

Stark Solutions' RFID-Enabled HackTrac™ System Helps Brick and Ceramic Product Manufacturers Improve Inventory Control and Delivery Accuracy

The growing acceptance and reliability of RFID technology for supply chain management and asset tracking is spurring software companies to develop RFID solutions that will help them penetrate new markets.

For example, Stark Solutions, of Greenville, South Carolina, a systems integrator and provider of turnkey RFID solutions designed to transform supply chain efficiency for brick and refractory products manufacturers. The company's innovative RFID HackTrac™ application delivers an accurate, real-time asset tracking solution that greatly improves inventory visibility, management and control.

According to Lance Burnett, the company's co-founder and president, although this market sector has adopted technology-based enterprise solutions for running business processes efficiently, a large majority of companies still rely heavily on manual processes for managing inventory and fulfilling orders.

“For these industries, the challenge of managing inventory is due in large part to the sheer volume of manufactured products in the brickyard or warehouse, which makes manual, line-of-sight inventory difficult, if not impossible,” says Burnett. “As we explored the capabilities of RFID technology, we decided to be first-to-market with an inventory tracking system that would make the job faster and easier. Now, having implemented HackTrac in several customer sites, it is clearly proving to be a transformative RFID solution.”

Brick Industry Challenges

Brick manufacturers serve the residential and commercial construction industries, typically selling through distribution channels to builders and contractors. In the commercial building market especially, where on-site labor costs are high and sequential workflow is carefully planned, the right materials must be delivered to the right place at the right time to meet construction schedules. This is essential to customer satisfaction.

Burnett explains: “If a load of bricks is not delivered on time, if a shipment is sent to the wrong location, or if the product delivered does not match the order specifications, the entire construction job can be delayed until the right materials can be obtained. This is a costly proposition for builders and, for their suppliers, it can result in punitive fines and even law suits.”

Many of the problems experienced by brick manufacturers occur not in the factory, but rather in the brickyard where inventory is stored and prepared for shipment. Manufactured bricks for the construction trade are massed in strapped loads of about 500 bricks to a cube, often called a hack. The cubes are delivered to the brickyard where they sit outdoors, subject to dust, dirt, rain, sleet and snow –

making it difficult to label the cubes with vital product information such as electronic product codes and lot numbers. Lot numbers are important, since the same type of bricks manufactured on one day will vary somewhat in color from bricks made the next day. Builders and contractors may refuse to accept a 'mixed run' shipment if the colors are poorly matched.

Before Stark Solutions developed the HackTrac System, entering the newly manufactured cubes of brick into inventory and deciding where it should be stored was a manual process typically performed by brickyard personnel. It was a time- and labor-intensive process, prone to human error. Similarly, when it was time to assemble and load an order for shipping, the process was reversed. This also led to frequent mistakes as workers spent a great deal of time finding, identifying and loading the right cubes of bricks to transport via forklift to waiting trucks.

“We knew these inventory management and quality control issues were the major pain points to be addressed in creating a solution that would bring a higher level of automation to brickyard management,” says Burnett. “The concept of building a system for this application on RFID technology struck us as the perfect answer.”

Real-Time Inventory Tracking

HackTrac is the first RFID-enabled solution designed specifically to help brick manufacturers automate their inventory management and order fulfillment processes. With this system, the company can print and encode rugged 8-inch wide labels with all the necessary product information, then fold the labels and affix them to each strapped cube of new bricks.

When the cubes are delivered to the brickyard, HackTrac's Bin Loading module informs the forklift operator's computer where to place the cubes in the yard, based on the type of product being unloaded. Once the bricks have been placed in the proper bin, the inventory system is automatically updated. Likewise, once they are removed from the yard for shipping, they are automatically removed from the inventory count.

More Accurate Order Fulfillment

When an order is scheduled for shipping, the enterprise system generates a pick list and Bill of Laden and beams them to the computer of a forklift operator, who is directed to the right product location. There the RFID reader reads the tag to verify that the product specifications match the order printed on the pick list and Bill of Laden before the brick cubes are lifted and loaded for transport to the assigned truck. This process of order location, product identification and verification, which could take a significant amount of time in a manual system, has now been reduced to mere minutes. And, with positive RFID tag identification, the inventory manager and brickyard personnel have the assurance that the right order has been picked.

Combining rugged hardware and weather-proof RFID tags, the HackTrac system eliminates the physical counting of and finding cubes in the brickyard by enabling the product identification tags to be read from virtually any angle, without a direct line of sight. “This capability alone saves significantly on inventory management time and labor and greatly improves inventory and shipping accuracy. RFID tagging could also make it easier for brick suppliers to sell their products to Big Box retailers with RFID compliance mandates,” notes Burnett.

HackTrac System Components

The components comprising Stark Solutions' HackTrac system include:

- Forklift-mounted computers made by noax Technologies AG, a German producer of ruggedized, industrial touch-panel computers
- RFID readers from Alien Technology, also forklift-mounted
- Rugged, weather-resistant, 8-inch wide, wet inlay RFID tags (Class 1 Gen 2) incorporating Intermec antennas and Avery Dennison RFID's AD-220 Inlays
- An 8-inch RFID label printer/encoder, supplied by Avery Dennison
- HackTrac proprietary software, built on a Microsoft MS.Net platform, and incorporating 802.11b wireless communication protocol to integrate with a user's centralized wireless local area network (WLAN)

Since each manufacturer has its own inventory management procedures, Stark Solutions works closely with customers to map out their processes and configure the system to their specific requirements. The company also provides users with middleware to allow them to integrate the inventory management system with their ERP system, providing a convenient end-to-end turnkey solution.

Burnett adds that Stark Solutions performed its own extensive 'guerilla' testing of the RFID tags in real-world outdoor environments to ensure their performance, durability and reliability, even under extreme weather conditions.

Real-World Results: Cost Savings, Improved Customer Service

The true test of an RFID-enabled solution is how well it performs in the real world. According to reports from Stark Solutions' HackTrac customers, the system has proven to be so reliable that not a single mis-shipment has occurred since HackTrac has been up and running. Among Stark's brick manufacturing customers are Lee Brick of Sanford, North Carolina, a manufacturer of high quality residential, commercial and architectural brick, and Columbus Brick, a regional brick producer in Columbus, Mississippi.

HackTrac has proven to be a highly effective automation tool for companies in the refractory manufacturing industry as well. One HackTrac user in this market sector is a leading global provider of custom-engineered, high-temperature insulating fibers, firebrick and monolithics used in industrial furnaces and for fire protection. For all users, the primary benefits of the RFID-enabled track-and-trace system include improved inventory accuracy, elimination of incorrect shipments, and increased speed and productivity in order picking, loading and shipping. In fact, the inventory manager at Lee Brick said his company was able to completely eliminate manual cycle counts due to the dead-on accuracy of the HackTrac system.

Once HackTrac is implemented and workflow becomes faster and more streamlined, manufacturers may find that fewer forklifts are required in the brickyard or warehouse. The result: more efficient asset utilization, significant cost savings, improved profitability, and higher customer satisfaction.

Burnett asserts that the toughness and durability of the system's RFID tags are key to its successful performance in these harsh industrial environments. "For a track-and-trace system like HackTrac to work effectively, you need to ensure 100 percent RFID tag read rates – and we have achieved that goal," he states. "Avery Dennison RFID's technical support team was extremely helpful in guiding our choice of RFID inlays, antennas and tags to be sure they would perform and hold up well over time, even in the toughest environmental conditions."

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