

Department of Defense Compliance With Military Labeling Standards



MIL-STD-129

Container and Shipment Labeling

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Introduction

MIL-STD-129 standard ensures uniformity in marking military equipment and supplies that are transported through ships. This standard has been approved to be used by the United States Department of Defense and all other government agencies.

Items must be marked for easy identification before they are transported. The marking helps the military personnel to fill the necessary requisition, when a particular stock goes short of the balance level.

RFID is fast emerging as the technology of choice for reliable tracking of products across a wide spectrum of industries, The US Government's Department of Defense has adopted this standardized label and tagging system to track containers and shipment pallets and their contents employing RFID for some shipments going to specific destinations.

If you or your customers ship to the DoD, you will need to comply with Military Labeling Standards. The most common are MIL-STD-130 unit marking including Unique Identification (UID) and MIL-STD-129 container and shipment labeling which may include RFID.

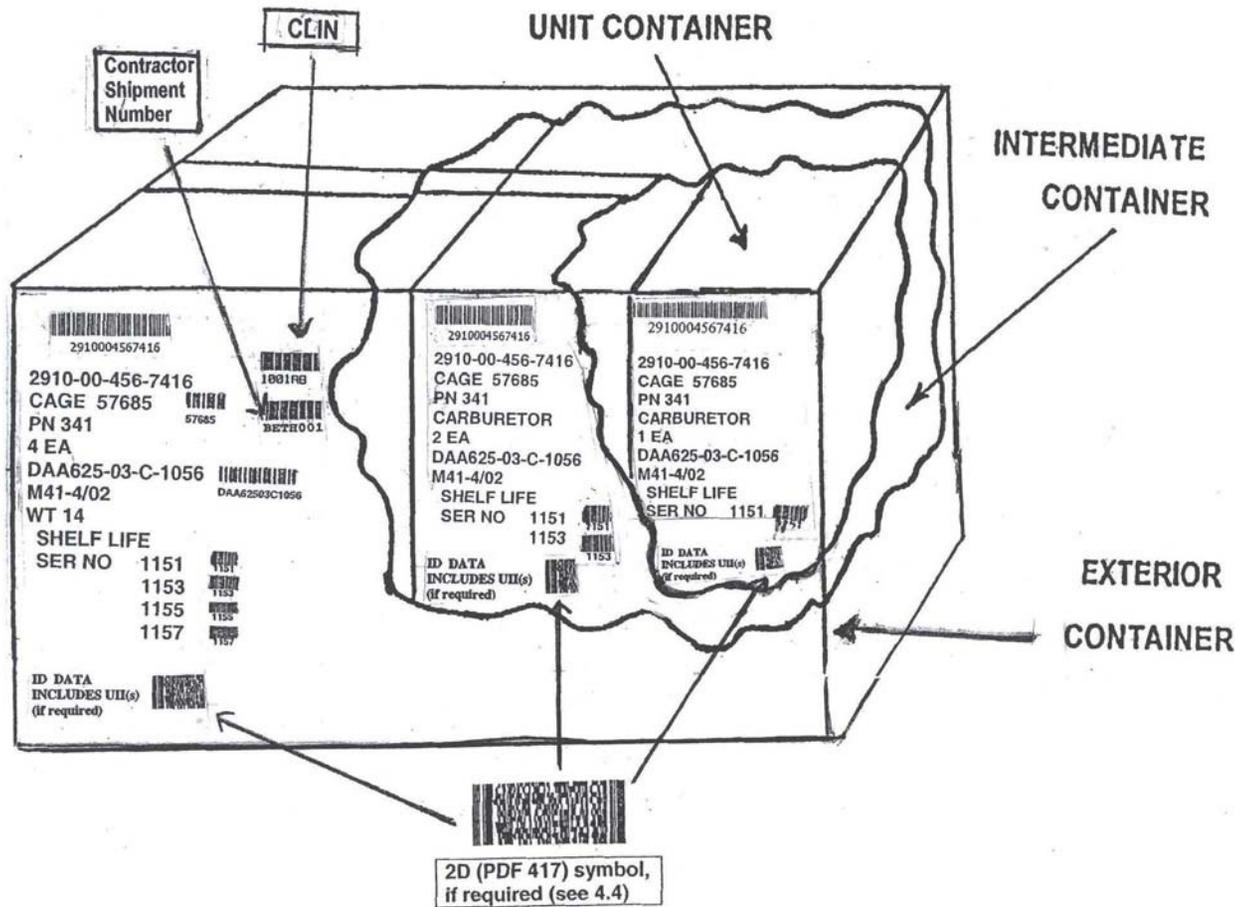
Submit the associated data to the DoD via iRAPT (Invoicing, Receipt, Acceptance, and Property Transfer (formerly Wide Area Workflow WAWF)).



Basically, there are two things you need to do to comply with MIL-STD-129 - Produce your labels and manage the workflow or communicate the related shipment data back to the DoD.

This document focuses on compliance with MIL-STD-129 and RFID requirements.

MIL-STD-129 Military Labeling Standard



[Levels of Labeling Requirements under MIL-STD-129 Container and Shipment](#)

[Examples of unit pack, intermediate and exterior container identification markings \(including an example of bar code markings\) are shown here.](#)

MIL-STD-129 was put in place to enable the DoD to track shipping containers carrying military items using a standardized label format, list of data items and a requirement to transmit the relevant data back to the DoD upon shipment. The DoD can track those shipments for better field management and you get paid faster.

The current standard as of this document's publication date is MIL-STD-129P (4). It was generated after changes were made to the old MIL-STD-129P (3) on 19 September 2007.

The main changes that will effect DoD labeling are exterior marking and MSL, labeling serialized and UID Product, formatting the PDF417 barcode.

MIL-STD-129P may be the beginning of a convergence of MIL-STD-129 (labeling of packaging) and MIL-STD-130 (labeling of items). MIL-STD-129P4 requires IUII information from MIL-STD-130 UID items to be included on exterior and intermediate containers.

Levels of Labeling DoD Shipment Containers

Under MIL-STD-129, shipping containers are categorized into 3 types -Unit Containers, Intermediate Containers and Exterior Containers.

Each has its own labeling requirements. For all type of containers, the basic format such as National Stock Number (NSN), item description and part number are mandatory.

For Exterior containers certain additional labels like Military Shipment Level (MSL), serial number barcode and Direct-Vendor Delivery level (DVD) are required.

Labeling Serialized and UID Product

Until now, serial numbers were required to be encoded into Linear Code39 barcodes on the Unit Container, Intermediate Container and Exterior Container Labels.

Under Change 4, this information now needs to be encoded into 2D PDF417 barcodes on these labels as well as the linear barcodes.

Here is an example of a label made for a UID item.



In this case, the DCMA official asked for the UID mark to be printed on the label as well because it could not be marked on this particular item.

Also, this contract required RFID labeling for the item, so the RFID data has also been printed in barcode form. The RFID data consists of 24 hexadecimal characters.

Formatting the PDF417 Barcode

The 2D PDF417 barcode is encoded in accordance with ISO 15438, which is also used to encode the Datamatrix code on the UID labeling. The data fields included in the PDF417 are:

- Contract Line Item Number (CLIN)
- Contractor Shipment Number
- Contract Number
- NSN
- Item Serial Number(s)
- Unique Item Identifier(s) (UII)
- Cage Code

The formatting is as shown in the table below.

| Table IV-D Unit Pack and Container ID 2D Symbol Format | | | | | | | |
|---|-------------------|---------------|---------------|----------------|-------------------------------------|-------------------------|----------------------------|
| Compliance Indicator | Element Separator | Format Header | Format (6 DI) | Format (7 DEI) | Data Field | Data Format Type/Length | Sample Data without DI/DEI |
| D | | | | | Message Header Compliance Indicator | | D |
| | RS | 06 | | | Data Identifier Format Header | | 06 |
| | GS | | 4K | | Contract Line Item Number (CLIN) | an6 | 0013AD |
| | GS | | 5K | | Contractor Shipment Number | an7 | FBFA001 |
| | GS | | 0K | | Contract Number | an.21 | N00023-90-D-0009 |
| | GS | | N | | NSN | an14..15 | M12001200100001 |
| | GS | | S | | Serial Number or Code | an.30 | 674A3645 |
| | GS | | S | | Serial Number or Code | an.30 | 674A3646 |
| | GS | | S | | Serial Number or Code | an.30 | 674A3647 |
| | GS | | 25S | | Unique Item Identifier (UII) | an..50 | UN077991289674A3645 |
| | GS | | 25S | | Unique Item Identifier (UII) | an..50 | UN077991289674A3646 |
| | GS | | 25S | | Unique Item Identifier (UII) | an..50 | UN077991289674A3647 |
| | GS | | 17V | | CAGE Code | an3 | 12345 |
| | RS EOT | | | | | | |

The Labels

Two Steps To Determining If You Need RFID Labels

The first thing you want to look for in your government contract is the DFARS clause, DFARS-252.211-7006 Radio Frequency Identification. If this clause is present, you may need to supply an RFID label or tag.

Second, look further down the contract for a more specific listing, such as shipments of a particular item class, or a list of distribution destinations that require the RFID component.

If your item matches a specific item called out in the contract, or is destined for a specific distribution location that requires RFID, then you will know your product or shipment requires that RFID label or tag in accordance with MIL-STD-129.

Exterior Marking and MSL

Two new items were added in Change 4 that affects all users printing MIL-STD-129 labels. The Contract Line Item (CLIN) and Contractor Shipment Number (SN) must be printed in barcode form on the exterior label. These new data items are either encoded into Code39 barcodes or included in the PDF417 barcode.

The two items are also required to be included in the PDF417 barcode on the MSL label.

The exterior label can be encoded with up to 5 serial numbers. If there are more than 5 serialized items included in the container, a separate listing of serial numbers (including barcodes) needs to be placed inside the package.

There are 3 exterior label possibilities:



MIL-STD-129 Exterior Label:
Normally you would use this along with the UPS or FedEx label. The label will look similar to that shown here to the left.



Military Shipping Label or MSL: This is the DoD label that has all the shipping and product information included. A typical MSL is shown here.



RFID Label: If you already have the shipping labels, you can add an RFID label—just like this example.

The RFID label is the simplest to make because it contains far less information than the others. That is if you have an RFID printer/encoder or you can use a label printing service to produce 100% compliant labels.

You may have to do some or all of these levels of labeling to comply with MIL-STD-129 and this may or may not include RFID.

How Do You Know Which Label Format You Need?

If it isn't clear from the contract (which is often the case) I'd suggest contacting your DCMA rep. They should be able to guide you in the right direction.

Once you have determined which type of label you will need, you have two choices for producing the labels required under MIL-STD-129.

You can choose to have your labels preprinted for you or printing and possibly encoding the labels on your own.

Integrated DoD Workflow

UID, RFID and iRAPT

In the simplest case a single product can be RFID labeled. A more complicated example could be a pallet that contains several containers each with their RFID label and several individual packaged products with their RFID labels.

Whether a single container is labeled or a nested layer of containers are labeled, the data from each labeled level is needed for iRAPT submission.

The RFID serialization and the RFID associations between the logistic units of the shipment must be reported together as a parent-child relationship.

The mandate requires that the individual IUIDs in a shipment are associated with the RFID label serial number of the logistic unit in which they are contained. The RFID label numbers or IUID serial numbers must be entered into the iRAPT manually or automatically using the iRAPT or specially designed software.

Contract to Compliance

For many companies, when your DoD contract arrives in the mail or by fax, the person(s) responsible for entering the data gets to work. They are familiar with the manual process of entering the pertinent information such as the shipping address, the receiving address, how many, what class, shipping methods, methods of preservation, and much more; too many to list here. This includes all the information per standard, per item, that you will need to ship via the iRAPT.

To save time, go back to your contract contact person and request your contract data be sent electronically in EDI 850 Data Format. For those who subcontract, this may mean going back to your customer.

Once your labels are done, there is still much to be done to be in compliance. The DoD requires information about the units, shipping containers and pallets to be sent so they can track goods in the supply chain and inventory.

Managing the DoD Workflow

As part of the compliance process, the data associated with each UID mark such as Cage Code, Serial Number, and identifiers must be reported back to the DoD. At this point, you may be looking at both MIL-STD-130 unit level and UID labeling data in conjunction with MIL-STD-129 and RFID shipment data.

Complex UID hierarchies may exist when using subassemblies. It may be that the embedded UIDs are sealed up within the parent product or the product is already shrink wrapped, but the

user needs to have explicit knowledge of the UID hierarchy without taking the product apart.

This parent/child relational data including UID data and RFID shipping labels can be very complex, time-consuming and prone to errors when handled manually.

UID Registry Data Submission

The UID registry is a software system created by the Department of Defense that acts as a repository for information on all items that meet UID criteria. The UID registry allows the DoD to gain increased visibility into their vast network of assets. In order to comply with the DoD mandate for UID, you must submit all UID information to the UID registry directly or via the iRAPT.

The iRPAT or Invoicing, Receipt, Acceptance, and Property Transfer, is an essential communication tool for every business that supplies inventory to the DoD. Submission to iRAPT replaces the manual DD250 document. It helps expedite payments and is now required by the DoD.

The iRAPT system can now accept UID data along with receiving reports and combo (2-N-1) documents. iRAPT will then forward on all UID data to the UID registry.

Suppliers can submit their shipments to the iRAPT through the iRAPT web site or direct electronic submission. The choice is yours. You should look at all the costs to decide - including your time and error rates.

MIL-STD-129 Compliance Solutions

Preprinted Label Service

MIL-STD-129 requires an MSL shipping label on every carton and pallet that ships to the DoD. If you have low volume labeling requirements, or a limited number of cartons and pallets shipping to the DoD destinations that require RFID encoded information, preprinted and/or pre-encoded labels are an economical choice.

100% Compliant Labels

As labels are printed and encoded, each label is verified to ensure each barcode and encoded chip contains exactly the information it is required to contain. MIL-STD-129 Label Printing Service provides a verification report for each label. This report serves as the Certificate of Compliance and will meet requests for compliance verification from your DCMA.

Traveler Form Labels

If your company already has a labeling system to handle shipping requirements, and your contract calls out DFARS 252.211-7006 and destination for RFID, a preprinted, pre-encoded, sequential Traveler Form Label can be applied in addition to your existing shipping label for compliance.

Traveler Form Labels are a two-part, preprinted, pre-encoded, sequentially numbered 2"x 4" RFID label. The bottom portion of the label is encoded with the necessary information and is affixed to the carton or case alone or next to your current shipping label. The top is perforated, bar coded with the same information and attached to the Traveler Form. When ready to send the information via the iRAPT, this portion is scanned into the data transmission field, sending accurate shipment identifiers without having to be at the shipment container.

Place the bottom part of the label next to your current shipping label and affix the top to your Traveler Form. Scan this part when transmitting information to the iRAPT for accuracy and efficiency.



Metal Mount RFID Labels

If you are applying RFID tags to metal or packaging/pallets that contain metal objects or parts, your preprinted labels can be applied to a spacer of specially engineered foam to hold the tag far enough away from the metal surface for the RFID tag to function.

RFID Metal mount Labels are available in a number of forms. Printed, encoded and mounted (ready to use) as you see in the photo. Printed and encoded labels along with a roll of the die cut foam spacers (this is a little less expensive) and can also be provided just the rolls of foam if you print and encode the labels yourself.



Print Your Own Labels

For larger volume, or frequent requests for military shipping labels, printing your MIL-STD-129 and RFID labels can save you time and provide control over your labeling production.

Complete printing systems include high-resolution thermal transfer printers, RFID label design software with preset templates, scanners and readers to help avoid unnecessary delays at a DCMA inspection.

Optional installation and training can help you to maximize your staff productivity and ensure 100% compliance with DoD MIL-STD-129.

Available compliance Kits and components include:

- Barcode/RFID Thermal Transfer Printers
- Handheld or Fixed Readers
- Label Design Software and Templates
- Blank or Preprinted labels and RFID labels with matching ribbons
- Mobile Workstations to bring your DoD labeling to the source of production
- On-site service for repairs and maintenance



[Handheld and fixed RFID Readers for accurate reading of encoded data.](#)

The Complete Solution with ID Technology

ID Technology has unique qualifications to help you meet the requirements of DoD Military Labeling under MIL-STD-129 including RFID and MIL-STD-130 including UID.

What makes ID Technology different?

- ID Technology is a label manufacturer that understands all the aspects of the label to meet and exceed longevity, performance and formatting requirements.
- ID Technology has been designing bar code and labeling systems for over 25 years in many different industries. We understand the challenges of the most demanding client applications.
- ID Technology partners with industry manufacturers and suppliers to enable us to deliver quality products and service to fit our customer's needs.
- ID Technology provides the services and support to simplify the DoD compliance labeling process. With ID Technology, you will know you are in compliance and will know what you need to avoid costly delays in shipments.



Radio-frequency identification (RFID) is the use of an object (typically referred to as an RFID tag) applied to or incorporated into a product, animal, or person for the purpose of identification and tracking using radio waves. Some tags can be read from several meters away and beyond the line of sight of the reader.

Most RFID tags contain at least two parts. One is an integrated circuit for storing and processing information, modulating and demodulating a radio-frequency (RF) signal, and other specialized functions. The second is an antenna for receiving and transmitting the signal.

There are generally two types of RFID tags: active RFID tags, which contain a battery and thus can transmit its signal autonomously, and passive RFID tags, which have no battery and require an external source to initiate signal transmission.

Today, RFID is used in enterprise supply chain management to improve the efficiency of inventory tracking and management.

Frequently Asked Questions

When is RFID required?

RFID is required when the relevant DFARS clauses are included in your contract with the Department of Defense. Though you are not required to become RFID compliant before you execute on the new contract, it is usually a good idea to implement and pilot an RFID solution well beforehand because substantial planning can be required.

The RFID mandate from the Department of the Defense is not as simple as slapping an additional label on the outside of a box. The required steps may change business processes across many organizational boundaries and a final RFID solution will usually require input from decision makers in various departments such as IT, Manufacturing, Quality Assurance, Shipping, Contracts, and Finance.

What information is in an RFID label?

The data in an RFID label destined for the Department of Defense is usually very minimal, it won't contain much more than your DoD cage code and a serial number. No other significant information is programmed into the label.

How does the DoD use RFID to know what is in your boxes?

The answer is that you communicate information about what is in each logistic unit by sending receiving reports to the DoD via the Wide Area Workflow e-Business Suite, a software system developed by the Department

of Defense that receives invoice and shipping data from DoD suppliers in electronic form.

As you label your RFID shipping units, you must keep track of which contract line items (and optionally which UID or Unique Identification instances) are in each of the boxes and pallets you are labeling. When you ship your goods to the DoD you must also submit a receiving report containing all of this RFID information. When the Department of Defense RFID system interrogates your boxes with its RFID readers it will look up each RFID label it finds in the Wide Area Workflow database and only then can it discover what contract line items and UID instances are in each shipping container.

How are UID and RFID related?

If you are shipping UID items to the DoD you must specify which UID instances are in each RFID logistic unit. This is troublesome because many DoD suppliers may have systems that allow them visibility into what serialized items are in a shipment, but they do not have systems that track serialized items down to the case or pallet level.

What kind of equipment do I need for RFID?

All RFID technology used in the Department of Defense MIL-STD-129 mandate be compliant with EPC Global Class 1 Generation 2 classification. By purchasing EPC compliant labels, printers, and readers you can be assured that regardless of manufacturer, your equipment will be compliant with DoD RFID policy.

At a minimum you will need an RFID enabled printer to program your RFID shipping labels. Additionally, you will likely want to use an externally mounted RFID reader to verify that your RFID labels are still working after they have been applied to cases and pallets.

However if you are not ready to make the investment in hardware, consider using a preprint/pre-encoding label service. Make sure you receive a Certificate of Compliance for each lot for back up should your DCMA request it.

Critical Factors of RFID Label Performance

There are many environmental, product, and packaging factors known to interfere or alter the performance of RFID.

Product makeup may affect readability (liquids absorb radio signals, metals scatter them), as will mixed pallet scenarios and label placement.

Package contents and packaging design may affect label readability, particularly if metals, liquids, high carbon or salt content is involved. You will want to place the RFID label as far away from any of these elements as possible and be sure to test for readability.

Before applying your RFID label and shipping to the DoD, it is critically important to conduct read tests. Identifying sources of interference in your RFID labeling environment is best done as early in the labeling process as possible.

You must also understand how the environmental attributes of your products will affect RFID readability. Corrugated cardboard that is exposed to humidity will hold moisture and that can be enough to interfere with your label read.

If you are applying RFID labels to metal or packaging/pallets that contain metal objects or parts, you will need to use a spacer of specially engineered foam behind the label to hold it far enough away from the metal surface for the RFID label to function.

RFID Metal mount Labels are available in a number of forms. Printed, encoded and mounted (ready to use) as you see in the photo. Printed and encoded labels along with a roll of the die cut foam spacers (this is a little less expensive) and can also be provided just the rolls of foam if you are printing and encoding the labels yourself.

If you need a more durable solution, there are also special encapsulated tags available for use on metal objects. These are normally used for returnable objects (where they can easily be reprogrammed for the next shipment) as well as for use in RFID asset tracking applications.



What are the DoD Mandates?

The three main DoD mandates that currently affect suppliers to the DoD are commonly referred to as the UID, RFID, and iRAPT mandates.

The UID mandate requires that products have a globally unique serial number embedded in a 2D Datamatrix barcode, and that this barcode is either directly marked on the part or affixed to the part via a label. In addition, this information is to be stored in a DoD database called the UID Registry.

The RFID mandate requires that logistic shipping units (pallets, cases, boxes, etc) containing products that are sent to the DoD shall be globally uniquely serialized, and this serial number is stored in an RFID (Radio Frequency Identification) label affixed to the logistic unit.

The iRAPT mandate requires electronic submission of invoices, advance shipping notices, UID, and RFID data, and is intended to replace the paper DD250 system.

The DoD mandates are intimately linked. For example, RFID labels on a case must "point" or be "associated with" the UID items contained in the case.

Getting the Government Contract

Help is available by contacting the Procurement Technical Assistance Program (PTAP) in your area.

The New Hampshire Procurement Technical Assistance Program (NH-PTAP) is sponsored and brought to you by the State of New Hampshire Business Resource Center and the Defense Logistics Agency. This national program provides specialized and professional assistance to individuals and businesses seeking to learn about contracting and subcontracting opportunities with Department of Defense (DoD), other federal agencies, or state and local governments.

If you are interested in learning more about this program, please visit the [Procurement Technical Assistance Centers website](#).

What is the difference between RFID and IUID?

Within IUID, UII is a piece of data associated with an item that uniquely identifies it throughout its life. RFID is a vehicle for holding and sharing data.

IUID of tangible items deals with physical marking as prescribed in the policy and are applied directly on items or on labels

themselves. IUID also requires data to be captured about the item and submitted electronically to a registry database. Think of this as creating a birth certificate for the item.

RFID is either a passive (unpowered) or active (powered) transmitter/receiver that stores information on the case or pallet in which UII'd and non-UII'd items are placed. The RFID label may store the unique item numbers for the items in the case or pallet or simply a different unique packaging number that when accessed in a transportation or logistics database provides an inventory of the items in the case or pallet. Eventually we will see RFID labels on the item packaging.

Can I still use the same shipping labels I've been using to ship to the DoD?

If your company already has a shipping label system that works, there is no need to reinvent another. If you are required to comply with MIL-STD-129, you will need to affix another label that meets the requirements of MIL-STD-129 and RFID along with your original shipping label.

Traveler Form Labels are especially helpful in these scenarios as labeling your shipment typically takes place in another area from transmitting the related data via iRAPT.

Get In Compliance And Stay Current

MIL-STD-129 and MIL-STD-130 outlines specific requirements such as label type, format, data to be encoded and how. This may include identification at the unit level, the box or case level, shipping container, RFID, UID or all of these.

ID Technology can help you implement your compliance plan, meet immediate labeling needs, and manage the associated data. You'll know you are in compliance before your DCMA representative arrives for inspection with a little planning and expert advise.

Choose the option that best meets your business needs:

Preprinted, pre-encoded, labels let you ease into compliance with MIL-STD-129 and RFID requirements.

Complete label printing and encoding systems for printing your own container and pallet labels lets you gain tighter controls over your labeling and shipping process.

Once you are in compliance, we will help you "stay" in compliance.



Other Helpful Resources

Labeling News - Stay current with changes in Standards, access to new products and reviews, technical tips, and related industry stories at our Online Magazine:

<http://www.labelingnews.com>

DPAP: Defense Procurement and Acquisition Policy:

<http://www.acq.osd.mil/dpap/>

MIL-STD-129R: Military Marking for Shipment and Storage:

http://www.dla.mil/Portals/104/Documents/LandAndMaritime/V/VS/Packaging/LM_MILSTD129R_151007.pdf

Guide to DoD Contracting Opportunities:

http://www.acq.osd.mil/dpap/cpic/cp/docs/guide_to_dod_contracting_opportunities_us_20070425.pdf

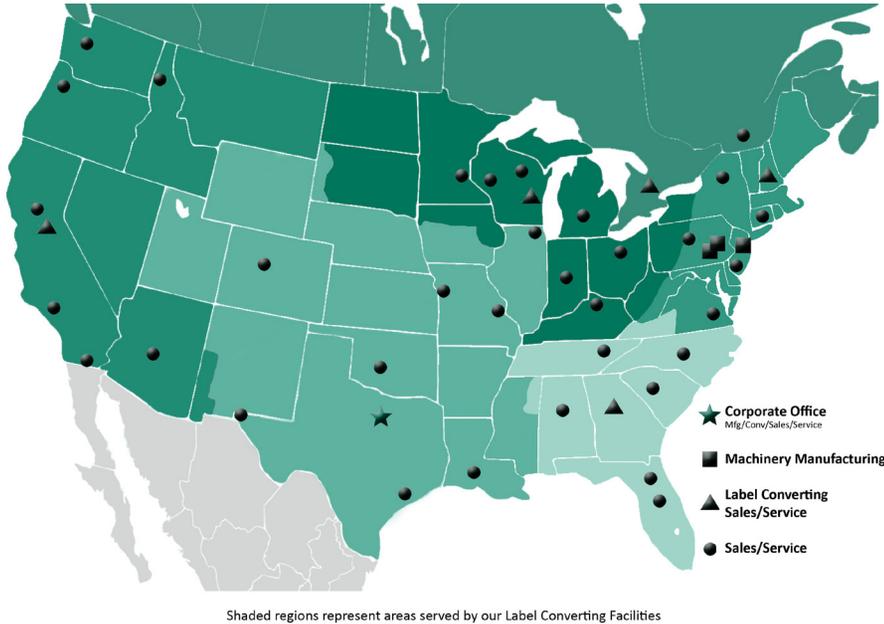
Documents Designed To Assist In UID implementation:

<http://www.acq.osd.mil/dpap/pdi/uid/guides.html>

Attaining Government Contracts through PTAP:

<http://www.dla.mil/HQ/SmallBusiness/PTAP.aspx>

If you have to comply with MIL-STD-130 with Unique Identification, please contact ID Technology to help you simplify your labeling and label compliance.



Nationwide Service & Support

We pride ourselves in providing responsive nationwide customer service and support from any of our 17 regional sales, service and stocking facilities.

ID Technology technicians are PMMI Certified Trainers to ensure the highest standards of quality training are being met and unparalleled value is being given to the customer.



Our field service personnel are factory trained to service and support our full range of labeling, coding and marking equipment.

In addition to the field service team, ID Technology employs factory trained bench service technicians to accommodate timely depot service.

ID Technology boasts six label converting plants across the US and Canada that produce top quality labels and tags with local support.



*Complimentary Limited
Lifetime Equipment Warranty*

For customers using ID Technology labels with our labeling systems, we provide a lifetime limited equipment warranty free of charge. Just ask us for details!



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