

RFID for PACKAGE VALIDATION



Advantages for Contract Manufacturers and Packers

sponsored by



UPM

UPM RAFLATAC



Package Validation Showcases RFID Advantage for Contract Manufacturers and Packers

This white paper represents a collaborative effort by Impinj, UPM Raflatac, and Zebra Technologies to provide educational information about the use of item-level, UHF Gen 2 RFID technology for gaining efficiency and reducing cost in process-intensive operations.

Item-level Visibility—The RFID Advantage

A key advantage of RFID technology is its ability to provide efficient, low-cost, item-level visibility into any process. Such visibility in turn brings about the possibility of process change. For process-intensive companies, this change can be the difference between a black or red bottom line.

Prime examples of process-intensive companies include contract manufacturers and packers. Contract operations may serve diverse industries with different products and with varying levels of efficiency, but the item-level visibility RFID technology offers can improve profitability for all. With sufficient volume, highly efficient companies benefit from even small improvements in process. For less efficient companies, process improvements alone can bring a return on investment (ROI). Where cost of failure is huge (i.e., potentially life-threatening), preventing a single failure becomes critical to the success of the organization.



One area for process improvement is at the back end of pick and place operations—validating the contents of the box prior to shipment. By deploying RFID-enabled package validation, process-intensive companies can realize immediate cost savings with improvement in shipping accuracy. And when companies push the RFID tagging back to the beginning of the process, other efficiencies and improvements provide additional ROI.

In Search of Efficiency

The profitability bottom line for contract manufacturers and packers has its basis in both the accuracy and efficiency of operations. Accuracy in creating the correct final product or fulfilling a custom order depends largely on the skill of laborers, the process sophistication level, and the management's commitment to process improvement. All of these factors influence the resultant quality, which encompasses the delivery of a complete product. Efficiency of forward logistics (everything associated with getting a product to market) comprises a number of factors:

- Automation levels
- Availability of components and materials required for end product
- Ability to readily locate assets (machinery, tools, etc.) required for job to reduce unproductive labor
- Ability of management to track key performance indicators (manufacturing cycle time, throughput, delivery versus schedule, etc.) and promptly act upon the information
- Visibility level into process so that waste, under-utilization of resources, shrinkage, and choke points can be identified
- Accurate knowledge of completed inventory location

For reverse logistics (after-market customer service), efficiency is even more important, because products requiring service add significant cost for the companies involved. Making products accurately in the first place affects reverse logistics, because fewer mistakes mean fewer products require service. For those products that require service for mis-shipment, repair, or recall, associated costs result from:

- Return shipping fees
- Labor to restock, repack, and reconcile sold versus returned products
- Reshipment fees
- Penalties from contractors

- Customer-service personnel labor (call centers, warranty servicing)
- Repair (field service call, spare parts inventory, warehouse requirements, paperwork management)
- Recycling requirements (environmental laws)

Contract manufacturers and packers have a variety of software solutions to help with forward and reverse logistics. But results from any of these solutions depend on the accuracy of data input, and for many operations that input comes from manual entry or barcode-assisted entry. RFID technology improves upon these methods by providing more automation, greater accuracy, and unique item-level identification.

Start by Deploying Package Validation

To understand the benefits, let's start at the package validation part and work back. Whether a pick and pack operation is the primary company output (e.g., contract packers doing order fulfillment) or an end step along the manufacturing line, it typically involves selecting proper components from a variety of options and stuffing them into the packing material in the proper location and with the right order.

A cell phone box might include the cell phone, battery charger, battery, and product documentation. Similarly, a laptop box contains the computer, charger cord, and product documentation. For each of these items, the laborer has a few options to select. Because cell phone carriers supply to more than one carrier, the cell phone may have carrier-specific labels. If the laptop is customizable, the box may include customer-specific software CDs. The battery charger and charger cord may be country specific, or the documentation may differ. When picking and packing is labor intensive (either completely manual or barcode-assisted), the possibility for errors always exists. After a box is sealed, both human eyes and barcodes are useless. Methods to combat this problem include buddy system checking, and random package sampling, but such methods require interrupting the production line.

Because RFID technology operates 24/7, without the constant human intervention and line-of-sight reading required by barcodes, the simple addition of RFID tags to each of the cell phone or laptop components allows laborers to assemble the box and seal it, with validation occurring on the regular production line after the box is sealed. At the location where the packed and sealed box crosses from packing into the storage area, an RFID reader tied into the manufacturing execution system verifies the box's contents against the order. Any box not registering the correct components may be taken out for rework before entering the finished goods area.

RFID Benefits

RFID tags have supplementary benefits to barcodes, including:

- RFID does not require line-of-sight reading
- Greater depth of serialization—RFID can uniquely identify each individual item, rather than simply the product type or lot code
- Many RFID tags may be read simultaneously
- Information contained in RFID tags may be updated in the field
- Unique serial numbers make product authentication possible

RFID Advantages

RFID can revolutionize the way companies do business and benefit consumers along the way.

- Ability to intelligently recall defective or dangerous items
- Protection for high-value goods via easier monitoring
- Identification of authentic versus counterfeit products
- Visibility into the supply chain for a more efficient distribution channel and reduced cost of doing business
- Shrinkage control
- Better inventory control
- Visibility into process operation

RFID Package Validation Process



Individual items are labeled



Items are boxed



Reader scans each item



Monitor indicates validation

If a company incorporates just RFID package validation (and does not extend RFID tagging further back into their process), that improvement alone will provide a return by increasing the accuracy of orders entering the supply chain. Operation expenses include the recurring cost of tagging each component, validation readers and reader antennas, installation costs, and software to tie into existing systems. The ROI comes from increased forward logistics efficiencies, savings in reverse logistics, and the benefit of improved customer satisfaction.

Extend Benefits to Rest of Line

What if your operation already has barcodes? You can either entertain a hybrid labeling system or consider complete replacement. In either case, what other ROI can you obtain from RFID technology?

If we push the component labeling back to receiving, where many companies re-label components to support their manufacturing execution system (MES) requirements, automated, item-level serialization provides additional benefits. Some of the problems now facing operations that handle numerous costly components in vast facilities include:

- Inaccurate knowledge about inventory levels or location
- Inability to locate tools or machinery required
- Shrinkage
- Inability to identify choke points

These problems decrease efficiency levels and negatively affect the bottom line. Armed with the knowledge that item-level visibility brings, plant operators have accurate data about the flow of products and assets around their facility. Knowing where and how much inventory exists means fewer dollars allocated to margin inventory. When laborers do not have to search for tools or manually verify machinery, fewer dollars go to wasted time. Increased business knowledge supports security, reduces process failures, provides a record of proper handling, and enables easier documentation (reporting and mandate compliance)—all with little human intervention or associated data entry errors.

Solution Co-developed by Impinj, UPM Raflatac, and Zebra Technologies

RFID industry leaders Impinj, UPM Raflatac, and Zebra Technologies joined forces to offer RFID-enabled package validation using UPM Raflatac tags based on Impinj Monza™ 3 tag chips, Impinj Speedway® readers and reader antennas, and Zebra Technologies' UHF Gen 2 RZ400™ printer/encoder. This winning collaboration ensures the success of your RFID deployment from start to finish. Contact any of the three companies involved for more information.



UPM RAFLATAC

About Impinj, Inc.

Impinj® develops award-winning radio frequency identification (RFID) technologies that are at the heart of many of the world's most efficient supply chain, asset management, and retail operations. For more information, visit www.impinj.com.

Impinj, Inc.

701 N. 34th Street, Suite 300
Seattle, WA 98103
USA
Telephone: +1 206 517 5300
Toll free: +1 866 467 4650

About UPM Raflatac, Inc.

UPM Raflatac is one of the world's leading suppliers of self-adhesive label materials and the world's number one producer of HF and UHF RFID tags and inlays. UPM Raflatac's products meet the needs of demanding applications in a vast array of end-uses. For more information, visit www.upmraflatac.com.

UPM Raflatac, Inc.

267 Cane Creek Road
Fletcher, NC 28732
USA
Telephone: +1 828 651 4800

About Zebra Technologies Corporation

Zebra Technologies Corporation is a global company built on integrity, innovation, and delivering value to our customers. We help customers identify, track and manage assets, transactions and people with systems and solutions that improve business processes. For more information, visit www.zebra.com.

Zebra Technologies Corporation

Corporate & International Headquarters
Zebra Technologies 333
Corporate Woods
Parkway Vernon Hills, IL
60061-3109
USA
Telephone: +1 847 793 2600
Toll-free: +1 800 423 0442