up to 100 shipments. The company is also designing plastic inserts for the containers to insulate the embedded tag from any metallic or liquid contents inside the containers that could cause RF interference and make the tags hard to read.

By using containers and pallets with embedded tags, users would not need to replace their current label application system to accommodate smart (RFID-embedded) label applicators.

"We don't expect that we will replace the [smart label] industry, but we are developing an alternative to labels," says Hsieh.

The containers will be made-to-order so that the RFID tag is embedded in what the user deems to be the best location on the case or pallet with respect to the product they carry. (Many systems integrators offer tag-testing services to help users determine where on each case of goods a tag should be placed to allow for the best readability.) According to Hsieh, the tags used in BeamFetch products are encased in a protective fiberglass laminate before being embedded into the corrugated cardboard in order to protect the tags from heat and pressure during the embedding process. By being embedded in the cardboard, the tags are less likely to be damaged during transportation than a smart label on a case or pallet would because they are more protected from shock and vibration.

Hsieh says BeamFetch is in discussions with Cambridge, Mass., RFID reader developer ThingMagic and Plano, Texas, systems integrator Venture Research regarding collaboration on a pilot project to test the products using EPC Gen 2 Class 1 tags later this year. The companies are looking for an end user, likely a company deploying RFID to meet a retailer or Department of Defense tagging mandate, to participate in the

pilot.

The company is currently using the XRA00 UHF EPC Class 1 96-bit tag from STMicroelectronics in its containers. Before filing its patent in Taiwan and China, BeamFetch ran a small pilot with a logistics company in Taiwan in which it shipped and tested the tags in 50 cases for two months.

One potential application for the BeamFetch product would be as reusable shipping containers for FedEx or UPS. Hsieh says a customer would provide shipping information to the delivery company, which would then encode that information to the tag embedded in the container. Once that package reaches its destination, the RFID-embedded box would be emptied and returned to the delivery service provider, which would overwrite the shipping information on the tag with the next shipper's information. She says the reusable cardboard products could also be used in a closed-loop supply chain, where they could be easily collected for reuse.

In an open supply chain scenario, the boxes would not be reused because the collection and return of the boxes to their owners would be difficult and also because retailers will be placing the empty tagged cases in box crushers where readers take a final read of the tag before the case it is associated with is crushed and then sent to a recycling agent.

The tags and laminate will need to be extracted from BeamFetch boxes before the cardboard can be recycled because the tags and laminate could not be recycled with the cardboard. Smart labels have to be removed from cases before recycling for the same reason.

Hsieh says BeamFetch is pricing the containers with the XRA00 UHF EPC Class 1 96-bit tag close to the price of single RFID labels, which currently run between 75 cents to $1.50 each.