Identification & Authentication in a 21st Century Identification Environment

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Today's Agenda

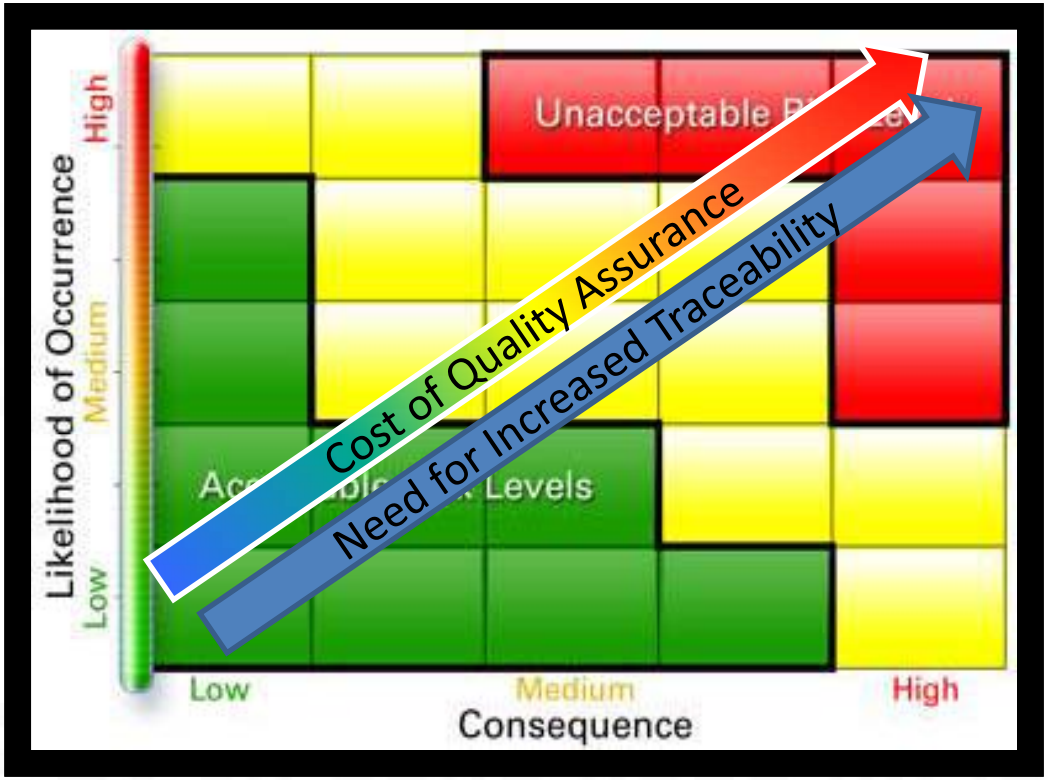
- Risk-Based Counterfeit Assessment
- Introduce Identification and Authentication Concepts
  - Identification Methods
    - Automatic Identification Technologies
    - Item Marking Methods
  - Authentication
    - Autonomous
    - Reliant
- Metalphoto ® - Anti-counterfeit Reliant Marking Method
- Questions and Answers

What Does Risk-Based Mean?

- Risk Tolerance is a function of the ***likelihood*** and ***consequence*** and item will be counterfeited
- Risk-based means accepting some risk and mitigating the rest
- Mitigation techniques require traceability and increase in complexity with risk
- Traceability is achieved by leveraging identification technologies and quality assurance
- Where a customer mandate exists already (e.g. DLA DNA Marking) it has been predetermined as at risk

Foundational Principle:"Identify Counterfeit Risk and Manage It"

- Risk Management is Part of Program Management
- Counterfeiting Is One Of Many Program Risks



Sample Program Risk Assessment

Likelihood						
	Near Certainty ~90%	Certificate of Authenticity	Process Audit/Review	Auditable Part History	Legally Authorized Source	Legally Authorized Source
	Highly Likely ~70%	Receipt Visual Inspection	Process Audit/Review	Verification Testing	Legally Authorized Source	Legally Authorized Source
	Likely ~50%		Receipt Visual Inspection	Authorized Supplier	Authorized Supplier	Auditable Part History
	Low Likelihood ~30%			Certificate of Authenticity	Verification Testing	Verification Testing
	Not Likely ~10%			Receipt Visual Inspection	Certificate of Authenticity	Certificate of Authenticity
	Risk Categories:	Negligible	Minor	Moderate	Serious	Critical
		Impact of Non-Mitigated Counterfeit Item				

Item Risk Mapped

High

Medium

Low

Reference: Risk Management Guide For DoD Acquisition, Sixth Edition (Version 1.0), August 2006

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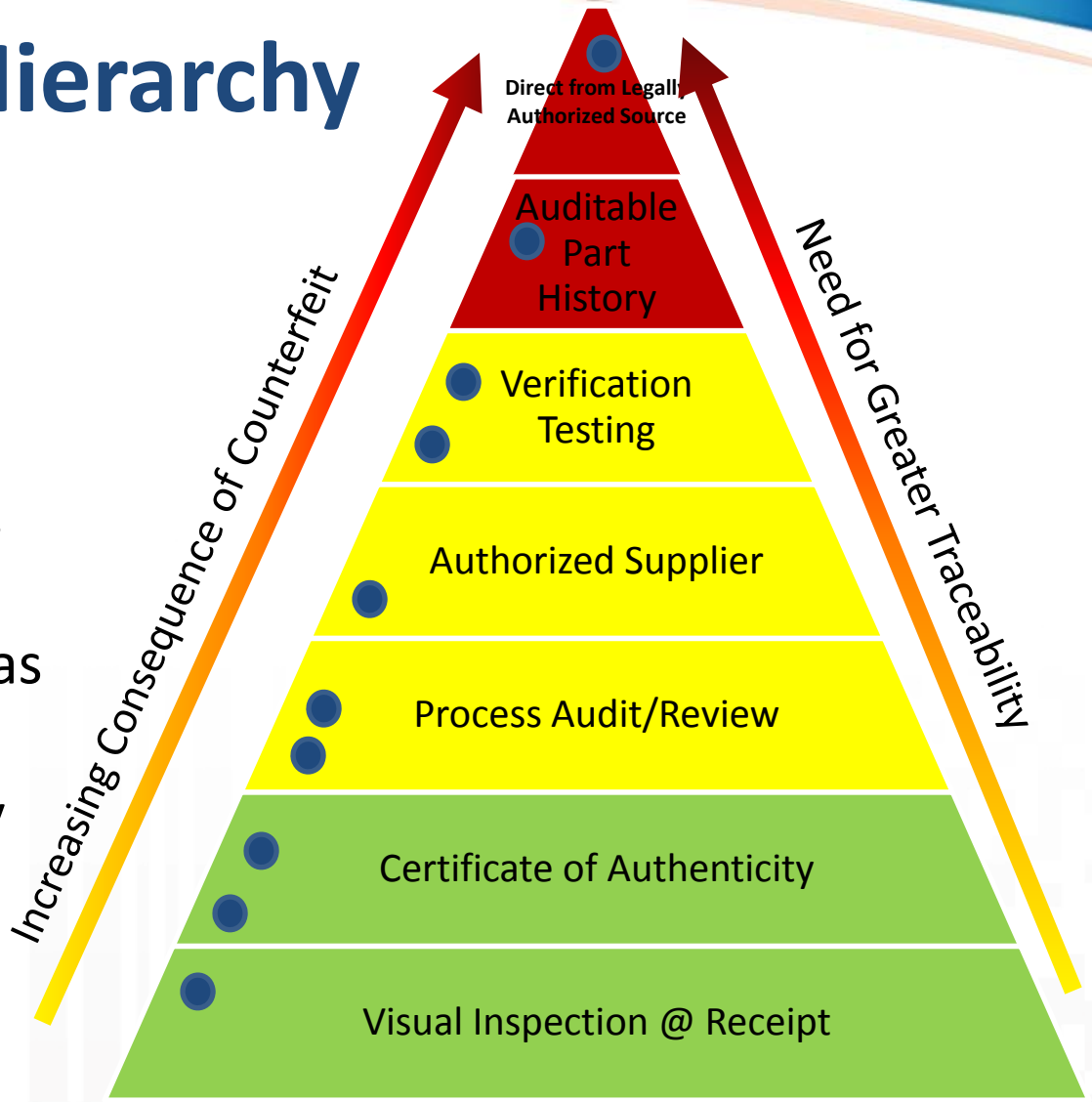
Traceability Hierarchy

As counterfeit risk and consequence increase – mitigation must increase through the supply chain.

Risk drives identification as Critical Application Item driving higher traceability requirements

Item Risk Mapped to Traceability Level



Note: This and the preceding 2 slides are consistent with those published within AS 6174 which the author was instrumental in adding and represent an additional refinement..

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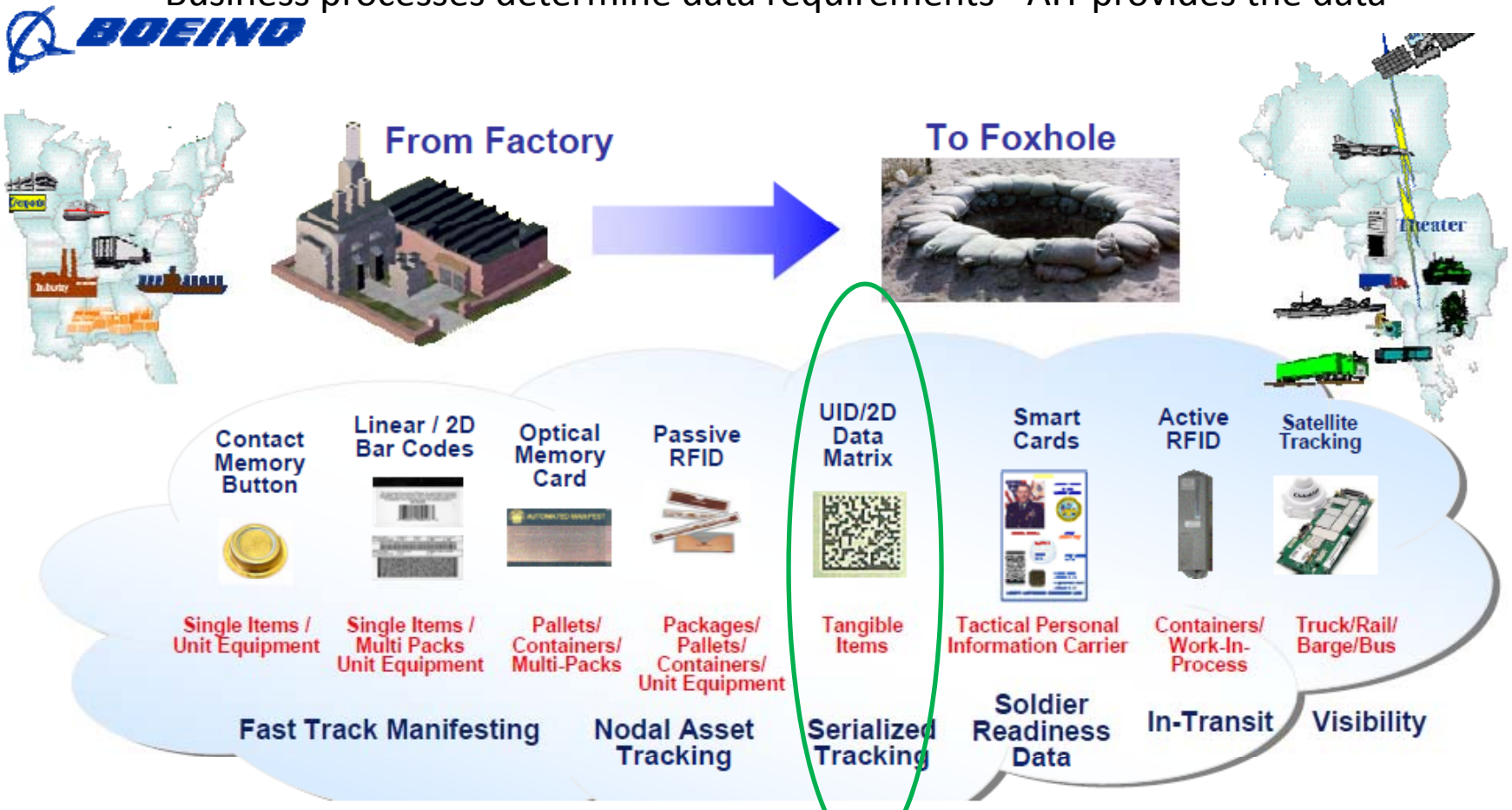
Automatic Identification Technology (AIT) is a Suite of Enabling Technologies

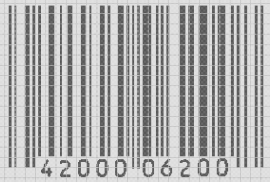
Business processes determine data requirements - AIT provides the data



Source: NDIA Industry Leadership Advisory Group, UID Forum June 18, 2008

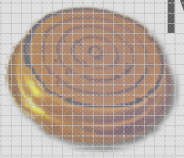
Item Level Automatic Identification Technologies

1-D Barcode

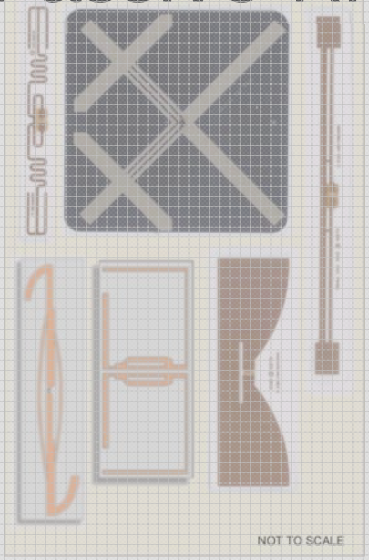


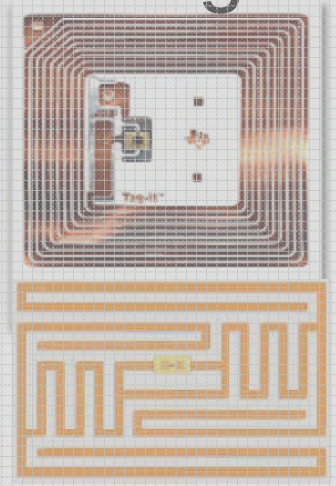
1D Barcode

Contact Memory Buttons



Passive RFID Tags



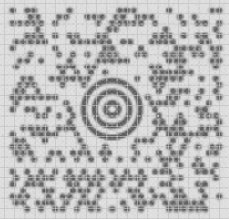


EPC RFID Tag

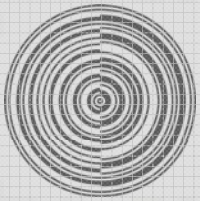
2-D Barcodes

Data Matrix

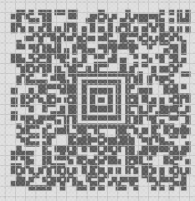
QR Code



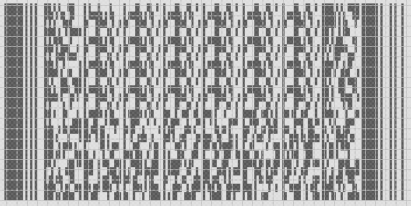
MaxiCode



Bullseye



Aztec



PDF417

Active RFID Tags

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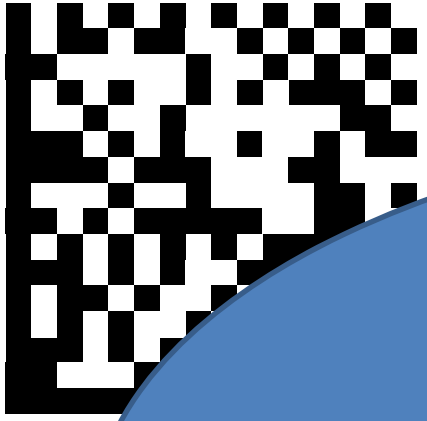
Why the Data Matrix?



Multiple ways
ke
k

Key Attributes

- Open Standard
- Decode Infrastructure Already Fielded

(i.e., Image Capture Devices such as Smart Phones)

- Complements Existing Required Marking

Ca

Up to 2,33
alphanumeric characters

Error Correction: ~50%

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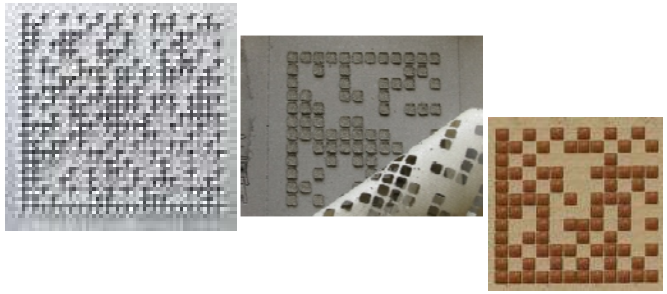
Item Marking Techniques





- Labels
- Data Plates
- Dot Peen
- Laser Etch
- Chemical Etch
- Silk Screening
- Thermal Spray
- Ink Jet Printing
- Laser Ablation
- Laser “Annealing”
- Cast/Forged
- Laser Bonding
- Embroidery
- Photo Etch
- Metalphoto

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Ensuring Authenticity

- Can be accomplished by methods that are either:
  - Autonomous
    - A tamper proof unique mark that is not able to be duplicated
    - Examples include: Taggants, DNA Marking, Nanotube, Ionic Film
  - Reliant
    - A durable mark providing an International Standards based approach to Unique Identification (ISO 15459) that when connected to supply chain data provides a traceable and auditable assurance of authenticity
- Observation from OMB Sponsored Industry Meeting Supporting IPEC Federal Anti-Counterfeiting Working Group, Jan 2011
  - Industry Representative from a large commercial Information Technology firm providing hardware and software stated that - "Given sufficient resources any mark can be counterfeited, however connecting the item to an audit information trail in the supply chain provides high confidence in authenticity."

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Autonomous

- Advantages
  - Does not require access to outside data sources
  - Real-time results
  - Tamper resistant
- Disadvantages
  - Costs
    - Application costs higher in low volumes and only slightly less in high volume
    - Infrastructure costs are borne at each point authenticity must be asserted since there are no visual cues
  - Durability
    - It has not been determined how durable certain autonomous marks will be and will likely be pbor in high temperature, high abrasion or contact with lubricants/chemical cleaners
    - Limited sources for both application and “reading” devices
  - Will require new work instructions to identify location and training for handling and on unfamiliar equipment

Reliant

- Advantages
  - Costs
    - Builds upon existing marking infrastructure with time proven technologies
    - Uses marking approach that is already in being applied to these and similar items
    - Minimal additional passed on costs from industry
  - Durability known and proven
  - Can leverage both overt and covert features throughout the lifecycle
  - Reduced training requirements and process changes
- Disadvantages
  - Only provides near real-time results with reasonable communications or a local cache option
  - By its nature contains at least one overt feature in addition to covert

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Reliant is Already Required and Can Provide High Confidence in Authenticity

- By policy and guidance DoD and NATO **mandate** Unique Identification for items with specific marking, identification and registration. **Covert marking does not meet these requirements.**
  - DODI 4151.19, "Serialized Item Management"
  - DODD 8320.03, "Unique Identification"
  - DODI 8320.04, "Item Unique Identification"
  - NATO Allied Publication, APUID-1, "Unique Identification of Items"
- Adjustments to the marking to provide both visual and "covert or hidden" authenticity cues is allowed in addition to IUID compliant marking. When using Reliant marking:
  - limited cost impacts on both application and infrastructure required to support the above DoD and NATO requirements
  - Industrial suppliers already use these methods today
  - Tools and software tools are already in place

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Objectives for Automatic Identification Technologies as an Anti-counterfeiting strategy

- Develop identification processes to:
  - Rebaseline items introduced years and even decades for authentication
  - Increase traceability in new production
- General solutions should be broadly applicable to load bearing parts, electro-mechanical, food, pharmaceuticals, and others
- Data Plates or Labels with item information in barcodes to provide enhanced traceability
- Solutions should comply with existing DoD architectures and leverage existing and proposed AIT investments
- Executable at the echelons of the DoD supply chain
- Cannot be easy for the counterfeiters to defeat
- Must support DoD supply chain objectives for decreasing response times, lowering costs, and supporting warfighter readiness globally

Why AIT and Traceability?

- AIT can identify and enable traceability for authentic parts throughout their lifecycle
- AIT requires sophistication to apply particularly where fraud is used such as remarking parts as new
- More efficient data gathering and connection to part information for confirmation and alerts (e.g. GIDEP)
- Traceability to item level connected to information about the item
  - Traceability must be integrated in business processes
- In high-end closed loop applications consider additional infrastructure intensive technologies (e.g, taggants, DNA marking)
- Layered AIT solutions provide added confidence of authenticity

Layering of AIT Solutions

- Human Readable Information
- Barcodes (2D Data Matrix preferred)
- Visible Security Features (e.g., holographic images)
- Hidden Features (e.g. microtext, shading)
- Additional covert marking methods (e.g. taggants, DNA)
- Service Applications
  - Verification Service
  - Item Visibility Service

The number of layers and choice of technologies depending on the nature of the item, counterfeit risk and the supply chain!

Anti-Counterfeiting Approach Metalphoto ® and SecurUID ™

- New features for existing Metalphoto ® product line
- Assess counterfeit risk and select mitigation level
- Risk mitigation levels:
  - **Standard UID- Level 0**
  - **SecurUID - Level 1 Low/Medium Level**
  - **SecurUID - Level 2 Medium/High Level**
  - **SecurUID - Level 3 High/Very High**
- Web-based component provides authentication

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Why SecurUID ™ for Anti-Counterfeiting?

- Leverages Durable Metalphoto ®
  - Photographic qualities similar to those used in passports, identification cards and money
  - Naturally anti-tamper due to limited proprietary technology and limited distribution network
  - Can be customized and attractive as well as functional
- 2D Barcode and embedded URL leverages smart phone infrastructure
- Entry at Level 0 or 1 limited additional cost
- Upgraded Level 2 or 3 provides higher assurance of authenticity and provides value for other business processes (e.g. product registration, supply chain visibility)

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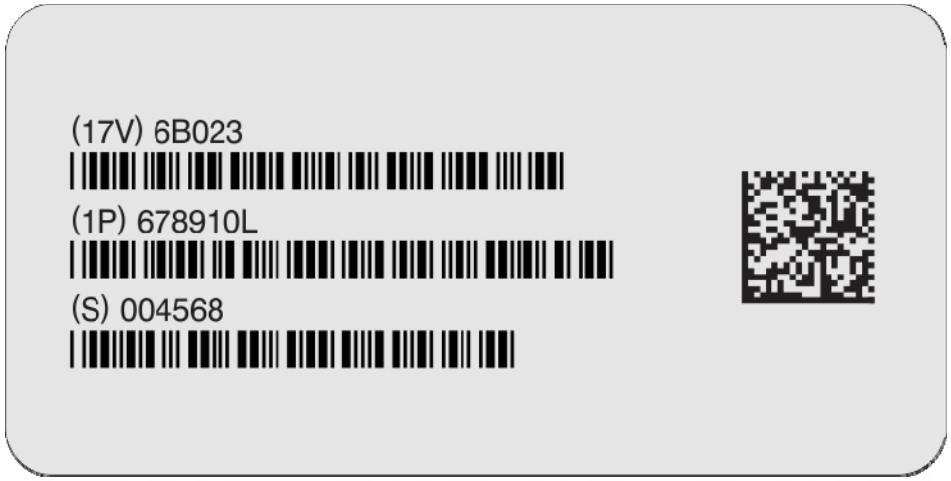
Standard Unique identification (UID) - LEVEL 0



- Standard Metalphoto® Process
- Allows most custom sizes
- Globally unique serialization using ISO 15459 UID

(e.g., D6B023678910L004568)

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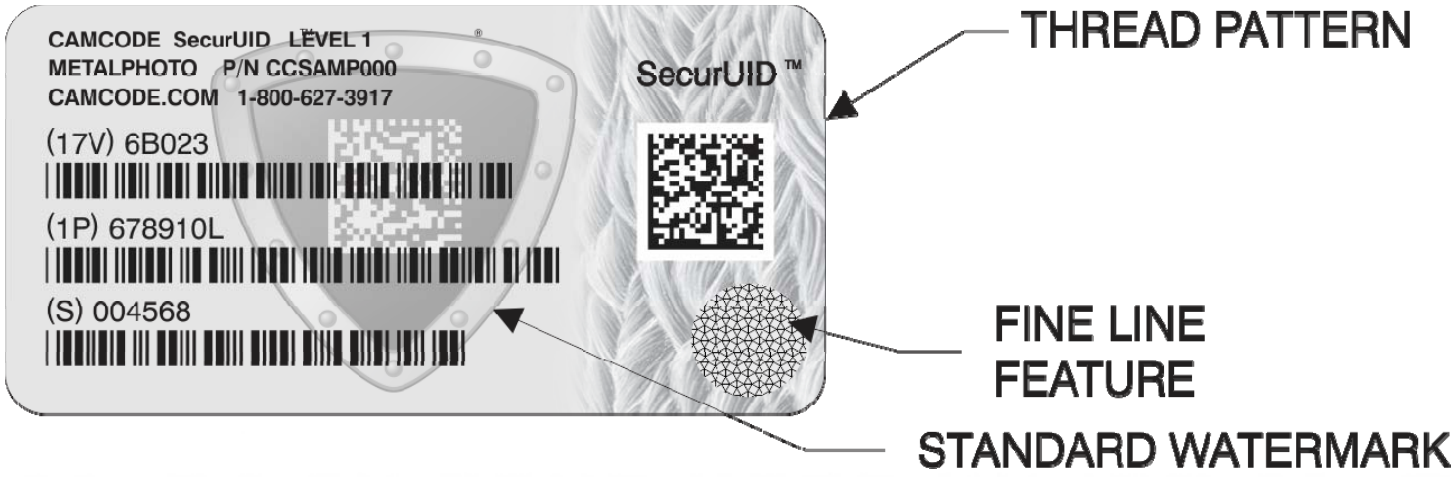
SecurUID - LEVEL 1 LOW/MEDIUM RISK



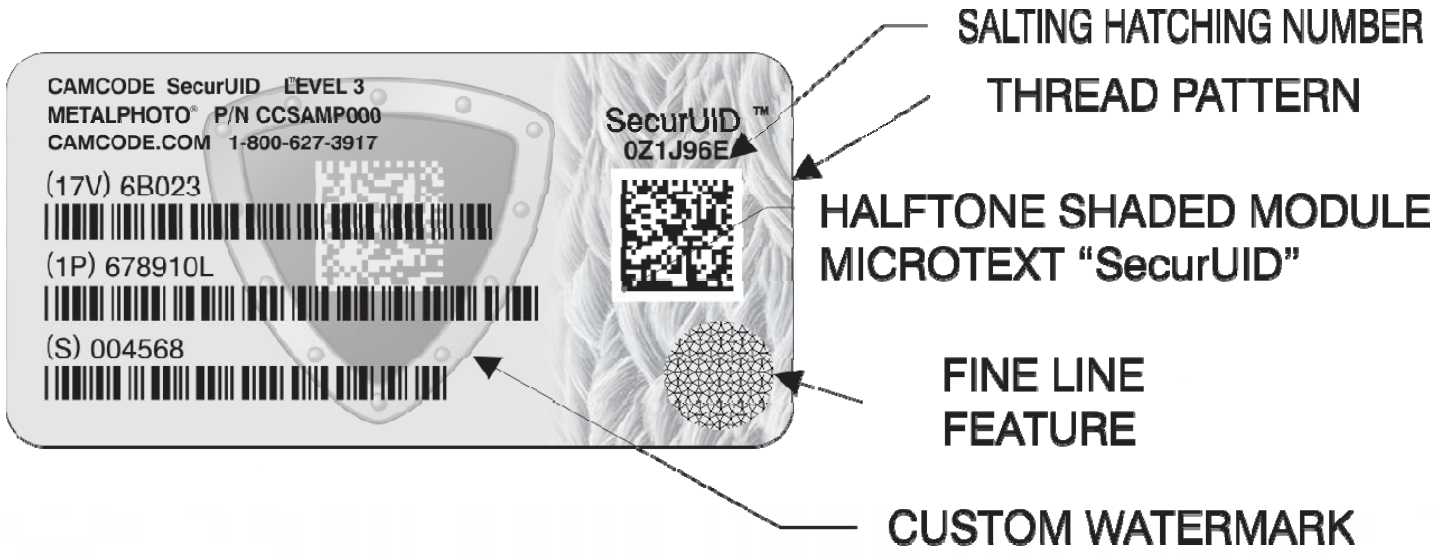
- May require minimum size
- Globally unique serialization

(e.g., D6B023678910L004568)

SecurUID - LEVEL 2 MEDIUM/HIGH RISK

- May require minimum size
- Globally unique serialization (e.g., D6B023678910L004568)
- Half-shading of a cell in the finder pattern at a single point per lot/batch
- Hosted web page with part #/Lot/Batch features by manufacturer

SecurUID - LEVEL 3 HIGH/VERY HIGH RISK



- May require minimum size
- Globally unique serialization (e.g., D6B023678910L004568)
- Microtext Scrambled Numeric Value, based On CAGE, P/N & S/N
- Covert Halftone In Datamatrix Location variable Based on Batch/lot or even individual item
- Full Website Integration

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Questions?