

MIL-N-27444D (USAF)

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SUPERSEDING
MIL-N-27444C (USAF)
24 April 1968

MILITARY SPECIFICATION
NET, CARGO TIEDOWN, PALLETS, HCU-7/E,
HCU-15/C, HCU-11/C, and HCU-16/C

This specification is approved for use by the Department of the Air Force and is available for use by all Departments and Agencies of the Department of Defense

1. SCOPE

1.1 This specification covers pallet cargo tiedown nets, designated HCU-7/E, HCU-15/C, HCU-11/C and HCU-16/C.

1.2 Classification.

Type I - Net Cargo Tiedown, Pallet HCU-7/E
Type II - Net Cargo Tiedown, Pallet HCU-15/C
Type III - Net Cargo Tiedown, Pallet HCU-11/C
Type IV - Net Cargo Tiedown, Pallet HCU-16/C

2. APPLICABLE DOCUMENTS

2.1 Government documents.

Beneficial comments (*recommendations, additions, deletions*) and any pertinent data which may be of use in improving this document should be addressed to: WR-ALC/MMEDTA, Robins AFB, GA 31098, 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 1670

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2.1.1 Specifications, standards, and handbook. Unless otherwise specified (see 6.2), the following specifications, standards, and handbooks 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**

PPP-B-601	Boxes, Wood, Cleated-Plywood
PPP-B-621	Boxes, Wood, Nailed and Lock-Corner
PPP-B-636	Boxes, Fiberboard

Military

MIL-P-116	Preservation, Methods of
MIL-W-4088	Webbing, Textile, Woven, Nylon
MIL-I-6903	Ink, Marking (For Parachutes And Other Textile Items)
MIL-W-27265	Webbing, Textile, Woven, Nylon Impregnated
MIL-I-45208	Inspection System Requirements

STANDARDS**Federal**

595	Colors
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Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-810	Environmental Test Methods
MIL-STD-1186	Cushioning, Anchoring, Bracing, Blocking, and Waterproofing, With Appropriate Test Methods

“(Copies of specifications, standards, handbooks, drawings, publications and other Government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)”

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2.1.2 Other Government Documents, Drawings and Publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

DRAWING**Air Force**

67F46303	Type I - Net-HCU-7/E, Side
67E46290	Type II - Net-HCU-15/C, Top
67F46476	Type III - Net-HCU-11/C, Side
67E46475	Type IV - Net-HCU-16/C, Top

(Copies of specifications, standards, handbooks, drawings, publications and other Government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

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

3. REQUIREMENTS

3.1 Preproduction. This specification makes provisions for preproduction testing.

3.2 General requirements. The requirements of applicable drawings of required net type and details thereto apply as requirements of the specification, with the exceptions and additions specified herein. In cases of conflict between the specification and drawings, the specification shall govern.

3.2.1 Materials. The nets shall be constructed of materials as specified on the detail drawings.

3.3 Construction. The nets shall be so constructed that no part will work loose in service. It shall be built to withstand the strains, jars, vibrations, and other conditions incident to shipping, storage, and service.

3.4 Reliability. The nets shall be constructed as specified herein to assure the optimum service life under all service conditions specified herein, and shall be acceptably demonstrated during the testing specified herein.

3.5 Net configuration. The nets shall be constructed in accordance with applicable drawings.

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3.6 Net assembly. A net assembly shall consist of two side nets and one top net. Combination of Types I and II makes one set. Combination of Types III and IV makes one set.

3.7 Webbing. The webbing shall conform to MIL-W-4088 and condition R of MIL-W-27265 except, for testing purposes, the minimum breaking strengths of the webbing shown below shall be considered to be:

<u>Type</u>	<u>Minimum Breaking Strengths (lbs)</u>
VII	5500
VIII	3600
XIII	6500

Webbing colors shall be as follows and shall conform to FED-STD-595:

Type I, Olive Drab, Color Number 14087, 24087, or 34087

Type II, Yellow, Color Number 13538, 23538, or 33538

Type III, Strata Blue, Color Number 15045

Type IV, Green, Color Number 24108 or 34108

3.8 Hardware. All hardware shall be installed in accordance with the applicable detail drawing. All hardware shall be securely sewed to the webbing or otherwise attached to the net.

3.9 Stitching. Stitching design and thread shall be selected by the contractor. They shall meet the requirements of the specification and the tests in Section 4.

3.10 Strength. The following factors and load configuration shall be used in the construction of the nets:

3.10.1 Maximum stock height and load. The cargo stock height shall be 96 inches maximum for the Types I and II nets, 72 inches maximum for the Types III and IV nets. The total maximum load for Types I and II shall be 10,000 pounds, for Types III and IV 5,000 pounds.

3.10.2 Load configuration. The load shall be considered to be rectangular boxes approximately 20 inches wide by 20 inches long by 12 inches high for Types I and II nets. For Types III and IV, the load shall be boxes approximately 20 inches wide by 24 inches long by 12 inches high. All boxes are free to move relative to adjacent boxes.

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3.10.3 Maximum range of adjustment. The Type I net set shall enclose on 84 inches wide by 108 inches long load. The Type III net set shall enclose on 54 inches wide by 88 inches long load.

3.11 Performance. The nets shall be capable of withstanding the following condition; vibration incident to use in aircraft.

3.12 Special marking. The nets shall be marked with 1-inch high block letters to indicate outside, top or side as applicable in accordance with type required, and 463L. Nets shall be stenciled with ink in accordance with MIL-I-6903. The colors shall be as in accordance with FED-STD-595 and as follows:

Type II, Blue, Color Number 15102 or 25102

Types I, III, and IV, Yellow, Color Number 13538, 23538 or 33538

3.13 Workmanship. Workmanship shall be of the highest quality to insure proper functioning under conditions to which the nets may be subjected. Unsatisfactory workmanship such as loose, cocked, or inadequately headed rivets; distorted or loose bushing and pins; loose, broken, or incomplete stitching and rough malformed, misaligned, or improperly fabricated fittings shall be defects. Corners shall be rounded, and sharp edges, burrs, or other protrusions that could damage the webbing will not be permitted.

3.14 Dimensional tolerances. Dimensions and tolerances not specified shall be consistent with best commercial practices. Where dimensions and tolerances may affect the interchangeability, operation, or performance of the net, they shall be held or limited accordingly.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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 Inspection. The requirements of MIL-I-45208 apply.

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4.2 Classification of tests. The inspection and testing of the nets shall be classified as follows:

- a. **Preproduction testing** - 4.3
- b. **Acceptance testing** - 4.4

4.3 Preproduction testing.

4.3.1 Preproduction test sample. The preproduction test sample of each type net shall consist of the following:

a. Two complete nets of each type shall be produced and examined in accordance with 4.5.1. One net shall be used for test specimens and one net shall be retained for comparison with production nets. The retained net shall be shipped as one of the last shipments of the contract.

b. Test specimens shall be selected from one of the nets and shall be as assembled in the net. A specimen shall be selected for each type hardware, except the loop stop, combined with each type of attached webbing. In places where two or more types of webbing are attached to one piece of hardware (an example of this is the ring) a specimen shall be selected for each type of webbing, thread and sewing pattern used. In places where two pieces of hardware are assembled together, the test specimen shall include the assembly. Each test specimen shall be tested in accordance with 4.5.2.

c. In addition to the specimens selected in 4.3.1b, a test specimen shall be selected for each type of stitch pattern not included in the specimens in 4.3.1b. An example is the grid area (where webbing is sewn to webbing) stitching. Each test specimen shall be tested in accordance with 4.5.2.

d. A tensioning mechanism test specimen shall be fabricated and tested in accordance with the requirements of 4.5.3.1.

4.4 Acceptance tests. The acceptance tests shall consist of the following:

- a. **Individual test** - 4.4.1
- b. **Lot test** - 4.4.2

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4.4.1 Individual test. Each net shall be subjected to the test specified in 4.5.1.

4.4.2 Lot sampling plan. A lot shall consist of one week's production of one type of net. The Government shall randomly select, for contractor testing, nets from the lot in accordance with MIL-STD-105, inspection level S-2. The AQL shall be 6.5. The test specimen shall, as a group, cover all combinations of hardware, webbing and stitching used in the nets. Loop stops shall be excluded. The specimens shall be tested according to 4.5.2. Failure of any specimen shall constitute failure of the net from which it was extracted.

4.4.2.1 Rejection and retest. When a lot is rejected, a retest may be allowed after the contractor has explained to the Government representative the cause of failure and the action taken to preclude recurrence, the cause of failure has been corrected, all nets on hand have been purged and 4.4.2 successfully repeated at the contractor's expense.

4.4.2.2 Defects in nets already accepted. The investigation of a test failure could indicate that defects may exist in nets already accepted. If so, the contractor shall fully advise the procuring activity of all the defects likely to be found and the method of correcting them.

4.5 Test methods.

4.5.1 Examination of product. The net shall be examined to determine compliance with the requirements specified herein with respect to materials, workmanship, dimensions, and marking.

4.5.2 Load test. Each specimen shall be subjected to a load equal 85% of the minimum breaking strength of the webbing (see 3.7) except as noted on the component drawing and herein. The load shall be applied for 30 seconds minimum. The test load for the slide, 67B46274-01, shall be 3500 pounds. The test load for the ring, 67B46275-01, and the hook assembly, 64C43921, test specimen shall be 5100 pounds. The test load for the specimen containing the hook, 67B46270-10 and Type XIII webbin shall be 4200 pounds. The grid area stitching (see details A, C and E of 67E46290, detail B of 67F46476, detail C of 67F46303, and details B and C of 67E46475) shall be loaded to 1700 pounds.

4.5.3 Environmental test. The hardware of the net shall be subjected to the following environmental test conducted in accordance with the specified procedure of MIL-STD-810.

4.5.3.1 Vibration. A tensioning mechanism shall be subjected to vibration in accordance with procedure X. The tensioning mechanism shall be vibrated while under a tension of 200 pounds. No loss of tension shall result due to slippage of the webbing through the tensioning mechanism.

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4.6 Inspection of the preservation, packaging, packing, and marking for shipment and storage. Inspection of the preservation, packaging, packing, and marking for shipment and storage shall be in accordance with the requirements of Section 5, or the documents specified therein.

5. PACKAGING

5.1 Preservation and packing. Preservation and packing shall be level A or C as specified (see 6.2).

5.1.1 Level A. Net shall be preserved in accordance with MIL-P-116, Method III, and packaged one each per unit container conforming to PPP-B-636, Class Weather Resistant.

5.1.2 Level C. Net shall be preserved and packaged in accordance with the manufacturer's commercial practice and packaged one each per unit package.

5.2 Packing. Packing shall be Level A, B or C as specified (see 6.2).

5.2.1 Level A. Nets preserved and packaged as specified in 5.1.1 shall be packed in export-type exterior shipping containers conforming to PPP-B-601, or PPP-B-621, as applicable. Insofar as practicable, exterior containers shall be uniform size and shape of cube and tare consistent with the protection required and shall contain identical items and quantities. The gross weight of each pack shall be limited to 200 pounds. Unit containers shall be used for shipping containers in shipment of single items. Contents of shipping containers shall be waterproofed in accordance with MIL-STD-1186.

5.2.2 Level B. Nets preserved and packaged as specified in 5.1.1 or 5.1.2 as applicable, shall be packed in domestic-type exterior containers conforming to PPP-B-601, PPP-B-621, and PPP-B-636. Exterior containers shall be of minimum cube and tare consistent with the protection required. Insofar as practicable, exterior containers shall be uniform size and shape and shall contain identical quantities. The gross weight of each pack shall be limited to 500 pounds. When gross weight exceeds 250 pounds, skids shall be provided. Containers shall be closed and strapped in accordance with the applicable container specification or appendix thereto.

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5.2.3 Level C. Packages which require overpacking for acceptance by the carrier shall be packed in exterior-type shipping containers in a manner that will insure safe transportation at the lowest rate to the point of delivery. Containers shall meet Consolidated Freight applicable to the mode of transportation.

5.3 Marking. Interior and exterior containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. The nets are intended for use in securing cargo to pallets conforming to MIL-P-27443 as applicable.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Type required, see 1.2.
- c. Required levels of preservation, packaging and packing (see Section 5).

Custodian:

Air Force - 99

Preparing Activity:

Air Force - 84

Project Number:

1670 - F685

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL <i>(See Instructions - Reverse Side)</i>	
1. DOCUMENT NUMBER	2. DOCUMENT TITLE
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): _____
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5. PROBLEM AREAS	
a. Paragraph Number and Wording:	
b. Recommended Wording:	
c. Reason/Rationale for Recommendation:	
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