

INCH-POUND

MIL-STD-792E (SH)
Notice 1
23 October 1992

NOTICE OF CHANGE

MILITARY STANDARD
IDENTIFICATION MARKING REQUIREMENTS
FOR SPECIAL PURPOSE COMPONENTS

TO ALL HOLDERS OF MIL-STD-792E(SH)

1. THE FOLLOWING PAGES OF MIL-STD-792E(SH) HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
iii/iv	23 October 1992	iii/iv	12 August 1986
3	23 October 1992	3	12 August 1986
4	23 October 1992	4	12 August 1986
5	23 October 1992	5	12 August 1986
6	23 October 1992	6	12 August 1986

2. RETAIN THIS NOTICE PAGE AND INSERT BEFORE THE TABLE OF CONTENTS.
3. HOLDERS OF MIL-STD-792E(SH) WILL VERIFY THAT THE PAGE CHANGES INDICATED ABOVE HAVE BEEN ENTERED. THE NOTICE PAGE WILL BE RETAINED AS A CHECK LIST. THIS ISSUANCE, TOGETHER WITH APPENDED PAGES IS A SEPARATE PUBLICATION. EACH NOTICE IS TO BE RETAINED BY STOCKING POINTS UNTIL THE MILITARY STANDARD IS COMPLETELY REVISED OR CANCELLED.

Preparing Activity:
Navy - SH
(Project GDRQ-0138)

AMSC N/A

AREA GDRQ

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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
- Type IX - Dot matrix marking

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 materials 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.

5.8.1 Type IX, dot matrix marking. The depth of the marking shall be nominally 0.001 to 0.002 inch and no deeper than 0.004 inch. Dot matrix marking shall have a 135° included angle nominally and a minimum tip radius of 0.015 inch. For each material to be marked, the minimum air pressure necessary to obtain characters of nominal depth shall be used. The marking tool tips shall not be cadmium plated. Type IX marking may be used as a substitute for type I marking where vibrating tool marking is allowed.

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 by the type II method. The base material thickness of pipes is considered to be the nominal wall thickness. The base material thickness for tubing is considered to be the minimum wall thickness specified.

5.10.3.1 Piping less than 1/8 in thick may also be permanently marked using the type IX method with the following exceptions:

- (a) No marking shall be applied in bent or welded areas (including heat affected zones) of pipe or areas which will be bent or welded after marking.
- (b) No marking shall be applied to areas of pipe which will be flared or flanged.

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, type VIII and type IX 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.

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5.11 Limitations on temporary identification or layout marking.

5.11.1 Type I, type V, type VII, type VIII and type IX 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.