

NORTHROP GRUMMAN SYSTEMS CORPORATION

Bethpage, New York 11714-3580
CAGE CODE No. 26512

Specification No.: **NGSS4712A**

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**NORTHROP
GRUMMAN STANDARD
SPECIFICATION**

**REQUIREMENTS FOR UNIQUE
IDENTIFICATION (UID) MARKING, OF
FABRICATED PARTS, ASSEMBLIES, TOOLING
AND GOVERNMENT PROPERTY**

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4/27/2007
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5/14/2007
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REQUIREMENTS FOR UNIQUE IDENTIFICATION (UID)

MARKING OF FABRICATED PARTS, ASSEMBLIES,

TOOLING AND GOVERNMENT PROPERTY

1 SCOPE

1.1 Scope. - This specification establishes the requirements for Unique Identification (UID) marking of parts, assemblies, tooling, Government Property (GP) and Property In Possession of the Contractor (PIPC) in accordance with MIL-STD-130, Revision M, when Unique Identification (UID) is required by contract.

NOTE: Further references herein to MIL-STD-130 apply to MIL-STD-130, Revision M.

1.1.1 Superseding Data. This specification cancels and supersedes NGSS4712NC, dated 2006-10-26 and has been revised with Class II changes.

1.2 UID is a marking system used to assure globally unique and unambiguous identification. UID uses a Unique Item Identifier (UII), which is comprised of data elements containing machine-readable information (MRI) and human-readable information (HRI). MRI is comprised of a 2D Data Matrix symbol.

1.3 This specification applies to both new and legacy marking of GP and PIPC.

2 APPLICABLE DOCUMENTS

2.1 Government and Industry Documents. - The following documents, of the issue in effect on the date of the purchase order, shall form a part of this specification to the extent specified herein. Unless a specific document issue is identified, the site may work to a subsequent revision. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

ANSI/ASQ Z1.4	Sampling Procedures and Tables for Inspection by Attributes
AMS-S-8802	Sealing Compound, Temperature Resistant, Integral Fuel Tanks and Fuel Cell Cavities, High Adhesion
AMS-QQ-A-250/1	Aluminum 1100, Plate and Sheet
AMS3276	Sealing Compound, Integral Fuel Tanks and General Purpose, Intermittent Use to 360°F (182°C)
AS9132	Data Matrix Quality Requirements for Parts Marking
ASTM B209	Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
FED-STD-595	Colors Used in Government Procurement
GG-P-455	Plates and Foils, Photographic (Photosensitive Anodized Aluminum)
DFARS Guide	Government Personal and Real Property In the Possession of the Contractor (PIPC), Guidance for Industry

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2.1 (Continued)

ISO/IEC 15415	Bar Code Print Quality Test Specification - Two-Dimensional Symbols
ISO/IEC 15418	EAN/UCC Application Identifiers and Fact Data Identifiers and Maintenance
ISO/IEC 15426-2	Automatic Identification and Data Capture Techniques, Bar Code Verifier Conformance Specification - Part II: 2D
ISO/IEC 15434	Transfer Syntax for High Capacity ADC Media
ISO/IEC 16022	Information Technology - International Symbology Specification – Data Matrix
MIL-A-8625	Anodic Coatings for Aluminum and Aluminum Alloys
MIL-DTL-15024	Plates, Tags, and Bands for Identification of Equipment, General Specification for
MIL-P-19834	Plate, Identification, Metal Foil, Adhesive Backed
MIL-STD-130M	Department of Defense Standard Practice, Identification Marking of U.S. Military Property

2.2 Northrop Grumman Corporation (NGC) Documents. - The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issue of these documents is that in effect on the date of the purchase order or contract.

GC144NJ	Compound, Ribbon, Printer, Thermal Transfer
GS30BF	Substitution List - Materials, Metallic and Non-Metallic
GN11AC	Protective Coating, Nameplate Overcoat, Placard and Panel Protective Coating
GC115DU	Compound, Sealing, Temperature Resistant, Integral Fuel Tanks and Cavities
GM4107	Sealing Compound, Fuel Resistant, Fillet and Faying, -65°F to 360°F Service
GM802AD	Marker, Identification Label, Thermal Transfer PVF Film, with Printable Coating and Acrylic Pressure Sensitive Adhesive
GSS4200	Cleaning and Chemical Surface Treatment of Aircraft Surfaces
GSS4706	Marking - Electro-Etch Process
GSS4710	Identification of Fabricated Metallic Parts and Assemblies
GSS4711	Identification of Fabricated Non-Metallic Parts and Assemblies
NGM802AE	Die Cut Marker, Identification, Wire or Cable, Polyvinyl fluoride, Pressure Sensitive Adhesive
V0-0203	Identification of U.S. Government or Customer Owned Property (Applicable to NGC only)

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2.3 Availability of Documents. -

2.3.1 Government Documents. - Copies of Government documents may be obtained online at <http://assist.daps.dla.mil/quicksearch>, <http://dodssp.daps.dla.mil/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.

2.3.2 NGC Documents. - Copies of NGC documents may be obtained, upon request, from the buyer specified in the purchase order or contract.

2.3.3 ANSI/ASQ Documents. - Copies of ANSI/ASQ documents may be obtained from the American National Standards Institute (ANSI), 25 West 43rd Street, 4th Floor, New York, NY 10036.

2.3.4 AS Documents. - Copies of AS (Aerospace Standard) documents may be obtained from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.

2.3.5 ISO/IEC Documents. - Copies of International Organization for Standardization / International Electrotechnical Commission may be obtained from the American National Standards Institute (ANSI), 25 West 43rd Street, 4th Floor, New York, NY 10036.

2.4 Precedence. - When UID is contractually required, the approved methods within this document shall take precedence over the requirements specified in GSS4710 and GSS4711.

3 REQUIREMENTS

3.1 General. - When UID in accordance with MIL-STD-130 is required by contract, it shall be accomplished as specified herein.

NOTE: Deviations from the requirements of this specification shall not be permitted without prior written approval from NGC Materials and Processes (M&P) Engineering. Requests for deviations shall be forwarded to the attention of the buyer identified in the purchase order or contract. Deviations shall be specific to the program(s) for which they were requested and shall be approved in accordance with program requirements.

3.2 UID Marking Class Where the Engineering Drawing Specifies GSS4710 or GSS4711 Marking. -

3.2.1 Where the Engineering Drawing Specifies Class 1 Marking. - For all Class 1 marking, per GSS4710 or GSS4711, refer to Table I for the appropriate UID marking class.

3.2.2 Where the Engineering Drawing Specifies Class 2 Marking. - For all Class 2 marking per GSS4710 or GSS4711, refer to Table I for the appropriate UID marking class.

3.2.3 Where the Engineering Drawing Does Not Specify a Marking Class or Subclass. - When the Engineering drawing does not specify a marking method or marking class / sub-class per GSS4710 or GSS4711, contact NGC M&P Engineering for appropriate, approved, UID marking methods.

3.3 UID Marking of GP or PIPC. - When UID marking of GP or PIPC is specified by V0-0203, use UID marking class CL-2 per Table I, for material, and Table III, templates TP-10, MP-7 or L-7 for format.

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3.4 Common HRI and MRI Requirements. -

3.4.1 Location. -

- (a) Markings shall be located as specified on the Engineering drawing. When the marking location is not specified on the Engineering drawing, marking shall be applied adjacent to the existing identification marking. If there is no existing marking on the item, the marking should be located, whenever practical, in an area that will allow its readability and accessibility during normal operational use.
- (b) When UID markings cannot be applied due to part size or other restrictions (i.e., insufficient space, deleterious effects, etc.) or in accordance with the approved methods within this process specification, contact NGC M&P Engineering for guidance.
- (c) When space allows, the preferred marking shall be per Figure 8a and 8b.

3.4.2 Size and Format. - Determine the required marking size and format as follows:

- (a) Human Readable Information (HRI): per Table IV
- (b) Machine Readable Information (MRI): per Table II
- (c) UID marking classes CL-2 and CL-3 Labels per Table III and as follows. Select marking format based on available marking space and the label size needed to accommodate the maximum character count for either the part number or the serial number.
 - (1) 'Standard' is the preferred format, limited to 18 characters for either the part number or serial number.
 - (2) If the part number or serial number character count is between 19 and 32, the 'Maximum' format shall be used.
 - (3) If space limitations preclude the use of the 'Standard' or 'Maximum' formats, use the 'Minimum' format consisting of MRI (2D Data Matrix) only.
 - (4) If the item cannot be marked with the aforementioned formats, packaging shall be marked using the 'Standard' format.

3.4.3 Readability and Legibility. -

- (a) MRI marking shall conform to the readability and legibility requirements specified in Table II. HRI marking shall conform to requirements specified in Mil-STD-130.
- (b) Marks, contaminations, distortions, streaks or other anomalies that are not part of the intended markings are not acceptable.

3.4.4 Durability. Only the marking materials and procedures specified herein shall be used to meet the durability requirements of MIL-STD-130.

3.4.5 Serialization. -

- (a) A serial number is an assigned designation that provides a means of distinguishing a specific item from all other like items. Items having the same part number and produced by the same enterprise shall not have the same serial number.

NOTE: Items having different part numbers may have the same serial number.

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3.4.5 (Continued) -

- (b) Each UID item shall include a serial number as part of the construction and application of UID part marking.
- (c) The serial number shall not exceed thirty (30) characters.
- (d) For each item to be marked with a UID at NGC facilities, a unique serial number shall be generated from the *Store and Query Unique Identification Database* (SQUID) for inclusion in the application of the UID part marking. Refer to applicable company procedure(s) for operation of SQUID.
- (e) Unless otherwise specified by contract, NGC sub-contractors shall ensure unique serialization of UID items in accordance with their internal procedures, MIL-STD-130 and as specified herein.
- (f) For GP or PIPC, the asset identification number, or other unique property control number normally used to track the item, shall be used (in lieu of a serial number) to construct the UII. NGC Property Management will maintain serialization assignment and ensure a globally unique UII.

3.5 MRI (2D Data Matrix) Marking Requirements. -

3.5.1 General. -

- (a) The 2D (two-dimensional) symbol shall be Data Matrix ECC200 in accordance with ISO/IEC 16022 and Table II.
- (b) Data matrix size limitations shall be in accordance with Table II.
- (c) The following minimum information content shall be provided by the MRI marking:
 - (1) Applicable Enterprise Identifier (CAGE, DUNS, etc.)
 - (2) Part or other Identifying Number (PIN)
 - (3) Unique serialization per 3.4.5
- (d) For marking of GP or PIPC, the following minimum information content shall be provided in the MRI marking:
 - (1) Applicable Enterprise Identifier (CAGE, DUNS, etc.)
 - (2) Asset identification number or other unique property control number which meets the intent of all serialization requirements per 3.4.5.
- (e) Encoded data shall be complete, correct and validated in accordance with MIL-STD-130 and the requirements specified herein.

3.5.2 Marking Format. - Data encoding for MRI shall meet the requirements of Mil-STD-130, including syntax for high capacity media per ISO/IEC 15434 and semantics per ISO/IEC 15418. See Table III for selection of marking format templates.

3.5.2.1 Marking Format for NGC Internally Marked Items. - NGC internally marked parts and assemblies, other than tooling, shall use Construct 2 per Figure 2. Tooling shall use Construct 1 per Figure 1.

3.5.2.2 Marking Format for NGC Sub-Contractors & Suppliers. - NGC sub-contractors and suppliers may use established industry standard marking protocol in compliance with MIL-STD-130.

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3.5.3 Verification. - All MRI marking shall meet the minimum acceptance criteria requirements specified in Table II for the applicable marking method.

3.5.4 Validation. - Items marked using MRI shall be validated for:

- (a) UID uniqueness (serialization)
- (b) Format
 - (1) Construct 1 or Construct 2 per MIL-STD-130
 - (2) Proper use of data identifiers
 - (3) Syntax

3.5.4.1 NGC Internally Marked Items. - Data integrity and validation shall be maintained by SQUID per 3.4.5(d).

3.5.4.2 NGC Subcontractor Marked Items. - Data integrity and validation shall be maintained by the subcontractor.

3.6 HRI Marking Requirements. - HRI letter and character requirements are specified in Table IV.

3.7 Equipment. -

3.7.1 Labeling Equipment. - Labeling equipment shall be capable of producing marking that meets the quality acceptance criteria of Table II.

3.7.2 Verification Equipment. - All verifiers shall meet ISO/IEC 15426-2 for verifier performance and be capable of verifying MRI quality acceptance criteria per Table II.

3.8 Materials. -

3.8.1 Marking Materials. - Refer to Table I.

3.8.2 Material Substitutions. - Material substitutions in accordance with GS30BF are permissible.

3.8.3 Storage. - Materials shall be stored in accordance with the applicable procurement document requirements or the manufacturer's instructions.

3.9 Procedure. -

3.9.1 Preparation of Surfaces. - Prior to marking application, surfaces shall be cleaned in accordance with GSS4200.

3.9.2 Marking Application. -

- (a) UID marking class CL-1 intrusive markings shall be applied directly to the surface of the item prior to the application of chemical treatments (i.e., passivation, chemical film, etc.).
- (b) UID marking classes CL-2 and CL-3 labels shall be applied directly to the surface of the item in the final finished condition.
- (c) UID marking classes CL-2 and CL-3 labels shall be overcoated and edge sealed per Table I.

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3.9.3 Re-Identification of Existing Items. -

NOTE: This section does not apply to GP or PIPC.

3.9.3.1 Addition of UID to Existing Non-UID Marking. -

- (a) To re-identify parts previously identified with non-UID markings (rubber stamps, placards, nameplates, etc.) that consist of the three minimum UID human readable data elements (enterprise identifier, part number & serial number), apply the UID marking per 3.2 and Figure 4 adjacent to the existing marking.

NOTE: Unique serialization must be assured per 3.4.5

- (b) When the existing permanent non-UID marking conflicts with the new marking, it shall be obliterated using the existing marking method by striking out the text with a single horizontal line. Protective finishes shall be restored in accordance with the Engineering drawing requirements. Contact NGC M&P Engineering in all cases where obliteration of an intrusive mark (Class 1) is required.

NOTE: When required by contract and/or the Engineering drawing, markings other than those required for part identification shall remain undisturbed.

- (c) If severe space limitations prevent the application of both HRI & MRI, the 2D Data Matrix alone may be applied to the item per Figure 3 and shall be located as close to the existing marking as possible and, whenever practical, in an area that will enable its readability during normal operational use.

3.9.3.2 Revising Part Number for UID Marked Item. -

- (a) When the dash number of an item, which has previously been marked with a UID marking, is changed or "rolled" (via an Engineering and/or Manufacturing change), the existing UID marking (enterprise identifier, part number, and serial number) must not be changed, removed or otherwise rendered unreadable.

- (b) Upon completion of rework or reconfiguration of an item requiring a dash number change, a supplemental identification marking, which reflects the new dash number of the part, shall be applied adjacent to the existing UID marking. This supplemental identification marking shall be referred to as the "current part number".

(1) The current part number marking shall reflect the latest configuration or dash number of the item in accordance with Figure 6 or Figure 7.

(2) When an item has previously been reworked and identified with supplemental "current part number" marking, only the existing supplemental "current part number" marking shall be replaced.

(3) The marking should be located, whenever practical, in an area that will enable its readability during normal operational use. For extreme space limitations Figure 12b may be used.

(4) Existing HRI marking shall be obliterated in accordance with 3.9.3.1(b).

(5) Existing "current part number" MRI shall be obliterated in accordance with Figure 23 by adding vertical and horizontal lines through the interrupted frame lines of the matrix finder pattern and diagonal lines crossing each other through the center of the matrix. When scanned, the obliterated symbol shall be unreadable.

(6) After re-marking, the part finish shall be reworked, as required to meet the drawing requirements.

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- (c) When space permits, the current part number marking shall consist of a human readable part number annotated with "(30P) PNR" plus the machine readable 2D Data Matrix. The marking shall be of the same type of UID marking as the original marking or existing UID marking in accordance with Table I.

3.9.4 Rework of Damaged or Unreadable Marking. -

- (a) Whenever possible, the existing UID data must be recovered and re-applied with new marking in accordance with section 3.
- (b) When the existing UID marking cannot be recovered, re-mark the part as if it were a new item (being marked for the first time) in accordance with section 3.

4 QUALITY ASSURANCE

4.1 Responsibility. - Site Quality Assurance shall ensure that all requirements of this specification have been complied with.

4.2 End Product Inspection. - Markings shall be clearly defined, legible and conform to the requirements specified herein.

4.2.1 Inspection Plan. - Site Quality Assurance shall develop an Inspection Plan using ANSI/ASQ Z1.4 as a guide. When applicable, the site Inspection Plan shall be made available to NGC, upon request.

4.2.2 MRI Marking. -

4.2.2.1 Verification. -

- (a) MRI marking shall be verified in accordance with 3.5.3 and Table II.
- (b) NGC sub-contractors shall submit data to substantiate the verification of the marked item(s) via a NGC approved, industry standard for electronic data transfer as specified by NGC Procurement.

4.2.2.2 Other. - MRI marking shall be inspected to verify conformance to the following minimum requirements:

- (a) Correct UID marking class per 3.2 or 3.3
- (b) General MRI requirements per 3.5.1
- (c) Location per 3.4.1
- (d) Size, method and format per 3.4.2 and 3.5.2
- (e) Readability and Legibility per 3.4.3
- (f) Serialization per 3.4.5
- (g) Validation per 3.5.4

4.2.3 HRI Marking. - HRI marking shall be inspected in accordance with Table IV.

4.3 Non-Conforming Marking. - UID marking which does not meet the requirements specified herein shall be rejected and dispositioned in accordance with contract requirements.

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5 NOTES

- 5.1 Health, Safety, Environmental. - This specification does not purport to address the health, safety or environmental concerns, if any, associated with its use. Prior to use, it is the responsibility of the user of this specification to determine and establish appropriate health, safety and environmental practices in accordance with the applicable Government, state, local and site regulations.
- 5.2 Department Names. - Recognition shall be given to the fact that each site or functional area may have departments or individuals whose names differ from those noted in this specification, but whose duties and responsibilities are essentially the same. The requirements specified herein apply equally to these departments or individuals.
- 5.3 Changes From Previous Issue. - The margins of this specification are marked with revision bars (marginal indicia) to indicate where changes from the previous issue were made. This has been done as a convenience only and NGC assumes no liability whatsoever for any inaccuracies in these notations, or misinterpretations thereof. Users of this specification are cautioned to evaluate the requirements of this document based on the entire content, irrespective of the marginal notations and their relationship to the previous issue.
- 5.4 Definitions. -
- 5.4.1 Equipment. - A tangible article of personal property that is complete in-and-of-itself, durable, nonexpendable, and needed for the performance of a contract. Equipment generally has an expected life of one year or more, and does not ordinarily lose its identity or become a component part of another article when put into use.
- 5.4.2 Government Property (GP). - All real and personal property owned or leased by the Government, regardless of whether the property is located at a Government or contractor facility.
NOTE: Leased property refers to either operational lease or capital lease.
- 5.4.3 Material. - Property that may be consumed or expended during the performance of a contract, component parts of a higher assembly or items that lose their individual identity through incorporation into an end-item. Material does not include plant equipment, special tooling, special test equipment or agency peculiar property (APP).
- 5.4.4 Processor. - Organizations to which the requirements of this specification apply. Includes, but is not limited to, sub-contractors, processors, special processors, etc.
- 5.4.5 Property In the Possession of Contractors (PIPC). - Tangible, personal property to which the Government has title and which is in the stewardship, possession or controlled by the contractor for performance of a contract. PIPC consists of both tangible Government Property (GP) and Contract Acquired Property (CAP) including plant equipment, special tooling, special test equipment and agency peculiar property (APP).
- 5.4.6 Purchaser. - The organization that procures items processed to the requirements specified herein; may be NGC or an NGC approved sub-contractor / supplier.
- 5.4.7 Site. - Facility performing the process specified herein.
- 5.4.8 Validation. - Confirmation of the accuracy of data, as it applies to data integrity.
- 5.4.9 Verification. - The objective assessment of the quality of UID symbols using industry standards.

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TABLE I - SELECTION OF UID METHODS WHEN GSS4710 OR GSS4711 IS SPECIFIED ON THE ENGINEERING DRAWING

UID Marking Class	GSS4710 Marking Class	GSS4711 Marking Class	UID Marking Method	Material System	UID Marking Process	Overcoat or Sealant
CL-1	Class 1A & 1B	N/A	Dot Peen	N/A	Dot Peen <u>4/</u>	N/A
	Class 1C	N/A	Electrochemical Etch	N/A	Electrochemical Etch per GSS4706	N/A
CL-2	All Class 2 (Except Class 2D)	All Classes (Except Class 2D)	Printed Polyvinylfluoride (PVF) Label	NGM802AE or GM802AD Label with GC144NJ1A Ribbon	Thermal Printing	GN11AC Type 12 or Type 13 <u>3/</u>
CL-3	Class 2D	Class 2D	Metal Foil Label	MIL-DTL-15024, Type G	Metal Photo or Electrochemical Etch <u>1/</u>	AMS3276 <u>2/</u>

1/ Anodized aluminum with electrochemical etch or Type 'L' (per MIL-DTL-15024) laser convert only. The laser conversion process may not exceed a depth of 0.0002 inch.

2/ No overcoat required. Edge seal perimeter to a dimension of 0.06 +/- 0.03 inch using GM41073B0, GC115DU01 or any qualified AMS3276, Class A or AMS-S-8802, Class A sealant.

3/ For marked containers (Class 2E per GSS4710 or GSS4711), overcoating and edge sealing of labels is not required.

4/ Contact NGC M&P Engineering for dot-peening procedures

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TABLE II - DATA MATRIX (MRI) MARKING REQUIREMENTS

UID Marking Class	UID Marking Process	Specification & Verifier Grade, Minimum	Mark Dimension, Maximum (inch)	Dot or Module Size (inch)	Reported Verification Information ISO/IEC 15415 ONLY	Reported Verification Information AS9132 ONLY
CL-1	Dot Peen	AS9132 / PASS OR ISO/IEC 15415 / B <u>1/ 2/</u>	<1.000	<u>3</u> 0.0075 to 0.0250	Final Grade, Illumination Wavelength and Angle, Aperture Size	Pass
	Electrochemical Etch					
CL-2	Thermal Printed Label	ISO/IEC 15415 / B <u>1/ 2/</u>				
	Direct Inkjet	AS9132 / PASS OR ISO/IEC 15415 / B <u>1/ 2/</u>				
CL-3	Placard, Metal Photo	ISO/IEC 15415 / B <u>1/ 2/</u>				
	Placard, Electrochemical Etch					

- 1/** Unless otherwise specified in the contract or order, the symbol shall have a minimum print quality of grade 3.0/05/660 when measured with an aperture size of 0.005 inch (0.127 mm) and a light source wave length of 660 nm +/- 10 nm
- 2/** As an exception, the ISO/IEC 15415 parameters Modulation (MOD), Symbol Contrast (SC) or both may measure as low as 2.0, providing the overall ISO/IEC 15415 grade would be 3.0 if the MOD and SC grades are 3.0 or higher
- 3/** Although Mil-STD-130 permits a minimum module size as low as 0.0075 inches, a Data Matrix module size of no less than 0.012 inches is recommend to avoid verification failures of polyvinylfluoride (PVF) label media (e.g., GM802AD and NGM802AE)

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TABLE III - FORMAT TEMPLATE GUIDE

Marking Method	Format Template # <u>3/</u>	Format	Figure #	Construct #	Foot Print (inches)	Linear HRI Character Count <u>1/</u>	Material
Thermal Print	TP-1	Standard	4, 8a	2	2.0 x 0.6	<19	NGM802AE2 or GM802AD300T9
	TP-2	Minimum	3, 12a		0.5 x 0.5	N/A	NGM802AE1
	TP-3	Maximum	5		3.0 x 0.6	≥19	NGM802AE3 or GM802AD300T9
	TP-4	Standard, Current P/N	6, 8b	Current P/N	2.0 x 0.6	<19	NGM802AE2 or GM802AD300T9
	TP-5	Minimum, Current P/N	12b		0.5 x 0.5	N/A	NGM802AE1
	TP-6	Maximum, Current P/N	7, 9b		3.0 x 0.6	≥19	NGM802AE3 or GM802AD300T9
	TP-7	Standard	10	1	2.0 x 0.6	<19	NGM802AE2 or GM802AD300T9
	TP-8	Minimum	3		0.5 x 0.5	N/A	NGM802AE1
	TP-9	Maximum	9a		3.0 x 0.6	≥19	NGM802AE3 or GM802AD300T9
	TP-10	Bethpage PIPC	11		1 With Current P/N	3.0 x 1.0	≥19
Metal Photo	MP-1	Standard	14, 18a	2	2.0 x 0.6	<19	MIL-DTL-15024, Type H or GG-P-455, Type I, Class 1, Grade A
	MP-2	Minimum	13, 22a		0.5 x 0.5	N/A	
	MP-3	Maximum	15		3.0 x 0.6	≥19	
	MP-4	Standard, Current P/N	16, 18b	Current P/N	2.0 x 0.6	<19	
	MP-5	Minimum, Current P/N	22b		0.5 x 0.5	N/A	
	MP-6	Maximum, Current P/N	17, 19b		3.0 x 0.6	≥19	
	MP-7	Bethpage PIPC	21	1 With Current P/N	3.0 x 1.0	≥19	
CO ₂ Laser	L-1	Standard	14, 18a	2	2.0 x 0.6	<19	MIL-DTL-15024, Type L, Style III <u>2/</u>
	L-2	Minimum	13, 22a		0.5 x 0.5	N/A	
	L-3	Maximum	15		3.0 x 0.6	≥19	
	L-4	Standard, Current P/N	16, 18b	Current P/N	2.0 x 0.6	<19	
	L-5	Minimum, Current P/N	22b		0.5 x 0.5	N/A	
	L-6	Maximum, Current P/N	17, 19b		3.0 x 0.6	≥19	
	L-7	Bethpage PIPC	21	1 With Current P/N	3.0 x 1.0	≥19	

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- 1/** Linear HRI Character Count is the maximum number of characters allowed in a single part number, serial number or CAGE code. Spaces, punctuation and alpha-numeric characters are to be included in the Linear HRI Character Count.
- 2/** 0.020 inch thick, 1100 aluminum alloy per AMS-QQ-A-250/1 or ASTM B209; Anodize per MIL-A-8625, Type II, Class 2, black (color #37038 per FED-STD-595); adhesive per MIL-P-19834, Type I.
- 3/** Internal NGC sites shall access format templates through SQUID. NGC sub-contractors and suppliers may access SQUEST for approved templates.

TABLE IV - HRI CHARACTER REQUIREMENTS

Character	Character Type	Character Height, Minimum (Inches)	Character Height (Points)	Font	Line Spacing
Letter	English, Capitals	0.1	7	Arial	Single Carriage Return
Numeral	Arabic	0.1	7	Arial	Single Carriage Return

TABLE V- ENTERPRISE IDENTIFIER CODES

Enterprise Identifier (CAGE)	Entity
0TFN5	NORTHROP GRUMMAN AEROSPACE CORP OPNS DIV – LAKE CHARLES, LA
61174	NORTHROP GRUMMAN CORP – SAINT AUGUSTINE, FL
70974	NORTHROP GRUMMAN SYSTEMS CORPORATION, DIV INTEGRATED SYSTEMS – MELBOURNE, FL
26512	NORTHROP GRUMMAN SYSTEMS CORPORATION – BETHPAGE, NY
As Applicable	Northrop Grumman Sub-Contractors

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Construct #1

$[D]>^R_s 06^G_s 18S 70974 012345^R_s E_{OT}$

1	2	3	4	5	6	7	8
[D]>	^R _S	06	^G _S	18S	70974	012345	^R _S ^E _{OT}

1. [D]> , Compliance Indicator
2. ^R_S , Record Separator, ASCII Character
3. Format Type
4. ^G_S , Group Separator, ASCII Character to be used between data fields
5. 18S , Unique Identification (not including IAC) Data Identifier
6. Unique Identification consisting of CAGE Code + Serial Number (Maximum of thirty (30) characters)
7. ^R_S , Record Separator, ASCII Character
8. ^E_{OT} , End of Transmission, ASCII Character

Figure 1 - Data Matrix Encoded UID Sample - Construct #1

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SPECIFICATION

No. **NGSS4712A**

Construct #2

$[D]>^R_s 06^G_s 17V 70974^G_s 1P 1128ABM61009-101^G_s S 012345^R_s E_{OT}$

1	2	3	4	5	6	7	8	9	10	11	12	13	14
[D]>	^{R_s}	06	^{G_s}	17V	70974	^{G_s}	1P	1128ABM61009-101	^{G_s}	S	012345	^{R_s}	^{E_{OT}}

1. [D]> , Compliance Indicator
2. ^{R_s}, Record Separator, ASCII Character
3. Format Type
4. ^{G_s}, Group Separator, ASCII Character to be used between data fields
5. 17V, CAGE Code Data Identifier
6. CAGE Code – See Table V (Maximum of thirteen (13) characters)
7. ^{G_s}, Group Separator, ASCII Character to be used between data fields
8. 1P, Part Number Data Identifier ASCII Character
9. Part Number [Maximum of thirty-two (32) characters]
10. ^{G_s}, Group Separator, ASCII Character to be used between data fields
11. S, Serial Number Data Identifier
12. Serial Number [Maximum of thirty (30) characters]
13. ^{R_s}, Record Separator, ASCII Character
14. ^{E_{OT}}, End of Transmission, ASCII Character

Figure 2 - Data Matrix Encoded UID Sample - Construct #2

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Figure 3

(17V) CAGE 70974
(1P) PNO 1128ABM61009-101
(S) SN 012345



Figure 4

(17V) CAGE 70974
(1P) PNO 1128ABM61009-101
(S) SN 012345



Figure 5



(30P) PNR 1128ABM61009-101

Figure 6



(30P) PNR 1128ABM61009-101

Figure 7

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No. **NGSS4712A**



Figure 8a (top)
Figure 8b (bottom)

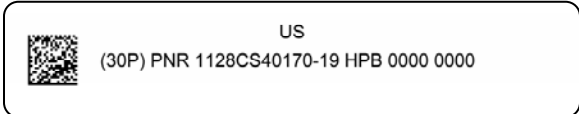


Figure 9a (top)
Figure 9b (bottom)



Figure 10

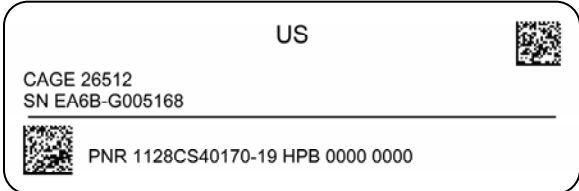


Figure 11

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SPECIFICATION

No. **NGSS4712A**



Figure 12a (top)
Figure 12b (bottom)



Figure 13

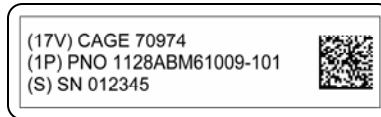


Figure 14



Figure 15

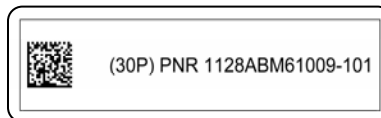


Figure 16

NORTHROP GRUMMAN SYSTEMS CORPORATION

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SPECIFICATION

No. **NGSS4712A**

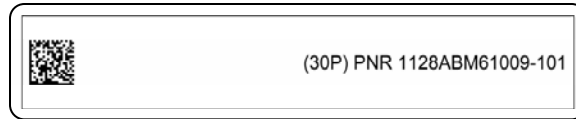


Figure 17

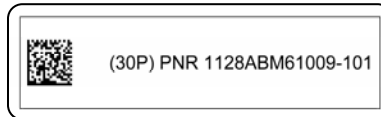
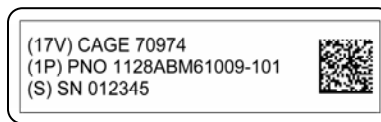


Figure 18a (top)
Figure 18b (bottom)



Figure 19a (top)
Figure 19b (bottom)

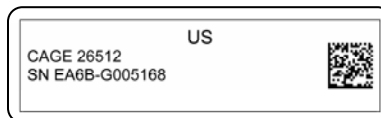


Figure 20

NORTHROP GRUMMAN SYSTEMS CORPORATION

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SPECIFICATION

No. **NGSS4712A**

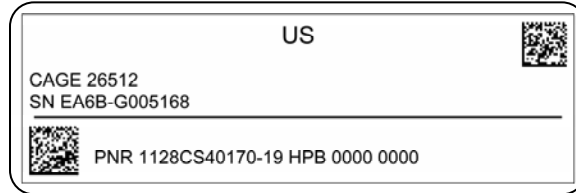


Figure 21



Figure 22a (top)
Figure 22b (bottom)

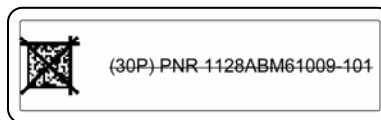


Figure 23