

Mikoh Develops Reusable Container With RFID Security Seal

The company's SecureContainer system features a passive tag designed to notify an RFID interrogator if a sealed container has been opened while passing through the supply chain.

By Claire Swedberg

Feb. 15, 2007—With both government and commercial interests in mind, Mikoh has developed a reusable container with an RFID security seal intended to alert a user's RFID interrogator if a container is tampered with as it passes through the supply chain.

According to Peter Atherton, the company's CTO, Mikoh is in discussions with several government agencies to test the SecureContainer. However, he says, he is unable to name the agencies at this time..

Although early trials will focus on government applications, Atherton says, the SecureContainer has potential both for government and commercial use. Government agencies can use the containers to move high-value electronics and important paperwork. Retailers, pharmaceutical companies and other commercial entities, meanwhile, might use SecureContainer to transport high-value items.

One problem for commercial users of item-level tags, Atherton notes, is that a container with 100 or more tagged items (such as might be the case for pharmaceutical companies) is likely to pass readers at a high rate of speed throughout the supply chain. Under such conditions, however, interrogators might not always read 100 percent of the tags. When that happens, the company either has to pull the box off the conveyor and examine its contents, or send it on and hope the missing items are still there. Other factors affecting read rates include how the tags are applied and how the product is packed in the containers.

Manufacturers and distributors have come up with a variety of solutions to ensure that every tag in a box is read. These include rotating a container while it is being interrogated, as well as installing multiple readers at each read point. "The problem with that," Atherton explains, "is it's more expensive and more complex—and it slows the supply chain."

To remedy this problem, Mikoh developed the SecureContainer, which makes use of the company's existing Smart&Secure RFID tag incorporated in a seal. As long as SecureContainer's RFID tag can be read and its seal hasn't been tampered with, a company can be confident that 100 percent of items being shipped are inside the container—even if the system is unable to read 100 percent of the item tags inside it.

Mikoh offers two types of seals: one in which the RFID tag continues to send data to readers throughout the supply chain even if the container has been opened or the seal has been damaged; and a second option in which the tag stops working as soon as someone tampers with it.

In the first case, the device includes a passive RFID chip and antenna connected to the tamper sensor. If a person attempts to remove the seal or damages the sensor, a release coating—a layer within the tag

construction—allows the RFID chip and antenna to continue functioning. A single bit in the data represents the tag's tamper status, Atherton says. "Once this bit has been changed from its original 'untampered' status to 'tampered' status, it cannot be changed back." When an RFID interrogator reads a tag in a damaged sensor, the tag transmits that tampered status, indicating it has been damaged.

The second case involves a more basic device, which Atherton says may be more desirable for the commercial market. If someone were to attempt to remove or tear the tag, its antenna would be damaged and its connection to the RFID chip would be broken. In such a situation, an RFID interrogator would not be able to read that container's tag. The cost of the first option would be about 50 percent higher than that of a regular RFID container tag, he notes, while the cost of the basic option would be 10 to 20 percent greater.

The SecureContainer is a reusable plastic container typically measuring 15 by 12 by 5.5 inches, though other sizes are available. The container includes one point of entry, in the form of two doors at the top of the container, which are closed and secured with an adhesive seal integrated with a Smart&Secure passive RFID tag. The SecureContainer has been developed for testing by government agencies using 13.56 MHz or 915 MHz RFID chips, but the tags are available in a range of frequencies and air-interface standards to meet the needs of each end user. Although the seals use passive tags, Atherton notes, Mikoh is also testing the system with semi-active tags.

RELATED_ARTICLES The seals can leave behind a residue after use, making it difficult to apply a new seal over it. Therefore, Mikoh designed the SecureContainer such that the seal attaches to disposable plastic inserts that slide into the container's doors. The inserts can be removed at the end of the shipment, leaving a clean surface for the next shipment.

According to Atherton, Mikoh's SecureContainer, consisting of the container and seal, is commercially available now, with no special software required.

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