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INCH-POUND
MIL-DTL-4M
10 January 1997
SUPERSEDING
MIL-T-4L
30 March 1994

DETAIL SPECIFICATION

TIRES AND INNER TUBES (NON-AIRCRAFT); PACKAGING OF

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

1. SCOPE

1.1 Scope. This specification covers the preservative, packing, and marking for shipment and storage of: Vehicle (non-aircraft) tires, pneumatic; inner tubes, pneumatic tires; and tires with flaps.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirement documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/BLUE, Warren, MI 48397-5000, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document, or by letter.

AMSC N/A FSC 2610
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2.2 Government documents.

2.2.1 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

A-A-228	- Twine, Fibrous, Jute.
A-A-1451	- Twine, Fibrous.
A-A-52408	- Preservative Coating, Rubber: For Rubber Surfaces.
L-P-378	- Plastic Sheet and Strip, Polyolefin.

DEPARTMENT OF DEFENSE

MIL-B-117	- Bags, Sleeves and Tubing.
MIL-T-50036	- Talc, Technical, T1 and T3.

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-129	- Marking for Shipment and Storage (Part 1 of 4 Parts).
MIL-STD-2073-1	- DoD Materiel, Procedures for Development and Application of Packaging Requirements (Part 1 of 2 Parts).

HANDBOOKS

DEPARTMENT OF DEFENSE

MIL-HDBK-774	- Palletized Unit Loads.

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

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2.3 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 issues of the documents cited in the solicitation (see 6.2).

AMERICAN NATIONAL STANDARD INSTITUTE (ANSI)

ANSI/ASQC Z1.4 - Sampling Procedures and Tables for Inspection By Attributes (DoD Adopted).

(Application for copies should be addressed to American National Standard Institute, 11 West 42nd Street, New York, NY 10036.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D1974 - Standard Practice for Methods of Closing, Sealing, and Reinforcing Fireboard Boxes (DoD Adopted).
ASTM D3950 - Standard Specification for Strapping, Nonmetallic (and Joining Methods)(DoD Adopted).
ASTM D3951 - Standard Practice for Commercial Packaging (DoD Adopted).
ASTM D4169 - Standard Practice for Performance Testing of Shipping Containers and Systems (DoD Adopted).
ASTM D5118 - Standard Practice for Fabrication of Fiberboard Shipping Boxes (DoD Adopted).
ASTM D5168 - Standard Practice for Fabrication and Closure of Triple-Wall Corrugated Fiberboard Containers (DoD Adopted).

(Applications for copies should be addressed to American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

UNIFORM CLASSIFICATION COMMITTEE, AGENT

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, Tariff Publishing Officer, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

2.4 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.

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3. REQUIREMENTS

3.1 First article. When specified (see 6.2), a sample pack shall be subjected to first article inspection in accordance with 4.2.

3.2 Materials. Materials used for preservation and packing in accordance with this specification shall be as specified herein or in referenced specifications and shall be either new or reused. Reuse of serviceable packaging materials is permitted and shall be free from defects affecting serviceability. All materials required to preserve and pack items under this specification shall be of appropriate size and specified strength to contain the items and packages as applicable (see 4.4.1).

3.2.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.3 Packaging. Tires and tubes shall be packaged to the level as specified (see 4.4.1 and 6.2).

3.3.1 Packaging requirements. Unless otherwise specified herein, the packaging and inspection shall be in accordance with MIL-STD-2073-1.

3.3.2 Preservation. Preservation shall be level A or C, as specified (see 6.2).

3.3.2.1 Tires, Level A.

3.3.2.1.1 Cleaning. Tires shall be cleaned in accordance with MIL-STD-2073-1 to ensure that all loose particles, foreign matter, and mold release agents are removed.

3.3.2.1.2 Drying. Tires shall be dried in accordance with MIL-STD-2073-1.

3.3.2.1.3 Preservative. Tires shall be preserved in accordance with A-A-52408.

3.3.2.1.4 Tires with flaps. Flaps shall be rolled and placed inside the tire. When the size of the rolled flap and normal distance between beads assure that flap will remain in place during normal handling and transportation, no tying is required. When the size of the rolled flap is such that it will not be securely held within the tire, it shall be secured within the tire using twine conforming to A-A-228 or A-A-1451, or nonmetallic strapping conforming to ASTM D3950, in such a manner as to assure safe delivery. When it is too difficult to insert the rolled flap within the

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tire, it shall be secured within the tire in the normal installed position. Safe transportation shall be ensured by securing flaps within the tire using twine conforming to A-A-228 or A-A-1451, or nonmetallic strapping conforming to ASTM D3950.

3.3.2.2 Tires, Level C. Tires shall be processed as required in paragraph 3.3.2.1, except A-A-52408 preservative is not required, unless otherwise specified (see 6.2).

3.3.2.3 Tubes, Level A.

3.3.2.3.1 Tubes weighing less than 15 pounds (lbs). Tubes shall be dusted with talc conforming to MIL-T-50036, Type T1, individually rolled or folded, and placed one each into a bag conforming to MIL-B-117. The bag shall be closed by heat sealing. As an alternative to bagging alone, tubes prepared in the preceding manner, shall be first placed one each into a fiberboard box conforming to ASTM D5118, class weather resistant and closed, sealed, and reinforced in accordance with box closure 1D of ASTM D1974, and then placed into a waterproof bag conforming to MIL-B-117. The bag shall be closed by heat sealing to ensure there are no leaks in the sealed bag. For Navy use only, bag material shall be limited to nonlaminated, pure plastics (i.e. L-P-378).

3.3.2.3.2 Tubes weighing more than 15 lbs. Tubes shall be dusted with talc conforming with MIL-T-50036, Type T1, and individually rolled or folded, and packed one each into a box conforming to ASTM D5118, class weather resistant and closed, sealed, and reinforced in accordance with box closure 1D of ASTM D1974, and then placed into a waterproof bag conforming to MIL-B-117. Container closure shall be in accordance with the container specification. The bag shall be closed by heat sealing to ensure there are no leaks in the sealed bag. For Navy use only, bag material shall be limited to nonlaminated, pure plastics (i.e., L-P-378).

3.3.2.3.3 Intermediate container. Intermediate containers shall conform to ASTM D5118, class weather resistant and closed, sealed, and reinforced in accordance with box closure 1D of ASTM D1974 and shall be used under the following conditions:

a. When they are considered economical because of total quantity on order, production schedule, or when it facilitates handling, storage and reshipment.
b. When the quantity to be shipped to a single destination permits the use of two or more intermediate containers in an exterior container.
c. When the exterior surface of the unit pack is a bag.
d. When the unit pack volume is less than 64 cubic inches and the exterior container is a rigid type.

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In the event that an intermediate container is required, the following limitations shall apply:

a. Quantity of unit packs per intermediate container shall be divisible by two.
b. Maximum 100 unit packs per intermediate container.
c. Maximum size of 2 cubic feet (ft^3).

The container closure shall be in accordance with the requirements of ASTM D5118 and ASTM D1974.

3.3.2.4 Tubes, Level C.

3.3.2.4.1 Preservation. Tubes shall be preserved in accordance with ASTM D3951.

3.4 Packing. Tires and tubes shall be packed to the level as specified (see 4.4.1 and 6.2).

3.4.1 Tires, Level A.

3.4.1.1 All motorcycle and bicycle tires, and vehicle tires with outside diameter of less than 14 inches (in.). Tires shall be packed in one of the exterior containers specified in the Appendix of MIL-STD-2073-1, or meet the performance requirements of ASTM D4169, Distribution cycle 18, Assurance level 1.

3.4.1.2 Tires with an outside diameter of 14 in. and greater. Tires with an outside diameter of 14 in. or greater shall be unitized. Tube and tubeless type tires shall be unitized into bundles not exceeding 43 in. in height. Means of unitizing may be by shrink wrapping with material conforming to L-P-378, type IV, Class 3 or 4, grade A or B, finish 1 or 2, stretch wrapping with material conforming to L-P-378, Type I, II, or III, grade A or B, finish 1 or 2, or strapping bundles with nonmetallic strapping conforming to ASTM D3950, type I, II, or III, grade A or B. When using strapping, a minimum or three vertical straps shall be used. Straps shall be evenly spaced, tensioned, and tires compressed a maximum 15% of the bundle. As a minimum, strapping shall be tensioned sufficiently to ensure integrity of the load. Edge protectors shall be used where applicable to prevent any damage to the tires. Unitized tires shall be arranged in the vehicle conveyance in a manner which facilitates handling with the appropriate material handling equipment, and which does not damage any of the tires.

3.4.1.2.1 For Navy use only. The requirements of 3.4.1.2 apply, except that means of unitizing shall be limited to nonmetallic strapping conforming to ASTM D3950, type I, II, or III, grade A or B.

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3.4.2 Tires, Level B.

3.4.2.1 All motorcycle and bicycle tires, and vehicle tires with an outside diameter less than 14 in.. Motorcycle, bicycle, and vehicle tires with an outside diameter less than 14 in. shall be packed in corrugated fiberboard boxes. Boxes shall conform to ASTM D5168, class weather resistant. As an alternate, any container that meets the requirements of ASTM D4169, Distribution Cycle 18, Assurance level II, may be provided.

3.4.3 Tires, Level C.

3.4.3.1 All motorcycle and bicycle tires, and vehicle tires with an outside diameter of less than 14 in.. A multiple quantity of unit or intermediate packs, bearing the same stock number, shall be placed in close-fitting containers conforming to transportation rules and specifically shall meet the performance requirements of rule 180-A, performance testing of shipping containers, and shall additionally meet rule 41 of the Uniform Freight Classification for rail shipments.

3.4.3.2 Tires with an outside diameter of 14 in. or greater. Tires shall be unitized when the quantity of tires being shipped will fit the cargo conveyance being used. Unless otherwise specified (see 6.2), when the unitization of the tires would result in the tires encompassing more space than is available in the cargo conveyance, tires may be shipped loose. Unitized tires shall be of a size and weight which permits handling with the appropriate material handling equipment, and shall be arranged in the vehicle conveyance in a manner so as to facilitate such handling. Loose and unitized tires shall be arranged in a manner which would not cause damage to any of the tires.

3.4.3.2.1 For Navy use only. Plastics shall not be used as a unitizing material unless absolutely necessary. Any plastic used shall be limited to nonlaminated polyolefin material or the equivalent of (i.e. L-P-378).

3.4.4 Tubes, Level A. Tubes shall be packed same as 3.4.1.1.

3.4.5 Tubes, Level B. Tubes shall be packed in fiberboard exterior boxes conforming to ASTM D5118, class weather resistant and closed, sealed, and reinforced in accordance with box closure 1D of ASTM D1974.

3.4.6 Tubes, Level C. Tubes shall be packed in accordance with ASTM D3951.

3.5 Unitization. Unskidded, boxed tires or tubes being shipped to a single destination and exceeding a total weight of 125 lbs should be palletized in accordance with MIL-HDBK-774. Unitized tires and unitized loads of packaged tubes shall be comprised of items of the same

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manufacturer, National Stock Number, and shelf life (marked in terms of calendar quarter followed by the last two digits of the calendar year, with the day of the quarter being the last day; e.g., EXP DATE 4Q93) (see 4.4.1).

3.5.1 For Navy use only. Plastics shall not be used as a unitizing material unless absolutely necessary. Any plastic used shall be limited to nonlaminated polyolefin material or the equivalent of (i.e. L-P-378).

3.6 Marking. In addition to any special marking required by the contract or order (see 6.2), all tires (boxed, loose, or within a unitized load), unit packs, intermediate packs, exterior shipping containers and unitized loads shall be permanently and legibly marked in accordance with MIL-STD-129 (see 4.4.1).

3.6.1 Special marking. Tires and tubes are a type I, 5 year nonextendable shelf-life item, and shall be marked as required for such a shelf-life item in accordance with MIL-STD-129. Shelf life marking shall be applied to all tires, unit packs, intermediate packs, exterior packs, and unitized loads. Loose tires and unitized loads of loose tires (and tires within such loads), which have DoT or DoD markings molded into the sidewall, indicating the week and year of manufacturer (cure date) of the tire, do not require the cure date to be marked, but do require the expiration date to be marked.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.2).
b. Conformance inspections (CI) (see 4.3).

4.2 First article inspection. Unless otherwise specified (see 6.2), first article inspection shall be performed in preproduction samples of one pack as specified in table I.

4.3 CI. CI shall include the examination of 4.3.2. Noncompliance with any of the specified requirements in section 3 shall be cause for rejection of the sample and the inspection lot.

4.3.1 Sampling plan for examination. Unless otherwise specified (see 6.2), the sampling plan for examination as specified herein shall be used.

4.3.1.1 Lot formation. A lot shall consist of all packaging of items having the same stock number and from an identifiable package period.

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4.3.1.2 Sampling for examination. The sample for CI examination shall be randomly selected from the inspection lot in accordance with ANSI/ASQC Z1.4.

4.3.2 Examination. The sample selected in accordance with 4.3.1.2 shall be examined and defects classified as specified in table I (see 4.4.2). The acceptance number in all cases is zero.

TABLE I. Classification of defects.

Defects				
Category	Packaging of tires	Packaging of tubes	Packaging	Method of inspection
Major:				
101	Improper preservation (see 3.3.2)	Tubes improperly folded (see 3.3.2.3.1 and 3.3.2.3.2)	Container closure improper (see 3.3.2.3.3 and 3.4)	Visual
102	Insecure tire flaps (see 3.3.2.1.4)	Bags not as specified (see 3.3.2.3.1 and 3.3.2.3.2)	Container size improper (see 3.3.2.3.3 and 3.4)	Visual
103	Incorrect marking (see 3.6 and 3.6.1)	Improper or inadequate bag closure (see 3.3.2.3.1 and 3.3.2.3.2)	Exterior shipping container not as specified (see 3.3.2.3.3 and 3.4)	Visual
104	Illegible marking (see 3.6 and 3.6.1)	Container not as specified (see 3.3.2.3.3)	Weight limitation of container exceeded (see 3.3.2.3.3 and 3.4)	Visual
105		Container closure improper (see 3.3.2.3.3)	Improper unitization (see 3.4.1.2, 3.4.3.2 and 3.5)	Visual
106		Excessive looseness in package (see 3.3.2.3.3)	Improper and illegible marking (see 3.6 and 3.6.1)	Visual
107		Improper and illegible marking (see 3.6 and 3.6.1)		Visual

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4.4 Methods of inspection.

4.4.1 Materials, design, and construction. Conformance to 3.2 through 3.6.1 shall be determined by inspection of contractor records providing proof or certification that design, construction, processing, and materials conform to requirements. Applicable records shall include drawings, specifications, design data, receiving inspection records, processing, and quality control standards, vendor catalogs and certifications, industry standards, test reports, and rating data.

4.4.2 Defects. Conformance to 3.3 through 3.6.1 shall be determined by examination for defects listed in table I. Examination shall be visual, or by measurement with standard inspection equipment.

5. PACKAGING

(This section is not applicable to this specification.)

6. NOTES

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

6.1 Intended use. The preservation, packing, and marking requirements specified herein are intended to provide safe transportation and storage of tires, tubes, and tires with flaps.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this specification.
b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1 and 2.3).
c. If first article is required (see 3.1).
d. Selection of applicable level of packaging for tires and tubes (see 3.3 and 3.4).
e. If level A or level C preservation should be used (see 3.3.2).
f. Whether preservative is required for Level C (see 3.3.2.2).
g. When tires, otherwise allowed to be shipped loose, must be unitized (see 3.4.3.2).
h. Special marking requirements (see 3.6).
i. When sampling plan for examination is other than as specified (see 4.3.1).

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6.3 Subject term (key word) listing.

Flap
Intermediate container
Preservation
Shipment
Storage
Unitization

6.4 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodians:
Army - AT
Navy- MC
Air Force - 99

Review Activities:
Army - AV
Air Force - 84

Preparing Activity:
Army - AT

(Project 2610-0162)

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I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE (YYMMDD)
	MIL-DTL-4M	970110

3. DOCUMENT TITLE

Tires and Inner Tubes (Non-Aircraft); Packaging of

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME	b. TELEPHONE (Include Area Code) (1) Commercial: (810) 574-8745 (2) AUTOVON: 786-8745
c. ADDRESS (Include Zip Code) Commander U.S. Army Tank-automotive and Armaments Command ATTN: AMSTA-TR-E/BLUE Warren, MI 48397-5000	**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:** Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340