

MIL-P-52999(ME)
31 December 1981

MILITARY SPECIFICATION

PALLET, MATERIAL HANDLING, WOOD

STRINGER CONSTRUCTION, 4-WAY PARTIAL,

48 by 40 INCHES

This specification is approved for use by the Mobility Equipment Research and Development Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the design, materials, and fabrication of a 48 by 40 inch wood pallet for general storage and handling of material.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. Unless otherwise specified, the following specifications and standards 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 specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

QQ-S-781

- Strapping, Steel, and Seals.

STANDARDS

MILITARY

MIL-STD-105

- Sampling Procedures and Tables For Inspection by Attributes.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: US Army Mobility Equipment Research and Development Command, ATTN: DRDME-DS, Fort Belvoir, VA 22060 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 3990

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MIL-STD-129

MIL-STD-731

MIL-STD-1188

- Marking for Shipment and Storage.
- Quality of Wood Members for Containers and Pallets.
- Commercial Packaging of Supplies and Equipment.

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

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

3. REQUIREMENT

3.1 Description. Pallets covered by this specification are of a single design and size: stringer construction with 4-way partial fork entry, and 48 x 40 inches in size. Except for oak, all wood shall be unseasoned. Stringers shall be of high density wood; deckboards shall be either high or low density woods readily available to the contractor.

3.2 Materials.

3.2.1 Wood. All wood shall be of any of the species, or combination thereof within a group, listed in MIL-STD-731. Stringers shall be of Group III or IV woods; deckboards shall be of any species listed in Groups II, III, or IV.

3.2.1.1 Wood quality. Wood quality for stringers and deckboards shall be as follows:

- (a) Knots: Diameter of sound knots and knotholes shall comply with MIL-STD-731 for class 2 structural members. There shall be no more than two maximum diameter knots in any one piece. Knots in stringers above the notches shall not exceed 1/2 inch diameter.
- (b) Wane: Wane shall be defined as absence of wood; bark shall not be allowed on any piece. Wane shall be in accordance with MIL-STD-731 for class 2 structural members except that there shall be no limitations on its length. Wane shall not exist on exposed edges of end deckboards. Not more than half the pieces in a pallet shall have wane.
- (c) Warp: No individual piece on any one pallet shall have deviation due to warp greater than the following percent of its measured dimension:

Bow	- 2% per foot of length
Crook	- 2% per foot of length
Cup	- 3% per width of piece

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- (d) Checks and splits: Through checks and splits longer than the width of the piece shall not be permitted. Superficial checks and splits less than the full thickness of a member shall not be limited.
- (e) Other defects: Any form of visible decay shall not be permitted in any piece. Worm holes are permissible providing their combined diameter does not exceed that allowed for knots. Infestation of powder post beetles, termites, and other wood destroying insects shall not be permitted in any piece.

3.2.1.2 Moisture content. There shall be no limitation of moisture content for stringers and deckboards except for oak which shall not exceed 20 percent.

3.2.2 Nails. Hardened steel nails with the following characteristics shall be used:

Length: 2-1/4 inches + 1/16 inch.
 Wire diameter: 0.110 inch + 0.002 inch.
 Head: 1/4 inch diameter + 5 percent.
 Point: Diamond (not longer than 5/32 inch), or chisel provided the width does not exceed the wire diameter.
 Thread: Helical with a minimum of four flutes forming an angle of 60 degrees, + 5 degrees, with a plane perpendicular to the axis.
 Threads shall extend from the point to at least 2/3 of the shank length.
 Pitch diameter: 0.138 inch + 0.005 inch.
 Hardness: Rockwell C42 minimum.

The nails shall be ductile enough to bend 90 degrees over a mandrel the same diameter of the nail wire without fracture.

3.3 Design and construction. Details of pallet components, tolerances, and fabrication shall be as specified herein and with figure 1.

3.3.1 Tolerances and positioning of components. A plus or minus tolerance of 1/4 inch shall be permitted in the overall length and width of assembled pallets. Pallets shall have an out-of-square deviation not to exceed 3/8 inch (3/4 inch difference in diagonal measurements). Deckboard and stringers of any one pallet shall be uniform in thickness and width. Deckboard tolerances shall be + 1/8 inch for length and width, and +1/8 -0 inch for thickness. Stringer tolerances in relation to the specified actual sizes shall be: width +1/4 -0 inch, height +1/8 -0 inch, and length + 1/8 inch. Spacing between top deckboards shall not exceed 3 inches.

3.3.2 Stringers. Stringers shall be 48 inches long, 1-3/4 inches wide, and 3-3/4 inches high. Fork notches shall be provided in each stringer as shown in figure 1. Notch openings shall be no closer than 6 inches from the ends of the stringers. The center stringer shall be parallel to and equidistant between the outside stringers.

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3.3.3 Deckboards. Top and bottom deckboards shall be nominal 1 x 4 and 1 x 6 inch pieces as shown in figure 1. Deckboard thickness shall be not less than 5/8 in. Top deckboards must provide a cumulative surface of not less than 30 inches. Upper edges of all bottom deckboards shall be chamfered. Chamfers shall be centered within the spaces between stringers and shall be 12 inches long. Chamfers shall be cut at a 45 degree angle to the face of the deckboard, and shall extend to within 1/4 to 3/8 inch of the bottom surface. Bottom deckboards shall not protrude into any fork notch opening.

3.4 Fabrication of pallets. Top and bottom end deckboards shall be fastened to stringers with three nails at each intersection. All remaining deckboards shall have two nails at each intersection. All nails shall be staggered to prevent wood splitting. Nails shall be driven not less than 3/4 inch from the ends of deckboards, or less than 1 inch from the side edges of deckboards. Heads of all nails shall be driven beneath the surface of the wood. All nails bent in driving shall be removed or broken off below the wood surface and replaced.

3.5 Workmanship. Except for permissible defects, assembled pallets shall be clean and properly assembled. All components shall be smooth sawn or surfaced to square edges and ends. Nail points and heads shall not protrude from deckboards or stringers.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use 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 specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Component and material inspection. The contractor is responsible for insuring that components and materials used are manufactured, examined, and tested in accordance with referenced specifications and standards and the requirements specified herein.

4.2 Classification of inspection. Inspection shall be classified as follows:

- (a) Quality conformance inspection (see 4.3).
- (b) Inspection of packaging (see 4.5).

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4.3 Quality conformance inspection.

4.3.1 Inspection of nails. Prior to starting production, the pallet contractor shall provide assurance that nails proposed to fabricate pallets comply with the requirements specified herein. In the absence of certification from the nail contractor, the pallet contractor shall perform or have performed the inspection necessary to assure conformance. If the nails are acceptable, no further inspection is necessary if the pallet contractor continues to use the same type nails from the same manufacturer.

4.3.2 Sampling. Sampling of pallets for examination shall be in accordance with MIL-STD-105, inspection level S-4.

4.3.2.1 Lot. The inspection lot shall consist of all pallets offered for delivery at one time.

4.3.2.2 Sample unit. For examination purposes, a sample unit shall be a completely assembled pallet.

4.4 Examination. Samples selected in accordance with 4.3.2 shall be examined for the major defects listed in 4.5. The AQL shall be 4.5, expressed in terms of defects per hundred.

4.5 Inspection procedure.

4.5.1 Examination. Pallets shall be examined for the following major defects:

101. Wood components of improper wood Group (3.2.1).
102. Wood quality not as specified (3.2.1.1).
103. Moisture content of oak not as specified (3.2.1.2).
104. Nails not as specified (3.2.2).
105. Pallet of improper size (3.1).
106. Pallet not square with specified tolerances (3.3.1).
107. Stringers not positioned as specified (3.3.2).
108. Fork notches not as specified (3.3.2).
109. Deckboards of improper size (3.3.3).
110. Bottom deckboards not chamfered as specified in (3.3.3).
111. Deckboards not fastened to stringers as specified (3.4).

4.6 Inspection of packaging.4.6.1 Quality conformance inspection.

4.6.1.1 Unit of product. For inspection purposes a completed bundle of pallets shall be considered a unit of product.

4.6.1.2 Sampling. Sampling for examination shall be in accordance with MIL-STD-105 from a lot offered for delivery at one time.

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4.6.1.3 Examination. Samples selected in accordance with 4.6.1.2 shall be examined for the following defects. The AQL shall be 2.5 percent defective.

- 12. Pallet bundle of greater height than specified (5.1.1 and 5.1.2).
- 13. Bundles not strapped as specified (5.1.1 and 5.1.2).
- 14. Marking incorrect, missing, or illegible (5.2).

5. PACKAGING5.1 Packing

5.1.1 Level A. Pallets shall be packed in bundles which shall not exceed 43 inches in overall height. Bundles shall be secured with a single strap conforming to QQ-S-781, class 1, type I or IV, finish optional, 3/4 by 0.031 or 0.035 inch. The strap shall pass through the bottom pallet adjacent to the center stringer, encircle the bundle and pass over the top pallet. Seals shall conform to QQ-S-781.

5.1.2 Commercial. Unless otherwise specified (see 6.2), pallets shall be packed in bundles not to exceed 55 inches in height. Bundles shall be secured with flat steel strapping of an appropriate size.

5.2 Marking

5.2.1 Level A. Marking shall be in accordance with MIL-STD-129.

5.2.2 Commercial. Marking shall be in accordance with MIL-STD-1188.

6. NOTES

6.1 Intended use. Pallets covered by this specifications are intended for use with forklift and handlift trucks for handling and storage of general cargo. The pallets are not preservative treated.

6.2 Ordering data. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Degree of packing required (see 5.1).
- (c) When pallets shall not be bundled for commercial packing (see 5.1.2).

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Preparing activity:

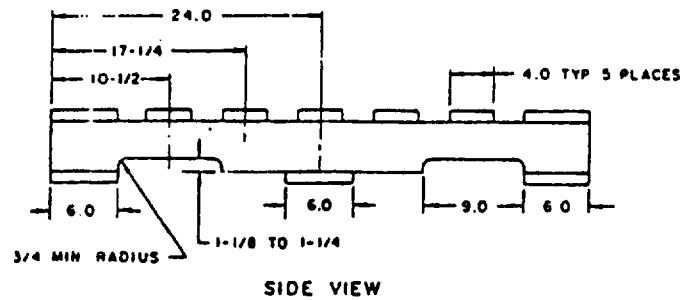
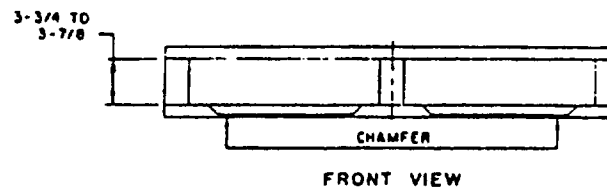
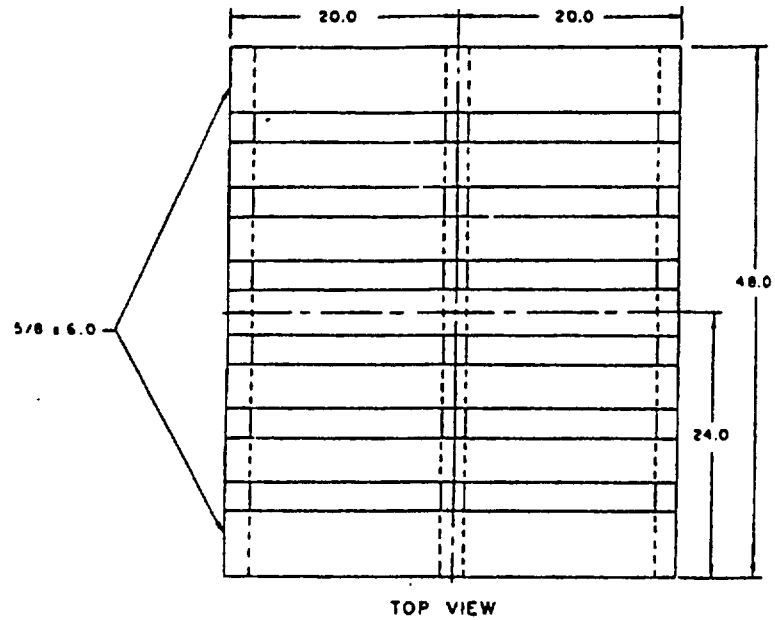
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User activity:

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ALL DIMENSIONS IN INCHES

FIGURE 1 Design details, 48 x 40 stringer pallet.

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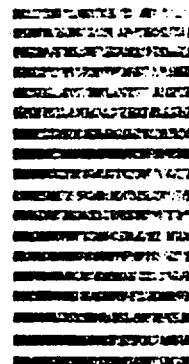
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<p>DOCUMENT IDENTIFIER (Number) AND TITLE <u>MIL-P-52999(ME) Pallet, Material Handling, Wood</u> <u>Stringer Construction, 4-Way Partial, 48 by 40 Inches</u></p>	
<p>NAME OF ORGANIZATION AND ADDRESS OF SUBMITTER</p> 	
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