

An **Avery Dennison** White Paper

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Products and Services

RFID Compliance for CPG Manufacturers

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Introduction:

If you have been asked recently to mark you cases and pallets with RFID labels, you are probably sending those products to Wal-Mart!

Compliance is nothing new for you, many retailers have asked you to put a special label or identifier on your finished goods. RFID could be a bit more of a challenge because of the technology but with the right supplier you can achieve compliance with minimal disruption to your operations.

How do you sort through the myriad options to meet compliance? How can you comply with minimal cost and effort? How do you make sure that your RFID solution is going to work? How do you manage the new data that RFID compliance will generate?

RFID Compliance for CPG Manufacturers

Determine what items will need to be RFID tagged:

The current Wal-Mart initiative is for product at the carton and pallet level only. In some instances, the case is indeed the item. Therefore, the item will need an RFID tag.

You need to identify what Wal-Mart Distribution Centers you currently ship to today and what products would make the best test case scenario. You may want to consider the following when selecting products to send:

- Do they contain metal or liquid?
- Are they easily counterfeited?
- Are they a high shrinkage item?
- Is there a product we want to track through the supply chain?
- Is there a promotional item we want to track?

You may be able to develop a ROI by choosing the right items to send to Wal-Mart with RFID labels.

Determine the best inlay for your application and where best to apply the RFID label

RFID inlays come in a variety of antenna configurations and price ranges. In general, UHF inlays work well on RF-friendly products – which would be products such as paper and cloth that do not have high amounts of liquid or metal. In this case, tag selection and inlay position are not critical.

Liquid products tend to absorb UHF RFID energy, making it more difficult to achieve adequate read ranges. If your cases have liquid contents, you will need to take extra care in choosing the correct inlay design and inlay placement. Often, slight shifts in the location of the inlay on the carton will be enough to move away from the liquid and resolve the read range issues. In some cases, it may be necessary to pick a more robust inlay design to help compensate for the loss of read range due to the liquids.

Metals also pose a challenge to UHF RFID labels. Since metals reflect RF energy, they often cause 'echoes' that confuse RFID readers. Again, choosing the

correct inlay design and placement on your package can typically yield good results.

You can save a lot of time and expense by choosing an RFID partner with a qualified lab that can help you choose the best inlay and placement for your application. Some labs offer inlay-positioning analysis as a free service.

Have a process analysis completed to understand the best possible place to implement RFID within your current operations:

Experts in the CPG Market and RFID can perform an analysis of your operations from raw materials to shipping finished goods and help you determine the best area to implement compliance requirements as well as ways to increase productivity. Some companies offer this as a free consultative service.

Determine what you will encode to the RFID chip:

Once you join EPCglobal they will assign a unique EPC company prefix – which is a unique identifier for the company. In this case the supplier can follow the EPC Tag Data Standard, which supports a number of constructs of the Electronic Product Code. This 96-bit Electronic Product Code typically consists of 4 basic segments: a Header, an EPC company prefix, a Product Code, and a Unique Serial Number. The **Header** defines the overall length, identity type, and structure of the EPC tag encoding. The **Product Code** or **Object Class** identifies the general product being shipped (for example, a case of diet coke). The **Serial Number** is a unique number within each class. You are responsible for assigning unique, non-repeating serial numbers for every instance within each object class.

It is beyond the scope of this white paper to explain the EPC Tag Data standard. More information on developing the RFID data Tag Data Standards can be found at:

<http://www.epcglobalinc.org/standards/>

By far, the easiest way to comply with the tag data standards is to work with one of the many software suppliers that offer relatively inexpensive applications that use your existing data to build the EPC code for you.

Determine what you will print on your labels:

It is recommended that you print a human readable and a barcode backup of the RFID data as a minimum. Some companies also choose to print whether the label

is carton or pallet. You may additionally choose to print your company name or other information that makes the label more useable in your specific application.

If you choose to use a separate 4" x 1" or 4" x 2" label for your RFID tag, the printing requirements are minimal. It is recommended that you print a human readable and a barcode backup of the RFID data as a minimum.

Determine how you will print and apply your labels:

Printing and encoding RFID labels is not as straightforward as printing barcode labels. Unfortunately, there are still varying levels of quality in both RFID encoding devices and RFID tags and labels.

It is critical that the RFID printer and the RFID labels are designed to work as a system. If you choose to purchase your encoding equipment and your labels from different suppliers, be sure that they guarantee that the products will work as a system.

It is very rare to receive 100% yield of RFID labels through printer/encoders. However, you should expect at least 98% yield. Be sure to choose a partner who will provide a guarantee on encoded labels. Your partner should be willing to provide credit to you for any label that does not encode.

There are four basic methods to choose from for printing and encoding of RFID Smart labels:

Purchase pre-printed and pre-encoded labels to meet your specifications:

If you are shipping relatively low volumes of RFID-labeled product, (hundreds or less per month as opposed to thousands), you may not want to invest in the hardware and the software required for printing and encoding your own RFID labels. There are several companies that provide pre-encoded RFID labels. You simply provide the correct data, and the labels are printed and encoded for you. You should expect that the supplier tests the labels and that they ship in a static-resistant bag. You should expect that your label order ship within 48 hours once the initial design template has been created.

Print and encode your own labels using an RFID Printer/Encoder:

If your volumes are high enough, and you want to maintain control of your printing process, you may choose to purchase an RFID printer/encoder and print and encode the labels as you need them.

Print, encode, and apply your labels using an RFID Printer/Encoder/Applicator:

For very high-volume applications, you can choose to use a machine that will not only print and encode your RFID labels, but also automatically apply them to your product. For solutions involving automatic print, encode, and apply, you should be

sure to use the highest quality labels available and also be sure to consider how you will handle exceptions if your label does not encode.

Open-Air Encode:

Finally, you may choose to do what is called an open-air encode. With this method, an RFID reader is used to encode the RFID labels after they are applied to your package. This method is not recommended because it will typically result in the lowest encode yield and also does not provide human readable or barcode backup of the RFID data.

Determine how you will test/verify your RFID tags before shipment:

The Wal-Mart initiative requires that the RFID tag be verified before shipment. This can be achieved with either fixed or handheld RFID readers. The choice of the reader will be driven by your specific application: package size, current process constraints, and shipment volume will determine which reader best meets your needs.

Determine how to communicate the RFID data Wal-Mart:

Retail Link is a tool that you use today to communicate order status with Wal-Mart. Retail Link has a new link for RFID that provides all the information you need to know about RFID compliance standards.

This information can be found in Find Documentation/RFID Information.

Choose your supplier(s) wisely:

A reliable, experienced supplier can guide you through the many decisions you need to make at very low cost. Here are some questions you may want to consider asking a supplier:

- How much experience do you have with RFID technology? With suppliers to Wal-Mart? Can you guide me through those initiatives?
- Can you install the solution and train my people on how to use it?
- Do you have service available to come to my location should I run into issues after installation?
- Can you supply me with a complete package of what I need? What is the cost of your simplest, most basic package (note: supplier should be able to provide

you with the basic software you need, one printer/encoder, a reader and initial labels, and install it for well under \$20,000)

- Do you offer software that can encode the required Electronic Product Code numbers?
- Do you guarantee that your labels will scan? Can I return failed labels for a credit?
- Do you offer laboratory services to guide me through the placement of the tag on my product, and guide me through selecting the proper inlay for my product? What is the cost of this service?
- Are the printer/encoder and smart labels you offer certified as “Interoperable” with other Gen2 products by the recognized standards agency, EPCglobal (Products certified as “Interoperable” meet EPCglobal Gen2 specifications and will work in harmony with the reader hardware they will use to read your labels).

The right supplier can provide all the information and services outlined in the questions above, and help you achieve compliance with minimal disruption to your operations and make it easy for you to accomplish!

References:

EPCglobal Inc. website:

www.epcglobalinc.org

EPCglobal Tag Data Standard:

<http://www.epcglobalinc.org/standards/>

Technical Questions:

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