

MIL-STD-163C

NOTICE 1

7 July 1980

## MILITARY STANDARD

## STEEL MILL PRODUCTS

## PREPARATION FOR SHIPMENT AND STORAGE

TO ALL HOLDERS OF MIL-STD-163C:

1. THE FOLLOWING PAGES OF MIL-STD-163C HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
1	7 July 1980	1	10 May 1978
2	7 July 1980	2	10 May 1978
13	10 May 1980	(REPRINTED WITHOUT CHANGE)	
14	7 July 1980	14	10 May 1978
21	7 July 1980	21	10 May 1978
22	10 May 1980	(REPRINTED WITHOUT CHANGE)	
33	10 May 1980	(REPRINTED WITHOUT CHANGE)	
34	7 July 1980	34	10 May 1978
45	7 July 1980	45	10 May 1978
46	10 May 1980	(REPRINTED WITHOUT CHANGE)	

2. RETAIN THIS NOTICE PAGE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-STD-163C will verify that page changes indicated above have been entered. This notice page will be retained as a check sheet. 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 canceled.

## Custodians:

Army - ME  
Navy - SA  
Air Force - 99

## Preparing activity:

Army - ME

Project PACK-0604

## Review activities:

Army - SM, MI  
Navy - AS, YD  
DLA - IS

## User activities:

Navy - SH, OS

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## 1. SCOPE

1.1 Scope. This standard describes the minimum requirements for materials, methods, containers, and procedures for the preservation, packing, and marking of steel mill products. Materials, methods and containers not listed in this standard will not be used without prior approval of the procuring activity. Quality assurance provisions are given in the appendix of this standard and forms a mandatory part of this standard.

1.2 Application. This standard is intended for use in new procurements and by military activities which physically process steel mill products for shipment and storage.

## 2. REFERENCED DOCUMENTS

2.1 Issues of documents. The following documents of the issue in effect on date of invitation for bids or request for proposal form a part of this standard to the extent specified herein:

### SPECIFICATIONS

#### FEDERAL

FF-N-105	- Nails, Wire; Brads and Staples.
NN-P-530	- Plywood; Flat Panel.
QQ-S-781	- Strapping, Steel, and Seals.
VV-L-800	- Lubricating Oil, General Purpose, Preservative, (Water Displacing, Low Temperature).
CCC-C-467	- Cloth, Jute (or Kenaf) Burlap.
PPP-B-621	- Boxes, Wood, Nailed and Lock-Corner.
PPP-D-723	- Drums; Fiber.
PPP-L-1607	- Lugging, Wood, Wirebound.
PPP-T-97	- Tape; Pressure-Sensitive Adhesive, Filament Reinforced.

#### MILITARY

MIL-P-3420	- Packaging, Materials, Volatile Corrosion Inhibitor Treated Opaque.
MIL-I-8574	- Inhibitor, Corrosion Volatile, Utilization.
MIL-C-16173	- Corrosion Preventive Compound, Solvent Back, Cold Application.
MIL-C-16286	- Tubes, Steel, Seamless, Marine Boiler Application.

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MIL-B-52775	- Barbed Tape, Obstacle, General Purpose and Barbed Tape, Fence Topping.
MIL-C-52950	- Crates, Wood, Open and Covered.

## STANDARDS

### FEDERAL

FED-STD-101	- Preservation, Packaging and Packing Materials: Test Procedures.
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### MILITARY

MIL-STD-129	- Marking for Shipment and Storage.
MIL-STD-731	- Quality of Wood Members For Containers and Pallets.
MIL-STD-1186	- Cushioning, Anchoring, Bracing, Blocking, and Waterproofing; with Appropriate Test Methods.

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

2.2 Other publications. The following documents form a part of this standard to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

#### AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM Standard A700

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

### 3. DEFINITIONS

3.1 Battens. A strip of wood attached to a container to reinforce it.

3.2 Binder. Any material used for securement.

3.3 Bundle. Two or more articles fastened together by suitable means usually without compression so as to form a shipping unit.

3.4 Crosspieces. Supports placed across the width of the unit or units for protection of the shipment in transit.

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4.9.3.8.3 Strapping (see Figure 7 and 4.9.3.4).

4.9.3.9 Boxes for stainless steel plates, sheet and strip. Boxes for these steel products shall be plywood, nailed wood, or fiber-hardboard.

4.9.3.9.1 Plywood box. The plywood shall be not less than 5/32 inch thick. If splicing is necessary, the joint shall be covered with a cleat not less than 3-1/2 inches wide, secured to the plywood. For boxes up to 96 inches long, one intermediate cross batten shall be used; for boxes over 96 inches long, two intermediate cross battens shall be used. Cross battens shall be not less than 2-1/2 inches wide and secured to the side rails, of proper thickness to contact the box top and level with the rail top (see Figures 8, 9, and 10).

4.9.3.9.1.1 Sides and ends. The size of the sides and ends shall be as follows:

Inside depth of box (inches)	Minimum thickness ends and sides (inches)
5/8 to 1	2-1/4 by depth of box
Over 1 to 2	1-3/4 by depth of box
Over 2 to 3	1-3/16 by depth of box

4.9.3.9.1.2 Strapping. Strapping, 3/4 by 0.035 inch, or 8-gage high-tensile wire shall be placed girthwise over end cleats and intermediate cleats.

4.9.3.9.2 Nailed wood boxes. Tops and bottoms shall be not less than 1/2 inch and the bottom must have two 3-1/2 by 3/4 inch lengthwise cleats for widths 30 inches or less, and three lengthwise cleats for widths over 30 inches. Tops shall be set inside the sides and ends and firmly secured with wooden strips, approximately 1 by 1 inch. Where girthwise bands are used, filler strips of required thickness shall be inserted to support bands. The sides and ends shall be as specified in 4.9.3.9.1.1 (see Figure 9).

4.9.3.9.2.1 Intermediate bottom cleats. Intermediate bottom cleats shall be not less than 3/4 by 2-1/2 inches and shall be secured at the ends with staples or metal bands.

4.9.3.9.2.2 Strapping. Strapping, 3/4 by 0.035 inch, or 8-gage high-tensile wire shall be placed girthwise over end cleats and intermediate cleats with addition of corner reinforcements as shown in Figure 9.

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4.9.3.9.3 Fiber-hardboard box. The fiber-hardboard shall be not less than 1/8 inch thick. The top and bottom shall be in one piece and not spliced. For boxes up to 96 inches long, one intermediate cross batten shall be used; for boxes over 96 inches long, two intermediate cross battens shall be used. Cross battens shall be not less than 2-1/2 inches wide, secured to the side rails, of proper thickness to contact the box top and level with the rail top (see figures 8 and 11).

#### 4.9.4 Class 2 crates.

4.9.4.1 Unsheathed (open) crates. When specified, unsheathed crates conforming to MIL-C-52950, style A, type II, shall be used for shipment of stainless steel tubing or similar steel products.

#### 4.9.5 Class 3 drums.

4.9.5.1 Fiber drums. When specified, fiber drums equal to or better than type II, grade A, of PPP-D-723 shall be used for wire products. Net weight of fiber drums shall not exceed 550 pounds.

#### 4.9.6 Class 4 tin mill platforms.

4.9.6.1 Construction. Boards making up the tops of platforms shall be not less than 3/4 inch thick and shall be uniform in thickness, producing a smooth continuous surface. The lumber shall be either group III or group IV wood, or Douglas Fir. Deck sizes should be the same size or slightly smaller than plate size but never larger (see figure 12). Runners shall be not less than 2-1/2 inches and not more than 4 inches high. They shall be of sufficient number to prevent the platforms from sagging. Tops shall be firmly secured to the runners with nails not less than 2-1/4 inches long nor lighter than 11 gage, and spaced not more than 2-1/2 inches apart. Nails shall be overdriven 1/8 inch to provide a smooth surface. When cross strapping is used, runners shall be notched on the top edge for the proper accommodation of the straps. Ends of runners shall be beveled (see figure 13a).

#### 4.9.7 Class 5 skids systems.

4.9.7.1 General. All skids shall be of sound lumber of nominal 3 x 4 inch size. It is important that the length of skids be equal to the full dimension of the package along the direction in which they are used. Skid ends shall be beveled as shown in figure 13. Straps must be stapled to skids with corrosion-resistant staples. One staple shall be applied to each bevel. The number of skids to be used under a given pack is indicated in the specific details applying to each product, except as specified in 4.9.7.3 through 4.9.7.5.

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Per 3/8 inch in diameter, width or thickness shall be packed in hand bundles tied with No. 12-gage soft annealed wire or equivalent and then secured into lifts (see figures 37, 38, and 39). Lifts shall not exceed 6,000 pounds maximum

**5.1.1.3 Bars, carbon steel, cold finished; bars, carbon steel, centerless ground, rough-turned.**

A. Preservation. All cold finished and centerless ground bars shall be adequately protected against rusting with a single coat of type A preservative (see table I). Unless otherwise specified, rough-turned bars shall be shipped without preservative.

B. Packing. Roughturned bars up to and including 1-1/2 inches in diameter and cold finished carbon steel bars and centerless ground bars shall be shipped in class 1 wooden boxes or class 9 metal-sheathed lifts (when specified, lifts shall be provided with an applicable type skid system). Rough-turned bars over 1-1/2 inches in diameter shall be shipped in secured lifts (when specified, lifts shall be provided with an applicable type skid system). Weight of boxes or containers shall be 2,240 pounds maximum and of lifts 6,000 pounds maximum.

- (1) For details of wooden box construction, see figure 2 and 4.9.3.
- (2) Metal-sheathed lifts (see 4.9.11 and figure 42).
- (3) Secured lifts shall be secured in accordance with table V.

**5.1.1.4 Bars, carbon steel, hot-rolled, and bar-size shapes.**

A. Preservation. When specified a brush, spray, or dip coat of type A preservative shall be applied (see table I).

B. Packing. Hot-rolled carbon steel bars and bar-size shapes shall be shipped in secured lifts, (when specified, lifts shall be provided with an applicable type skid system), or when specified shall be shipped in class 1 boxes. Lifts shall contain bars or shapes of one size and quality only. Lifts shall be securely tied with flat bands 1-1/4 by 0.031 inch, tension-tied 8-gage high-tensile wire, or hand-tied doubled-wrapped No.5 rods. See schedule of ties, table V. When specified, rounds, squares, and similar shapes under 3/8 inch in diameter, width or thickness shall be packed in hand bundles tied with No. 12-gage soft annealed wire or equivalent and then secured into lifts (see figures 37, 38, and 39). Lifts shall not exceed 6,000 pounds maximum. If stack piling or nesting is required on squares or flats or on barsize shapes, the contract or order shall so specify.

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5.1.1.5 Bars, concrete reinforcing.

A. Preservation. Not required.

B. Packing. Concrete reinforcing bars shall be shipped in secured lifts (see Figure 41). Lifts shall contain bars of one size and quality only. Lifts shall be securely tied in accordance with schedule of ties, Table V. When specified, lifts shall be provided with an applicable type skid system. Lifts shall not exceed 6,000 pounds maximum.

5.1.1.6 Billets, carbon, or alloy steel (including tube rounds).

A. Preservation. Not required.

B. Packing. Billets over 3 inches shall be shipped loose and billets 3 inches or under shall be shipped loose or in secured lifts (see similar lift, Figure 37) depending on mill facilities. Lifts shall contain billets of one size and quality only. Weight of lifts shall be 6,000 pounds maximum. Lifts shall be securely tied in accordance with schedule of ties, Table V.

5.1.1.7 Billets, shell steel, carbon, or alloy.

A. Preservation. Not required.

B. Packing. Billets shall be shipped loose or in secured lifts (see similar lift, Figure 37). Lifts shall contain billets of one size and quality only. Lifts shall be securely tied in accordance with schedule of ties, Table V.

5.1.1.8 Blooms.

A. Preservation. Not required.

B. Packing. Blooms shall be shipped loose.

5.1.1.9 Conduit, rigid.

A. Preservation. Not required.

B. Packing.

(1) Secured lifts. Rigid conduit in sizes larger than 1-1/2 inches nominal diameter shall be shipped in Class 8 secured lifts. When specified, lifts shall be provided with an applicable type skid system.

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with tension-tied bands or with bands or wire that have been twisted by means of tongs or forks. If shipped in groups, a minimum of two ties shall be used on individual coils, the group to be secured with a minimum of three ties (see Figures 23 and 30).

- (2) Cut length. Skelp in cut lengths shall be shipped loose, or in secured lifts of 6,000 pounds maximum. Lifts are securely tied (oval lifts are generally furnished) with flat bands 1-1/4 by 0.031 inch, tension-tied 8-gage high-tensile wire or hand-tied double-wrapped No. 5 rods (see Figure 25 and schedule of ties, Table V). Securing cut lengths into hand-bundles is not required. Skelp 36 inches and wider shall be shipped loose.

#### 5.1.1.35 Slabs.

A. Preservation. None required.

B. Packing. Slabs shall be shipped loose or in secured lifts, depending on mill facilities. Lifts shall contain slabs of one size and quantity only. Weight of lifts shall be 6,000 pounds maximum. Flat bands, 1-1/4 by 0.031 inch, tension-tied 8-gage high-tensile wire or No. 5 rods double-wrapped and securely tied shall be used (see schedule of ties, Table V).

#### 5.1.1.36 Strips, cold-rolled in coils.

A. Preservation. Type A preservation shall be used (see Table I), when specified.

B. Packing. Cold rolled strips in coils shall be wrapped in oil-resistant paper and shipped in wooden boxes or in metal-wrapped packs. (For box construction refer to 4.9.3). Metal wrapped packs shall be similar to those used for cold rolled sheets (see Figures 18, 19, and 20). Coils of different sizes and grades shall not be packed in the same box or container. Weight shall be 2,240 pounds maximum for wooden boxes and 6,000 pounds maximum for metal wrapped packs.

#### 5.1.1.37 Strip, cold-rolled, in cut lengths (see 5.1.1.41).

#### 5.1.1.38 Strip, hot-rolled in coils.

A. Preservation. None required.

B. Packing. Hot rolled strip in coils shall be shipped securely tied with tension-tied bands, or with bands or wire that have been hand twisted by means of tongs or forks. When specified, strip coils shall be



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packed in groups. The weight of groups shall not exceed 6,000 pounds (see figure 24).

5.1.1.39 Strip, hot-rolled, in cut lengths.

A. Preservation. Unless otherwise specified, strips shall be coated with type A preservative (see table I).

B. Packing. Cut lengths of strips are usually packed in unwrapped secured lifts (see figures 25 and 33). However, when type A preservative is specified, the strip shall be wrapped in oilresistant paper. When specified, strips under 2 inches in width shall be secured in hand bundles, using three soft wire ties or flat mill bands for bundles up to 10 feet and one additional tie for every 3 feet of additional length. Such hand bundles shall than be assembled into secured lifts. Secured lifts shall be tied, using not lighter than 1-1/4 by 0.031 inch tension-tied bands, 8-gage high tensile wire, or (on oval lifts) hand tied No. 5 rods. Use three ties for lengths up to 10 feet and one additional tie for every 3 feet of additional length. If wire is used, the number of ties shall be increased 50 percent. Package weight shall be 6,000 pounds maximum.

5.1.1.40 Strip, hot-rolled, pickled and oiled in coils.

A. Preservation. Strips shall be coated with type A preservative (see table I).

B. Packing. Hot rolled strip, pickled and oiled, in coils shall be packed as individual coils (figure 31) or coil groups secured to skeleton platforms (figure 32). When specified coil or coil groups shall be packed in metal packs or wooden boxes. Weight of coil groups and metal wrapped packs shall be 6,000 pounds maximum.

- (1) Individual coils or coil groups shall be wrapped with one layer of oil-resistant waterproof paper securely tied with four cross-wise ties or a spiral wire tie.
- (2) When coils are packed in metal wrapped packs, the coil or group of coils shall be wrapped with oil-resistant waterproof paper.

5.1.1.41 Strip, hot-rolled, pickled and oiled in cut lengths; strip, cold rolled in cut lengths.

A. Preservation. Unless otherwise specified, strips shall be coated with type A preservative (see table I).

B. Packing. The strips shall be wrapped in oil-resistant waterproof paper and shipped in wooden boxes or metal-wrapped lifts.

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5.2.1.2.2 Plates. Each quality plate (such as pressure vessel quality) shall be marked with the required marking for shipment. Each plate other than quality plate shall be marked with the required marking for shipment except that markings in 5.2.1.2.1 (a) and (b) need only be applied on two of the top plates of the shipment.

5.2.2 Commercial packaging. Marking shall be as specified in ASTM A 700. In addition, the National Stock Number (NSN) or part number, quantity and unit of issue, contract or delivery order number, and address shall be shown.

Custodians:  
Army - ME  
Navy - SA  
Air Force - 99

Preparing activity:  
Army - ME  
  
Project: PACK-0604

Review activities:  
Army - SM, MI  
Navy - AS, YD  
DLA - IS

User activities:  
Navy - SH, OS

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## APPENDIX

### QUALITY ASSURANCE

#### 10. Quality Assurance Provisions.

10.1 Scope. This appendix establishes the inspection methods and procedures necessary to achieve the desired quality assurance. This appendix is a mandatory part of this standard.

#### 20. Referenced documents.

20.1 The following document, of the issue in effect on date of invitation for bids or request for proposal forms a part of this specification to the extent specified herein:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.

30. Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements specified herein. The contractor may utilize his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the standard where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

30.1 Material inspection. The contractor is responsible for insuring that materials used are manufactured, examined, and tested in accordance with referenced documents or as specified herein.

#### 40. Quality conformance inspection.

40.1 Inspection stages. Inspection shall be in two stages as follows:

- (a) The first stage shall include inspection of materials; preservation, wrapping, and blocking methods and processes; and the container construction requirements.
- (b) The second stage shall include inspection of the container closure requirements, markings after container closure, pallet construction, methods of securing to the pallet and pallet enclosure.