

**INCH- POUND**  
MIL-C-24707/3  
27 January 1989

## MILITARY SPECIFICATION

### CASTINGS, FERROUS, CORROSION-RESISTANT, AUSTENITIC, CHROMIUM-NICKEL

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

#### 1. SCOPE

1.1 Scope. This specification covers austenitic chromium-nickel alloy castings for corrosion-resistant and low magnetic permeability applications (see 6.1).

1.2 Classification. Corrosion-resistant steel castings shall be of the following grades and types, as specified (see 6.2). Grades are as specified in ASTM A 744.

##### Grades

CF-8  
CF-8C  
CF-8M

##### Types

I - No magnetic restrictions  
II - Low relative magnetic permeability

#### 2. APPLICABLE DOCUMENTS

##### 2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issue of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

#### SPECIFICATIONS

##### FEDERAL

QQ-P-35 - Passivation Treatments for Corrosion-Resisting Steel.

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 5523, 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.

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## MILITARY

MIL-C-24707 - Castings, Ferrous, General Specification for.

## STANDARDS

## MILITARY

MIL-STD-271 - Requirements for Nondestructive Testing Methods.

MIL-STD-278 - Welding and Casting Standard.

(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Naval Publications and Forms Center (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

2.2 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 which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issue of the documents cited in the solicitation.

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A 262 - Standard Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels. (DoD adopted)

A 342 - Standard Test Methods for Permeability of Feebly Magnetic Materials.

A 744 - Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for Severe Service. (DoD adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Nongovernment standards and other publications are normally available from the organizations that prepare or 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 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.

## 3. REQUIREMENTS

3.1 General. Castings ordered to this specification shall be in accordance with MIL-C-24707, ASTM A 744, and as specified.

3.2 Supplementary requirements. Supplementary requirements SZ1 (intergranular corrosion test) and SZ2 (tension test) of ASTM A 744 shall be mandatory.

3.3 Magnetic permeability. When type II is specified (see 1.2), the relative magnetic permeability of the castings shall not exceed 1.3 for first article and 1.6 for quality conformance tests. Unless otherwise specified (see 6.2), the field strength shall be 0.5 oersteds for first article testing.

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3.4 Heat treatment. Castings shall be heat treated as specified in ASTM A 744 except the minimum temperature shall be 1950 degrees Fahrenheit (°F).

3.5 Passivation. After all cleaning and machining, the castings shall be passivated in accordance with QQ-P-35.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Quality assurance provisions shall be in accordance with MIL-C-24707 and as specified.

4.2 First article testing. First article testing shall consist of the tests specified in 4.3.1 and 4.4.2, and shall meet the requirements for soundness and mechanical properties in accordance with MIL-C-24707. Unless otherwise specified (see 6.2), first article sampling shall be in accordance with MIL-C-24707.

#### 4.3 Quality conformance inspection.

4.3.1 Relative magnetic permeability. Unless otherwise specified (see 6.2), tests shall be performed on actual castings. Each casting shall be tested.

4.3.2 Nondestructive test. Unless otherwise specified (see 6.2), castings shall be liquid penetrant inspected and radiographed to the requirements of MIL-STD-278.

4.3.3 Radiographic examination. Radiographic examination shall be conducted in accordance with MIL-STD-271. The extent of inspection and acceptance criteria shall be as specified (see 6.2). Unless otherwise specified (see 6.2), each casting shall be examined.

4.3.4 Intergranular corrosion test. Two samples per lot shall be tested.

#### 4.4 Test procedures.

4.4.1 Relative magnetic permeability test. For quality conformance testing the relative magnetic permeability ( $\mu$ ) shall be measured as less than that of a calibrated standard in accordance with ASTM A 342, method 6. For first article tests, the normal permeability ( $\mu$ ) shall be measured in accordance with ASTM A 342, method 1, 2, or 3. Methods 1, 2, and 3 may be used for measuring a ( $\mu$ ) of 1 to 4 and method 6 may be used for measuring a ( $\mu$ ) of less than 2.5.

4.4.2 Intergranular corrosion test. The intergranular corrosion test shall be conducted in accordance with practice E of ASTM A 262. The oxalic acid screening test of practice E is specifically prohibited. Any evidence of intergranular corrosion shall be cause for rejection.

#### 5. PACKAGING

5.1 Packaging shall be in accordance with MIL-C-24707.

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## 6. NOTES

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

6.1 Intended use. These castings are intended for use where austenitic corrosion-resisting steel having low relative magnetic permeability is required. Grade CF-8 is for general corrosion resistance. Grade CF-8M is for applications where pitting may be a problem. Grade CF-8C is for welded applications and elevated temperatures up to 1050°F.

6.2 Acquisition requirements. In addition to the acquisition requirements of MIL-C-24707, acquisition documents must specify the ordering information of ASTM A 744 and the following:

- (a) Title, number, and date of this specification.
- (b) Grade and type (see 1.2).
- (c) Issue of DoDISS to be cited in the solicitation and, if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- (d) When field strength for measuring magnetic permeability ( $\mu$ ) is other than specified (see 3.3).
- (e) When sampling for first article magnetic permeability testing is other than specified (see 4.2).
- (f) If the test specimen for quality conformance magnetic permeability inspection is other than specified (see 4.3.1).
- (g) If quality conformance nondestructive test requirements are other than specified (see 4.3.2).
- (h) The extent and acceptance criteria for radiographic examination and if testing of each casting is not required (see 4.3.3).

6.3 Supersession data. The supersession data for the applicable grades are as follows:

<u>Previous specification</u>	<u>Replacement specification</u>
	MIL-C-24707/3
MIL-S-17509, class I	ASTM A 744, Gr CF-8
MIL-S-17509, class II	ASTM A 744, Gr CF-8C
MIL-S-17509, class III	ASTM A 744, Gr CF-8M
MIL-S-867, class I	ASTM A 744, Gr CF-8
MIL-S-867, class II	ASTM A 744, Gr CF-8C
MIL-S-867, class III	ASTM A 744, Gr CF-8M

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6.4 Subject term (key word) listing.

Heat treatment  
Intergranular corrosion test  
Magnetic permeability  
Passivation

Custodians:

Army - MR  
Navy - SH  
Air Force - 20

Preparing activity:

Navy - SH  
(Project MECA-0331)

Review activities:

Army - AR, MI  
Navy - AS, YD, OS  
Air Force - 84

User activities:

Navy - MC  
Army - ME

## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MIL-C-24707/3		2. DOCUMENT TITLE CASTINGS, FERROUS, CORROSION-RESISTANT, AUSTENITIC, CHROMIUM-NICKEL	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one) <input type="checkbox"/> VENDOR <input type="checkbox"/> USER <input type="checkbox"/> MANUFACTURER <input type="checkbox"/> OTHER (Specify): _____	
b. ADDRESS (Street, City, State, ZIP Code)			
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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**INSTRUCTIONS:** In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (*DO NOT STAPLE*), and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

**NOTE:** This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

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