

MIL-B-17757E

16 September 1974

SUPERSEDING

MIL-B-17757D

19 April 1966

MILITARY SPECIFICATION

BOXES, SHIPPING, FIBERBOARD (MODULAR SIZES)

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

1. SCOPE

- * 1.1 Scope. This specification covers fiberboard boxes and liners of four modular sizes (see 6.1).
- * 1.2 Classification. Boxes and liners shall be of the following types, classes, varieties and grades as specified (see 6.2). Sizes, styles and dimensions of the boxes are as specified in table I (see 6.2). Liners are as specified in 3.4.

Type - CF (corrugated fiberboard).

Class - Domestic

Variety - SW (single wall).

Grades - 200, 275 and 350.

Variety - DW (double wall)

Grades - 200 and 275.

Class - Weather-resistant

Variety - SW (single wall).

Grades - V3c, W5c and W6c.

Variety - DW (double wall)

Grade - V15c.

Type - SF (solid fiberboard).

Class - Weather-resistant.

Grade - V2s, V3s, and V4s.

* 2. APPLICABLE DOCUMENTS

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

FSC 8115

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SPECIFICATIONS

FEDERAL

- QQ-S-781 - Strapping, Steel, Flat and Seals.
- PPP-B-636 - Boxes, Shipping, Fiberboard.
- PPP-B-638 - Boxes, Liners and Sleeves, Fiberboard, Knocked-Down, Flat; Packing of.
- PPP-F-320 - Fiberboard, Corrugated and Solid, Sheet Stock (Container Grade) and Cut Shapes.
- PPP-S-760 - Strapping, Nonmetallic (and Connectors).

STANDARDS

MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.

(Copies of specifications and standards required by suppliers 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 specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply:

National Motor Freight Traffic Association, Inc., Agent

National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Associations, Inc., Tariff Order Section, 1616 P Street, N.W., Washington, DC 20036.)

Uniform Classification Committee, Agent

Uniform Freight Classification

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

3. REQUIREMENTS

- * 3.1 Fiberboard. The fiberboard shall be in accordance with PPP-B-636 for the applicable type, class, variety, and grade. The fiberboard used to fabricate class domestic or class weather-resistant boxes shall be B or C flute, at the option of the supplier.

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* 3.2 Body manufacturer's joint of boxes. Body joints of class domestic boxes shall be a lapped joint secured with glue or metal fastenings. Metal fastenings shall conform to the requirements for class weather-resistant boxes of PPP-B-636. Body joints of class weather-resistant boxes shall conform to PPP-B-636. Stitches shall be applied vertically or diagonally or horizontally as shown in figures 1, 2, and 4.

* 3.3 Liners. Unless otherwise specified (see 6.2), the fiberboard used in fabricating liners for box sizes 1A, 2A and 3A (see table I) shall be type CF, class domestic, variety SW or DW as specified (see 6.2), A or C flute in conformance with PPP-F-320. The fiberboard used in liners for box sizes 1A and 2A shall be grade 200 and for box size 3A, the fiberboard shall be grade 275. When specified (see 6.2), the fiberboard used in the liners shall conform to type CF, class weather-resistant, grade V3c, V15c, W5c or W6c, A or C flute of PPP-F-320. The liners shall be scored and cut to fit properly in the box, subject to the box tolerances, and to cover the end and side panels with the ends of the liner to meet in a box corner. Liners shall have the flutes perpendicular to the box openings.

3.4 Dimensions. Inside dimensions of the boxes shall be as specified in table I and shall be designated by the size number. The length dimension shall be the distance between the end panels of the box, the width dimension shall be the distance between side panels of the box, and the depth dimension shall be the distance between the inner flaps of the top and bottom of the box when closed. A tolerance of $\pm 1/8$ inch is permitted in box dimensions.

TABLE I. Size number, style, and inside dimensions of boxes

Inside dimensions of boxes (inches)				
Size no.	Style	Length	Width	Depth
1	CSSC	15-1/2	11-9/16	7-1/8
1A 1/	CSSC-L	15-1/2	11-9/16	7-1/8
2	CSOSC	23-1/2	15-1/2	6-3/4
2A 1/	CSOSC-L	23-1/2	15-1/2	6-3/4
3	CSOSC	23-1/2	15	15
3A 1/	CSOSC-L	23-1/2	15	15
4 2/	FOL	46-3/4	16-1/4	24

1/ Boxes designated as size numbers 1A, 2A and 3A shall be furnished with liners.

2/ Class weather-resistant only.

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3.5 Styles. Boxes shall be of the styles for the applicable box size number as specified in table I.

3.5.1 Style CSSC, center special slotted container. This box shall be in accordance with figure 1. The inner flaps shall be of sufficient length to meet at the middle of the face with a gap not to exceed 1/4 inch when in closed position. The outer flaps shall be cut to meet at the middle of the face when in closed position.

3.5.2 Style CSOSC, center special overlap slotted container. This box shall be in accordance with figure 2. When closed, the inner flaps shall meet in the middle of the face with a gap not to exceed 1/4 inch when in closed position. Outer flaps shall be the same length as inner flaps and shall overlap. (No flap cutting is required).

3.5.3 Style FOL, full overlap slotted container. This box shall be in accordance with figure 4. The length of the outer flaps when measured from the outer edge of the flap to the center line of the score shall not be less than the inside width of the box minus 1 inch. Inner flaps shall be the same length as the outer flaps. Style FOL box may be fabricated from two pieces of fiberboard with two body joints on diagonally opposite edges.

3.6 Marking. The compliance and certification markings and printing shall comply with PPP-B-636.

3.7 Workmanship. The completed box shall be clean, free of frayed or torn edges, improperly aligned panels, improper scores and slots, and the marking shall be clear and legible. All dimensions of the boxmakers blank shall be accurately cut, scored, and slotted so that the assembled box parts fit closely without undue binding. No flap shall project beyond an edge of the box by more than 1/8 inch when the box is set up and closed. All metal fasteners, staples, or stitching wire shall be well clinched, flush with or below the interior and exterior surfaces of the corrugated fiberboard joined, and shall be flush or slightly above the surfaces for solid fiberboard.

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 in the contract or order, the supplier 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.

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4.1.1 Inspection. Sampling for inspection shall be performed in accordance with MIL-STD-105, except where otherwise indicated hereinafter.

4.2 Component and material inspection. In accordance with 4.1 above, components and materials shall be inspected and tested in accordance with all the requirements of referenced specifications, drawings and standards unless otherwise excluded, amended, modified or qualified in this specification or applicable purchase document.

4.3 Inspection of the end item.

4.3.1 Examination of the end item. Examination of the end item shall be in accordance with the classification of defects, inspection levels and acceptable quality levels (AQLs) (see 4.3.5). A sample of boxes, including liners, when applicable shall be selected from each inspection lot for each type, class, variety, grade, style, and size offered for inspection for visual and dimensional characteristics. The lot size for determining the sample size shall be expressed in units of boxes, including liners, when required.

4.3.2 Examination of the end item for defects in appearance, construction, and workmanship. The sample size for this examination shall be one complete box and box liner when applicable. The lot size shall be expressed in units of boxes, and box liners when applicable.

<u>Examine</u>	<u>Defect</u>
Condition (all boxes, and liners)	Tear, split, or puncture. Dirty, stained, or scuffed. Ragged, uneven, or crushed edge. Any ply separation more than 1/2 inch from edge of material (examine visually, measure if in doubt).
Scoring (all boxes and liners)	Direction of flutes does not run perpendicular to the score line of the box opening. Outer component ply or facing split completely through when folded. Poor scoring, making it difficult to fold box or liner into required position.
Liners (when applicable)	Edges do not meet, allowing space of more than 1/8 inch plus thickness of the board.
Boxes, for box-makers certificate	Missing.

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<u>Examine</u>	<u>Defect</u>
Type of board fluting, etc., are visible)	Not single wall or double wall as specified.
Style of box construction CSOSC, FOL and CSSC	Not specified style. Fabricated from more than one piece of fiberboard (unless otherwise specified). Joint not along one edge of the four edges perpendicular to the open face.
Style CSSC	Not in accordance with figure 1. Inner flaps do not meet in the middle of the face when in closed position so that an opening of more than 1/4 inch exists. Outer flaps do not meet when closed.
Style CSOSC	Not in accordance with figure 2. Inner flaps do not meet in the middle of the face when in closed position so that opening is greater than 1/4 inch. Outer flaps not same length as inner flaps.
Style FOL	Not in accordance with figure 4. Constructed so that inner flaps are not same length as outer flaps. Length of outer flaps less than inside width of box by more than 1 inch.

4.3.3 Examination of the end item for dimensional defects. The sample unit for this examination shall be one complete box and liner (when applicable). The lot size shall be expressed in units of boxes and liners (when applicable).

<u>Examine</u>	<u>Defect</u>
Box dimension	Not as specified in table I, $\pm 1/8$ inch.
Liner dimension	Not as specified in table I.

- * 4.3.4 Examination of preparation for delivery. An examination shall be made to determine that packing and marking as required by section 5 of this specification are complied with. Defects shall be scored as indicated below. The sample unit shall be one shipping container fully prepared for delivery. The lot size shall be the number of containers in the inspection lot.

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<u>Examine</u>	<u>Defect</u>
Marking (exterior and interior containers)	Incorrect; illegible; of improper size, location, sequence, or method of application.
Materials	Any nonconforming component; component missing, damaged or otherwise defective affecting serviceability.
Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose strapping or tape, bulging or distortion of containers.
Contents (exterior and interior containers)	Number per container is less than specified.

4.3.5 Inspection levels and acceptable quality levels (AQLs). The AQLs, expressed in defects per hundred units, and the inspection levels, as specified in MIL-STD-105, shall be as follows:

	<u>Inspection levels</u>	<u>AQLs</u>
For examination in 4.3.2	I	6.5
For examination in 4.3.3	S-2	4.0
For examination in 4.3.4	S-2	2.5

5. PREPARATION FOR DELIVERY

- * 5.1 Packing. Packing shall be level A, B, or C, as specified (see 6.2).

5.1.1 Level A. Boxes shall be packed in accordance with PPP-B-638, as specified therein for level A.

5.1.2 Level B. Boxes shall be packed in accordance with PPP-B-638, as specified therein for level B.

- * 5.1.3 Level C (commercial packing). Boxes shall be packed in a manner to insure carrier acceptance and safe delivery at destination at the lowest transportation rate for such supplies. Containers shall be in accordance with Uniform Freight Classification Rules or National Motor Freight Classification Rules, as applicable.

5.1.4 Unit packing. When specified (see 6.2), size numbers 2 and 3 boxes and 2A and 3A liners shall be unit packed as specified below.

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- * 5.1.4.1 Size numbers 2 and 3 boxes. Size numbers 2 and 3 boxes shall be unit packed in accordance with figure 6 and the following procedure: Stack 10 boxes in a bundle and secure bundle at two sides with strong twine. Stack fifteen bundles (150 boxes) in 15 layers and secure the entire unit with two 5/8-inch wide flat steel straps conforming to type I or IV, finish A of QQ-S-781 or nonmetallic strapping conforming to type II or III (minimum breaking strength 850 pounds) of PPP-S-760, as follows: Two bundles, one on top of the other, with the bundles reversed, shall be placed on the straps. Four spiralwound paper tubes shall then be placed on top, one at each corner and the remaining 13 bundles placed on top of the tubes, with each bundle reversed. The approximate dimensions of the tubes shall be: inside diameter - 4 inches; wall thickness - 1/4 inch; height - 4 inches. The completed unit shall not exceed 50 inches in height. Corrugated fiberboard, metal, or other corner protectors shall be placed under the straps to prevent straps cutting into the boxes.
- * 5.1.4.2 Size number 3A box liner. The liners for size number 3A shall be unit packed in accordance with figure 7 and the following procedure: Fold liners in half at center score, stack 15 liners in a bundle and secure bundle at each end with strong twine. Stack 20 bundles (300 liners) in 7 layers and secure the entire unit with two 5/8-inch wide flat steel straps conforming to type I or IV, class A of QQ-S-781 or nonmetallic strapping conforming to type II or III (minimum breaking strength 850 pounds) of PPP-S-760, as follows: Two bundles shall each be centered lengthwise on a strap and 18 bundles each. Corrugated fiberboard, metal or other corner protectors shall be placed under the straps to prevent straps cutting into the liners.
- 5.1.4.3 Size number 2A box liner. The liners for size number 2A shall be unit packed in accordance with figure 8 and the following procedure: Fold liners in half at center score, stack 30 liners in two stacks of 15 each to form a bundle, and secure bundle at each end with strong twine. Stack 20 bundles (600 liners) in 7 layers and secure the entire unit with four 5/8-inch wide, flat steel straps as follows: Two bundles shall be placed lengthwise on the straps with one strap centered under each of the 4 stacks, and 18 bundles shall be placed on top crosswise to the straps in 6 layers of 3 bundles each. Corrugated fiberboard, metal or other corner protectors shall be placed under the steel straps to prevent straps cutting into the liners.
- * 5.2 Marking. In addition to any special marking required by the contract or purchase order, shipping containers and bundles shall be marked in accordance with MIL-STD-129.

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6. NOTES

6.1 Intended use. The boxes covered by this specification are primarily for use as interior or exterior containers for shipment of packed supplies and equipment of FSC Group 83 (Textiles, Leather and Furs) and FSC Group 84 (Clothing and Individual Equipment).

* 6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type, class, variety, and grade of fiberboard required (see 1.2).
- (c) Size number of box required (see table I).
- (d) Applicable level of packing (see 5.1).
- (e) Whether unit packing is required (see 5.1.4).

6.3 The margins of this specification have been marked with an asterisk (*) to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and suppliers are cautioned to evaluate the requirements of this document based on the entire content, irrespective of the marginal notations and relationship to the last previous issue.

Custodians:

Army - GL
Navy - SA
Air Force - 69

Preparing activity:

Army - GL
Project No. 8115-0251

Review activities:

Army - SM, MD

User activity:

Navy - MC

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APPENDIX

USE CRITERIA, CLOSURE, AND REINFORCING REQUIREMENTS

10. SCOPE

- * 10.1 This appendix covers requirements for use, closure, waterproofing of contents, reinforcing, and palletization of filled boxes.

10.2 Use criteria.

10.2.1 Boxes, sizes 1, 2 and 3. For boxes, sizes 1, 2 and 3, the class of fiberboard, as specified, shall be used for fabrication of the boxes (see 1.2).

10.2.2 Boxes, sizes 1A, 2A and 3A. When additional protection is needed for contents and the rigidity of the boxes require reinforcement, box sizes 1A, 2A and 3A should be used in order to utilize the liners with which these boxes are equipped. When specified, liners made of class weather-resistant fiberboard may be utilized (see 3.3).

10.2.3 Box, size 4. This box is primarily intended for use as a unitizer (for level A shipment). This unitizer box will accommodate twelve size 1 or 1A boxes, six size 2 or 2A boxes, or three size 3 or 3A boxes, or a combination of these boxes. Figure 5 depicts one arrangement of a packing combination.

20. APPLICABLE DOCUMENTS

- * 20.1 The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this appendix to the extent specified herein:

Federal Standard:

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

Military Standard:

MIL-STD-147 - Palletized Unit Loads For 40" x 48" Pallets.

30. REQUIREMENTS

30.1 Assembly. All boxes shall be assembled in accordance with figures 1, 2 and 4.

30.1.1 Placement of liners in boxes 1A, 2 and 3A. The liner shall be placed in the box to cover the end and side panels, with the ends of the liner abutting in the corner opposite the manufacturer's joint of the box (see figure 3).

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- * 30.2 Closure requirements for class domestic boxes. Top and bottom flaps shall be closed in conformance with method II of the Appendix of PPP-B-636. Metal fastenings, when applicable, shall be positioned as illustrated in figure 9.
 - * 30.3 Closure and waterproofing requirements for class weather-resistant boxes. Top and bottom flaps shall be closed in accordance with method III, and waterproofed in accordance with method V in conformance with the requirements of the appendix of PPP-B-636.
 - * 30.4 Reinforcing requirements for class weather-resistant boxes. Boxes shall be reinforced with flat steel strapping, nonmetallic strapping, or tape banding in conformance with the requirements of the appendix of PPP-B-636.
- 30.5 Palletization. Palletization shall be in conformance with MIL-STD-147 except as shown in tables II and III.

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TABLE II. Unit load data for MILVAN shipments

Box size No.	Box size, approximate outside dimensions (inches)	Pallet pattern 1/ load	No. of courses per unit load	No. of boxes per course	No. of boxes per unit load	Height of load 2/ load 2/ (inches)
1 and 1A	15 3/4 x 11 13/16 x 7 5/8	9	9	10	90	74 1/8
2 and 2A	23 3/4 x 15 3/4 x 7 1/4	3	10	5	50	78
3 and 3A	23 3/4 x 15 1/4 x 15 1/2	3	4	5	20	67 1/2

1/ Pallet patterns in accordance with MIL-STD-147.

2/ Includes 5 1/2 inch height of pallet.

TABLE III. Unit load data for SEAVAN shipments

Box size No.	Box size, approximate outside dimensions (inches)	Pallet pattern 1/ load	No. of courses per unit load	No. of boxes per course	No. of boxes per unit load	Height of load 2/ load 2/ (inches)
1 and 1A	15 3/4 x 11 13/16 x 7 5/8	9	10	10	100	81 3/4
2 and 2A	23 3/4 x 15 3/4 x 7 1/4	3	11	5	55	85 1/4
3 and 3A	23 3/4 x 15 1/4 x 15 1/2	3	5	5	25	83

1/ Pallet patterns in accordance with MIL-STD-147.

2/ Includes 5 1/2 inch height of pallet.

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40. INSPECTION AND TEST PROCEDURES

40.1 Inspection. Boxes shall be inspected to determine compliance with the requirements of the appendix of PPP-B-636. Sampling shall be conducted in accordance with MIL-STD-105. Component and material inspection and testing shall be in accordance with 4.2 of this specification (see 40.2.1).

40.1.1 Examination for assembly, closure, waterproofing, and reinforcing. Examination for defects in assembly, closure, waterproofing, and reinforcing shall be in accordance with the appendix of PPP-B-636.

40.1.2 Examination for palletization. An examination shall be made to determine that the palletization complies with the requirements of 30.5. Defects shall be scored in accordance with the list below. The sample unit shall be one palletized unit load fully prepared for delivery. The lot size shall be the number of palletized unit loads in the end item inspection lot. The inspection level shall be S-1 and the AQL shall be 6.5 defects per hundred units.

<u>Examine</u>	<u>Defect</u>
Finished dimension	Length, width, or height exceeds specified maximum requirements.
Palletization	Not as specified. Pallet pattern not as specified. Interlocking of loads not as specified. Load not bonded with required straps as specified.
Weight	Exceeds maximum load limits.
Marking	Omitted; incorrect; illegible; of improper size, location, sequence or method of application.

40.2 Tests.

40.2.1 Joint strength. Three separate joint specimens shall be taken from one or more sample containers of each lot of strapped boxes submitted for inspection. The joints of metal strapping shall be tested in accordance with Method 2044 of FED-STD-101. Nonmetallic strapping joints shall be tested in accordance with PPP-S-760. If the breaking strength of one of the three samples is less than the requirements, it shall be cause for rejection of the lot.

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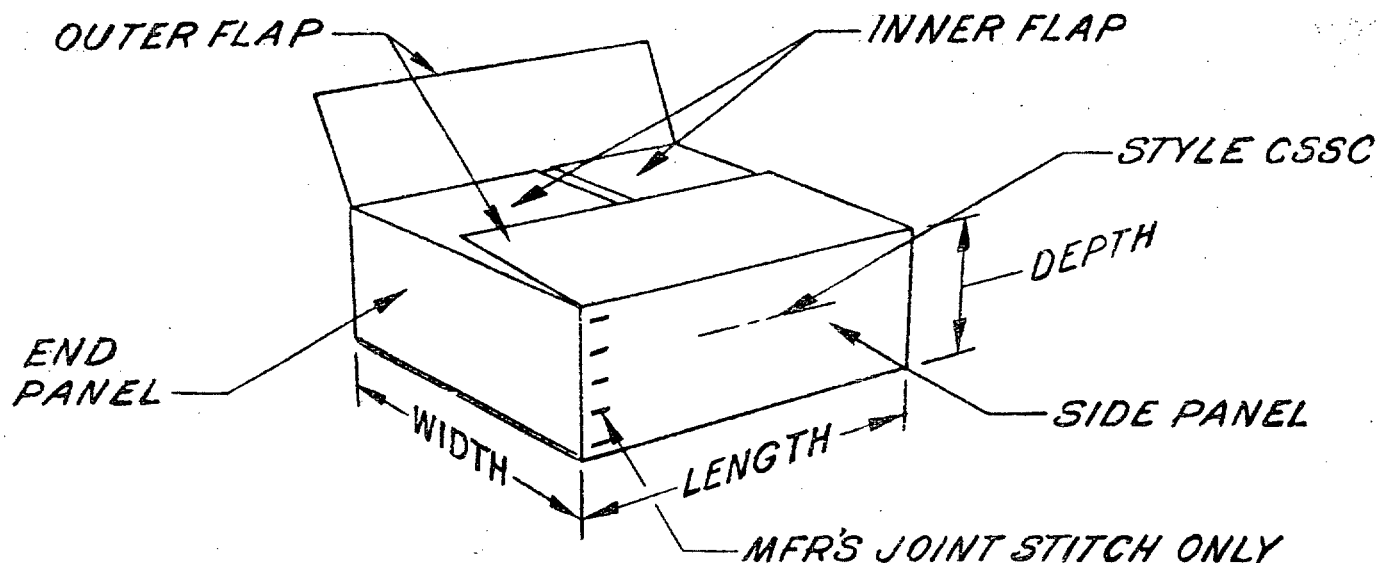


FIG. 1, SIZE 1 BOX

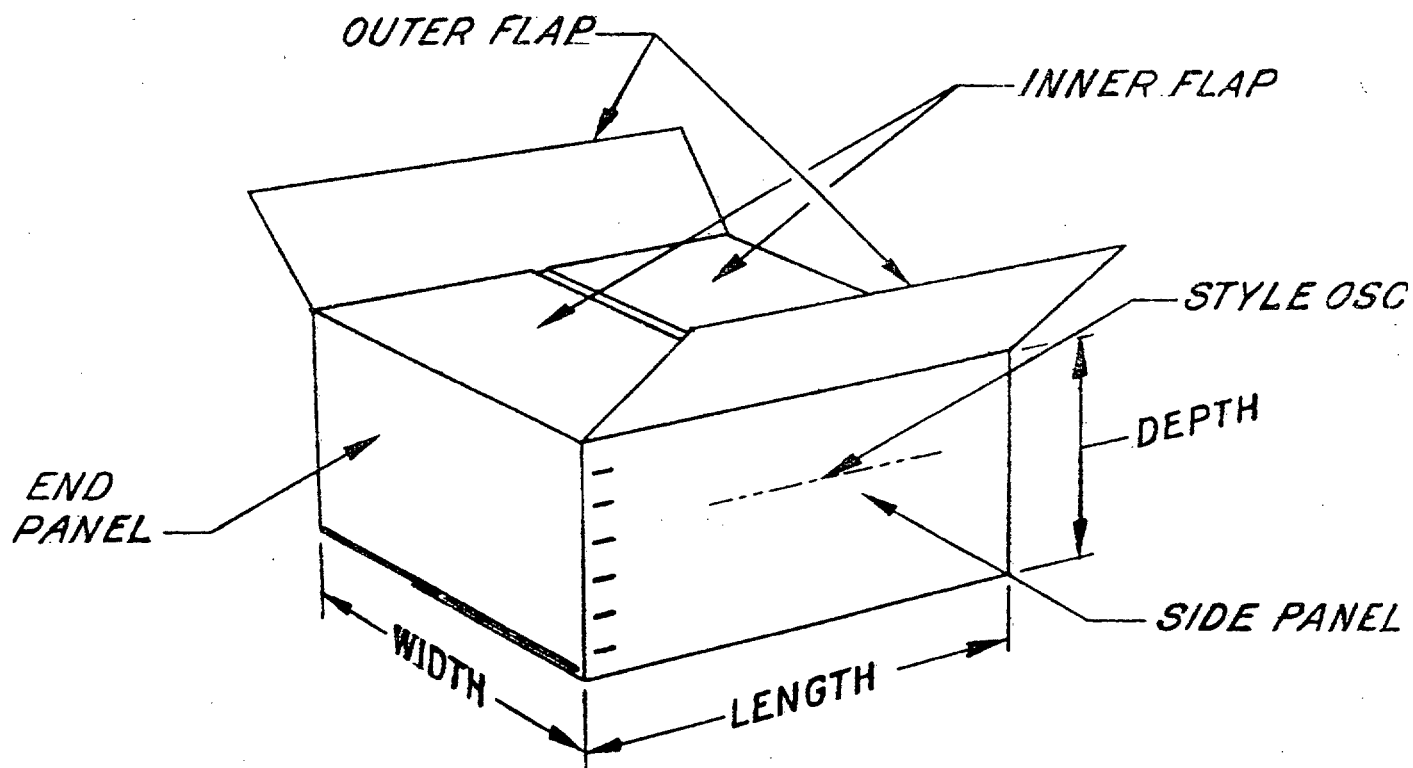
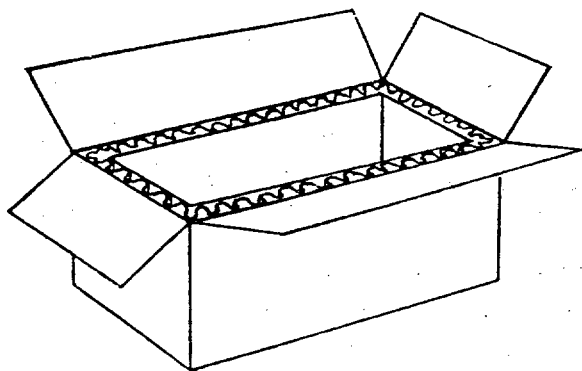


FIG. 2, SIZE 2 AND 3 BOX
10-1-272



WHEN BOXES ARE EQUIPPED WITH LINERS, BOX SIZE DESIGNATIONS BECOME 1A, 2A AND 3A, RESPECTIVELY

FIG 3, PLACEMENT OF LINER

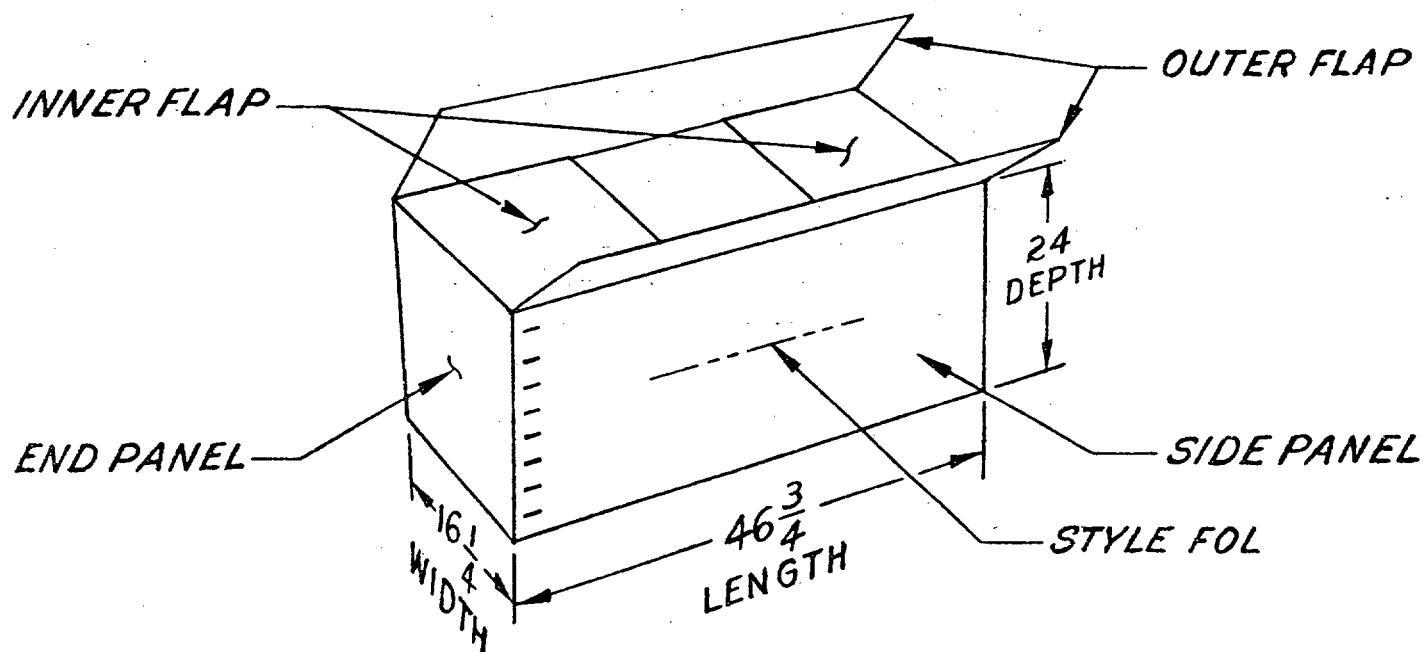


FIG 4, SIZE 4 BOX

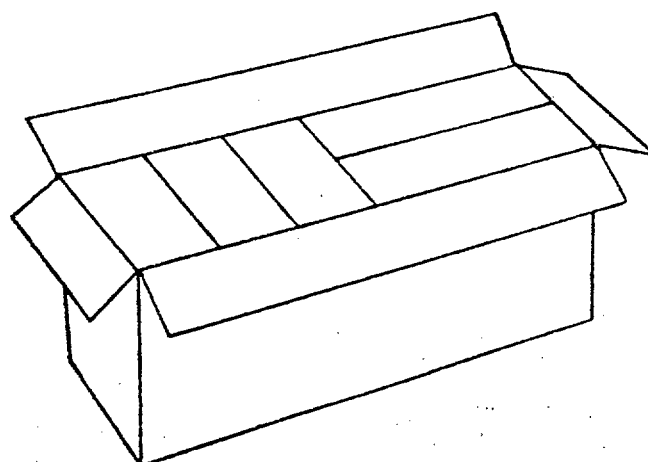
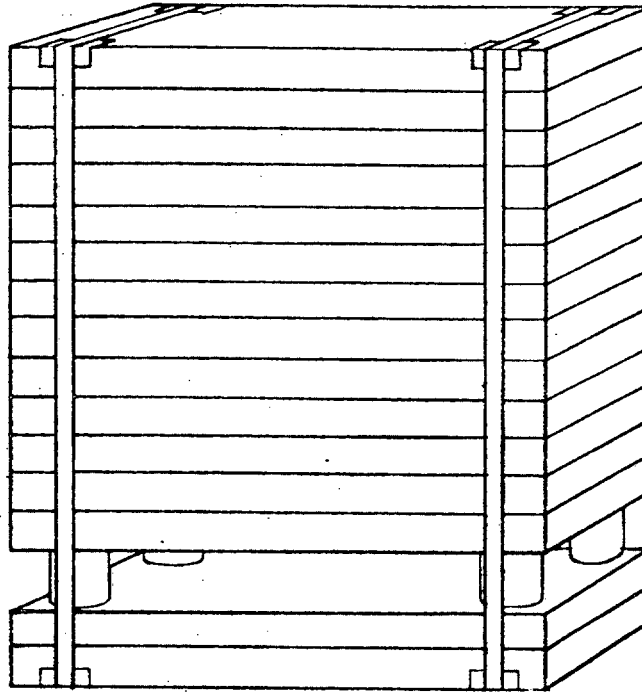


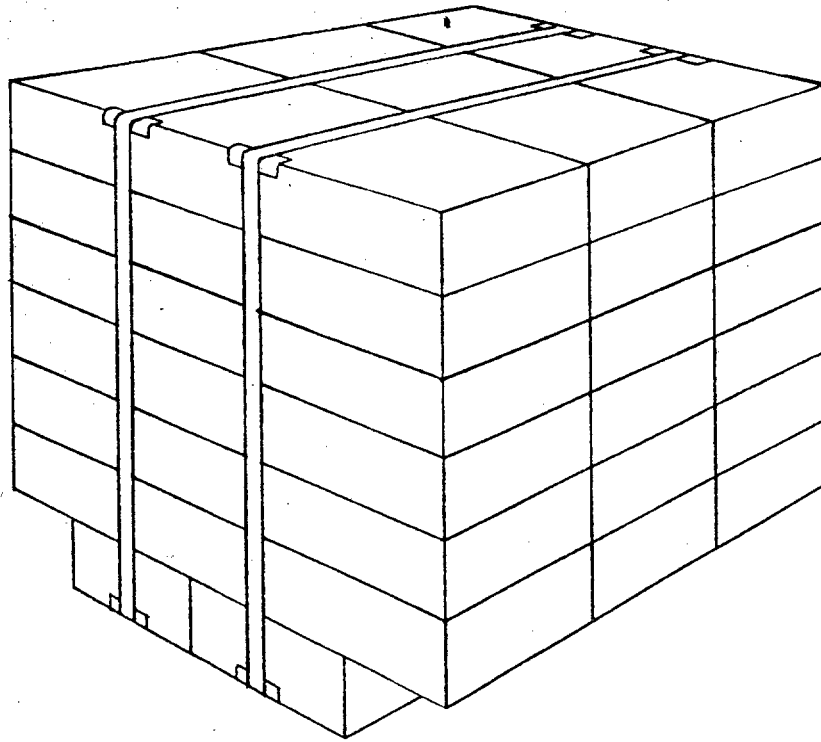
FIG 5, SIZE 4 BOX AND ONE PACKING ARRANGEMENT

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*FIG 6, METHOD OF UNIT PACKING THE
NUMBER 2 AND NUMBER 3 SIZE BOXES*

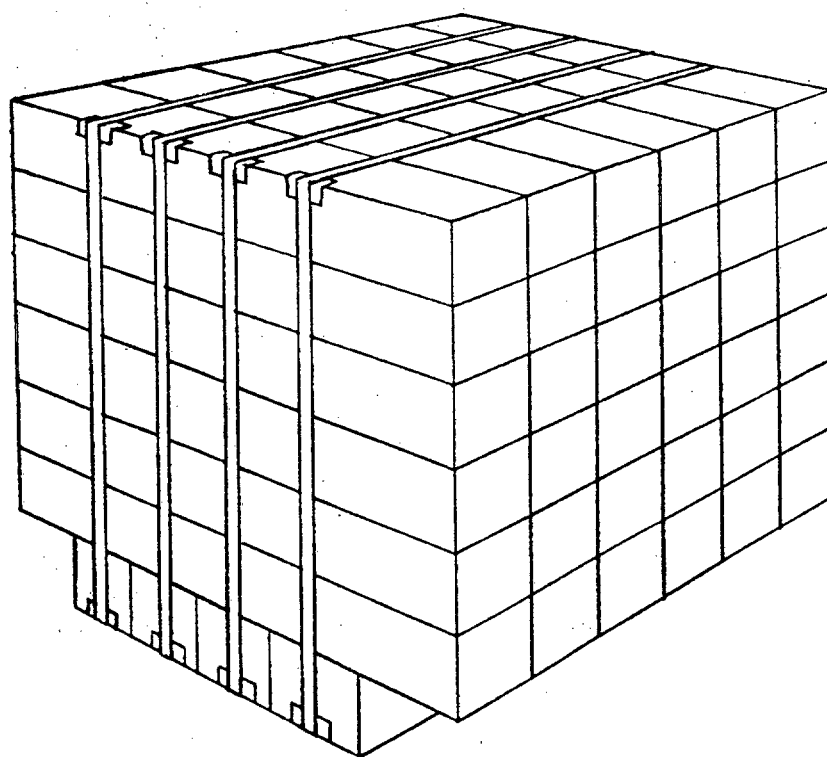
10-1-274



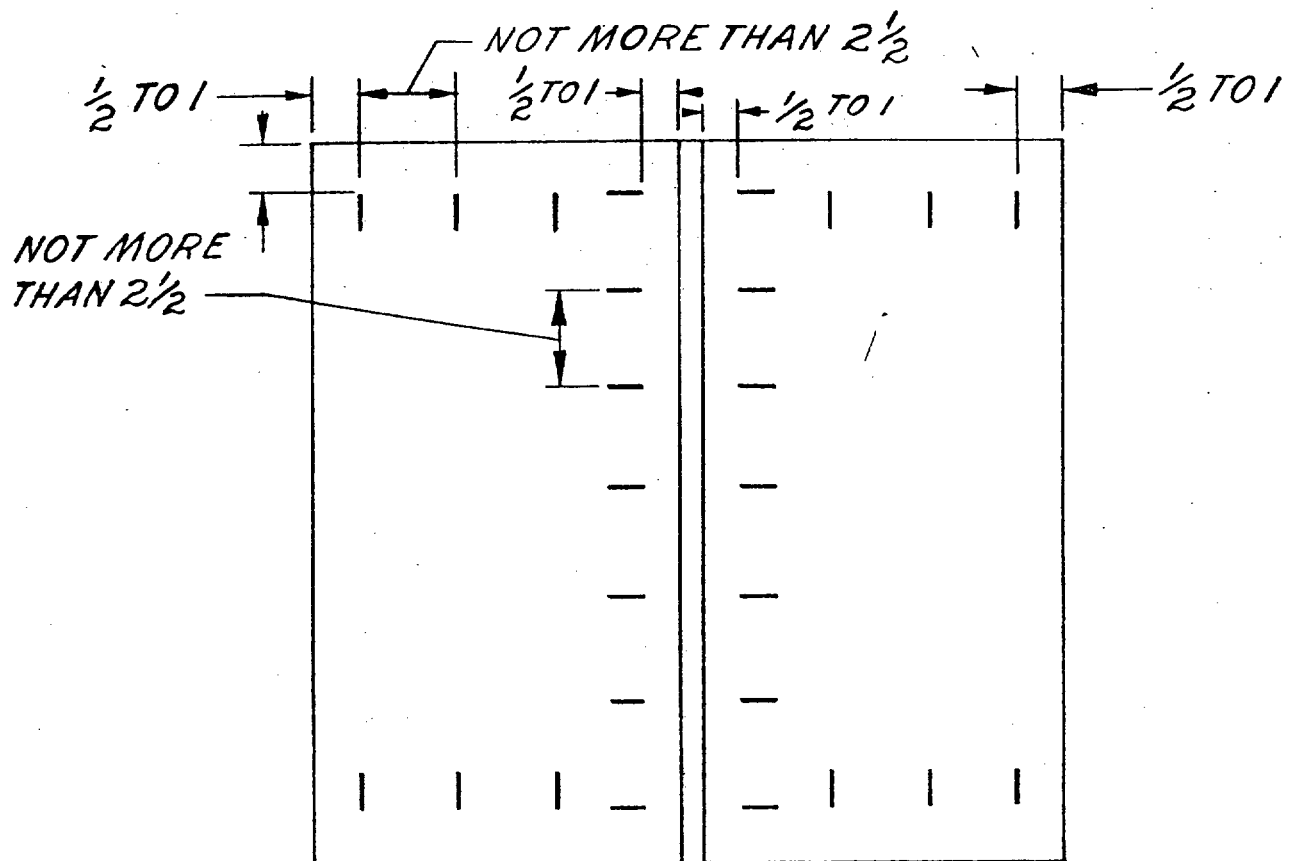
*FIG 7, METHOD OF UNIT PACKING THE
3A BOX SIZE LINER*

10-1-275

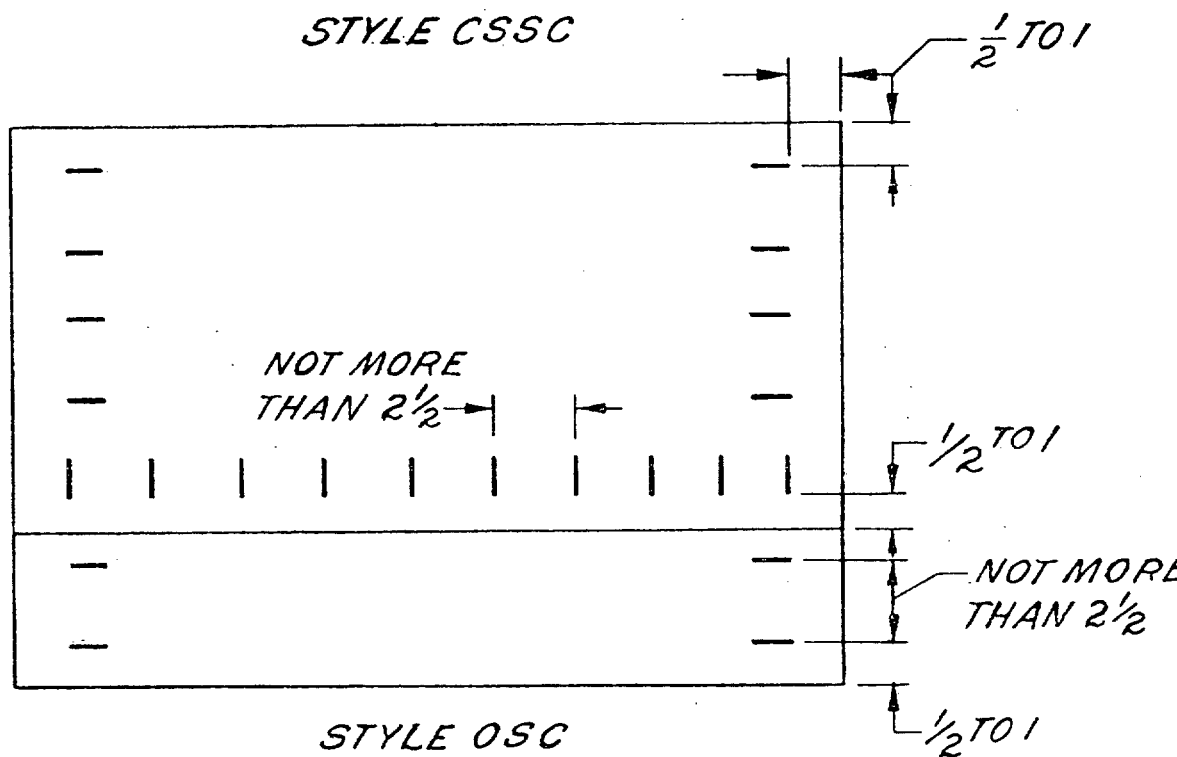
MIL-B-17757E



***FIG 8, METHOD OF UNIT PACKING THE
2A BOX SIZE LINER
10-1-276***



STYLE CSSC



STYLE OSC

**FIG 9, ILLUSTRATION OF TYPICAL STITCHING
BOTTOM FLAPS OF CLASS DOMESTIC BOXES**