

TNT Uses RFID To Track Temperatures of Sensitive Goods

The new service assures that health-care, pharmaceutical and chemical companies' products remain at appropriate temperatures during transit.

By Beth Bacheldor

Oct. 13, 2006—TNT, a logistics and global express-services provider headquartered in the Netherlands, is introducing a new RFID service in Asia. This service tracks temperature levels associated with health-care, pharmaceutical and chemical goods as they move along the supply chain. It is designed to assure companies their products are stored and shipped at the correct temperature, becoming neither too hot nor too cold while in transit.

TNT invested \$500,000 in its RFID cold-chain solution, which can capture temperature changes of goods in transit using temperature-monitoring RFID tags. The 2.4 GHz battery-assisted passive (BAP) tags can be programmed to turn on at any designated intervals, take temperature reads and then turn off again, says Steve Stine, director of life sciences for TNT Asia. When the goods arrive at their final destination, an RFID interrogator deactivates the tags and reads the recorded temperature data, automatically uploading it to software maintained by TNT. The service then generates a report detailing the temperature readings, the times at which they were taken and other statistics, making it available online both to TNT's team and to the customer.

The new offering is the result of an eight-month initiative that monitored nearly 100 shipments trucked from TNT's Life Science Regional Distribution Center in Singapore to a distribution hub in Bangkok, Thailand, as well as more than 50 shipments flown from the Singapore distribution center to a hub in Shanghai. The trial used Alien Technology's RFID BAP ALB-2484 tags, featuring built-in temperature sensors, and Symbol Technologies' RFID interrogators and RFID-enabled touch-screen computers. Individuals can use the latter to program, activate and deactivate the tags.

TNT began planning for the trial in January 2006. According to Stine, the trial ran from mid-June through late September.

During the trial, tags were programmed to take readings every half hour during the three-day road trip from Singapore to Thailand, and during the two-day air trip from Singapore to Shanghai. The tags and goods—chemical reagents—were placed next to each other in plastic sleeves, then packed into insulated boxes designed specifically for cold-chain shipments. These shipments contained frozen gel packs in a variety of quantities to help maintain the temperature of the products at between 2 and 8 degrees Celsius.

Stine says the trial taught TNT valuable lessons that will prove important for its new service. For example, the firm discovered that if it stores the tag and chemical in the same cooler prior to packing them together in insulated shipping, the tag's first reading will reflect the actual temperature. In comparison, if the tag is stored at room temperature while the chemical is kept in a cooler before shipping, the tag's first reading might not be

accurate.

"The research teams also discovered some extraordinary information about different packaging materials pertaining to quality issues, as well as some very interesting possibilities for improving the length of time the temperature integrity of products can be maintained," Stine says. Testing single-layer and double-layer insulated boxes, as well as different types of frozen gel in various quantities in a real-world environment, provided TNT the insight needed to gain a competitive advantage in assuring quality control for customers.

Now that the trials are complete, Stine says TNT is sharing the results with prospective customers. It is also working with those customers to identify ways the RFID cold-chain solution could be tailored to meet their specific needs.

"We believe the RFID cold-chain solution addresses a very real business issue for our customers in the life-science arena," says Stine, "to whom the integrity of their products is key to successful operations."

The company offers logistics services in 36 countries and is now planning to roll out its RFID cold-chain solution to other regions in which it currently provides services. TNT is also planning to leverage the investment it has made in RFID to track and monitor heart pacemakers and other medical devices as they move through the supply chain. The RFID tracking will provide TNT's customers real-time information about the medical devices' location in the supply chain. That's important, TNT explains, because medical devices are often needed in life-or-death situations, and more granular detail about the devices' whereabouts in the supply chain can help health-care companies plan their stock and inventory more accurately.

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