

The US Department of Defense Passive RFID Mandate

An RFID Tutorial by AST-RFID

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Introduction

This guide is intended to provide basic DoD RFID information and is not intended to be a final legal authority on the DoD Radio Frequency Identification (RFID) mandate. Please refer to the website www.dodrfid.org for the latest DoD RFID information.

Passive RFID requirements are contained in MIL-STD-129P change 3.

See [mil-std-129p-chg3-29oct04.pdf](#)

If you have a question that you would like answered, please contact your Contracting Officer or your Quality Assurance Representative (QAR) for more details.

DoD RFID Final Rule

The Defense Acquisition Regulations Supplement Final Rule was effective November 14, 2005 and this rule requires suppliers to affix passive RFID tags to cases and pallets being shipped to the DoD. This plan included a phased implementation plan called the United State's Department of Defense Supplier's Passive RFID Guide, version 8.0, which can be viewed at: [dod-suppliers-passive-rfid-information-guide_v8.0.pdf](#)

This plan called for a phased implementation with a rollout of Jan. 1, 2005, Jan. 1, 2006 and the final date for implementation was January 1, 2007, when all classes shipping to all depots are asked to use passive RFID tags on all cases and pallets shipped to the Defense Depots.

RFID Benefits for the DoD

The benefits of using passive RFID technology are many. It allows hands-free data capture which promotes increased efficiency all through the supply chain. When everyone in the supply chain, customers and vendors and end users alike all implement RFID tracking, the process becomes an efficient means of providing visibility to all parties.

The Department of Defense is ultimately supporting the war-fighter in an efficient and timely manner. The depot shelves will be stocked in a timely manner and the officers on the ground in Iraq will know where their ammunition is at any given time and can calculate when it will arrive. This helps prevent duplicate orders and keeps the logistical agents fully informed. The defense department will experience improved labor productivity.

Overall, the defense and the contract suppliers will gain a more accurate picture of consumption and delivery. Duplicate orders will be minimized, and

the logisticians will be more responsive and able to deliver what is needed when it is needed.

The defense war-fighters will have more confidence in the supply chain and the officers will be able to make better informed decisions based on accurate data.

Using RFID throughout the supply chain will enable the defense to deliver the right materials in the right condition at the right time which is a critical part of warfare support.

RFID Benefits for the Supplier

Internally companies are able to utilize RFID to track raw materials, work orders, work in process, through conveyor systems, storage of inventory in the warehouse and at remote sites, and finally through the shipping and receiving process. Using RFID internally can help reduce shrinkage and improve your ability to track and locate fixed assets at any point in time.

This entire process helps you get paid faster and allows your own business to function more efficiently when RFID is implemented internally. You will be able to produce faster demand responses, and even experience increased efficiency during recalls.

Implementation of RFID Tagging

The defense issued a phased rollout according to three criteria: procurement methods, classes and commodities, and finally according to location.

2005 Rollout

Classes:

- *Class I Subclass – Pkgd. Operational Rations*
- *Class II -- Clothing, Individual Equipment, Tools*
- *Class VI -- Personal Demand Items*
- *Class IX -- Weapon Systems Repair Parts & Components*

Depots:

- *Susquehanna, PA (DDSP)*
- *San Joaquin, CA (DDJC)*

2006 Rollout

Classes:

- *Class I Subclass -- Packaged operational rations*
- *Class II -- Clothing, individual equipment, tools*
- *Class III (P) – Packaged petroleum, lubricants, oils, preservatives, chemicals, additives*
- *Class IV – Construction & barrier equipment*
- *Class VI -- Personal demand items*
- *Class VIII – Medical materials (not pharmaceuticals)*
- *Class IX – Weapon systems repair parts & components*

Depots:

- Albany, GA
- Anniston, AL
- Barstow, CA
- Cherry Point, NC
- Columbus OH
- Corpus Christi, FL
- Hill AFB, Ogden UT
- Jacksonville FL
- Warner Robins, GA
- Tinker AFB, Oklahoma City, OK
- Norfolk VA
- Puget Sound, WA
- Red River, TX
- Richmond, VA
- N. Island, San Diego, CA
- Tobyhanna, PA

2007 Rollout

All New Contracts in 2007 should include an RFID Clause

- All Classes
- All Depots
- All Individual cases
- All cases on pallets
- All pallets
- All unit packs for UID items

Exceptions to the RFID Rule

According to <http://www.dla.mil/j-6/bsm/sirc/m122706.htm>, "The clause at DFARS 252.211-7006, (Posted 12/28/06) Radio Frequency Identification, applies to ALL DLA acquisitions, with limited exceptions. (PASSIVE RFID TAGS SHOULD NOT BE APPLIED TO SHIPMENTS OF PHARMACEUTICALS, BIOLOGICS, OR REAGENTS UNTIL FURTHER ANALYSIS CAN BE CONDUCTED BY DOD. Bulk commodities and shipments to destinations not listed in the clause do not require passive RFID tagging.)"

NOTE: "Packaging is a material contract requirement, and any exceptions taken must be clearly identified in quotes/offers. IN DIBBS, QUOTES/OFFERS MUST BE IDENTIFIED AS "BID WITH EXCEPTION" BY ANSWERING "NO" TO "MEETS PACKAGING AND RFID REQUIREMENTS?" ("Bids with Exception" may not be considered.) NOTE THAT COMPLIANCE WITH DFARS 252.211-7006 IS MANDATORY".

The Cost of Implementing RFID

The Passive RFID Guide states that the “cost of implementing RFID is allowable under contract”. This is subject to interpretation, but most departments tell us that you can include some funds in your quote to include the cost of implementing RFID technology. Certainly the RFID tags are directly related to the contract. The span of time you depreciate the equipment cost over is a decision you and your accountant will need to make.

The bottom line is that you still need to produce a competitive bid and the lowest bid will have the best chance of receiving the contract.

Three DoD Requirements for Using RFID Tags on Shipments

The RFID Guide indicates there are a few set requirements for using RFID tags.

- 1. The guide requires that the data on each tag be unique and no two tag numbers can ever be identical. If you are shipping pallets and cases, use different serial numbers for each transaction. We will talk about the tag data format later.*
- 2. The tag must be affixed to the appropriate location on each package.*
- 3. Each tag must be readable at the time of shipment.*

The Advanced Shipping Notice (ASN)

The Advanced Shipping Notice (ASN) transaction into the WAWF enables the sender to relate the RFID information to the contents of each shipment. In addition, in order to connect the RFID tag data with its' corresponding shipment the contractor must submit electronic advance shipment notices (ASNs) to DoD through the Wide Area Workflow (WAWF).

Wide Area Workflow (WAWF)

The ASN is available through the Wide Area Workflow (WAWF) and more information can be seen at: <https://wawf.eb.mil>.

Think of the RFID tag information as a FedEx tracking number. The FedEx number does not tell you what is inside each package, only the company and location it came from and the date it was shipped and the time and destination it was delivered to.

The WAWF is like the FedEx site where shipping information is entered. You enter the contract number, your Cage Code, the number of cases and pallets, and the ID of the RFID tag.

The RFID tag info contains a 24 character hexadecimal number that you need to enter into the WAWF in some manner. There are several options available to enter this information:

1. *The DoD Guide asks you to hand-type the 24 character hexadecimal code onto the website. While this is time consuming and error prone, this is one method of getting the data into the WAWF.*
2. *Another method is to “copy and paste” the hexadecimal number from an electronic document that contains the code.*
3. *A third method is to scan a barcode on the label (if it contains a human-readable barcode symbol that represents the hexadecimal code) with a tethered or handheld barcode reader.*

There are also two automatic methods of uploading the information into the WAWF that require special software. One is to use Electronic Data Interface (EDI) and the other is to use File Transfer Protocol or FTP. The EDI will require a monthly subscription fee, but the FTP should not incur an additional cost.

For more information, call the WAWF customer service helpdesk: phone 866-618-5988 or 801-605-7095.

DoD RFID Tag Identity Types

There are two types of tag formats available to DoD suppliers, the EPC standard and the DoD standard.

1. The Guide states that all DoD suppliers who are EPCGlobal subscribers should use their EPC number. See the EPC Tag Data Standards at <http://www.epcglobal.org>
2. The suppliers who do not have an EPC number should use the DoD Identity Type or their Commercial and Government Entity Code (Cage Code), a five digit government identifier

This option is for DoD contract suppliers who do not already have an EPC code and therefore they are not a member of the EPCGlobal Organization.

The Supplier will use their Commercial Government Entity (CAGE) Code. This is the 5 digit code assigned by the government which allows a company to transact business. Also the contract supplier is instructed to use 96-bit, Gen 2, RFID tags. The 96 bits refers to the space available on the tag to write data to, and the Gen 2 refers to the specific type of tag.

Proper RFID Tag Placement

The RFID tag may be incorporated with the shipping label or it may be an independent entity. This means you can use one or two tags (one RFID and one barcode tag), depending on how you intend to print and encode the RFID tags.

1. The tags should be placed where there is minimum risk of damage
2. Each shipping container should use only one RFID tag.

Fig. 1. DoD RFID Shipping Tag



Fig. 2. Military Shipping Label



Fig. 3. RFID Tag Placement on Case

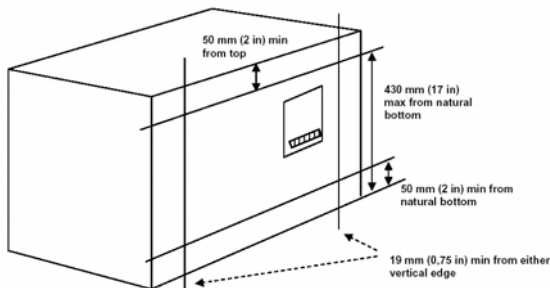
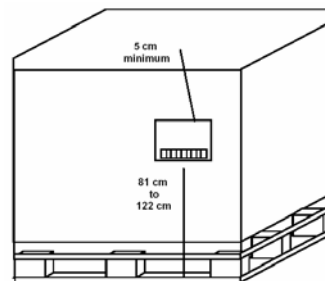


Fig. 4. RFID Tag Placement on Pallet



Three Options to Meet the DoD RFID Requirements

The DoD requires that a Military Shipping Label (MSL) be included with the RFID encoded label. There are several options available to the contract supplier to enable them to meet the DoD RFID requirement.

1. Pre-encoded RFID Tags

This option entails ordering pre-encoded RFID tags from a website. A supplier orders a certain quantity of tags, and specifies whether they want Case or Pallet Tags. They provide their CAGE number and specify the quantity. The serial number generally starts with one and

2. RFID Pinter and Label Software.

The reader can be fixed as in a portal, or a portable handheld may be used. This option entails purchasing an RFID printer to print and encode RFID Tags. The reader verifies that the tags are readable and collects information that is uploaded to the network about the tags.

3. Enterprise RFID System, Printer, Reader & Software

This is the most elaborate and most expensive system. It can range from \$20,000 to \$200, 000 and more. The RFID printer prints the tags, fixed readers in portals read the tags, and the data is interfaced with a company's ERP system.

Basically the size of your company and your budget as well as the size of your contracts will all dictate the size of the RFID system you might need. What we do know is that the contracts generally start small and increase in numbers very rapidly, so you will want to be prepared for growth no matter what RFID solution you choose initially.

- 1. Pre-encoded RFID Tags:** If you are shipping a few cases per week or month, the pre-encoded RFID tags will suit your needs. You will not have the initial outlay of cash to spend on RFID equipment and you can manage the cost of the tags and account for it in each contract.

If your contracts increase in size and you are purchasing a roll of labels every month or so, it may be more cost effective to purchase your own RFID printer and tags than to pay the high price of purchasing pre-encoded RFID tags.

- 2. RFID Printer and Label Software.** If you are shipping 100 cases or more every day, you will likely need an RFID printer to print the human-readable side of the label and the same printer will encode the RFID chip inside the label. Special RFID Label software with military formats will help guide you to set up the label format, and

the software will also help you enter information about each shipment.

Once the label is created, you will then need to enter the information into the WAWF website. There are several methods available to enter this information as discussed under the ASN heading.

3. Enterprise RFID System

This is a larger enterprise RFID system for larger suppliers which includes one or more RFID printers and fixed RFID readers with antennas. The readers are often set up in portals or doorways and the shipping containers are passed by the readers. Data is collected from the tags and is uploaded and managed by their ERP or Enterprise Software System. This system typically costs from \$20,000 to \$200,000 and may incur business analysis, site surveys, installation and setup and ongoing support and maintenance fees.

Some companies have redesigned their entire shipping area to accommodate an enterprise RFID system. They sometimes need to change their production or shipping process and then train their staff to use the RFID system. They will often incorporate RFID in a company-wide RFID initiative in order to help capture a return on their investment.

RFID Tags Should be Verified

No matter which system is used, the RFID tags should be verified at the point of shipment to make sure they are readable. The tags should not be placed directly on metal as on metal drums. They tags should not be placed directly on bottles or cans of liquid as these substances will affect the readability of the RFID tags. Often a stand-off of foam insert will work. In some special cases, a special tag tuned for use on metal can be used.

Consequences of Non-Conformance to RFID Mandate

DoD suppliers receive quality scores based on their performance supplying products to the DoD. These scores are called The Automated Best Value Score or ABVS.

See more information at: [about-abvs-revised.pdf](#)

Part of the ABVS is the Packaging score, which will be low if a company does not comply with the RFID mandate. A low ABVS could eventually result in a contract being awarded to a company who has a higher ABVS, even if their bid is higher

Payments will be delayed and the war fighter may not receive the supplies in a timely manner. Read on...

According to the DLA website:

<http://www.dla.mil/j-6/bsm/sirc/archive/m021506b.htm>

"Improperly marked shipments become frustrated freight at our Consolidation and Containerization Points at Tracy, California and New Cumberland, Pennsylvania, and cannot proceed through the Defense Transportation System. These frustrated shipments are costly and time-consuming to research. These delays can result in untimely payments to the contractor. The ultimate result is delayed shipment to the war fighter."

Web References

1. **Official DoD RFID Website**
www.dodrfid.org
2. **The United States Department of Defense Supplier's Passive RFID Information Guide, Version 8.0**
[dod-suppliers-passive-rfid-information-guide v8.0.pdf](#)
3. **EPCGlobal Website**
www.epcglobalinc.org
4. **Wide Area Workflow Website**
www.wawf.eb.mil
5. **Mil-Std 129P Change 3**
[mil-std-129p-chg3-29oct04.pdf](#)

Terms and Definitions

RFID – Radio Frequency Identification

EPC Technology – Passive RFID Technology that meets EPCGlobal Standards

CAGE Code – The five digit government identifier also called the "Commercial and Government Entity"

Unit Pack or UID – Unique identification placed on the first tie, wrap, or container supplied to a single item.

Case – Exterior container, sufficient to protect unit packs or items during shipping

Pallet – Quantity of cases arranged on a single pallet so entire load is handled as a single unit

DoD - Department of Defense: composed of all the military departments

DFARS – Defense Acquisition Regulation Supplement

DLA - Defense Logistic Agency

UID – Unique Identification, generally any asset that is worth over \$5000 needs a UID tag composed of a 2 Dimensional barcode symbol which contains information about the item

WAWF – Wide Area Workflow, the defense website where shipping information is entered. See www.wawf.eb.mil

ASN – Advanced Shipping Notice

POC – Point of Contact

MIRR – Material Inspection Receiving Report

JITC – Joint Interoperability Test Command

MIL-STD-129 – Approved standard issued by Department of Defense for military packaging marking for shipping and storage of items purchased by DoD

MIL-STD-130 – Approved standard issued by the Department of Defense for military marking of shipping containers and assets

AIT – Automatic Identification Technology, the technology that defines barcode and RFID data collection systems

RFID – Radio Frequency Identification, the technology that utilizes a tiny computer chip with an antenna that transmits radio waves when interrogated with an RFID reader

EPC – Electronic Product Code

EPCGlobal – A division of the UCC and is the organization entrusted by industry to establish and support the EPCGlobal Network™ as the global standard for real-time, automatic identification of information in the supply chain of any company, anywhere in the world

UHF – Ultra High Frequency

EDI – Electronic Data Interface which is one method of automatically uploading information to the WAWF

FTP – File Transfer Protocol, another method of automatically uploading information to the WAWF

SFTP – Secure File Transfer Protocol

Serial Number – A number that uniquely identifies a particular item, case, or pallet

Binary – Binary number system (aka base 2) represents values using two symbols, typically 0 and 1. Computers call these bits. A bit is either off (0) or on (1).

64 bit, 96 bit tag – The size of the data storage in each RFID tag

Portal – A doorway or a small frame, tunnel or opening where RFID readers and antennas are placed. Inventory or other items with RFID tags pass through the portal to be 'read' and data is collected from each RFID tag.

Hexadecimal – A numbering system that uses 16 characters per digit instead of the standard 10 characters per digit. The letters A through E are used to extend the range of each digit. This is the code from each RFID tag that the DoD requires to be entered into the WAWF.

Conclusion

For additional information or for a live presentation for a group, call at 1-800-705-9721 ext. 137 or email at info@enterprisecompanion.com