Small Arms UID

17 May 2006

William Boyle
US Army ARDEC
Picatinny Arsenal NJ

Michael Friedman
PM Soldier Weapons
Picatinny Arsenal NJ

Agenda

- **UID Requirements (Mike Friedman, PM Soldier Weapons)**

- **Summary of M9/M240 Environmental Testing** (Bill Boyle, ARDEC)
  - Initial
  - Hot/Cold
  - Salt/Fog
  - Chemical

What Is UID?

- UID is a 2-D data matrix used to uniquely identify an item.

What Needs To Be Marked?

- Any serialized managed item
- Any item that has a value of over $5,000.00
- Any item the PM wants to be coded
- GFM/GFE
- Controlled inventory
- Mission essential
- PM Implementation plan requires one mark per weapon on the serially tracked component (i.e.. Lower receiver)

REQUIREMENTS

- MIL-STD-130M, Establishes the marking requirement on the item.

- DFARS 252.211-7003 Defense Federal Acquisition Regulation Supplement, identifies the data submission requirements.

When Does This Need To Be Implemented?

New Production

- Industry needs to Implement NOW
- All new procurements have DFARS clause as part of the contract
- All options have this added as they are exercised

When Does This Need To Be Implemented?

Government Inventory

To be marked at Government Depot

All legacy items must “comply” by December 31, 2010

Will not mark inactive systems (i.e. M1, M14, M60, M1911)

Additional Information

- WWW.IUIDToolkit.com
- WWW.UIDsupport.com

Pilot Project Test Summary

- Initial testing has been conducted on various marking methods, testing includes:
  - Hot
  - Cold
  - Icing
  - Salt Fog
  - Chemical compatibility
  - Blowing Sand

Milestones

- Phase II Qualification Testing completed 20 Mar 2006
- Reviewing test results and continuing to implement approved plan
- Brief Industry
- Developing detailed implementation at Anniston Army Depot

Test Items

		# of samples	
Method	Coating	M9	M240
Laser coat and discolor	Krylon	X	5
	Bare Phosphate	X	10
	Anodized	8	X
	DataLase Clearcoat	7	5
	Aluma Hyde II	5	5
Laser etch & clear coat	Aluma Hyde II	5	7
	DataLase Clearcoat	5	5
	Evershield	5	7
	No coating	5	7
Deep laser engraving	No Coating	X	12
	Ahyde II	X	5
	Datalase	X	5
	Krylon	X	5
		10	X
Tesa Tape		20	15

Tests Conducted

- **Hot Test**
  - Samples conditioned to 155 deg F for 24 hrs
  - Temperature increased to 220 deg F for 1 hr then returned to 155 deg F for 4 hrs
  - Repeated for six cycles
- **Upon completion of test markings examined for damage and readability**

Tests Conducted

- **Cold Test**
  - Weapons conditioned to -55 deg F for 24 hrs
  - Temperature increased to 220 deg F for 1 hr then returned to -55 deg F for 4 hrs
  - Repeated for six cycles
- **Upon completion of test markings examined for damage and readability**

Tests Conducted

- **Icing Test**
  - Samples conditioned to 20 deg F for 24 hrs
  - Water was sprayed onto the test samples every hour until ice the thickness of 1/8 inch achieved
- **Samples returned to ambient temperature and markings examined for damage and readability**

Tests Conducted

- **Salt Fog**
  - M9 samples subjected to 5% salt solution for 336 hrs
  - M240 samples coated with CLP and subjected to 5% salt solution for 48 hrs
- **Upon completion of test markings examined for damage and readability**

Tests Conducted

- **Chemical Compatibility**
  - Test samples exposed to Army standard chemicals for a period of 24 hrs
- **Upon completion of test markings examined for damage and readability**

Tests Conducted

- **Sand and Dust**
  - M240 samples subjected to 3.5 lbs of blowing sand and dust
  - Sand nozzle directed on the mark being tested
- **Upon completion of test markings examined for damage and readability**

Sand and Dust Test

Sand Chamber

After Sand testing and before cleaning

Develop and Field Current and Future Small Arms for the Army

Test Results (Readability)

		Initially		After hot		After Cold		After icing		After chemical	
Method	Coating	M9	M240	M9	M240	M9	M240	M9	M240	M9	M240
Laser coat and discolor	Krylon	NA	2/2	NA	2/2	NA	2/2	NA	2/2	NA	2/2
	Bare Phosphate	NA	1/4	NA	0/4	NA	1/4	NA	1/4	NA	1/4
	Anodized	3/4	NA	4/4	NA	3/4	NA	4/4	NA	3/4	NA
	DataLase Clearcoat	3/3	2/2	3/3	2/2	3/3	2/2	3/3	2/2	3/3	2/2
	Aluma Hyde II	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Laser etch & clear coat	Aluma Hyde II	2/2	1/3	2/2	1/3	2/2	2/3	2/2	1/3	2/2	1/3
	DataLase Clearcoat	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
	Evershield	2/2	2/4	2/2	2/4	2/2	4/4	2/2	3/4	2/2	2/4
	No coating	2/2	2/3	2/2	2/3	2/2	2/3	2/2	1/3	2/2	1/3
Deep laser engraving	No Coating	3/4	6/6	3/4	5/6	3/4	2/6	1/4	4/6	X	4/6
	Ahyde II	NA	1/2	NA	0/2	NA	0/2	NA	0/2	NA	0/2
	Datalase	NA	2/2	NA	2/2	NA	2/2	NA	1/2	NA	1/2
	Krylon	NA	2/2	NA	2/2	NA	2/2	NA	1/2	NA	1/2
Tesa Tape		9/9	8/8	9/9	8/8	8/9	8/8	8/9	7/8	8/9	8/8

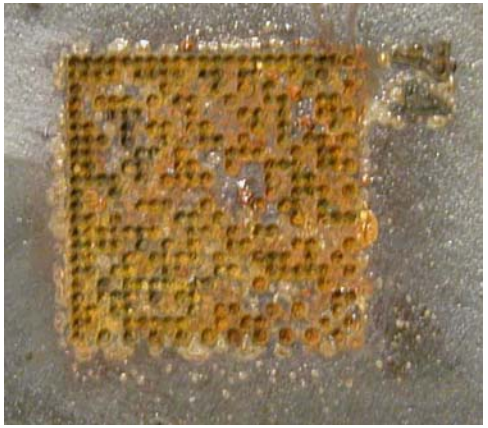
Test Results (Readability)

Hot/cold wpns

		Initially			After Salt Fog			After sand and dust	
Method	Coating	M9	M240		M9	M240		M9	M240
Laser coat and discolor	Krylon	NA	3/3		NA	0/3		NA	2/2
	Bare Phosphate	NA	0/4		NA	0/4		NA	1/1
	Anodized	4/4	NA		3/4	NA		NA	NA
	DataLase Clearcoat	3/3	3/3		0/4	0/3		NA	2/2
	Aluma Hyde II	3/3	3/3		0/3	0/3		NA	2/2
Laser etch & clear coat	Aluma Hyde II	3/3	4/4		0/3	2/4		NA	1/1
	DataLase Clearcoat	3/3	3/3		0/3	0/3		NA	2/2
	Evershield	3/3	3/3		0/3	2/3		NA	2/2
	No coating	3/3	3/3		0/3	1/3		NA	1/1
Deep laser engraving	No Coating	3/3	3/3		0/3	0/3		NA	2/2
	Ahyde II	NA	3/3		NA	0/3		NA	0/1
	Datalase	NA	3/3		NA	0/3		NA	1/1
	Krylon	NA	3/3		NA	0/3		NA	1/1
Tesa Tape		8/8	4/4		8/8	4/4		NA	2/2

Note: M9 not tested with Sand/Dust due to lack of fixture

After Salt/Fog Testing (M240)



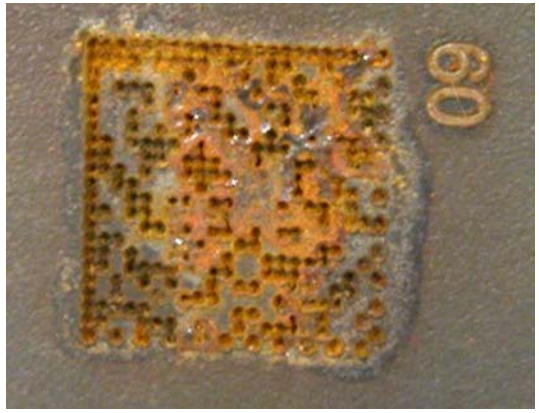
M240-74A deep laser,
Ahyde II w/clear coat

M240-41 laser etch
w/clear coat, Ahyde II

M240-2A DATALASE

Paint w/clear coat,
Ahyde II

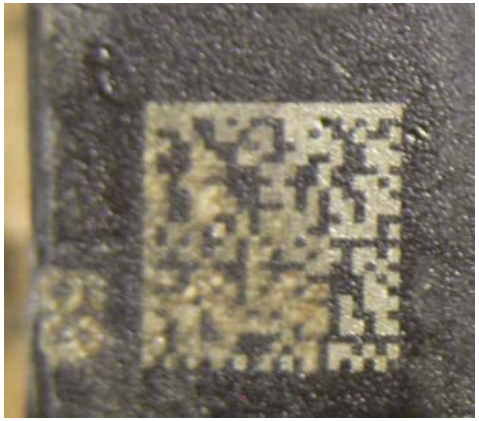
M240-49 laser etch
w/clear coat, Ahyde II



M240-60 deep laser w/clear coat (Krylon)

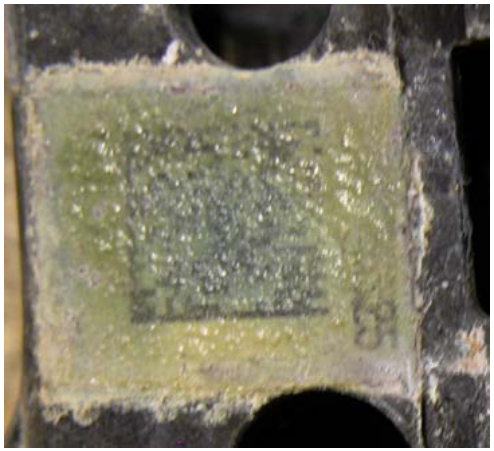
Develop and Field Current and Future Small Arms for the Army

After Salt/Fog Testing (M9)



M9 9-53 laser etch w/clear coat, Aluma Hyde II

M9 9-38 laser etch w/o coating



M9 9-25 Datalase paint, Aluma Hyde II w/clear coat

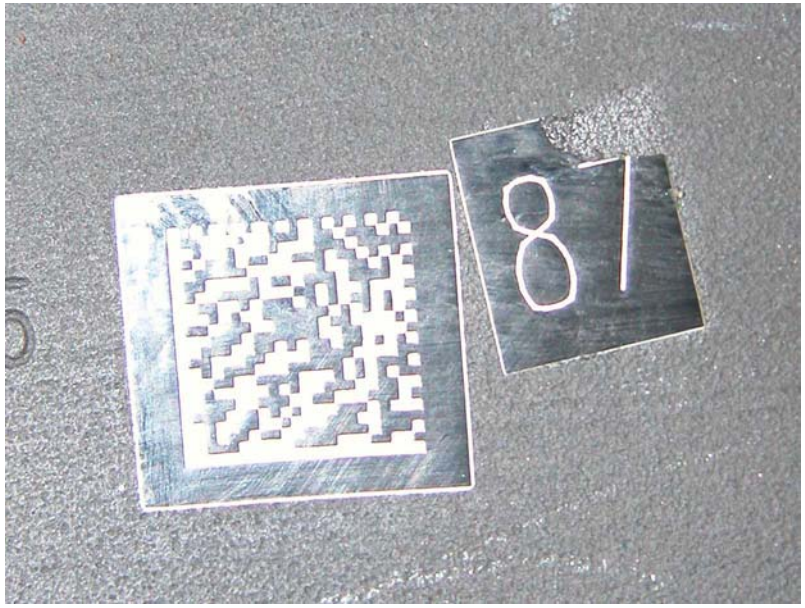
M9 9-45 laser etch w/clear coat (Evershield)

Corrosion Matrix

		Amount of corrosion after salt fog									
		M9					M240				
		Readable			Unreadable		Readable			Unreadable	
		None	Slight		Moderate	Severe	None	Slight		Moderate	Severe
Method	Coating										
Laser coat and discolor	Krylon	NA	NA		NA	NA	0	0		1	2
	Bare Phosphate	NA	NA		NA	NA	?	?		?	?
	Anodized	2	0		2	0	NA	NA		NA	NA
	DataLase Clearcoat	0	0		3	1	0	0		0	3
	Aluma Hyde II	0	0		2*	0	0	0		0	3
Laser etch & clear coat	Aluma Hyde II	0	1		1	1	1	2		0	1
	DataLase Clearcoat	0	0		0	3	0	1		0	2
	Evershield	0	0		2	1	0	2		1	0
	No coating	0	0		1	2	1	0		2	0
Deep laser engraving	No Coating	0	1		2	0	1	0		2	0
	Ahyde II	NA	NA		NA	NA	0	0		1	2
	Datalase	NA	NA		NA	NA	1	0		2	0
	Krylon	NA	NA		NA	NA	0	0		3	0
Tesa Tape		8	0		0	0	4	0		0	0

TESA Tape

M9



M240

Develop and Field Current and Future Small Arms for the Army

TESA Tape

M9

M240

Develop and Field Current and Future Small Arms for the Army

Test Results Summary

- **Some marks couldn't be seen on the weapons (laser discolor)**
  - Soldiers wouldn't be able to find them
- **Distance to hold scanner from the mark continuously fluctuated depending on the mark to be read**
  - Could result in multiple scans before mark read
- **All laser markings were unreadable after Salt/Fog test**

Test Results Summary

- **Laser etching w/clear coat performed well but clear coat unable to survive Salt Fog Test**
  - Blistering was evident on two of the marks
  - One of the two was still readable
  - Multiple attempts were necessary to read the marks
- **TESA tape performed well but some durability concerns with cracking/peeling**
  - Some tearing on M9 pistol when placed too high on the back strap
  - Personnel were able to peel corner of the label

Test Results Summary

- Follow on testing was conducted using various labels and clear coatings

- All of the labels tested (three types) passed the salt fog test and chemical compatibility test

- All of the clear coatings tested (four types) passed the salt fog and chemical compatibility test

Recommendations

- **Adhesive labels or name plates with a clear coat applied is recommended**
  - Clear coat prevents cracking or peeling and enhance durability of the tape
  - Use darker background (gray) rather than white 2D data matrix to reduce reflectivity

- **Laser and other engraving techniques not recommended for UID application to small arms**

Questions?

Develop and Field Current and Future Small Arms for the Army