Startup Says It Has Cost-Effective Means to RFID-Enable Packaging

Hide-Pack's system embeds an RFID inlay into the joint of a box during manufacturing, protecting the tag and eliminating the need for an externally applied RFID label.

By Mary Catherine O'Connor

Oct. 12, 2007—Box manufacturers have for years been searching for a means of cost-effectively embedding RFID tags into packaging. Doing so would give them a significant competitive advantage in their industry by providing a streamlined means for consumer packaged goods manufacturers to meet the RFID-tagging requirements that their customers—namely, retailers such as Wal-Mart and Target—have issued. Hide-Pack, a packaging solutions startup based in Montreal, claims it has figured out a method of integrating RFID inlays in boxes that doesn't slow box production and can reduce the costs for consumer packaged goods manufacturers to RFID-enabled cases of goods they sell. Furthermore, the company says its process operates in a way that wasn't supposed to work: by placing the inlay inside a box joint.

The joint of a box—the seam, where two sides of the box overlap and are joined together—is crucial to a box's physical integrity: its strength, in other words. Box-making 101 says that you should not have anything but adhesive or staple inside this seam, because foreign objects could hamper the box's compression ratio, or the number boxes (of the same size and strength) that can safely stacked. But taking this counter-intuitive approach, the Hide-Pack founders found that placing an RFID inlay inside the joint not only failed to degrade box strength, it also provided a means of protecting the inlay from the dirt, moisture and abuse while also providing a buffer (formed by the two layers of corrugate in which the inlay is sandwiched) around the inlay that improved the inlay's readability when the box is filled with RF-interfering materials, such water or metal.

To bring this patent-pending approach to market, Hide-Pack has partnered with Domino Integrated Solutions Group, a provider of auto-ID technologies and data integration services for the packaging industry. Domino says it will provide the Hide-Pack technology, an RFID inlay reader and applicator, on-site education, feasibility studies, pilot and project design, full integration and implementation services to box manufacturing companies for approximately $150,000 per packaging line.

Paul de Blois, vice president and general manager of Hide-Pack, says that consumer packaged goods (CPG) manufacturers that are under tagging requirements stand to realize significant cost savings by purchasing RFID-enabled packaging rather than adding RFID-enabled labels prior to shipping goods to retailers. The bare RFID inlay that the HIDE-Pack system would embed into a box is 35 percent cheaper than the RFID label a CPG manufacture might place on the outside of a box today, says de Blois. In addition, CPGs would lower their infrastructure costs by using HIDE-Pack cases since they would not need to purchase RFID printer-encoders and label applicators.

There are also other important benefits of using RFID-enabled boxes, such as the ability to begin tracking and tracing products earlier in the supply chain and integrating RFID data into their transportation and warehouse management systems.

But do box manufacturers currently see enough demand for RFID-enabled boxes to justify the costs of integrating RFID tags into their products? While the additional costs of deploying Hide-Pack's RFID system to a packaging line could be amortized to less than a penny per box when used to RFID-enable 20 million boxes, CPG firms are not currently creating demand for more than 2 or 3 million RFID-enabled boxes per year, says Dwain Farley, CEO for the Americas division, for Domino IGS. However, he says, this demand should grow consistently as Wal-Mart and other retailers begin asking suppliers to ship more and more products in RFID-tagged cases each year. Plus, box-makers won't need to dedicate a line to producing only RFID-enabled boxes, since the HIDE-Pack system can be turned on and off quickly, he says.

A number of box-makers are already engaged with Domino on pilot projects, says Farley, but non-discloser agreements preclude him from sharing company names. There is particularly strong interest, he says, from makers of the wax-covered corrugate used for shipping produce, because readability of RFID-enabled labels slapped to the outside of these boxes carrying water-rich produce has been a major hurdle for product companies. The placement of the inlay embedded in the box joint improves the tag's readability, he says.

Being encased within the box joint adhesive also fortifies the RFID inlays from water damage, says Farley. The company performed tests in which its boxes were soaked in water or placed inside freezers, neither of which prevented the tags from being consistently readable as they were moved down conveyor systems as speeds up to 600 feet per minute— the target speed for tag readability at Wal-Mart distribution centers.

RELATED_ARTICLES Hide-Pack has tested its approach with a variety of package-making equipment, used to make everything from large corrugate boxes to smaller product-level packages (such as thinner cartons used for products such as facial tissue or cereal boxes) to envelopes (think FedEx) and says it works on of these products. When tested with a corrugate box-making line that uses a Flexo Folder Gluer (the dominate system used to manufacturing corrugate cases), Hide-Pack has been able to insert an inlay into each box moving through the gluer at speeds up to 18,000 units per hour, which is the maximum line speed of most Flexo Folder Gluer machinery, says François Bozet, vice president of technology for Hide-Pack. By testing each inlay to ensure that it is functional before applying it to the box, the company says the tags in finished boxes have a failure rate of 0.1 percent or less. It has also tested its method with different types of adhesives and with passive UHF EPC Gen 2 inlays from eight different tag makers.

Hide-Pack also performed tests at a recycling mill that showed that the RFID inlay, despite being embedded into the box seam, could be extracted from the corrugate using standard contaminate-extraction filters already used at corrugate recycling mills. (These same filters remove the RFID labels added to the outside of corrugate boxes today.)