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MIL-STD-13231
w/CHANGE 1
18 November 2013
SUPERSEDING
MIL-STD-13231
2 November 1999

DEPARTMENT OF DEFENSE
STANDARD PRACTICE

MARKING OF
ELECTRONIC ITEMS

AMSC N/A

FSC MISC

FOREWARD

1. This standard is approved for use by all Departments and Agencies of the Department of Defense.

2. This standard provides uniform marking requirements for electronic items.

3. Comments, suggestions, or questions on this document should be addressed to Commander, DLA Land and Maritime, ATTN: VAI, P.O. Box 3990, Columbus, Ohio, 43218-3990 or emailed to Sound@dscc.dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.dla.mil.

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1. SCOPE

1.1 Scope. This standard covers the general requirements for marking of electronic items, except marking for shipment and as otherwise specified by an applicable Government document covering the item on which the marking appears. These requirements cover both the information to be shown by the marking and the materials and processes used therefor. This standard should be implemented by incorporating suitable requirements directly in acquisition documents.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, and 5 of this standard. This section does not include documents cited in other sections of this standard or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, and 5 of this standard, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

FEDERAL SPECIFICATION

L-P-535 - Plastic Sheet (Sheeting): Plastic Strip Poly (Vinyl Chloride) and Poly (Vinyl Chloride-Vinyl Acetate), Rigid.

COMMERCIAL ITEM DESCRIPTIONS

A-A-208 - Ink, Marking, Stencil, Opaque (Porous and Non-Porous Surfaces).
A-A-56032 - Ink, Marking, Epoxy Base

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-DTL-14072 - Finishes for Ground Based Electronic Equipment
MIL-DTL-19834 - Plate, Identification, Metal foil, Adhesive Backed
MIL-I-24092 - Insulating Varnishes and Solventless Resins for Application by the Dip Process
MIL-PRF-31032 - Printed Circuit Board / Printed Wiring Board, General Specification for

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-129 - Military Marking.
MIL-STD-130 - Identification Marking of U.S. Military Property
MIL-STD-196 - Joint Electronics Type Designation System (JETDS)
MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts
MIL-STD-810 - Environmental Engineering Considerations and Laboratory Tests
MIL-STD-1285 - Marking of Electrical and Electronic Parts
MIL-STD-1464 - Army Nomenclature System

(Copies of these documents are available online at http://quicksearch.dla.mil or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issue are those cited in the solicitation.

H4/H8 Section A - Commercial and Government entity (CAGE) (Name to Code).

(Cataloging Handbook H4/H8 is available online at http://www.dlis.dla.mil/hseries.asp, email dlacontactcenter@dla.mil, or contact Commander, Defense Logistics Service Center, ATTN: DLSC-WP, Federal Center, Battle Creek, MI 49037-3084.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents are those cited in the solicitation or contract.

ASME INTERNATIONAL

ASME Y14.44 - Reference Designations for Electrical and Electronics Parts and Equipment

(Copies of this document are available online at http://www.asme.org or from the ASME International, Three Park Avenue, New York, NY 10016-5990.)

ASTM INTERNATIONAL

ASTM D295 - Varnished Cotton Fabrics Used for Electrical Insulation, Standard Test Methods for

ASTM D709 - Laminated Thermosetting Materials R(1997), Standard Specification for

ASTM D3955 - Electrical Insulating Varnishes, Standard Specification for

(Copies of these documents are available online at http://www.astm.org or from the ASTM International, P.O. Box C700, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

MASTER PAINTERS INSTITUTE (MPI)

MPI #94 - Exterior Alkyd, Semi-Gloss, MPI Gloss Level 5,

(Paint information is available online at http://www.paintinfo.com or from the Master Painter Institute, 2800 Ingleton Ave. Burnaby, B. C. Canada V5C 6G7, • info@paintinfo.com, 1-888-674-8937. Contact information for approved manufacturers can be found at this link: http://www.specifypaint.com/APL/paintinfo_APL/manuf.asp.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.
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3. DEFINITIONS

3.1 Assemblies. A number of parts or subassemblies or any combination thereof joined together to perform a specific function and capable of disassembly. See 6.8 for more information.

3.2 Commercial and Government Entity (CAGE). The five-position alpha numeric number assigned to manufacturing and non-Manufacturing organizations that design or manufacture-assemble an item of supply acquired and catalogued by DoD agencies, as specified in Cataloging Handbook H4/H8).

3.3 Commercial off the shelf (COTS) products (also referred to as commercial products). Products in regular production sold in substantial quantities to the general public or industry at established market or catalog prices.

3.4 Container. A container shall be understood as a case or bag conforming to either of the following descriptions:

a. The container is furnished as one item of an article of equipment, for the purpose of holding and transporting the remaining parts and assemblies thereof. Example: Case forming part of and containing a set of tools or crystal units.
b. The container is furnished as a separate article of equipment, and is used to hold and transport one or more other articles of equipment. All of the articles, including the container, are units of a set.

3.5 Decalcomania. The process of transferring pictures or designs printed on specially prepared paper to materials such as glass or metal.

3.6 Design activity. A design activity is the activity having responsibility for the design of an item. It may be a Government activity, contractor, vendor, or other.

3.7 Document. Documents are the specifications, drawings, lists, standards, pamphlets, reports, or other information (printed or typewritten) relating to the design, acquisition, manufacture, test, or inspection of items under the contract.

3.8 Functional marking. The symbols, letters, numbers, and similar marking applied to indicate polarity, circuitry, and similar functional characteristics.

3.9 Joint electronics type designation systems. DoD names and type numbers in accordance with MIL-STD-196.

3.10 Manufacturer. A manufacturer is the person or firm who owns or leases and operates a factory or establishment that produces (on the premises) materials, supplies, articles, or equipment required under the contract (or for the general character described by the specifications, standards, and publications).

3.11 Manufacturer's identification. The actual manufacturer's name, CAGE (see 3.2), or NSCM (see 3.12) that identifies the place of manufacture (as specified in Cataloging Handbook H4/H8).

3.12 NATO supply code for manufacturers (NSCM). The five position alpha numeric code that is assigned to an organization entity, located in a country other than the United States or Canada, that maintains design control or is a source of supply for items acquired by agencies of the Federal Government, NATO member nations, and other participating friendly Governments (as specified in Cataloging Handbook H4/H8).

3.13 Nomenclature. Nomenclature, as defined in MIL-STD-130, is further understood as follows:

a. Commercial off the shelf (COTS) products that are normally marked by the manufacturer with nomenclature that deviates from the approved item name may be marked with the manufacturer's nomenclature, if substitution of the approved item name would be impracticable.
b. Government name and type number, which is described in 4.2.1 and 4.2.2, shall be used exactly as designated by the contracting officer and regardless of other considerations.

3.14 Order of precedence. Order of precedence is the priority for selecting markings, when minimum marking is specified.

3.15 Part or Identifying Number (PIN). The number used to identify an item. It is assigned by the design activity whose engineering drawings, specifications, standards, and inspection requirements control the design of the item. It may be a specification, drawing, part, model, type, or catalog number depending on the numbering system of the design activity.

3.16 Procurement instrument identification number (PIIN). These numbers are in the form "DAAB05-69-C0123", where the first six positions (DAAB05) identify the purchasing office. The next two positions (69) show the fiscal year, in which the number was assigned. The next position (C) indicates the type of procurement instrument code. The last four (0123) represent a serial number.

3.17 Sets. Units and necessary assemblies, subassemblies and parts connected together or used in association to perform an operational function. See 6.8 for more information.

3.18 Selected item drawing. Tightened or redefined acceptance criteria, such as selection for fit, reliability requirements, or limits within the capability range of existing items such as that depicted on an existing drawing, specification, or standard, will be delineated on a selected item drawing.

3.19 Sequence of markings. The order for specifying the physical location of markings selected in accordance with the order of precedence.

3.20 Units. A unit is an assembly or any combination of parts, subassemblies and assemblies mounted together, normally capable of independent operation in a variety of situations. See 6.8 for more information.

4. GENERAL REQUIREMENTS

4.1 General. Functional and part identification marking shall be applied in the location specified in the acquisition document. Where size, surface condition, or other design considerations will not allow marking, the acquisition document shall specify the method of application (unit package, tag, or label), and the exact marking requirements. Special marking (caution warnings, radioactive) also shall be as specified in the acquisition document. Identification and marking requirements shall be in accordance with sections 4 and 5 of this standard and the peculiarities as included in the acquisition document. In the event of conflict between this standard and an acquisition document, the acquisition document shall govern.

4.2 Nomenclature. Nomenclature is defined in MIL-STD-130. (see 3.13)

4.2.1 Government names and type numbers.

4.2.1.1 Joint electronics type designation systems. DoD names and type numbers, in accordance with MIL-STD-196, are in the following form: Radio Set AN/GRC-9C, Receiver-Transmitter RT-77/GRC-9, Vibrator Power Unit PE-237-GG, Generator GN-38. Tentative type numbers, which incorporate blank parentheses, are used in government procurement data, when the exact design is likely to vary from one procurement to another; for example: Vibrator Power Unit PE-237( ), Radio Set AN/GRC-9( ), Receiver-Transmitter ART-77( ) / GRC-9. The contractor shall replace tentative type numbers with final type numbers, assigned by the contracting officer.

4.2.1.2 Army nomenclature systems. Examples of Army nomenclature systems in accordance with MIL-STD-1464 are: Power Unit M7A1; Cartridge, Delay: XM280; Tank, Combat, Full Tracked: M1.

4.2.2 Identifying number. The identifying number shall be in accordance with MIL-STD-130.

4.2.3 Procurement instrument identification number. The procurement instrument identification number (PIIN) is the contract number. (see 3.16)

4.2.4 Inspector's stamp. Space for the inspector's stamp is not desired.

4.2.5 Special characteristics. The following special characteristics are listed as a guide:

VOLTAGE: _____VOLTS AC; _____ VOLTS DC; _____ VAC; _____VDC.

CURRENT: _____AMP; _____A; _____MA.

FREQUENCY OF POWER: _____HZ; _____HERTZ; _____~

PHASE OF POWER (if more than one phase): 2-PHASE; 3-PHASE.

POWER: _____WATTS; _____W; _____MW; _____HP.

SPEED (rotating machinery): _____RPM; _____RPS.

FREQUENCY, RADIO (frequency generators, tuning units): _____HZ; _____KHZ; _____MHZ.

IMPEDANCE, CHARACTERISTIC (transmission lines, wires): _____ohms; _____Ω

4.2.6 Contractor and Government Entity (CAGE) code. The CAGE Code (previously known as "Federal Supply Code for Manufacturers"), used for identification of sources, shall conform to H4/H8 – Commercial and Government Entity Cataloging Handbook.

4.3 Identification to be marked on equipment. All items of equipment subject to the requirements of this standard practice, including parts, assemblies, subassemblies, modules, units, groups, sets, systems, etc., shall be marked for identification. The primary purpose of such identification is to assist field personnel in logistic supply and maintenance functions, rather than to provide technical, manufacturing or assembly data. Such identification marking shall be in accordance with MIL-STD-130, except as modified herein. Marking shall include the information in table I, on a space available basis. Omission of any of this information shall be in accordance with the priority sequence shown in table I.

4.3.1 Exceptions to table I. There are certain usage or caution markings, which pre-empt the priorities of table I, e.g., high voltage, radioactive, electrostatic or electromagnetic sensitivity, polarity markings, etc. These markings have unique priority and take precedence above all others.

4.3.2 Uniquely small items. It is understood that certain items are physically too small for identification marking, e.g., glass diodes, composition resistors, etc. Table I would allow for such reasonable exceptions, as the polarity dot on the diode and color code banding on a resistor.

4.3.3 Limited use / multiple use. Table I, priority sequence 3, for assemblies, "End Item Application (part of)" is intended for limited use items (1 or 2 end-item applications only). Where a part or assembly has application in multiple use situations, "end item application" marking requirement does not apply. Where a question arises, obtain clarification from the procuring activity.

TABLE I. Priority of identification information on parts and assemblies.

Type /nomenclature status	Marking & priority
Parts 1/	
Standard Parts, QPL Parts, Mil Spec Parts, Parts in 59XX Federal Material Group and similar parts for which there are established standard marking requirements.	Refer to MIL-STD-1285.
Non Standard Parts; Identified by Source Control Drawings, Selected items, and Altered items.	Refer to MIL-STD-1285.
Specification Control Drawings	Refer to MIL-STD-1285.
Commercial Off-the-Shelf Parts (not specified by source or specification control drawings)	Refer to MIL-STD-1285.
Assemblies, sub-assemblies, and modules 1/	
All assemblies, sub-assemblies, modules, printed wiring board assemblies, line replaceable units, etc.	1. NSN 2. Serial Number 3. Prime Manufacturer's CAGE Code (Include Part No., if applicable) 4. Design Activity CAGE Code/Assembly and Drawing No. or Part No. 5. End Item Application ("Part of") see 4.3.3 6. Contract No. and Lot No./Date Code 7. Reference designation 8. Special Characteristics (see 4.2.5)
Units, groups, sets, and systems 1/	
JETDS Nomenclature assigned	1. NSN (material number, MN) 2. Serial Number 3. Prime Manufacturer's CAGE Code (Include Part No., if applicable) 4. Nomenclature (item name and type designation 5. Design Activity CAGE Code and Part Number 6. Contract Number 7. Military Service, e.g. "US Army" 8. Special Characteristics (see 4.2.5)
Commercial, Off-the-Shelf Equipment, No Military Nomenclature assigned	Prime Manufacturer's Name, LOGO or Trademark, (CAGE Code desirable) Manufacturer's Noun Name for devise Model No. and Serial No. Special Characteristics/Specifications Data Contract Number

1/ Identification requirements cited on the applicable Product Drawing takes precedence over all marking priorities specified. For lack of specific drawing requirements, items shall be marked in accordance with table I.

4.3.4 Specific item identification. On a “where applicable” and “space available” basis, identity of contract number and a lot number, date code, or serial number shall be marked on the item. If a serial number is required elsewhere by the contract for the item in question, apply the same; if not, unless precluded by space availability, apply date code or lot number, not all three.

4.3.5 Use of unit pack/bag and tag. When verified by the procuring activity that physical space is not available on the item to be identified, the unit pack identification marking of MIL-STD-129 shall be used.

4.4 Reference designations, government type numbers, and designators for parts assemblies.

4.4.1 Reference designations. Reference designations marking and marking processes shall conform to ASME Y14.44 and shall be marked on items, as specified therein.

4.4.1.1 Reprocurements. When the item on contract has been procured previously in quantity (not on a development contract), the reference designations used on the previous procurement shall be used on the current contract. Corresponding items shall be assigned the same reference designations as those used on the previous procurement (see 6.6). In case of doubt as to whether the current contract is a Reprocurement, the contracting officer shall be consulted. When deviation is made from a previous procurement, new or substitute items shall be assigned reference designations conforming in general to the previous system.

5. DETAILED REQUIREMENTS

5.1 Type numbers and type designation..

5.1.1 Electron tubes. The type designation or type number of these parts shall be marked adjacent to their sockets. When space is not available for marking the required type designation or type number, a suitable label showing location of these parts shall be mounted inside the unit where it will be readily visible, when viewing the tubes.

5.1.2 Electrical / electronic parts and printed wiring boards. Electrical / electronic parts and printed wiring boards shall be marked in accordance with MIL-STD-1285 and MIL-PRF-31032.

5.1.3 Nameplate data for articles of equipment. Articles of equipment shall be marked with nameplate data conforming to MIL-STD-130, figure 1, except as otherwise specified herein, regardless of whether the data is applied directly to a surface of the article or by means of an attached label. Marking of ‘additional information’, as described in MIL-STD-130, shall not be included unless specifically called for.

5.2 Special requirements for marking of containers.

5.2.1 Identification of set, article of equipment, or contents. The legend shall be the Government type number and, where space permits, the Government name of the item; or, when Government name and type number have not been assigned, the legend shall be the nomenclature and, where space permits, the part number. The legend shall identify one of the following, as applicable:

a. The set, when the container is part of and contains all other units, assemblies, and parts of the set.
b. The unit, when such consists of the container and its contents (see 3.4a).
c. The major units inside the container (3.4b).

The legend shall be located on the exterior of the container, as follows: For cases, on the top and front in the most prominent spaces available; for bags, in prominent locations that will be visible when the bag (with contents) is stored (see 5.6.1).

5.2.2 Identification of container only. Identification marking of the container shall be as specified by other paragraphs of this standard practice. However, location of the marking shall be as follows:

a. For cases, the marking shall be placed on an interior surface of the lid or cover. When the lid or cover is detachable, the marking shall in addition be placed on an interior surface of the case itself.
b. For bags, the marking shall be placed on an interior surface that is readily visible when the bag is opened; however, if such location is not available, the marking shall be placed on the exterior of the bag but shall be smaller and in a less prominent place than the legend specified in 5.2.1

5.3 Special markings on articles of equipment. Units shall be marked with the following information, as applicable (see 3.20).

5.3.1 Marking battery circuits. Units designed to operate from internal batteries shall be marked with the following, in a convenient form for use by operating and maintenance personnel:

a. Battery type numbers.
b. Battery location and position.
c. Polarity.
d. Nominal voltage.
e. Interconnection between batteries, if two or more are used.
f. Minimum acceptable voltage for equipment operation.

The markings shall be applied on or adjacent to the battery compartment or holder, and on or adjacent to terminals, connectors, contacts, removable leads, etc., that are part of the battery circuit, but not on the battery itself. When necessary to provide such information in convenient form, a block or pictorial wiring diagram of the battery circuit and batteries shall be provided instead of, or in addition to the markings, and shall be located on or as close as practicable to the battery compartment.

5.3.1.1 Warning label. Battery-powered equipment, with the exception of equipment requiring permanent battery installation, shall be labeled externally as follows:

WARNING
REMOVE BATTERIES BEFORE
SHIPMENT OR INACTIVE STORAGE
OF 30 DAYS OR MORE

Examples of equipment requiring permanent battery installation are sonobuoys, missiles, and fuses.

5.3.2 High voltage notice. When an AC or DC voltage of 500 volts or more (nominal value) is exposed, including exposure by opening or removal of an access door or cover, the following notice shall be marked on the article of equipment:

DANGER-HIGH VOLTAGE_____VOLTS

The notice shall be prominently located on, or adjacent to, the exposed circuits, or on the access door or cover. The legend shall be marked in white or aluminum letters not less than 0.375 inch (9.52 mm) high, on a red background.

5.3.3 Radioactive material. Items containing radioactive material shall be marked in accordance with MIL-STD-129.

5.3.4 Non-ionizing radiation. Items producing radio frequency or microwave radiation shall be marked in accordance with MIL-STD-129.

5.3.5 Technical literature caution notice. Each unit that has operating controls shall be provided with a technical literature caution notice. The notice shall be provided on the operating panel or in a prominent place, when there is no operating panel. The notice may be combined with the name plate data, as shown on figure 1; or may be separate, as shown on figure 2.

NOMENCLATURE
SERIAL NO.
MANUFACTURER'S IDENT.
ORDER NO.

CAUTION: READ INSTRUCTIONS
PACKED WITH EQUIPMENT, BEFORE USING

FIGURE 1. Name and caution plate (example of legend).

CAUTION

READ INSTRUCTIONS PACKED
WITH EQUIPMENT BEFORE USING

FIGURE 2. Caution plate.

5.3.6 Schematic, wiring, and cable diagram. When these are provided, they shall be in the form of labels or direct marking on a suitable surface of the item.

5.3.7 Chassis identification. The chassis of each unit shall be marked with the order number and the manufacturer's name, trademark or code symbol, using a group I process listed in table II. The marking shall be located where it will be readily visible, when the chassis is removed for maintenance. The serial number, when used, shall be marked next to the above marking. This may be done after manufacture of the unit is completed, by means of a group I, table II process or by use of an electric etching tool. (Chassis identification shall be in addition to nameplate data specified by 5.1.3).

5.3.8 Modification work-order number. A modification work-order (MWO) plate shall be mounted on the exterior of each unit. The plate shall be one of the types specified in 5.8.2a through 5.8.2d, and shall be 3.5 inches (88.9 mm) long by 3 inches (76.2 mm) high. When suitable is not available, however, for a plate of this size, the contracting officer shall be consulted regarding use of a smaller plate or, in extreme cases, omission of the plate entirely. The plate shall have a matte finish suitable for mounting an adhesive-backed, aluminum foil label thereon. The legend "MODIFICATION WORK ORDER" shall be marked across the top of the plate, in letters approximately 0.125 inch (3.17 mm) high. The MWO plate may be combined with a plate used for marking of nameplate data.

5.3.9 Sensitive electronic devices. Sensitive electronic devices [i.e. those devices sensitive to electrostatic discharge (ESD)] shall be marked as specified in MIL-STD-130.

5.4 Location of marking.

5.4.1 General. Reference designations shall be located as specified in ASME Y14.44. Other marking shall be located as specified in MIL-STD-130 and this standard practice. If physical or other limitations are evident, making it impracticable to locate marking as specified, the contracting officer shall authorize deviation.

5.4.2 Type number and type designations. Marking of the type numbers and type designations specified in 5.1 shall be so located that they are readily visible, with a minimum removal of cabinets, covers, shields, adjacent parts and assemblies.

5.5 Marking processes. Marking of required information shall be applied directly to the surface of the item or by a label or wrap-around tag, using one of the processes specified in table II. Marking processes used for reference designations shall be as specified in ASME Y14.44. Marking shall remain legible following completion of all inspections specified in the acquisition document for the normal life expectancy of the part. (see 5.11)

5.6 Marking on wood surfaces.

5.6.1 Exterior wood containers. The legend specified in 5.2.1 shall be applied by branding, prior to painting of the surface concerned.

5.6.2 Other wood surfaces. Marking on other wood surfaces shall be applied by branding, prior to painting of the surface concerned, or by plastic or metal labels, except that aluminum foil labels shall not be used.

5.6.3 Branding. Depth of branding in solid wood shall be 0.0625 inch (1.59 mm) and in plywood shall be two-thirds of the nominal thickness of the surface ply. In either instance, the tolerance shall be ± 0.0156 inch (0.40 mm). Minimum height of characters (letters, figures, etc.), for the legend specified in 5.2.1, shall be 0.75 inch (19.0 mm) and for other branding shall be 0.375 inch (9.52 mm).

5.7 Size and form of characters. Characters used for reference designations shall be as specified in ASME Y14.44. Letters, numbers and other characters used for other marking shall be as specified in MIL-STD-130. They shall be of such size as to promote maximum legibility under adverse conditions and, in any case, shall be at least 0.047 inch (1.19 mm) high.

5.8 Labels. Labels shall conform to the following:

5.8.1 Border. Borders are not required on labels used for reference designations. Where space permits, labels used for other marking shall have a border on each edge, of not less than 0.125 inch (3.17 mm).

5.8.2 Material and process (see 6.9). Material and process for labels shall conform to categories (a) through (g) below. Only categories (a), (b) and (c) shall be employed for surfaces exposed to abrasion or the weather during use, maintenance, installation or operational adjustment of units; however, categories (d) and (e) may be so employed, when permitted by foot note 2/ of table II. In no case shall categories (d) through (g) be used for nameplate data.

a. Plated steel, corrosion resistant steel, aluminum, brass or copper, finished in accordance with MIL-DTL-14072.

b. Laminated thermosetting plastic, conforming to ASTM D709. Marking on external surfaces of such labels shall be confined to direct etching, die stamping, or engraving, and except for type NDP (for engraving) material, the surface marking shall be filled with white enamel.

c. Photographically printed or photo etched aluminum plate, with a thickness of not less than 0.020 inch (0.51 mm) (see table II, group I).

d. Aluminum foil, adhesive-backed label conforming to MIL-DTL-19834, except that color of the plate need not conform to the specification.

e. Decalcomanias, when used on exterior surfaces, shall be fabricated with a hard-surface varnish coating and added fungicide and shall not be given any additional varnish treatment. When used on interior surfaces, they shall be protected by clear varnish, type II, conforming to ASTM D3955 and ASTM D295. Either varnish or solvent-applied type of decalcomania may be used on baked painted surfaces, but only the varnish-applied type may be used on other surfaces. Water-applied decalcomanias shall not be used under any circumstances.

f. Printed on white book paper, laminated between two sheets of not less than 0.015 inch (0.38 mm) thickness, composition B, type I, grade B, white plastic material conforming to L-P-535. The two sheets shall be bonded together, to seal against moisture.

g. Printed on minimum 0.020 inch .thickness (0.51mm) composition B, type II, grade C, white plastic material and covered with a minimum 0.010 inch thickness (0.25mm) composition B, type I, grade B, clear plastic material, both conforming to L-P-535. The two sheets shall be bonded together to seal against moisture.

h. Adhesive-backed thermosetting plastic labels, with over laminated copy (the thickness shall not be less than 0.006 inch and shall not be greater than 0.025 inch). The nameplate marking is subsurface printed beneath a protective polyester film.

5.8.3 Radius of corners. Decalcomanias and aluminum foil labels shall have corners rounded to minimum radii of 0.03 inch (0.76 mm) and preferably to radii of 0.0625 inch (1.59 mm) to 0.125 inch (3.17 mm).

5.8.4 Mounting. Labels, except decalcomanias and adhesive-mounted aluminum foil, shall be securely and permanently mounted by screws or rivets that will not stain the labels under specified service and test conditions. Adhesives and mounting processes, used for decalcomanias, shall be as recommended by the manufacturer thereof. Clearance between mounting holes in labels, and the mounting screws and rivets, shall be provided where necessary to prevent buckling of the labels, caused by expansion or contraction at specified temperature extremes.

5.9 Spectral gloss. Spectral gloss of exterior markings shall not exceed the maximum gloss permitted, for the finish on the surface of the article of equipment, to which the marking is applied, unless a higher gloss is inherent in the use of specified material and process for the marking.

5.10 Opacity. The opacity of decalcomanias, paint and ink used for marking shall be sufficient to hide completely the background, on which they are applied.

5.11 Permanency, durability and legibility. Direct marking, including background and labels, shall be capable of withstanding the tests in 5.11.1 and inspections specified in the acquisition document, without evidencing any of the following defects:

. Blistering
. Chipping
. Corrosion
. Cracking
. Delamination
. Dissolving
. Discoloration
. Fading
. Flaking
. Illegibility
. Loosening from the mounting surface
. Peeling
. Separation
. Softening
. Splitting
. Warping

5.11.1 Permanency and durability tests. For the purpose of inspecting for permanency, durability, and legibility, the following test methods shall be included in the acquisition document, with examination for the defects listed in 5.11:

a. Abrasion test. The specimens shall be subjected to 200 cycles on a “Taber Abraser” machine, or equal. The abraser wheels shall be properly dressed before each test. The wheels shall be CS17 Calibrase, with 1 Kilogram load. (see 5.11)

b. Corrosion test. The specimens shall be immersed in a saturated solution of sodium chloride at 25 degrees C (77 degrees F), for 24 hours and then, without rinsing, be allowed to dry for 24 hours at room temperature. (see 5.11)

c. Fungus test. Inks that are not known to be fungus inert shall be subjected to the fungus test specified in MIL-STD-810, method 508, for a period of 28 days. Certification by a qualified laboratory or by the material producer, based upon test data on record, that the treated material meets grade 0 or grade 1 requirements of table 508-I (MIL-STD-810), shall be sufficient evidence of acceptability.

d. Moisture-resistance test. Method 106 of MIL-STD-202, “Test Methods for Electronic and Electrical Component Parts” shall be performed. (see 5.11)

e. Solvents test. Method 215 of MIL-STD-202, “Test Methods for Electronic and Electrical Component Parts” shall be performed. (see 5.11)

f. Thermal shock. The specimens shall be placed in hot deionized water at 79 degrees C (174 degrees F) for 3 hours, then immediately transferred to a cold chamber at a temperature of -55 degrees C (-67 degrees F) for 1 hour. The cycle shall be repeated immediately. (see 5.11)

TABLE II. Marking process.

Group	Process	Restrictions on applications
I	Die stamping, engraving, photo-etching, molding, steel stamping, photosensitive printing on reverse surface of polyester film or photographically printed on sensitized aluminum (or photoetched) as furnished by: “Horizons, Inc.”, CAGE 4J541,Cleveland, OH, (800) 483-7758 or “Nelson-Miller, Inc.”, CAGE 07416, Los Angeles, CA, (323) 663-3971, or equal, and processed as recommended by the manufacturer of the material and 5.8.2. 1/	NONE
II	STENCILING OR SCREEN PRINTING WITH: a. Semi-gloss enamel conforming to MPI #94 Approved Product List. 4/. b. Quick drying ink (for non-porous surfaces only) conforming to Commercial Item Description (CID) A-A-208. c. Epoxy-based ink conforming to CID A-A-56032. SILK SCREENING OR OFFSET PRINTING a. Use ink conforming to the performance requirements of CID A-A-56032	(1) Shall not be used for nameplate data; use group I instead. (2) Shall not be used on surfaces subject to abrasion or the weather during use or storage of equipment, nor for surfaces subject to abrasion during installation, maintenance, or operational adjustment of equipment, except as allowed by 2/; use group I instead.
III	Lithography or lettering or rubber stamping with permanent ink. 3/	Same as group II.
IV	Branding on wood surfaces	As specified in 5.6.

1/ Pigment-filled group I markings shall be protected by clear varnish conforming to MIL-I-24092, except where such varnish is incompatible with a luminescent pigment, in which case the protective coating shall as recommended by the manufacturer of the luminescent material.

2/ Where use of the group I marking on these surfaces (surfaces subject to abrasion or the weather, as described under group II) is impracticable because of size, shape or other characteristics of the available surface, decalcomanias or pressure-sensitive-backed aluminum-foil labels or adhesive backed thermosetting plastic labels may be used. However, their use shall be subject to prior approval by the contracting officer and in no case shall they be used for nameplate data.

3/ Permanent ink is fade-resistant, does not “bleed” when coated with varnish conforming to ASTM D3955 and ASTM D295 and will not rub off when in an uncoated condition and exposed to moisture. Permanent ink shall be capable of satisfying the permanency and durability requirements of this standard practice. Since tropicalization treatment of equipment often involves as overall coating with ASTM D3955 and ASTM D295 varnish, the contractor shall certify that the permanent ink used can withstand a coating with the above varnish, without evidencing “bleeding”.

4/ Non-epoxy ink markings shall be protected by a clear transparent epoxy coating.

5.12 Facsimiles. Facsimiles (or scale drawings) of each different marking shall be submitted to the contracting officer for approval of the legend and its location on the article of equipment, assembly or part. Facsimiles of legends inscribed on labels shall show the entire label. All facsimiles shall include a scale showing the size of the marking, and shall include or be accompanied by information as to location. Copies of each facsimile shall be furnished as follows:

a. 3 copies of nameplate data.

b. 4 copies of electrical diagrams.

c. 2 copies if other markings.

5.13 Workmanship. Marking shall be legible and shall not exhibit any defects that will affect its intended purpose.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. This standard practice is intended as a general subsidiary to an end item specification, for the purpose of marking electronic items.

6.2 Acquisition requirements. Acquisition documents should specify the title, number, and date of this standard.

6.3 Marking for shipment. Marking for shipment is covered by MIL-STD-129.

6.4 Serial numbers. In general, the manufacturer will be instructed as to which items require serial numbers. This requirement usually will appear in the contract or order, or in the specification covering the item. Also, the contract or order usually will require the manufacturer to maintain accurate records of serial numbers relative to date of manufacture, substitutions, shop changes, etc., and to furnish copies of such records at the completion of the contract. The Government, in connection with maintenance, repairs, and modification of the items will use the records. Serial numbers usually are required on (a) major units such as radio receivers, generators, switchboards and oscilloscopes, (b) items which are selected, calibrated, machined, or adjusted for use together and (c) items which require serial numbers for accountability purposes. Serial numbers usually are not required on (a) bags, chests and other types of containers, (b) hardware, (c) small parts produced by automatic machinery and (d) minor units such as cable assemblies, ground rods and insulators.

6.5 Air-transportable items The contract or order, or the detailed specification covering the item will indicate which items are air-transportable.

6.6 Reprocurements. Evidence of previous procurement in quantity as referenced in 4.4.1.1, may be found in technical literature furnished to the manufacturer for his information and guidance, and in nomenclature marked on a model of the equipment furnished to the manufacturer for conformance thereto. When ”(X)” appears in the type-number portion of such nomenclature, it is evidence that the model was procured on a development contract and, consequently, the reference designations should conform to ASME Y14.44, instead. Drawings, other data, or a model furnished to the manufacturer solely for his information and guidance and to which conformance is not specified, should not be considered sufficient evidence of previous quantity procurement of the item.

6.7 Subject term (key word) listing.

Branding
Reference designations
Silk-screening
Type numbers

6.8 Assemblies, sets, and units. For more information, see MIL-HDBK-505, “Definitions of Item Levels, Item Exchangeability, Models, and Related Terms”. Copies of this document are available online at http://quicksearch.dla.mil or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.

6.9 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmental Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals and additional information is available on their website http://www.epa.gov/osw/hazard/wastemin/priority.htm. Included in the EPA list of 31 priority chemicals are cadmium, lead, and mercury. Use of these materials should be minimized or eliminated unless needed to meet the requirements specified herein (see 5.8.2).

6.10 Change notations. The margins of this standard are marked with vertical lines to indicate modifications generated by this change. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

CONCLUDING MATERIAL

Custodians:
Army - CR
DLA - CC

Review activities:
DLA – GS8, IS

Preparing activity:
DLA - CC

(Project MISC-2013-003)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.dla.mil.