

**INCH-POUND**

MIL-S-19434B(SH)

31 December 1990

SUPERSEDING

MIL-S-19434A(SHIPS)

1 October 1959

(See 6.6)

## MILITARY SPECIFICATION

STEEL GEAR AND PINION FORGINGS, CARBON AND  
ALLOY, HEAT TREATED, NAVAL SHIPBOARD  
PROPULSION UNIT AND AUXILIARY TURBINE

This specification 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.

## 1. SCOPE

1.1 Scope. This specification covers forging rims and blanks for gears and pinions to be used in gear assemblies for Naval shipboard propulsion units and auxiliary turbines.

1.2 Classification. Forgings shall be of the following classes as specified (see 6.2).

Class 1  
Class 2  
Class 3  
Class 4  
Class 5  
Class 6

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.

AMSC N/A

FSC 2030

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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 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

PPP-F-320 - Fiberboard; Corrugated and Solid, Sheet Stock (Container Grade), and Cut Shapes.

## MILITARY

MIL-H-6875 - Heat Treatment of Steel, Process for.  
MIL-L-19140 - Lumber and Plywood, Fire-Retardant Treated.

## STANDARDS

## FEDERAL

FED-STD-183 - Continuous Identification Marking of Iron and Steel Products.

## MILITARY

MIL-STD-163 - Steel Mill Products Preparation for Shipment and Storage.  
MIL-STD-248 - Welding and Brazing Procedure and Performance Qualification.  
MIL-STD-271 - Requirements for Nondestructive Testing Methods.  
MIL-STD-278 - Welding and Casting Standard.  
MIL-STD-792 - Identification Marking Requirements for Special Purpose Components.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, BLDG. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following document(s) 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 issues of the documents cited in the solicitation (see 6.2).

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A 370 - Standard Test Methods and Definitions for Mechanical Testing of Steel Products. (DoD adopted)  
A 751 - Standard Methods, Practices, and Definitions for Chemical Analysis of Steel Products.  
D 3951 - Standard Practice for Commercial Packaging. (DoD adopted)

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## ASTM (Continued)

- E 10 - Standard Test Method for Brinell Hardness of Metallic Materials. (DoD adopted)
- E 23 - Standard Methods for Notched Bar Impact Testing of Metallic Materials. (DoD adopted)
- E 45 - Standard Practice for Determining the Inclusion Content of Steel. (DoD adopted)
- E 112 - Standard Methods for Determining the Average Grain Size. (DoD adopted)
- E 381 - Standard Method of Macroetch Testing, Inspection and Rating Steel Products, Comprising Bars, Billets, Blooms, and Forgings. (DoD adopted)

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

(Non-Government 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 Melting. Unless otherwise specified in the contract or order (see 6.2), the material from which the forgings are made shall be continuous cast or cast in metal molds, and shall be manufactured as follows:

- (a) Classes 1, 2, and 3. Open hearth, basic oxygen, electric furnace, or vacuum induction melted (VIM).
- (b) Classes 4, 5, and 6. Electric furnace or VIM.

The primary melting may incorporate separate degassing or refining and may be followed by secondary melting using electroslag remelting (ESR) or vacuum arc remelting (VAR) (see 6.2).

3.1.1 Degassing. Classes 1, 2, and 3 may be vacuum degassed prior to or during pouring of the material. Unless otherwise specified (see 6.2), classes 4, 5, and 6 shall be vacuum degassed prior to or during pouring of the material to remove objectionable gases, particularly hydrogen.

3.1.2 Stability. Material shall be furnished in a condition to withstand, for an indefinite time, exposure to all climatic conditions without developing any external or internal cracks. The method of cooling or of heat treatment of the cast material shall be optional with the manufacturer, but he shall be responsible (in the same manner as for defects disclosed after delivery) for cracks that may develop before material is subjected to reheating.