Compliance With Military Labeling Standards

ID TECHNOLOGY
Labeling Coding and Marking Specialists

Department of Defense

MIL-STD-130 & Unique Identification

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It is well known that the US Government had to focus on better inventory management as one way to protect our armed forces and save billions of dollars in military supplies, weapons, and mission-critical equipment costs,

As of 2004, government contracts began including mandate for unit level marking and labeling to be used to track parts throughout the supply chain for efficient inventory control, quality control, and maintenance scheduling. This Standard is known as MIL-STD-130 and may include Unique Identification (UID) labeling and marking.

MIL-STD-130 is evolving and will continue to change. Deadlines have been placed on suppliers to comply. These changes are expected to occur at an increased rate over the coming years and the US Government is committed to enforcing the deadlines with strict penalties for noncompliance.

WHY UID?

The DoD's UID policy was designed to help the defense community save taxpayer dollars through increased productivity and efficiency:

- Provide improved item visibility for the warfighter for operational planning
- Lower the total life-cycle costs of items acquired and managed
- Provide item visibility regardless of the weapon system or who owned the item
- Supply item data needed for top-level logistics and engineering analysis
- Facilitate issuance of a clean audit opinion as required by the 1990 Chief Financial Officers' Act by providing an accurate data source for determining value and accountability of property and equipment
- Improve access to historical item data across the life cycle from system design to disposal

When you or your customers have to comply with the Department of Defense Military Labeling Standards, specifically MIL-STD-130, your labels must be 100% compliant and you must manage the related data as it is transmitted back to the DoD via WAWF or UID Registry. When the original contract includes DFARS 252.211-7003 which calls for UID (Unique Identification), your labels must also comply with the UID component of the mandate.

With some strategic planning, you can implement a successful workflow plan to make compliance as painless as possible.

You cannot ship your product until the labeling or marking is done in accordance with MIL-STD-130 and may have to pass at your DCMA inspection. Penalties, delays or loss of contracts can be the result of non-compliance.

This document is designed to help you understand the labeling requirements of MIL-STD-130, including Unique Identification. With some strategic planning, you can implement a successful workflow plan to make compliance as painless as possible.

A General Accounting Office (GAO) study estimated the DoD could have saved $2 billion in Desert Storm inventory, from a $2.7 billion total inventory through better information about available inventory.

Automatic I.D. News, Sep 99, Vol. 15 Issue 10, pg 36. (The GAO report was issued in September 1992.)

Which Items Require UID?

MIL-STD-130 requires suppliers of goods supplied to the DoD to identify these items (which may include a Unique Identification Number (UID)) used for tracking & efficiency purposes.

DFARS (Defense Federal Acquisition Regulation Supplements) include the details for exactly what is included under MIL-STD-130. If your contract has a clause that refers to DFARS 252.211-7003: Item Identification and Valuation, then you need to comply to the UID part of MIL-STD-130N.

DFARS 211.274-2 Policy for Unique Item Identification.

(a) It is DoD policy that DoD unique item identification, or a DoD recognized unique identification equivalent, is required for—

(1) All delivered items for which the Government's unit acquisition cost is $5,000 or more;

(2) Items for which the Government's unit acquisition cost is less than $5,000, when identified by the requiring activity as serially managed, mission essential, or controlled inventory;

(3) Items for which the Government's unit acquisition cost is less than $5,000, when the requiring activity determines that permanent identification is required; and

(4) Regardless of value—

(i) Any DoD serially managed subassembly, component, or part embedded within a delivered item; &

(ii) The parent item (as defined in 252.211-7003(a)) that contains the embedded subassembly, component, or part.

US Department of Defense (DoD)
UID Mandate Coverage

Effective for all DoD contracts after January 2004:

- Every supplier of parts to DoD is required to comply.

Every DoD Contractor with GFP/PIPC:

- Each DoD Agency.
- Over 400M legacy parts still need to be marked.

On April 28, 2006 the NATO Asset Tracking Interservice Working Group (ASTWG) approved the ratification draft of STANAG 2290 "Unique Identification (UID) of Items".

Wikipedia defines UID as…

Item Unique Identification is a system of establishing globally ubiquitous unique identifiers within the United States Department of Defense, which serves to distinguish a discrete entity or relationship from other like and unlike entities or relationships. Tangible items are marked with a unique identifier in the form of a character string, number or sequence of bits assigned to a discrete entity or its associated attribute which serves to uniquely distinguish it from other like and unlike entities. Each unique identifier has only one occurrence within its defined scope of use.

IUID is physically marked on tangible assets using a 2D data matrix in the format of ISO 15434.

What is a UID?

UID is a "unique" part identifier that can be used to link products to their histories.

A UID is formed by combining the manufacturer's identification, part identification numbers with formatting and data transmission characters.

DoD regulations require that a 2D Data Matrix Symbol be permanently marked on the part using a label or direct parts marking.

Manufacturer Identifier (CAGE Code) = 0ZPZ3
Part Number = X308FF97
Serial Number = 12345
Example of UID Mark Using Data Matrix Code

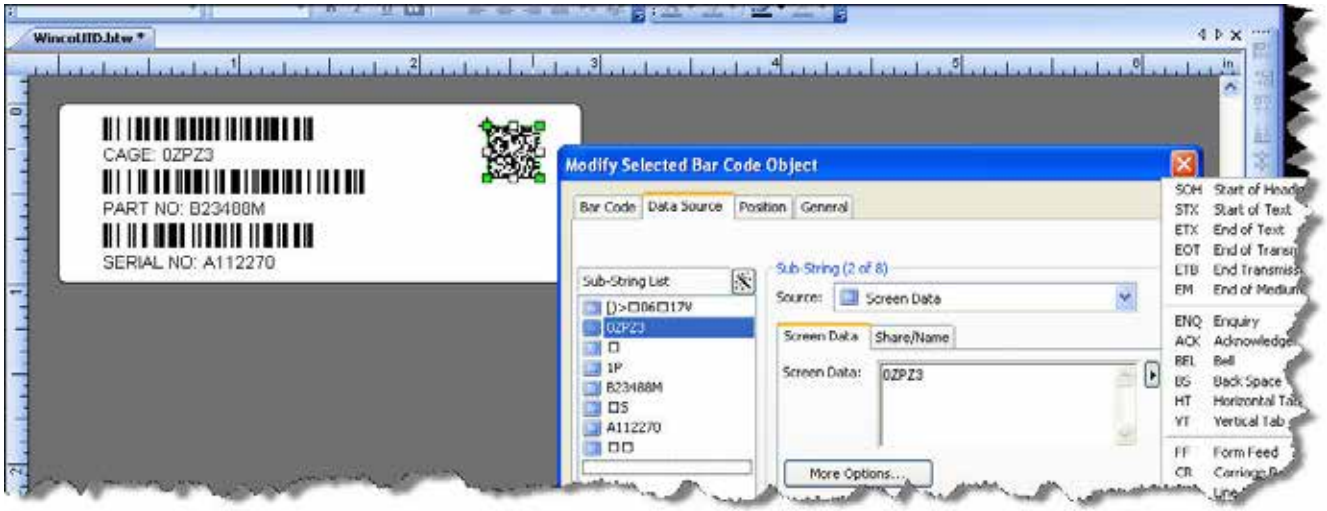
UID with formatting and transmission characters (ISO 15434)

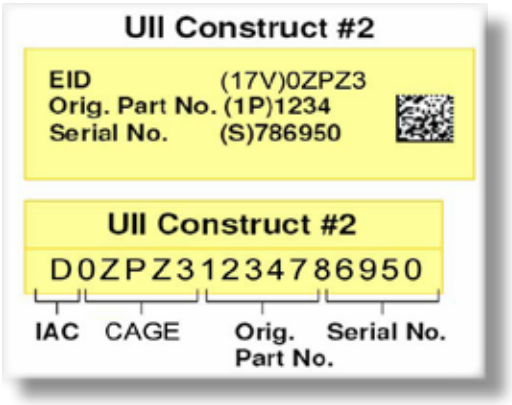
$[)>{}^{R}_{S}06{}^{G}_{S}17V0ZPZ3{}^{G}_{S}1PX309FF97{}^{G}_{S}S12345{}^{R}_{S}{}^{E}O_{T}$

UII, UID, IUID

The formatted data is called a Unique Item Identifier (UII). The UII is a globally unique and unambiguous identifier that distinguishes an item from all other like and unlike items. The Data Matrix symbol is a machine-readable representation of the UII.

UID (Unique Identification) The UII Sometimes referred to as IUID (Item Unique Identification)



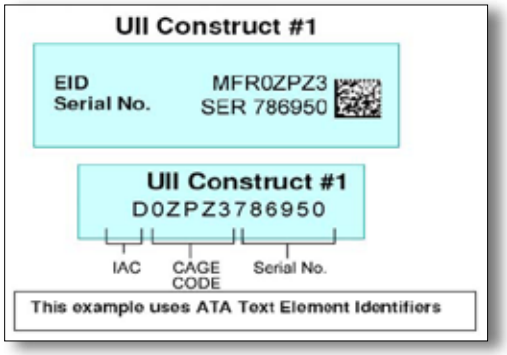


Construct I or Construct II?

There are two basic methods of constructing the UII for an item;

Choose Construct #1 for serialization if:

1. You can uniquely identify the item within your Enterprise Identifier. (Each serial # can only be used one time in your organization.)
2. You can include the Part # within the Serial # to provide uniqueness.



Choose Construct #2 for serialization if:

1. You manufacture many different part types.
2. You desire keeping the Part Number and Serial Number separate.
3. This construct fits your current data structure best.

The one you use depends on your company and your manufacturing process. Construct #2 is the most commonly used format.

Globally Unique Items using Data Matrix

IUID is physically marked on tangible items or assets using a two-dimensional (2D) Data Matrix symbol with the data formatted in accordance with specified standards. The encoded data is identified by the use of data identifiers, application identifiers or text element identifiers. The choice of which identifier to use is based upon normal industry practices of the organization assigning the serialization.

Examples of Levels of Identificatio

Universal Product Code (UPC): Two cans of Coke from the same plant will show the same data on the UPC.

Serial Number Tracking:

Serial numbers are unique, but not outside of their enterprise. The serial numbers from one company can be the same as another company.

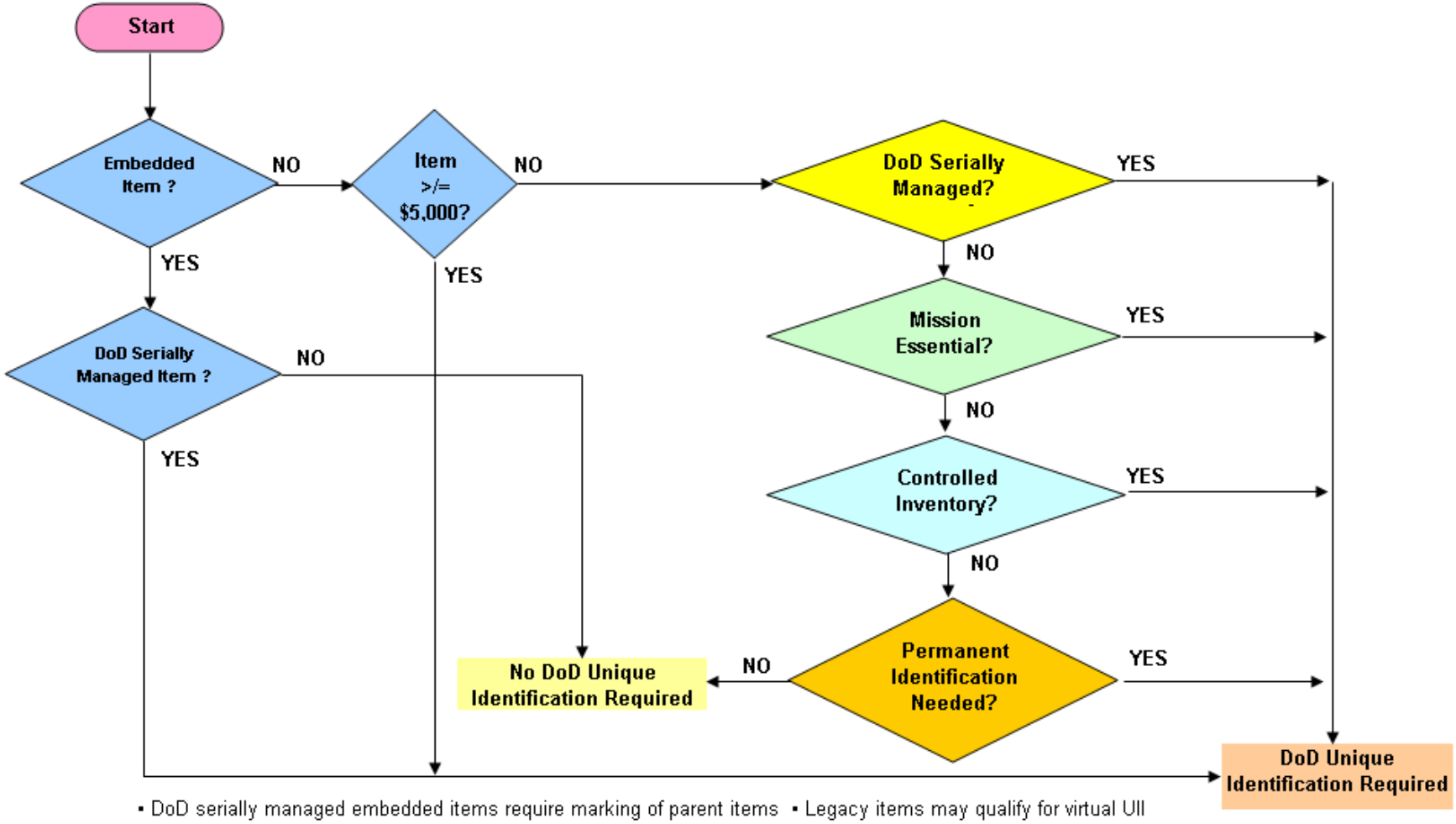
Unique Identification:

Each item has its own Globally Unique Identifier (UII). There is not another item with that number no matter where in the world the item comes from, or how long it survives.

Do I Need UID?

Each qualifying item must be marked with a permanent 2-dimensional data matrix encoded with the CAGE Code, Serial Number, Part Number and other data elements necessary to construct a Unique Item Identifier (UII). The UID identification must last the expected life of the product or until it comes back to be refurbished.

Not all items will require a UID identification. Use this chart to help you determine what needs to be marked.

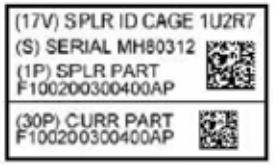


- DoD serially managed embedded items require marking of parent items
- Legacy items may qualify for virtual UII

What Is The Data Matrix Code?

The Data Matrix code is a two-dimensional matrix symbology containing dark and light square data modules making up a larger square or rectangular shaped symbol. It has a finder pattern of two solid lines and two alternating dark and light lines on the perimeter of the symbol.

A two dimensional imaging device such as a charge-coupled device camera is necessary to scan the symbology. Data Matrix is designed with a fixed level of error correction capability. It supports industry standard escape sequences to define international code pages and special encoding schemes. Data Matrix is used for item marking applications using a wide variety of printing and marking technologies. The Data Matrix symbol looks like this:

	Preferred Layout Data Matrix, linear bar codes, and human readable	**Alternate Layout** (Limited space) Data Matrix and human readable	**Alternate Layout** (Limited space) Data Matrix
Construct # 1 (Note 2)			
Construct # 2 (Note 2)			

Construct 1 / Construct 2 with the Data Matrix Code.

The labels shown on the left are the preferred layout and contains linear bar codes with human-readable text along with the Data Matrix Code. If space is a limitation, then the alternate layout may be used. The Data Matrix Code will be the only source of scannable data.

The Data Matrix code was designed to withstand a fair amount of destruction and have the encoded data remain readable. Meaning a whole section of the code can be scratched or completely gone and the mark will still read.

The other feature of the Data Matrix code is the ability to be read from different angles. This makes it easier and far more efficient to scan marked objects without the worry or effort to align them in one direction.

How Do I Know The Data Matrix Code Passes?

To satisfy the requirement of MIL-STD-130, the contract owner must be able to prove the Data Matrix marks are readable and contain the correct information. This is done by "verifying" the data.

With a table top model, as the Microscan one seen here, the label is placed under the reading light of the verification machine which is in turn connected to your computer. A report on your screen will indicate if the Data Matrix mark "passes" or "fails." If it fails, you will need to correct the problem reprint, and retest. If it passes, this report will need to be saved as evidence of compliance should your DCMA request proof.

Handheld models, like the DataMan® 7500 Series Readers and Verifiers include powerful features to meet the requirements of the US Department of Defense UID Program.

From Contract, To Labeling, To Getting Paid

A good compliance plan to meet MIL-STD-130 includes the steps you need to take to *meet your labeling or marking needs* and *manage the associated data*.

You need to know you are in compliance before your DCMA representative arrives for inspection.

Once you are in compliance, be sure you "stay" in compliance as Standards change.

Getting the Government Contract

To apply for a government contract, contact 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 for your state.

For businesses located in New Hampshire: http://www.nheconomy.com/sell-to-the-government/our-provided-services/.

Entering Your Contract Data

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 WAWF.

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

Producing Your Labels

If you are labeling your product, there are two ways to get your labels - print your own, or buy them preprinted.

Purchasing your UID labels pre-printed is perfect when you need your labels fast, or you are not sure of the exact formatting requirements and need to prove your labels are 100% compliant with MIL-STD-130. Some prefer this method for low volume labeling or infrequent demands, or they do not have or want to invest in a thermal transfer printing system.

Should your volume increase or you require more control over your compliance labeling process then printing your own labels on-demand and verification system may be advantageous.

How Do I Know What Label To Use?

Many items can be marked using a label. Durable labels are available to withstand exposure to some of the harshest environments such as freezing temperatures, grease, oil, blood, chemicals, sunlight, extreme heat as on engines, moisture, abrasion, and more.

All parts of a label will need to be considered in accordance use to ensure the highest performance and reliability.

Some of the most popular label materials are Kapton™ or polyester material, Both come in different varieties to cover a wide range of applications.

In addition to the label material, the adhesive used needs to be considered to meet the usage that the label is expected to endure. That label must remain affixed to the product - no matter what. A more aggressive label adhesive is used if the item is exposed to harsh environments such as but not limited to sea water, desert conditions,

long-term warehousing, rusty or irregular surfaces, or is located where it is handled a lot as compared to an item that lives in a more protected environment. A labels that falls off has failed, and you can be held accountable for the damages or incur penalties.

Lastly, be sure your thermal transfer ribbon is matched to the label material, topcoat, and is rated to withstand the labels environment to ensure printing on the label remains readable throughout the life of the product.

Always keep in mind, that no matter what method you choose to use to comply with MIL-STD-130, that direct mark, dataplate or label must survive the expected life of the product.

US Navy uses LCAC to transport tanks from carriers to land for repairs.

MIL-STD-130 calls for Durable Labels tough enough to withstand this wet, salty environment. ID Technologies provided durable Labels with a special high-strength aggressive adhesive stick to any oily, wet or rough surface and remain in place despite the salty waters, rain, and extreme temperatures. Acrylic coatings will further protect the labels and valuable information under harsh environmental use.

Should I Label or Direct Mark My Product

The identifying mark must last the life of the product. How you choose to mark your parts will have to do with the structure of the part, and the environment the part will be exposed to.

Labels are a cost-effective and readily available way to apply the identifying mark and required data to comply with MIL-STD-130 including the UID.

Marking directly on the part is another option.

Marking parts using a laser places a permanent 2-D Data Matrix Code mark directly into to the part. It is virtually indestructible.

This is commonly found on metal parts, plastics, and sturdy materials especially when the item will be exposed to harsh environments such as contact with chemicals, sea water, moisture, abrasion, and more.

DATAPLATES: Dataplates are also used to comply with MIL-STD-130 unit marking. The most common application for dataplates is on larger machinery, aircraft, tanks, and when exposure to the elements is expected.

LABELS
Compliance Level
ONE

MIL-STD-130
Unit Level
Unique Identification
Durable Labels &
Dataplates

Fast and Easy Compliance - Label Printing Service

Using a Preprinted Label Service is a fast, easy way to get in compliance with MIL-STD-130 and UID requirements. Simply provide some basic information. Each label is printed and verified. A verification report for each label acts as the Certificate of Compliance for hassle-free compliance.

MIL-STD-130 Label Printing Service

- Preprinted UID labels - DFARS 252.211-7003 compliant.
- You provide quantity, size, material, cage code, part number and serial number. We do the rest.
- Available to match Construct 1 or Construct 2.
- Durable materials: Polyester, aluminum, steel, and other durable materials to withstand the harshest environments while meeting/exceeding standard requirements.

Durable Labeling Solutions

As an expert label manufacturer, ID Technology will help you select the right label material for all your UID needs. MIL-STD-130 requires labels be durable enough to last the expected life of the product even under the harshest environments of water, sand, salt-spray, grease, high temperatures, abrasion, sunlight, chemical exposure, and other elements. Choosing the right adhesive, material, top coat and printing ribbon can all make a difference in the label's performance and lowering the cost of your labels.

LABELS
Compliance Level
TWO

Print & Verify Your Own - Label Printing Systems

For larger volume, or frequent requests for UID labels, printing your own MIL-STD-130 and UID labels may be the way to go.

Complete printing systems include high-resolution thermal transfer printers, durable labels, label design software with preset templates, scanners and verifiers to help avoid unnecessary delays at a DCMA inspection. Make sure you select the right blank or preprinted labels, durable label materials and matching ribbons as your label and the print must be readable for the expected life-cycle of the product.

Suppliers to the Department of Defense must be able to prove that their labels meet the requirements of MIL-STD-130, with regard to both Data Matrix Code quality and data accuracy. The UID Compliance Verifier is simple to use and provides a quick pass/fail check. In addition, it logs and archives the information to support audit needs. A printable compliance report is also produced. UID verification should be performed at each label run and compliance reports should be kept in a safe place and available for DCMA inspection. Choose between a table top unit or handheld verifier.

Optional installation and training can be available to maximize your staff productivity and ensure 100% compliance with DoD MIL-STD-130.

Available Compliance Kits and Components include:

- Barcode/RFID Thermal Transfer Printers.
- Handheld or Tabletop Verifier
- Blank or Preprinted labels with matching ribbons for full compliance, durability and quality output.
- Mobile Workstations to bring your DoD labeling to the source of production.
- On-site service for repairs and maintenance.

Handheld and Desktop
Label and Direct Parts Mark Verification

Managing the Data 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 for whatever reason, 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 WAWF.

The WAWF or Wide Area Workflow is an essential communication tool for every business that supplies inventory to the DoD. Submission to WAWF replaces the manual DD250 document. It helps expedite payments and is now required by the DoD.

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

Suppliers can submit their shipments to the WAWF through the WAWF 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.

A good compliance plan to meet

MIL-STD-130 includes the steps you need to take to *meet your labeling or marking needs* and *manage the associated data* ...

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 back to the DoD via the WAWF or UID Registry so they can track goods in the supply chain and inventory.

Integrated Workflow Solutions
for Efficient Processing

When transmitting using the WAWF, you can submit data directly or use software solutions that fully integrates data WAWF and the UID Registry.

For larger volumes of data, using idWorx! software will save on electronic submission costs and time.

WORKFLOW Compliance Level THREE

Mobile Workstations brings your DoD on-demand printing to where you need it, when you need it. Maximize the use of your printers and labeling supplies for new levels of control and flexibility.

WAWF, UID Registry - Managing The Data

The WAWF web site offers a graphical interface to submit product and shipment data without any additional software to generate the electronic documents and submit them by entering each submission by hand.

However, UID and especially RFID data can amount to large amounts of data quickly. This can mean wait times that make submitting shipment information difficult and almost assured user errors when using a manual system.

idWorx!

idWorx! uses direct electronic submission for fast and easy submission. idWorx! enables you to unify the UID workflow process into your existing business processes. This full-integrated approach to the workflow process can save you thousands of dollars annually by eliminating electronic submission costs.

Additional Support

ID Technology provides installation and training for idWorx! software to achieve DoD mandate compliance for RFID and UID. It is the only software solution that fully integrates RFID, UID, WAWF, and the UID Registry.

IdWorx!

idWorx! automatically encodes all of the shipment information, including UID and RFID data, into the EDI format required for electronic submission.

idWorx! double checks every business rule enforced by the WAWF and makes sure that they are correct before submittal.

Managing the data to the WAWF or to your trading partner via AIA can be done efficiently, accurately and without disruption to your current systems with idWorx!

idWorx! is easy-to-use right out of the box and modular.

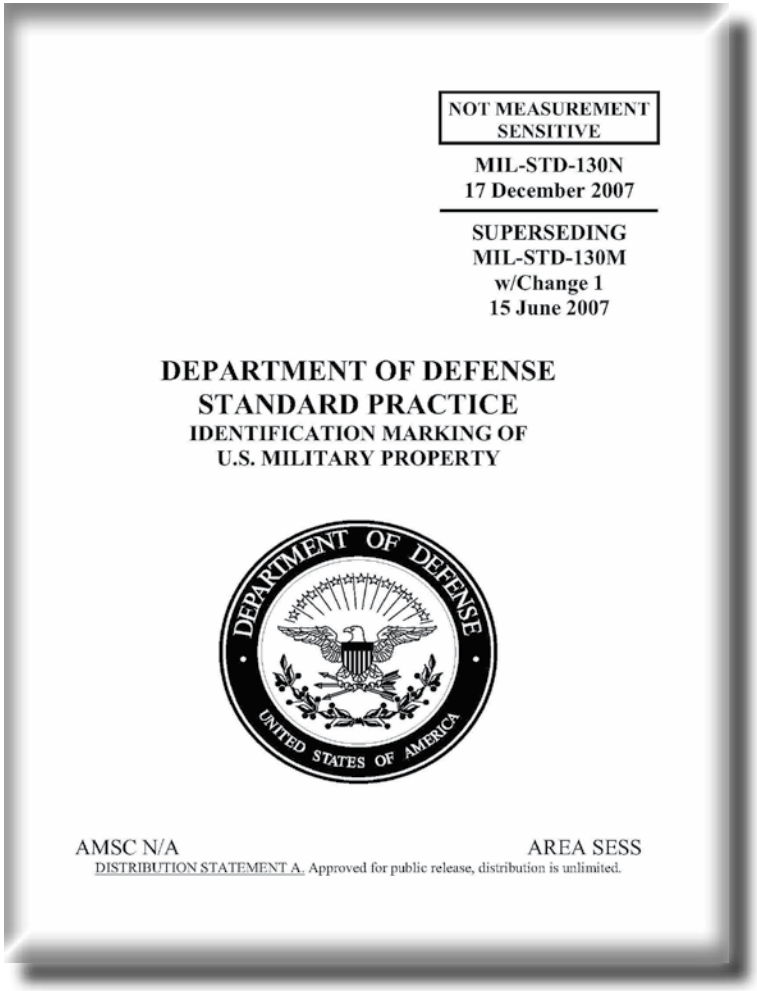
idWorx! software relates parent/child for UID and relates all UID items to the RFID number assigned to that box.

idWorx!™

The Complete Solution with ID Technology

ID Technology (IDT) has unique qualifications to help you meet the requirement of MIL-STD-130, UID and other DoD Military Labeling. Why makes ID Technology different?

- IDT is a label manufacturer that understands the aspects of the label to meet and exceed longevity, performance and formatting requirements.
- IDT 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.
- IDT partners with industry manufacturers and suppliers that enables us to deliver quality products and service to fit our customer's needs.



NOT MEASUREMENT SENSITIVE

MIL-STD-130N
17 December 2007

SUPERSEDING
MIL-STD-130M
w/Change 1
15 June 2007

DEPARTMENT OF DEFENSE
STANDARD PRACTICE
IDENTIFICATION MARKING OF
U.S. MILITARY PROPERTY

AMSC N/A AREA SESS

DISTRIBUTION STATEMENT A. Approved for public release, distribution is unlimited.

How Do I Stay Current With UID Policy Regulations?

Keeping up with Standards and updates can be a daunting task. The penalty for noncompliance can be more than the profits on a shipment, or result in loss of contracts. Some larger companies have individuals assigned to tracking these changes.

Here is a partial list of sources where Standards are outlined, or updated. You will need to be familiar with these to produce fully-compliant labels and stay current with any changes. ID Technology is fully versed to help you get in compliance and stay in compliance.

News at http://www.labelingnews.com

DFARS
DFARS 252.211-7003 Item Identification and Valuation
DFARS 252.211-7007 Item Unique Identification of Government Property.

MIL-STD
MIL-STD-130N – DoD Item Unique Identification Standard

UID Program Office Guide
Guide to Uniquely Identifying Items v1.6

Validation Standard
ISO 15434 – String Semantics

Data Matrix Standard
ISO 16022 – Data Matrix Specification

Verification Standards
SAE AS9132 - Data Matrix Verification
ISO 15415 – Data Matrix Verification
AIM DPM 1-2006 Direct Part Mark Quality Guidelines

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

If you have to comply with MIL-STD-129 and your contract calls for RFID, download your copy of our MIL-STD-129 eBook at http://www.labelingnews.com/PDF/ebook_130UID_v1.pdf.

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Identification Labeling

Durable Labels for Harsh Environments
Unique Sizes, Shapes, Color or Black/White
Bar Code or Text, Preprinted or Blank
RFID SmartTags
Sequential Numbering
Asset Tracking
Tamper Resistant

Barcode Solutions

Labeling Systems
Thermal Transfer Printing Systems
Barcode Data Collection Scanners
2D, Data Matrix, Linear Barcode Formats
Asset Tracking
Inventory Control
Label Design and Printing Software

MIL-STD-129 Labeling Support

Carton & Pallet RFID Labels
Pre-Printed, Pre-Encoded Compliance Label Service
Certificate of Compliance

MIL-STD-130 Labeling Support

Unique Identification Compliance Labels
On-demand Printing Systems
Preprinted, Verified UID Labels
Certificate of Compliance
Dataplates -Permanent Marking