NOTE: MIL-STD-792 has been redesignated as a Standard Practice. The cover page has been changed for Administrative reasons. There are no other changes to this Document.

INCH-POUND

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DEPARTMENT OF DEFENSE
STANDARD PRACTICE

IDENTIFICATION MARKING REQUIREMENTS FOR SPECIAL PURPOSE COMPONENTS

AMSC N/A AREA GDRQ

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DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND

Washington, DC 20362-5101

Identification Marking Requirements for Special Purpose Components

1. This Military Standard is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 55Z3, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

CONTENTS

1. SCOPE

* 1.1 Purpose. The purpose of this standard is to provide general requirements for the marking of raw materials, products and components.

* 1.2 Applicability. This standard provides general requirements for surface marking on components, component parts and piping for purposes of permanent identification, temporary identification and dimensional layout. Requirements for marking of raw materials as required by material specifications are not superseded
* by this standard. In the event of a conflict between the text of this standard and the marking requirements and prohibitions of product and component specifications and welding standards, this standard shall not take precedence.

2. REFERENCED DOCUMENTS

2.1 Government documents.

2.1.1 Specification. Unless otherwise specified, the following specification of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this standard to the extent specified herein.

SPECIFICATION

MILITARY
MIL-C-16173 - Corrosion Preventive Compound, Solvent Cutback, Cold-Application.

* 2.1.2 Other Government document. The following other Government document forms a part of this standard to the extent specified herein.

CODE OF FEDERAL REGULATIONS (CFR)
27 CFR 21.47 - Code of Federal Regulations, Subpart D, Alcohol, Tobacco Products and Firearms

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, DC 20402.)

(Copies of specifications and publications required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

* 2.2 Other publication. The following document forms a part of this standard to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. The issues of documents which have not been adopted shall be those in effect on the date of the cited DoDISS.

* AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
B4.0 - Methods for Mechanical Testing of Welds. (DoD adopted)

(Application for copies should be addressed to the American National Standards Institute Inc., 1430 Broadway, New York, NY 10018.)

(Nongovernment standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this standard and the references cited herein, the text of this standard shall take precedence.

3. DEFINITIONS

3.1 Identification marking. Identification marking consists of letters, numbers, directional arrows or symbols intentionally added to metal surfaces of components, components parts, or piping for identification or instructional purposes. Marking can be separated into two categories: permanent and temporary.

3.2 Permanent marking. Permanent marking is marking which is intended to remain integral with a component, component part or piping for purposes of permanent identification.

3.3 Temporary marking. Temporary marking is marking which is intended to remain integral with a component, component part or piping for a limited time only. Temporary marking may be applied for identification, recording inspection information or dimensional layout or control.

3.4 Low stress die stamps. A low stress die stamp is defined as a round bottom impression tool producing an indentation conforming to the tabulated dimensions:

Character size	Minimum tip radius	Nominal impression width for 0.010 inch depth
1/16 inch	0.005 inch	0.020 inch
3/32	.006	.021
1/8	.007	.022
3/16	.008	.026
1/4	.010	.031
3/8	.014	.042
1/2	.020	.062

3.5 Authorized representative of Naval Sea Systems Command (NAVSEA). An authorized representative of NAVSEA is the direct contractor, other than a shipbuilder, who has design and/or procurement responsibility. Vendors for the authorized representative normally communicate directly with the authorized representative and not NAVSEA.

3.6 Layout marking. Layout markings are those markings and reference points (and lines) intentionally added to components and component parts to aid in manufacture, fit-up, assembly and inspection.

4. GENERAL REQUIREMENTS

4.1 Permanent marking methods. The following methods shall be used for permanent identification on components, component parts or piping, subject to the limitations as specified in 5.9 and 5.10:

Type I - Vibrating marking tool
Type II - Electrochemical etch
Type III - Raised markings
Type IV - Nameplates
Type V - Die stamping
Type VI - Special marking
Type VII - Engrave marking
* Type VIII - Laser engraving

4.2 Temporary marking methods. Any method as specified in 4.1 acceptable for permanent identification by this standard is acceptable for temporary marking, subject to the limitations as specified in 5.11. In addition, the following methods may also be used subject to the limitations as specified in 5.11:

* Type A - Fluid or solid marking materials
Type B - Removable tape
Type C - Removable tag
Type D - Scribe mark
Type E - Center punch
Type F - Fabric tip marking pen

4.3 Exceptions to the permanent or temporary marking methods described herein must be submitted to NAVSEA or its authorized representative for approval.

* 5. DETAILED REQUIREMENTS

5.1 Type I, vibrating marking tools. Vibrating tools shall be fitted with a carbide marking point, or equivalent, and shall be adjusted to provide a legible shallow rounded impression not exceeding 0.010 inch in depth. The marking tool tip minimum radius shall be 0.005 inch. The minimum character size scribed by the marking tool shall be approximately 3/32 inch high to insure * legibility. The marking tool tips shall not be cadmium plated.

5.2 Type II, electrochemical etching. The electrolyte used shall be compatible with the base material to be marked. Electrolyte containing total halogens, sulfur and lead in excess of 250 parts per million (p/m) each shall not be used. Certified test results shall be submitted with each batch or mix of electrolyte to establish compliance with this limit. The certified test report shall also identify the analysis method(s) utilized. Etching shall be covered by a written procedure which includes as a minimum the specification of the electrolyte and cleaning methods. This procedure shall be made available to the authorized representative of NAVSEA concerned upon request. The depth of marking by electrochemical etching should be approximately 0.0005 inch deep or greater.

5.3 Type III, raised markings. Raised identification markings that are cast or forged integrally with the part are acceptable.

5.4 Type IV, nameplates. The method of attaching nameplates to parts shall be indicated on applicable drawings and shall minimize stress concentrations. Nameplates, where welded, shall be welded in accordance with the requirements of the applicable equipment specification.

5.5 Type V, die stamping. Die stamping can induce residual stresses in base material and therefore is not a preferred marking method. To reduce the * effects of residual stresses in base material caused by application of die stamping, the following additional requirements shall be met:

(a) Only round bottom, low stress die stamps in accordance with 3.4 shall be used. Impression depths shall not exceed 0.010 inch.
(b) The marking shall be applied as specified in 5.9.5.

5.6 Type VI, special marking. For certain marking applications, such as the serializing of internal component parts, the use of marking tools not permitted by the above requirements may simplify marking procedures and may not adversely affect the integrity of the parts where such markings are applied in areas of low stress. Any special marking applications that take exception to the requirements of this standard shall be specifically indicated on the applicable design drawings or in the applicable fabrication procedures and shall be submitted to the authorized representative of NAVSEA for approval prior to use.

5.7 Type VII, engrave marking. Engraved characters shall be restricted to the following dimensional limitations: maximum depth - 0.010 inch, minimum depth - 0.004 inch and minimum root radius - 0.005 inch.

* 5.8 Type VIII, laser engraving. Laser engraved characters shall have a nominal depth of 0.001 to 0.003 inch deep, but a maximum depth of the characters shall be no greater than 0.005 inch. The procedure for calibration shall be approved by the command or agency concerned. The procedures for user activities are as follows:

* (a) User activities are advised that variability exists among different laser engraving machines in producing controlled depth and contour of engraved marks.
(b) Each user activity shall have a formal qualification procedure for the laser engraving machine. The qualification procedure must demonstrate that the laser engraving machine will provide the intended engraving characteristics, that is, size, depth, and round bottom contour, for each material to be engraved. The qualification procedure shall be approved by the appropriate command or agency concerned.

5.9 Limitations on identification marking.

5.9.1 Electric arc marking pencils shall not be used for any marking applications.

5.9.2 No marking shall reduce the wall thickness of the part below the minimum required by the applicable drawing or specifications.

5.9.3 Tube and pipe shall not be marked with the type V permanent marking method.

5.9.4 All marking shall be legible.

5.9.5 Permanent identification marking shall be applied on low stressed areas such as a flange rim, top of nut, top of stud or an integral pad or boss as determined by considering applied loads on individual parts.

5.9.6 Where possible, marking shall be located so that the marking will not be defaced during installation (for example, not marked near welds, wrenching surfaces, on flange faces, and so forth).

5.10 Limitations on permanent identification marking.

5.10.1 Permanent identification markings and their locations shall be indicated on the applicable drawings or in a specification or procedure. Permanent marking may be characterized by the following attributes for inclusion in detail manufacturing instructions, manufacturing procedures or detail part drawings:

(a) type of marking
(b) specific characters to be applied
(c) approximate location of characters on a specific part
(d) minimum character size
(e) other characteristics as appropriate.

5.10.2 Hardened materials shall be marked only by the type II method. Hardened material is any material, except carbon steel with a specified carbon content of 0.35 percent or less, which has had its mechanical strength increased by quenching and tempering, aging or cold working.

5.10.3 Base material of pressure boundary parts less than 1/8 inch thick shall be permanently marked only by the type II method. The base material thickness for pipes is considered to be the nominal wall thickness. The base material thickness for tubing is considered to be the minimum wall thickness specified.

5.10.4 Type II permanent marking shall not be used on carbon steels except as specified in 5.10.2 and 5.10.3.

* 5.10.5 Type I, type II, type VII and type VIII permanent markings used on carbon steel shall be covered with a preservative to prevent corrosion of the marking. The preservative shall be in accordance with MIL-C-16173.

5.10.6 Type V permanent marking may be used on carbon steel, except carbon steel with a specified carbon content of greater than 0.35 percent. Type V permanent marking may be used on other materials only when specified or approved by NAVSEA or an authorized representative as defined in 3.5. This does not supersede requirements as specified in 5.9.2 or 5.9.3.

5.11 Limitations on temporary identification or layout marking.

* 5.11.1 Type I, type V, type VII and type VIII permanent marking and type D and type E temporary marking may be used only when the depression is blended smoothly into the general contour without violating the minimum wall thickness. The radius at the bottom of all areas resulting from the removal of such markings shall be at least three times the depth of the depression.

5.11.2 Type A, B, and F temporary marking shall be removed prior to being exposed to thermal treatments including preheat and heat of welding, except that type A and type F marking may remain on materials provided:

(a) It has been demonstrated by the organization proposing to use the marking fluid for temporary identification through thermal treatments that any material so marked is not affected when exposed to the thermal treatment.

* (b) Each lot of marking material is demonstrated by test to be non-detrimental for each material so marked. Two specimens (marked as in production marking) of each material to be marked along
* with one unmarked specimen shall receive a heat treatment at the maximum temperature for the maximum time as that used during production heat treatment. One longitudinal specimen shall be removed from each specimen and shall be metallographically inspected at a minimum of 100X magnification to assure that there has been no interaction of the marking material with the
* base material and no evidence of cracking, pitting, or corrosion caused by the marking material. Also, one marked and the unmarked sample shall be given guided-bend tests in accordance with ANSI/AWS B4.0. The bend test samples shall exhibit no cracking.

5.11.2.1 Type A and type F marking and residue from type B marking shall be removed using one of the following solvents:

(a) Unused or redistilled acetone
* (b) Denatured alcohol (formula 23-A of 27 CFR 21.47)
(c) Isopropanol
* (d) Perchloroethylene (tetrachloroethylene)
(e) Trichloroethylene
(f) Trichloroethane (methyl chloroform)

"WARNING"

Vapor of solvents (d), (e) and (f) are toxic.
Spills have caused death at low concentrations.
Use only in well ventilated areas.
ESCAPE IMMEDIATELY IF STRONG VAPOR ODORS ARE DETECTED.

* 5.11.2.1.1 Surfaces without crevices or inaccessible areas. Parts or surfaces containing no crevices or inaccessible areas may be cleaned by degreasing using any of the above solvents.

* 5.11.2.1.2 Surfaces with crevices and inaccessible areas. Parts or surfaces containing crevices or areas inaccessible to inspection for proper drainage shall be degreased only by immersion in solvents (a), (b), or (c) of the above list with no time restrictions. All parts shall be dried.

* 5.11.2.1.3 Halogenated solvents. Solvents (d), (e) and (f) of the above list shall not be used on parts or surfaces with crevices. Caution shall be taken when using halogenated solvents (d), (e) and (f) of the above list since decomposition into corrosive agents may occur. Corrosive agents which are generated at temperatures such as those produced during brazing and welding may attack materials of construction, notably corrosion resistant steel. When cleaned with halogenated materials, hardware shall be dried with clean air or inert gas.

5.11.3 All temporary markings shall be removed from material surfaces prior to fabrication operations which render markings inaccessible and prior to final heat treatment. The area exposed by mechanical removal of temporary markings shall be inspected by the same method (limited to liquid penetrant, * magnetic particle or visual inspection) originally specified for the base material and shall meet the original base material acceptance criteria.

5.11.4 Temporary marking on the surface of hard, brittle materials such as 17-4PH stainless steel or cold worked Haynes 25 shall be applied by ink using rubber stamps or fabric marking pens or by electrochemical etching.

5.11.5 Type II temporary markings shall not be used on carbon steels.

5.11.6 Metallic tags used for temporary marking and the materials used to attach the tag shall be of the same material as that which is being marked or of a material which affords cathodic protection to the material being marked.

6. NOTES

6.1 Intended use.

Not applicable.

* 6.2 Subject term (key word) listing.

Die stamp, low stress
Electrochemical etching
Engrave marking
Identification marking
Laser engraving
Marking, metal surface
Vibrating marking

6.3 Changes from previous issue. The margins of this standard are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. 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 and relationship to the last previous issue.

Preparing activity:
Navy - SH
(Project GDRQ-ND52)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-STD-792E(SH)	COMPONENTS IDENTIFICATION MARKING REQUIREMENTS FOR SPECIAL PURPOSE

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ USER
	☐ MANUFACTURER
	☐ OTHER *(Specify)*:

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

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