



Requirements for Meeting the DoD RFID Labeling DFARS Clause.

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The purpose of this document is to help you understand the four major requirements of meeting the DoD RFID labeling mandate. We explain the importance of the each requirement from a system and technology perspective and recommend 'best practice' solutions.

The DoD RFID labeling mandate is a condition of a new or renewed DoD contract that has the DFARS clause stipulated in the language. When the DFARS clause is in your contract, it mandates that you deliver goods with RFID labels and complete the RFID portion of the electronic Advance Shipment Notice.

If you have not received a contract with this clause it will be coming as the DoD rolls out this project on everything from commodities to field equipment. Industry intelligence indicates that a full roll out of this project should materialize by the end of 2007. Complying with this mandate is important as it affects your status as a contractor and eligibility for payment on your delivered goods.

RFID = Radio Frequency Identification
DFARS = Defense Federal Acquisition Regulations Supplement
UID = Unique Identification used on goods valued at \$5,000 or more.
Mandate = Compliance is required per the DFARS Clause and to get paid.
WAWF = Wide Area WorkFlow
RFID Tags = RFID Labels

There a number of helpful internet information sites on this subject. Please reference the DoD Supplier Implementation page at http://www.acq.osd.mil/log/rfid/implementation_plan.htm and www.RFIDLabeling.com under Announced Mandates for current information and timing requirements.

It's important to note that there are two programs being rolled out that relate to RFID. One is the UID mandate and the other is the DFARS RFID labeling mandate. Think of the UID labeling mandate as a asset tag or marking that must be permanently affixed to the equipment being delivered. The RFID labeling mandate should be thought of as a shipping requirement, which will also apply to UID packaging in the 2007 timeframe or earlier if the contract administrator requires it.

Addressing the RFID Labeling Mandate

The first thing to do when being faced with meeting the mandate, is to realize that there is more to complying than just slapping a label on a box and shipping it. In fact there are four key functions you must perform in order to meet the mandate.

Requirements for meeting the RFID DFARS Mandate!

- 1) Provide 915 MHz 96 bit RFID tags in either the EPC or DoD number format. After 9/30/06 only Class 1 GEN 2 tags will be accepted.
- 2) Deliver RFID tags on your cases and pallets so that they read at the DoD mandate requirement of 10'.
- 3) Associate each case label to a unique pallet tag.
- 4) Complete the Advance Shipment Notice (ASN) RFID requirement via the WAWF. This information provides the description of goods and case to pallet relationship of the RFID tag data.





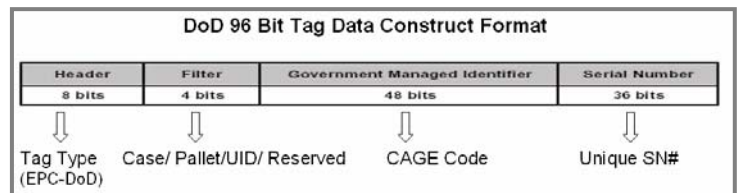
Lets look at each requirement in detail and its relationship within the entire process.

- 1) **Provide 96 bit 915MHz RFID Tags in proper EPC or DoD number format:** The RFID tag you supply, must be a 96 bit Class 0, 0+ or Class1, Generation 1 915MHz UHF frequency tag. After September 30, 2006 only Class 1 Generation 2 tags will be accepted. Your RFID label can be a standalone tag or a combination of your existing shipping label with an RFID inlay that is programmed in either the DoD or EPC number format. This format is at your discretion.

The EPC number format is required to meet retail mandates from companies such as Wal*Mart or Best Buy. If you are shipping to both the DoD and retail customers you might want to consider this format from a simplicity perspective. Although, there are royalties associated with the EPC format that are based on the size of your company. Rights and royalties to the EPC number format is controlled by EPC Global US and their web site is <http://www.epcglobalinc.org/>.

It is interesting to note the EPC format supports an intelligent naming convention. For example, the resulting tag number tells who the manufacturer is, the product, pack size, whether it's a case, pallet, or each followed by a unique serial number for that tag / item. This number is unique world wide. You can find definitions of both the EPC and DoD formats on www.RFIDLabeling.com in the Announced Mandates section.

The other choice is to use the royalty free DoD number format. This number format is not as descriptive as the EPC format but it doesn't require royalties. The configuration of a proper DoD number includes a header field which tells the DoD the label format (EPC or DoD). This is followed by a Filter that designates whether the item is a case, pallet or UID. The next segment is your 5 digit CAGE code followed by a unique serial number. All of these numbers are merged together in a specific sequence that leads to a single hex value that is encoded into the RFID tag. Take note that this format does not describe the goods...hence we have to associate cases to pallets and then the ASN describes the goods.



If you are going to purchase RFID labeling software, such as CP Express or Compliance Partner vRFID, then the software will automatically generate and manage these numbers for you without repeating them. With the right software, this all happens seamlessly, just as you would expect a barcode printing system to produce labels conforming to the conventions such as Code 39 or 128.

As mentioned earlier you can add RFID to your existing shipping label, this is referred to as a 'smart label'. However, it's not uncommon for companies to elect to add a separate label to meet the RFID mandate. This is usually happens when shipments to a mandating customer represent only a fraction of your overall shipments. This tag doesn't have to have any printing on it since the mandate only requires the tag to be readable by an RFID reader, not a human.



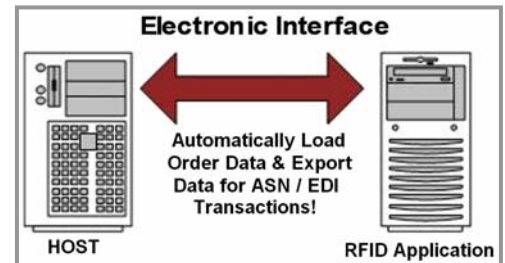
From a practical and operational perspective, we recommend you use a tag similar to the one above. Here we suggest printing a scannable barcode of the HEX value of the RFID tag, a label index, your company name and a label type. The HEX value is the unique number that is programmed into the



RFID tag at the machine language level. Machine language is what an RFID reader sees when the tag is in its read field. This is a 24 character data string.

Working with a 24 digit HEX number can be cumbersome and error prone, which is why we recommend that you add a simple index number to help in tracking tags. The label type also helps in tracking since it identifies if the label is for a case, pallet or UID tag. These two features help in simplifying and increasing accuracy of the third and fourth requirement....association and the ASN.

You now know the types of tag and formats you have to supply in order to meet the mandate. If you don't intend on purchasing software to aid in meeting the mandate then please consider our internet based DoD Label Printing Service at www.RFIDLabeling.com. There are no minimums or set up fees...simply order the amount of labels you need at 70 cents each and you're on your way to meeting the mandates.

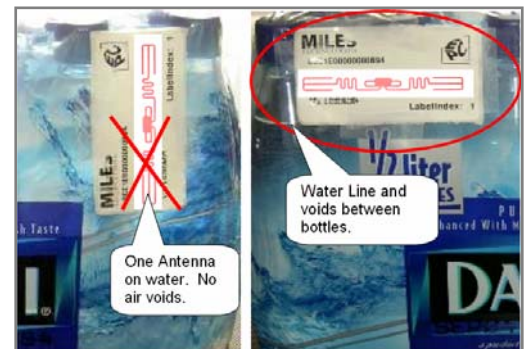


If you purchase software to print RFID tags you can manually input the number of tags and select the types you need. Or streamline the process and utilize an electronic interface to your business or WMS system for order data. Likewise you can typically use the same interface to send data back to your EDI or ASN system to complete the cycle.

- 2) **Deliver Tags that Read at Mandate Distances:** The second requirement of meeting the DoD mandate, states that you must place your tags on cases and pallets so that they read when 10 feet from an RFID reader. If you just print, slap it on anywhere and ship it, you risk not complying with this stipulation.

You might ask...Why does matter when the RFID printer boasts that it validates what it encodes in the tag by reading it after printing? It should be ready to go...shouldn't it?

Not exactly! The reason is simple, the printer is encoding and reading the tag at an inch or less and you have to provide labels that read at 10'. This is not as easy as it sounds, when you consider the technology and the fact that contents of packages, such as liquids or metal negatively affect the RF energy field. In fact, liquid absorbs and metal reflects RF energy potentially robbing the tag of enough RF energy to power up and perform at 10'.



Believe it or not, inches and orientation do matter in RFID labeling. The position of the tag on a carton and the orientation can mean the difference between reading at the mandate distance of 10' or not. For example, if we just slap a tag on a case of water anywhere in body of the case, it won't read past 6 feet, if we are lucky. However, if we change the position so that the tags' antennas are horizontal with each lobe in the air voids, between the bottle necks, it will read at over 12 feet.

I am sure you have heard the horror stories, but there is good news.

- First, be mindful that tag engineering is improving rapidly.
- There are concerted efforts to optimize tags for difficult products such as liquid and metal.



- Think of the items we are tagging, many will be in cartons, crates and shrink wrapped. This packaging can buffer the tag, which has to be on the outside of the carton or pallet from the contents of the package. So chances are you can tag these items without interference to meet the mandate.
- Lastly, you can easily and cost effectively train your operations people to place tags with optimum performance. The RFID Benchmark LAB, near O'Hare, teaches a one day class on how to optimize and document placing RFID tags on products. Training schedules can be seen at www.RFIDLabeling.com.



Displayed when SKU is selected!

As a best practice suggestion, when purchasing software, make sure it has a graphical feature with annotation functionality to take the guess work out of placement...a picture is worth a thousand words.

At the very least, we recommend that you include an RFID reader with your software and make sure that the software logs the time and date of when you read the tag. This becomes the beginning of your Quality Assurance program.

In fact, our field experience tells us that many of the DoD QAR's, or Quality Inspectors are requesting that you have a reader to verify that the tags are good, after handling, on your products and before you ship them.

#	SKU	Status	Signal	Read Time	EPC
1	123456	Associated	31	2/20/2006 1:07:51 PM	49350190489860
2	123456	FailedSigStr	3	2/20/2006 1:07:55 PM	49350190489870
3	123456	Associated	49	2/20/2006 1:07:75 PM	49350190489880

Both CP Express and Compliance Partner software log the time and date of each read...Compliance Partner offers an additional signal strength test and rejects weak or failed RFID Tags!

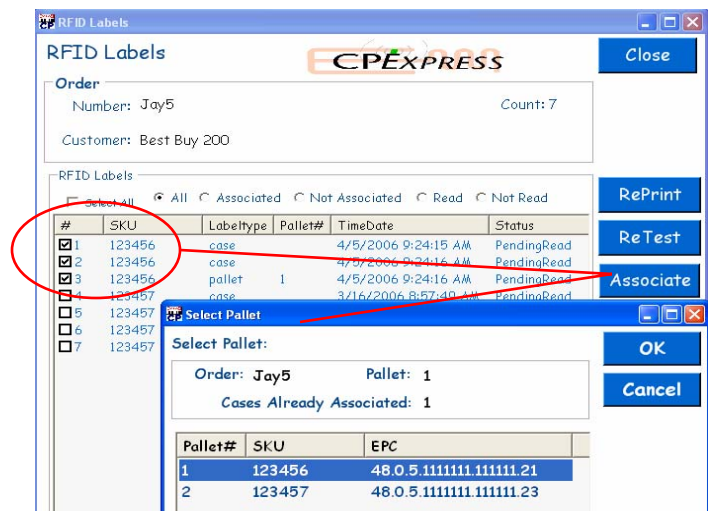
This is not a mandate requirement but it appears to be a best practice issue, similar to the barcode verifier days.

- 3) **Associate cases to pallet tags:** As mentioned earlier, this is an important aspect of meeting the DoD mandate. Remember that the DoD numbering format does not tell us what the product is. Therefore, you have to track cases by pallets using the unique IDs of the RFID labels. This process is referred to as Association. Then step 4, the ASN, provides this association structure and identifies the goods! So this step must be accurate or the ASN's integrity is compromised.

Frankly, association of cases to pallet labels is critical in any RFID application. The promise of the technology is superior identification, tracking and management. Therefore, being able to get as granular as what cases are on a particular pallet provides the ability to properly track inventory.

Automating Association

Association can and is done manually in small operations. It is not uncommon for some companies to ship 50 cartons a year. So they simply order 50 case and 2 pallets labels from our internet printing service. But, in larger contractors with higher volume shipments, a manual method is not feasible as errors and



Screen #1



time become critical operational deterrents. Realistically, the solution is automation and software.

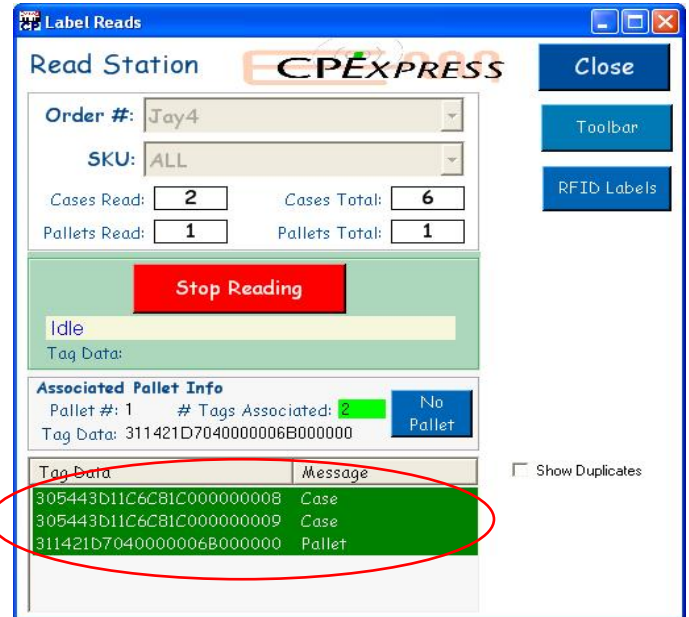
A couple of proven methods are: For smaller operations, to install software like CP Express which addresses this easily. Please reference screen # 1 to the right. Here the user selects the individual case tags then presses Associate and identifies the pallet tag to complete the association. The software captures this relationship which can be printed or exported.

If you take our suggestion and add an RFID Reader for QA purposes it also helps tremendously by automating case to pallet association. For instance, reference screen # 2 which shows CP Express with an RFID Reader attached. The reader reads the unique HEX value of the pallet tag then captures the IDs of every case tag that passes by and associates them to the pallet tag. Also note that the software logs the time and date of the read for QA purposes. At www.RFIDLabeling.com you can request an internet demo of either CP Express or the fully automatic Compliance Partner vRFID labeling software.

There are additional methods of automating the association function. These include such methods as assigning a reader at a divert gate on a production line to automatically capturing tags as pallets are shrink wrapped. In fact, this is shown in the picture titled Automatic Shrink Wrapper Associate. Here you can see an RFID reader mounted to the shrink material holder on the right. As the pallet spins the RFID reader captures all the RFID tags and associates them. When the pallet load is complete, the pallet tag is automatically printed and then tested or commissioned on the pallet to assure it will read at 10'.

Miles offers process and solution engineering services to identify how you should implement the technology i.e. repack operation or in your manufacturing line. Please contact us with any questions you might have.

You now understand the association process and its importance to the entire system of compliance labeling.



Screen # 2



Automatic Shrink Wrapper Associate!

- 4) **Complete the Advance Shipment Notice (ASN) requirements via the WAWF:** This step completes the RFID labeling cycle by providing the DoD with an electronic notice or Advance Shipment Notice



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(ASN). The ASN provides the DoD with order and shipping information, plus the description of goods and the association of cases to pallets by RFID HEX values.

When the DoD reads the pallet tag, the contents are instantly recognized with other logistic information the DoD system links to your order. Essentially, the goods are now identified as tomato juice or field equipment and where its going.

How is this done? This data is reported to the DoD via the WAWF (Wide Area WorkFlow) and can be done manually. The typical role of an RFID compliance labeling system is to export the tag and association data to a customers' established EDI / ASN reporting system. Exporting of data is supplied by both our CP Express and Compliance Partner. Custom reporting and full ASN functionality or integration is available upon request.

CP Express has a very handy report titled the DoD RFID Manifest. It helps to automate WAWF transactions significantly by printing out the association structure, pallet first then cases with bar codes of each RFID tag. Add a simple scanner on your PC, log-in to the WAWF and scan in the RFID numbers as required...makes reporting a snap and error free. A UID relationship option is also available.

Order #	DoD RFID Manifest			6/20/2006
SKU	Serial #	Label Index	Pallet	RFID Tag Data
BP1001	121	3	1	
Tag read on 6/20/2006 3:58:17 PM				
BP1001	283	1	1	
Tag read on 6/20/2006 3:58:17 PM				
BP1001	284	2	1	
Tag read on 6/20/2006 3:57:01 PM				

That completes the cycle for meeting the RFID DFARS contract clause! At American Barcode, RFID Labeling is our business. As with many inventory control technologies, we embrace RFID and the promise it brings to help streamline the supply chain.

To find out more, call American Barcode and RFID at 800-274-0324 and request an internet demo. To see things in action, consider a visit to the RFID Benchmark LAB conveniently located near O'Hare Airport. The RFID Benchmark LAB is a premier RFID demonstration and training facility uniquely nested in a real world factory, visit www.RFIDLabeling.com for more information and schedules.



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