

FED. STD. NO. 224A  
July 28, 1972  
SUPERSEDING  
Int. Fed. Std. No. 224  
April 17, 1964

FEDERAL STANDARD  
CLOSING, SEALING AND REINFORCING OF FIBERBOARD  
SHIPPING BOXES, GENERAL METHODS FOR

This standard was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

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FSC 8115

INFORMATION SHEET

ON

FEDERAL STANDARDS

This Federal Standard is issued in loose leaf form to permit the insertion or removal of new or revised sections and methods.

All users of Federal Standards should keep them up to date by inserting revised or new sections and methods as issued and removing superseded and canceled pages.

New and revised material and cancellations will be issued under Change Notices which will be numbered consecutively and will bear the date of issuance. Change Notices should be retained and filed in front of the Numerical Index of the Standard until such time as they are superseded by a reissuance of the entire Standard.

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## FEDERAL STANDARD

### CLOSING, SEALING AND REINFORCING OF FIBERBOARD SHIPPING BOXES, GENERAL METHODS FOR

Authority. This standard is issued pursuant to the Federal Property and Administrative Services Act of 1949, as amended, and its application to the purchase of commodities referred herein is mandatory on all Federal agencies.

S1 PURPOSE. The purpose of this standard is to provide uniform general methods for closing, sealing and reinforcing of fiberboard shipping boxes to and by Government activities.

S2 SCOPE. This standard provides acceptable methods for closing, sealing and reinforcing fiberboard shipping boxes.

S3 APPLICATION. Government agencies shall reference this standard in the preparation of commodity specifications, purchase descriptions, purchase orders, contracts and other purchase documents to assure inclusion of adequate requirements and clear instructions to contractors for the closing, sealing and reinforcing of fiberboard shipping boxes.

#### S4 APPLICABLE DOCUMENTS

S4.1 The following documents, of the issue in effect on the date of invitation for bids or request for proposals, form a part of this standard to the extent specified herein.

#### Federal Specifications:

3  
 QQ-S-781 - Strapping, Steel, Flat and Seals  
 QQ-S-790 - Steel Strapping, Round (Bare and Zinc Coated)  
 MMM-A-250 - Adhesive, Water-Resistant (For closure of Fiberboard Boxes)  
 PPP-B-636 - Boxes, Shipping, Fiberboard  
 PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall  
 PPP-S-760 - Strapping, Nonmetallic (and Connectors)  
 PPP-T-45 - Tape, Gummed, Paper, Reinforced and Plain, For Sealing and Securing  
 PPP-T-60 - Tape: Packaging, Waterproof  
 PPP-T-76 - Tape, Pressure-Sensitive Adhesive Paper, (For Carton Sealing)  
 PPP-T-97 - Tape, Pressure-Sensitive Adhesive, Filament Reinforced

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other product specifications required by activities outside the Federal Government for bidding purposes are available without charge at the General Services Administration Regional Offices in Boston, New York, Washington, DC., Atlanta, Chicago, Kansas City, MO., Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

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(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

**S4.2 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.

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.)

International Corrugated Case Association

International Box Code

(Application for copies should be addressed to the International Corrugated Case Association, 90 Rue d'Amsterdam, Paris, France.)

**S5 DEFINITIONS**

**S5.1 Closure.** The means of securing the flaps or covers of a box so that the box will not accidentally open during normal shipment, handling and storage.

**S5.2 Sealing.** The means whereby a box is made impervious to the entrance of extraneous material such as dust, water and similar materials, or is so made that the contents of the box will not spill during normal handling, shipping and storage. Normal sealing for fiberboard boxes would be the exclusion of dust and rain and the holding in of contents such as powders, granules, etc. NOTE: CLOSING and SEALING are not synonymous despite their frequent indiscriminate use.

**S5.3 Reinforcing.** The means whereby a box is strengthened by use of encircling bands girthwise, lengthwise and horizontally around the box or by use of strips of tape applied over the edges.

**S5.4 Styles of containers.**

**S5.4.1 Fiberboard boxes.** Styles of fiberboard boxes shall be in accordance with PPP-B-636. The four-digit number which appears in parenthesis beside the style designation is the applicable International Box Code number as assigned by the International Corrugated Case Association.

**S5.4.2 Triple wall fiberboard boxes.** Styles of triple wall fiberboard boxes shall be in accordance with PPP-B-640. The four digit number which appears in parenthesis beside the style designation is the applicable International Box Code number as assigned by the International Corrugated Case Association.

**S5.5 Determining physical dimension.** When measuring a container, the inside dimensions should be used unless otherwise specified. The guide outlined in this standard refers to inside dimensions only, except when otherwise specified:

<u>Method</u>	<u>Numerical Index of Methods</u>
101	Closure of fiberboard boxes, styles RSC (0201), FOL (0203), CSSC (0204), SFF (0206) and DSC, class weather-resistant, with adhesive or staples.
102	Closure of fiberboard boxes, styles RSC (0201) and CSSC (0204), class weather-resistant, with tape.
103	Closure of fiberboard boxes, style CSOSC (0205) and OSC (0202), class weather-resistant.
104	Closure of fiberboard boxes, style IC (0325), class weather-resistant.
105	Closure of fiberboard boxes, style DBLCC (0310), class weather-resistant.
106	Closure of fiberboard boxes, styles FTC (0301), OPF (0401), FPF (0410), SFF (0206), FOL (0203) and TS, class weather-resistant.
107	Closure of fiberboard boxes, style HSC (0312), class weather-resistant.
110	Closure of triple wall fiberboard boxes, style A, class 2 (weather-resistant).
111	Closure of triple wall fiberboard boxes, style B, class 2 (weather-resistant).
112	Closure of triple wall fiberboard boxes, style C, class 2 (weather-resistant).
113	Closure of triple wall fiberboard boxes, style D, class 2 (weather-resistant).
114	Closure of triple wall fiberboard boxes, style E (0201), class 2 (weather-resistant).
115	Closure of triple wall fiberboard boxes, style F (0301), class 2 (weather-resistant).
116	Closure of triple wall fiberboard boxes, style G (0312), class 2 (weather-resistant).
120	Closure of fiberboard boxes, styles RSC (0201), OSC (0202), FOL (0203), SFF (0206), CSOSC (0205), CSSC (0204) and DSC, class domestic, with adhesive or staples.
121	Closure of fiberboard boxes, styles RSC (0201) and CSSC (0204), class domestic, with tape.
122	Closure of fiberboard boxes, style DBLCC (0310), class domestic.
123	Closure of fiberboard boxes, style HSC (0312), class domestic.
124	Closure of fiberboard boxes, style IC (0325), class domestic.
125	Closure of fiberboard boxes, styles FTC (0301), OPF (0401), SFF (0206), FOL (0203), FPF (0410) and TS, class domestic.
130	Closure of triple wall fiberboard boxes, class 1 (nonweather-resistant).

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<u>Method</u>	<u>Title</u>
150	Sealing of fiberboard boxes, class weather-resistant (except triple wall fiberboard boxes).
151	Sealing of triple wall fiberboard boxes, class 2 (weather-resistant).
160	Sealing of fiberboard boxes, class domestic (except triple wall fiberboard boxes).
161	Sealing of triple wall fiberboard boxes, class 1 (nonweather-resistant).
200	Reinforcing fiberboard boxes, class weather-resistant (except triple wall fiberboard boxes).
201	Reinforcing triple wall fiberboard boxes, class 2 (weather-resistant).
210	Reinforcing fiberboard boxes, class domestic (except triple wall fiberboard boxes).
211	Reinforcing triple wall fiberboard boxes, class 1 (nonweather-resistant).

Method 101  
July 28, 1972

**CLOSURE OF FIBERBOARD BOXES, STYLES RSC (0201), FOL (0203), CSSC (0204), SFF (0206) and DSC, CLASS WEATHER-RESISTANT, WITH ADHESIVE OR STAPLES**

Styles RSC, FOL, CSSC, SFF and DSC boxes shall be closed by the application of adhesive conforming to MMM-A-250 over not less than 75 percent of the surface area of contact between the flaps. The adhesive shall be applied within 1/4 inch of the edges and scorelines of the inner flaps as shown in figure 1.

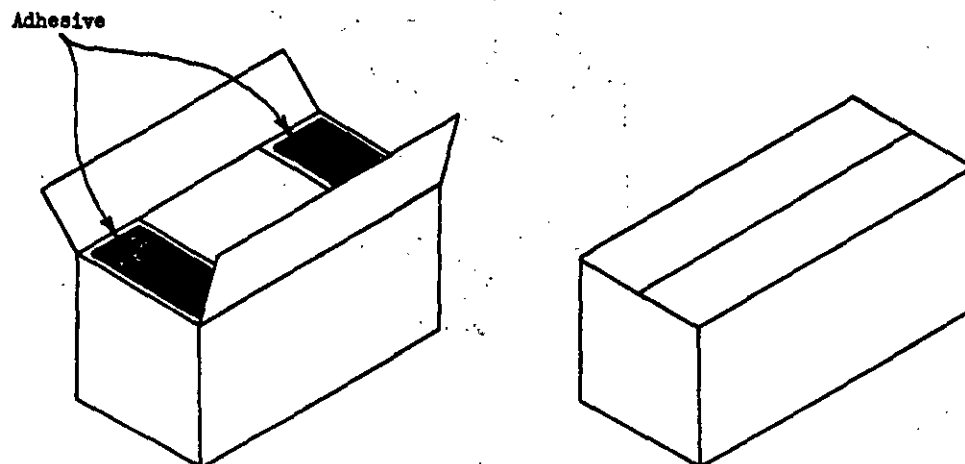


Figure 1

Top and bottom flaps of slotted boxes may be closed by the application of hot melt adhesive conforming to the Uniform Freight Classification 10, Rule 41.

The bottom flaps or flaps other than the final closure may in lieu of gluing be fastened with metal stitches or staples. Metal stitches or staples shall conform to the requirements of PPP-B-636.

The basic number of stitches required in table I shall pass through all flaps to be fastened and shall be clinched on the inside of the box, drawing the flaps firmly together. The metal stitches shall be distributed over the areas where outer flaps overlap and where outer flaps overlay inner flaps as shown in figure 2. One-half of the stitches or staples required shall pass through each of the inner flaps. Additional stitches or staples shall be used as required in Method 103.

Method 101  
July 28, 1972

Metal stitches or staples

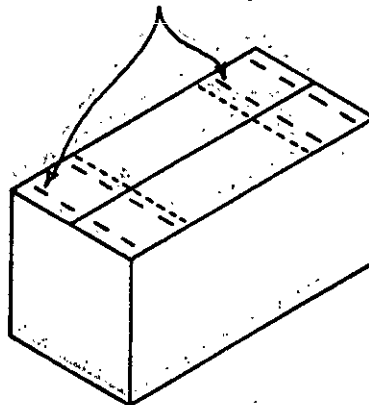


Figure 2

TABLE I. Basic number of stitches or staples			
Inside width of the box in inches	Basic number of stitches or staples 1-1/4 in. 1/		Basic number of stitches or staples 3/8 - 1-1/4 2/
Up to and including 8	8		12
10	10		16
12	12		20
14	16		24
16	18		28
18	20		32
20	22		36
22	24		40
24	28		44
26	30		48

1/ Staples or stitches hardened to not less than equivalent of Rockwell B 90.

2/ Not hardened to equivalent of Rockwell B 90.

Method 102  
July 28, 1972

**CLOSURE OF FIBERBOARD BOXES, STYLES RSC (0201) AND CSSC (0204), CLASS WEATHER-RESISTANT, WITH TAPE**

Styles RSC and CSSC boxes shall have the top and bottom flaps closed by application of minimum 2 inch wide tape conforming to PPP-T-60 or PPP-T-76 as shown in figure 3. The tape shall be centered over the seams formed by the closure of the outer flaps of the top and bottom and shall extend down over the end panels not less than 2-1/2 inches. When tape conforming to PPP-T-76 is used, the box shall be sealed with minimum 2 inch wide tape conforming to PPP-T-76 in accordance with Method 150. When the bottom flaps of these styles of boxes are closed as specified in Method 101, taping of the top flaps only is required.

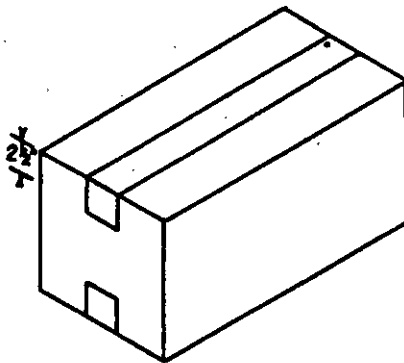


Figure 3

Method 103  
July 28, 1972

**CLOSURE OF FIBERBOARD BOXES, STYLE CSOSC (0205) AND OSC (0202), CLASS WEATHER-RESISTANT**

Styles OSC and CSOSC boxes shall be closed with tape or shall be closed in accordance with Method 101 except that when the bottom flaps of the boxes are closed by stitching or stapling, and the inner flaps gap by more than 3 inches, additional stitches or staples on approximately 2-1/2 inch centers shall be driven in a row parallel to and approximately 1/2 to 1 inch from the long edge of the outer flaps for the full length of the gap as shown in figure 4.

When tape is used, it shall conform to PPP-T-60, minimum width 2 inches. The tape shall be applied so that one half the width is applied to the outer flap and the other half is applied to the under flap as shown in figure 4. The tape shall extend down onto the end panels not less than 2-1/2 inches. Tape may be used to close both the top and bottom flaps or only the top flaps when the bottom flaps have been closed in accordance with Method 101.

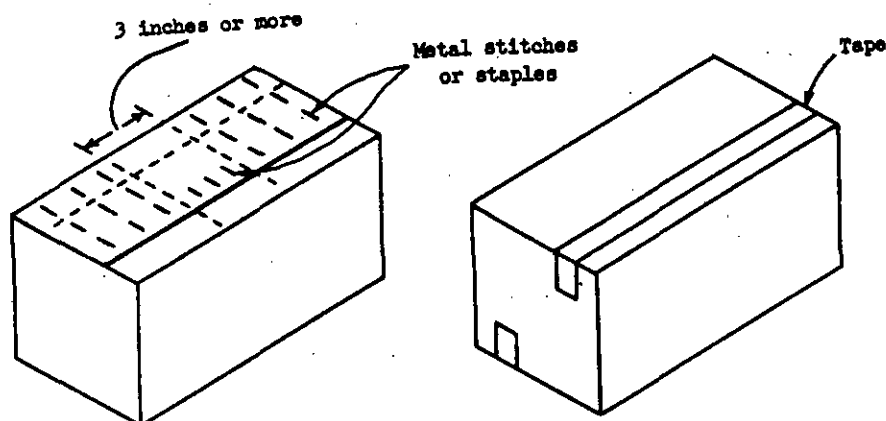


Figure 4

Method 104  
July 28, 1972

CLOSURE OF FIBERBOARD BOXES, STYLE IC (0325), CLASS WEATHER-RESISTANT

The style IC box shall be closed by securing the top and bottom covers to the body by means of flat strapping or filament reinforced tape. The strapping shall conform to QQ-S-781, class A or B, grade 2, minimum size  $\frac{3}{8}$  x .015 inch; or PPP-S-760, type II, minimum size  $\frac{1}{2}$  x .020 inch or type III, minimum size  $\frac{7}{16}$  x .023 inch. The strapping shall be applied horizontally one band width above the center line of the fold as shown in figure 5.

When filament reinforced tape is used, it shall conform to PPP-T-97, type IV, minimum width  $\frac{3}{4}$  inch. Strips of tape 16 inches long shall be applied horizontally to all corners one tape width above the center line of the fold. Eight inches of the tape strip shall be applied to one side of the corner and the remaining eight inches shall be applied to the other side of the corner as shown in figure 5.

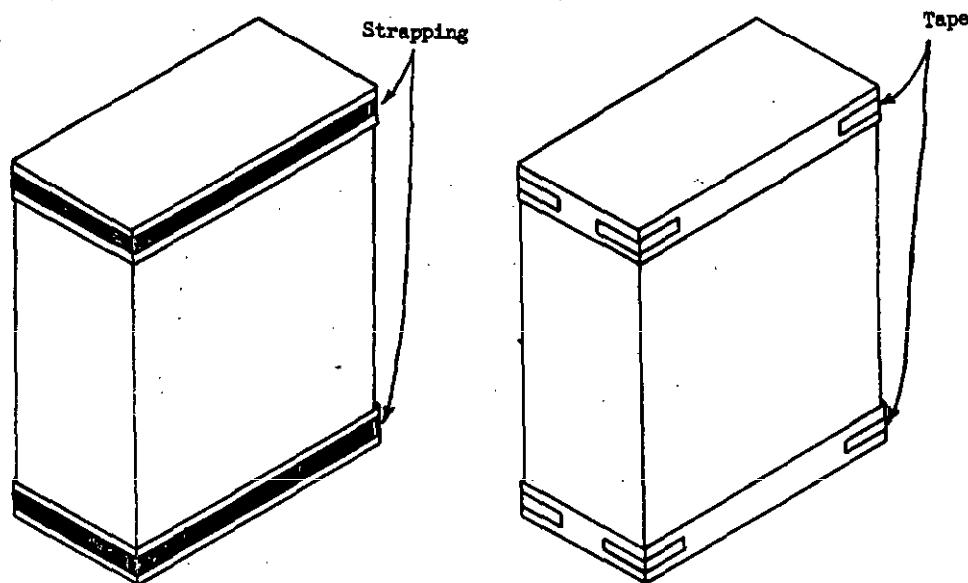


Figure 5

Method 105  
July 28, 1972

# CLOSURE OF FIBERBOARD BOXES, STYLE DBLCC (0310), CLASS WEATHER-RESISTANT

The style DBLCC box shall be closed by securing the top and bottom covers to the body by means of flat strapping, filament reinforced tape or adhesive. When adhesive is used, it shall conform with the requirements of MMM-A-250. The adhesive shall be applied as shown in figure 6 and shall cover not less than 75 percent of the surface area of contact between the covers and the body.

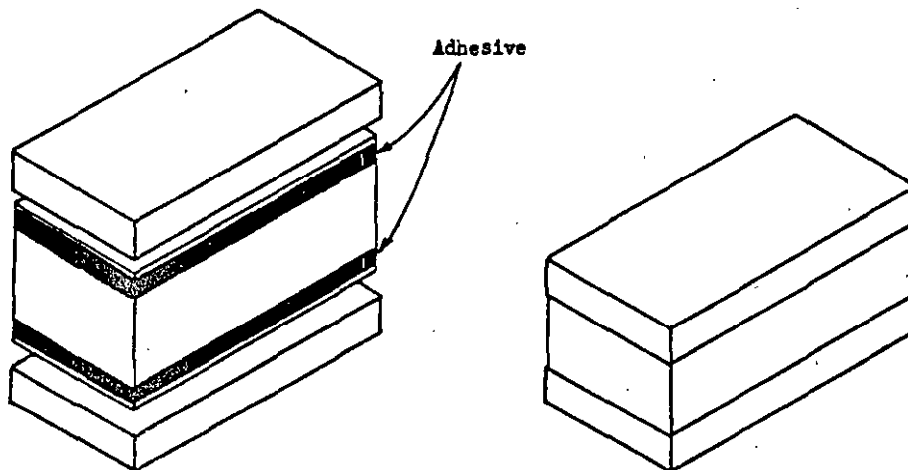


Figure 6

When tape is used, it shall conform to PPP-T-97, type IV. The width and number of tape strips to be used shall conform to the requirements of Table III and Table VI of Method 200. Each strip shall extend 3 inches onto the top surface of the box, down the side or end of the box and 3 inches onto the bottom surface of the box as shown in figure 7. When the length or width of the box is less than 6 inches, a complete band of tape may be used and shall be considered two strips.

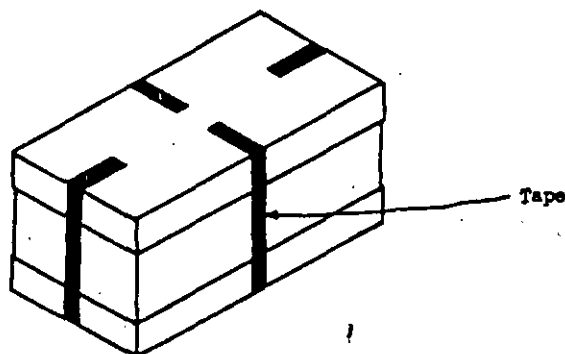


Figure 7

Method 105  
July 28, 1972

When strapping is used, it shall conform to the requirements of QQ-S-781 or PPP-S-760, type II or III, except that buckles (connectors) shall not be used, and Method 200 of this standard.

16

Method 106  
July 28, 1972

**CLOSURE OF FIBERBOARD BOXES, STYLES FTC (0301), OPF (0401), PPF (0410), SFF (0206), FOL (0203) AND TS, CLASS WEATHER-RESISTANT**

Styles FTC, OPF, PPF, SFF, FOL and TS boxes shall be closed by taping all seams with minimum 2 inch wide tape conforming to PPP-T-60 or minimum 3 inch wide tape conforming to PPP-T-76 as shown in figures 8, 9, 10 and 11; or styles FTC, PPF, SFF, FOL and TS boxes may be closed with strapping or filament reinforced tape as specified in Method 200. When snap together tongue or tuck lock corners are used, the shipping box shall be reinforced as specified in Method 200, except that the two girthwise straps shall be positioned over the tongue or tuck locks at each end of the box.

Style FTC

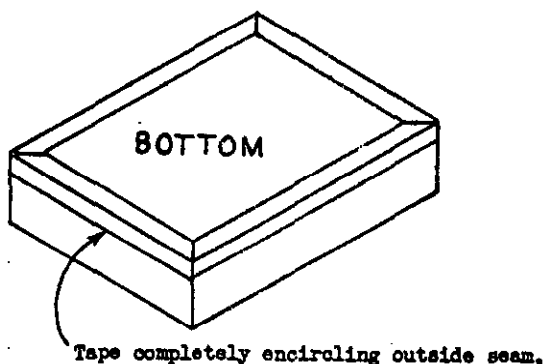


Figure 8

Style OPF

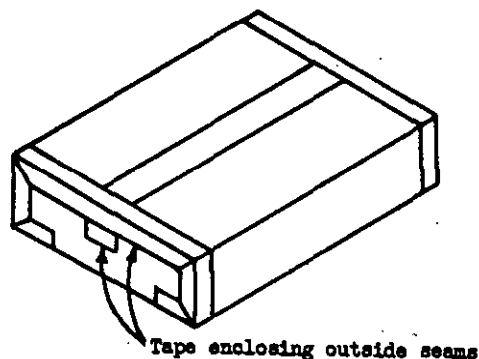


Figure 9

Style PPF

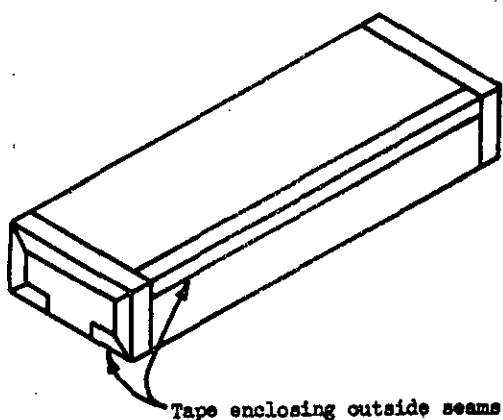


Figure 10

Style TS

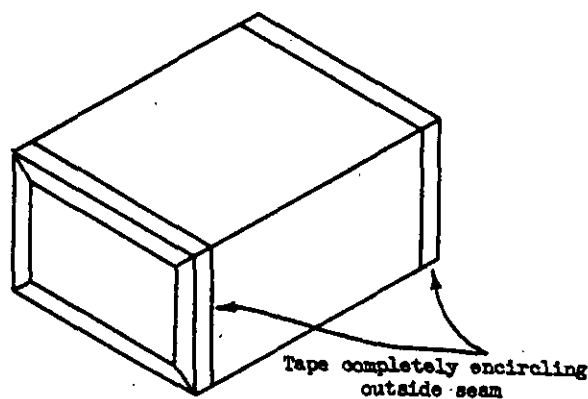


Figure 11

Method 107  
July 28, 1972

CLOSURE OF FIBERBOARD BOXES, STYLE HSC (0312), CLASS WEATHER-RESISTANT

The bottom flaps of style HSC boxes shall be closed in accordance with Method 101 or Method 102. The top shall be closed with tape or strapping as specified in Method 105.

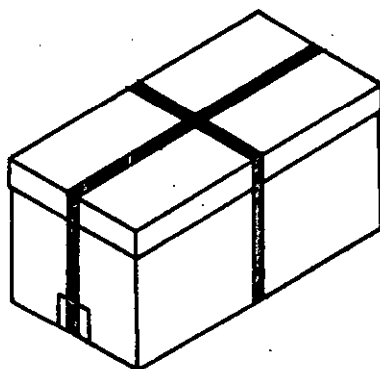


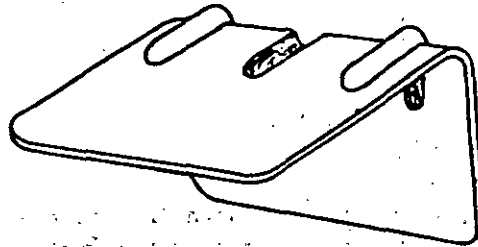
Figure 12

Method 110  
July 28, 1972

# CLOSURE OF TRIPLE WALL FIBERBOARD BOXES, STYLE A, CLASS 2 (WEATHER-RESISTANT)

Style A triple wall fiberboard boxes shall be closed with nails conforming with the requirements of PPP-B-640; staples conforming with the requirements of PPP-B-640; flat steel strapping conforming to QQ-S-781, type I, class A or B, minimum size  $5/8 \times 0.018$  inch; round steel strapping conforming to QQ-S-790, finish 2, class A, minimum diameter 0.0990 inch (12-1/2 gage) or class B, minimum diameter 0.1205 inch (11 gage); nonmetallic strapping conforming to PPP-S-760, type I, grade B, minimum width  $5/8$  inch, type II, minimum size  $1/2 \times 0.025$  inch or  $5/8 \times 0.020$  inch, or type III, minimum size  $7/16 \times 0.029$  inch or  $1/2 \times 0.025$  inch; or tape conforming to PPP-T-97, type IV, minimum width  $3/4$  inch.

Metal edge protectors as shown in figure 14 shall be used with flat or round steel strapping to prevent damage to the fiberboard. These shall be approximately 1-3/4 inches wide and the distance between the edges of the protrusions shall be approximately 1 inch. The indentation for protectors used with round strapping shall be at the center of the protector. The width of the protrusions and indentations shall be approximately  $3/16$  inch.



Edge protector

Figure 13

When nails or staples are used as shown in figure 14 they shall be spaced not more than 2 inches apart and shall be staggered as permitted by the thickness of the ends of the box. The nails or staples shall extend through each thickness of the fiberboard and into the wood ends. If the box is 24 or more inches long, an 8 inch strip of tape as specified above shall be placed at the center of the outer edge of the outside top flap so that 4 inches of tape adheres to the top flap and 4 inches of tape extends down onto the side panel.

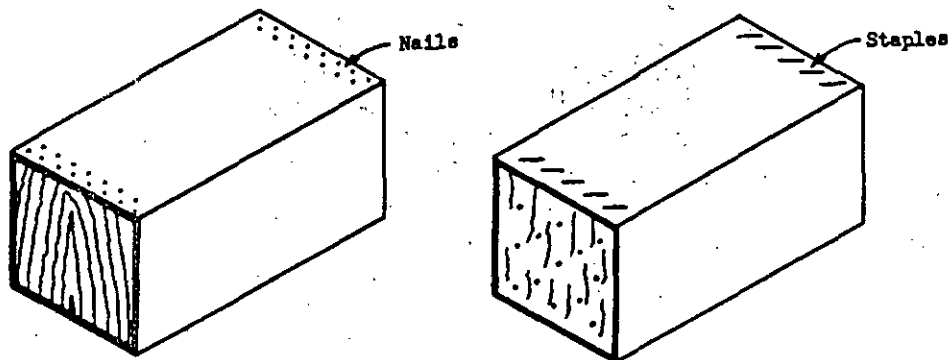


Figure 14

Method 110  
July 28, 1972

When steel or nonmetallic straps are used for closure as shown in figure 15, one strap shall be placed at each end of the box so as to encircle the top, sides and bottom of the box. The straps shall be tensioned sufficiently to effect an adequate closure without damaging the fiberboard or crushing the contents. Edge protectors as shown in figure 13 should be used. If the box is 24 or more inches long, a strap shall be added at the center and shall encircle the top, sides and bottom. Tape, as specified above, may be used in lieu of the additional center strap.

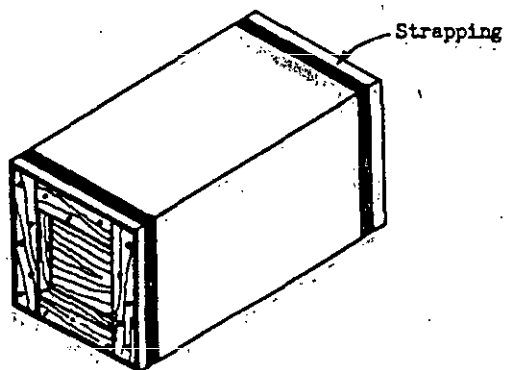


Figure 15

When closure is made entirely with tape as shown in figure 16, a strip shall be placed two inches in from each end of the box. Each strip shall be 8 inches long and shall be applied so that each is perpendicular to the joint from the top flap and side wall of the box. Each strip shall be centered over the joint so that 4 inches extend on the top flap and 4 inches on the side wall. If the box is 24 or more inches long, an additional strip shall be added at the center as shown in figure 16.

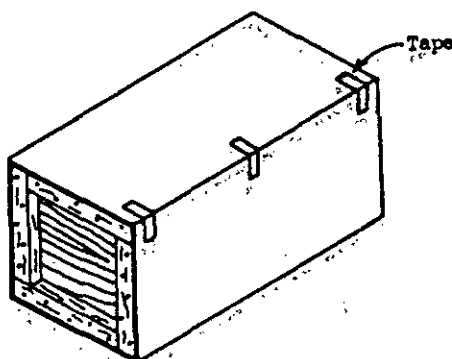


Figure 16

Method 111  
July 28, 1972

CLOSURE OF TRIPLE WALL FIBERBOARD BOXES, STYLE B, CLASS 2 (WEATHER-RESISTANT)

A style B box shall be closed in essentially the same manner as for a style A box as outlined in Method 110 except that in addition, a staggered row of nails or staples, spaced not more than 2 inches apart, shall be driven through the overlap portion of the top flap into the face of the wood end as shown in figure 17.

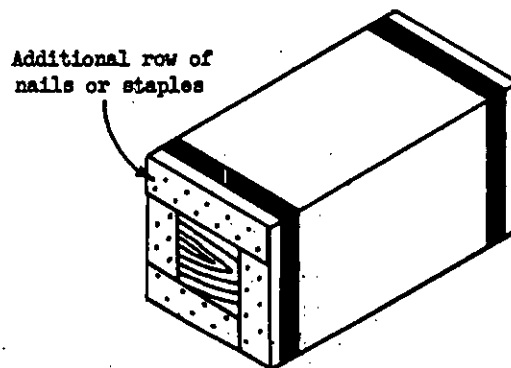


Figure 17

23  
24

Method 112  
July 28, 1972

**CLOSURE OF TRIPLE WALL FIBERBOARD BOXES, STYLE C, CLASS 2 (WEATHER-RESISTANT)**

A style C box shall be closed in essentially the same manner as for a style A box as outlined in Method 110 except when nails or staples are used, they shall be spaced not more than 2 inches apart and shall be staggered and driven through the top one half of the box into the wood ends along the two end edges of each side panel and both end edges of the top panel as shown in figure 18.

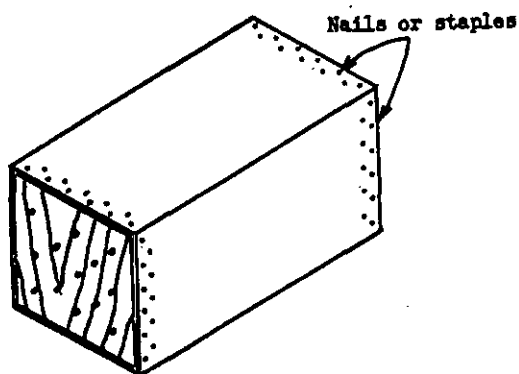


Figure 18

Method 113  
July 28, 1972

**CLOSURE OF TRIPLE WALL FIBERBOARD BOXES, STYLE D, CLASS 2 (WEATHER-RESISTANT)**

A style D box shall be closed in essentially the same manner as for a style A box as outlined in Method 110 except when nails or staples are used, they shall be spaced not more than 2 inches apart and shall be staggered and driven through the top one half of the box into the wood ends along the two end edges of each side panel and the overlapping top flaps as shown in figure 19.

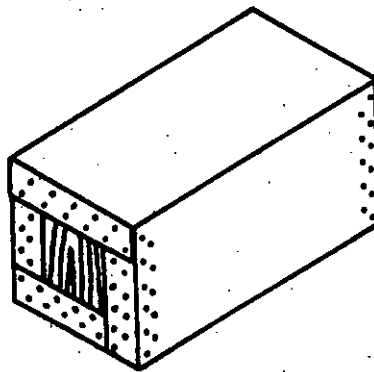


Figure 19

Method 114  
July 28, 1972

**CLOSURE OF TRIPLE WALL FIBERBOARD BOXES, STYLE E (0201), CLASS 2 (WEATHER-RESISTANT)**

A style E box shall be closed by the use of adhesive, staples, steel strapping, nonmetallic strapping or tape.

When adhesive is used, it shall conform with the requirements of MMM-A-250. The adhesive shall be applied within 1/4 inch of the scoreline and edges of the inner flaps and shall cover not less than 75 percent of the surface area of contact between the top and bottom flaps as shown in figure 20. Alternatively, the top and bottom flaps may be closed by the application of hot melt adhesive conforming to Uniform Freight Classification 10, Rule 41. The bottom flaps or flaps other than the final closure may in lieu of gluing be fastened with metal stitches or staples as shown in figure 21.

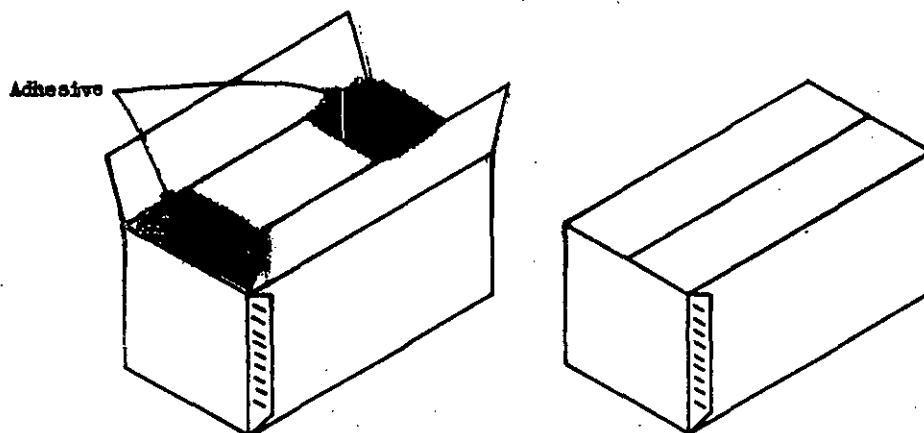


Figure 20

29 Staple closure for style E boxes shall be in accordance with the requirements of the Uniform Freight Classification 10, Rule 41 for closing conventional slotted boxes.

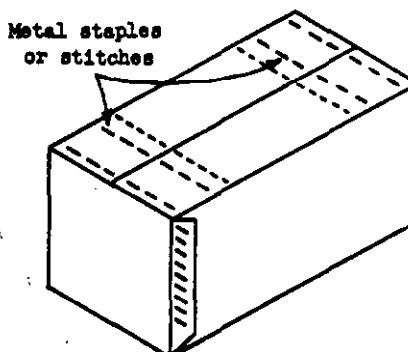
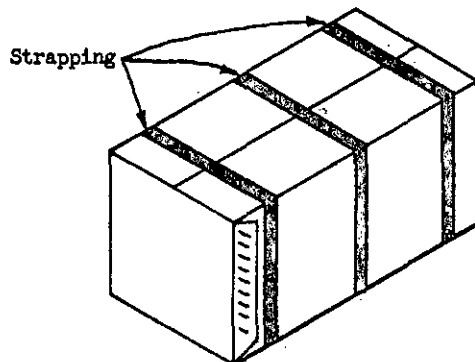


Figure 21

Method 114  
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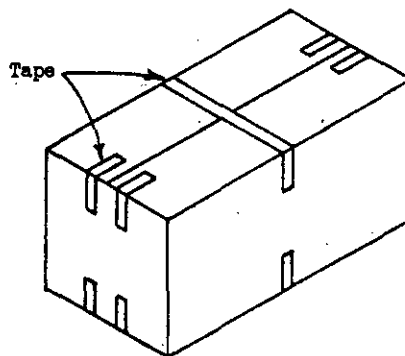
When steel or nonmetallic strapping is used, it shall conform to the material requirements outlined in Method 110. Edge protectors as specified in Method 110 shall be used with steel strapping. Two straps shall be applied girthwise encircling the top, sides and bottom and shall be located not more than 3 inches from the ends of the box as shown in figure 22. When the length of the box is 24 or more inches, an additional girthwise strap shall be applied at the center.



(Apply center strap when length of box  
 is greater than 24")

Figure 22

When tape is used for closure, it shall conform to PPP-T-97, type IV, minimum width 1 inch. A 12 inch tape strip shall be applied to each end of the two top flaps and two bottom flaps so that 6 inches of each strip is attached to the flap and 6 inches of the strip extends onto the end panel of the box as shown in figure 23. The strips shall be located adjacent to the inner length of the flaps and approximately 2 inches from this edge. When the length of the box is 24 or more inches, one strip of tape shall be applied across the top of the box and one across the bottom of the box so that they are perpendicular to the length of the box. They shall be of sufficient length so that the ends of the strips extend onto the side panels a minimum of 3 inches.



(Apply center strip of tape when length  
 of box is greater than 24")

Figure 23

Method 115  
July 28, 1972

**CLOSURE OF TRIPLE WALL FIBERBOARD BOXES, STYLE F (0301), CLASS 2 (WEATHER-RESISTANT)**

A style F box shall be closed with steel strapping, nonmetallic strapping or filament reinforced tape.

When strapping is used, it shall conform to the material requirements outlined in Method 110. Edge protectors as specified in Method 110 shall be used with steel strapping. Closure shall be accomplished in the same manner as for a style E box as outlined in Method 114.

When tape is used, it shall conform to PPP-T-97, type IV, minimum width 1 inch. A 12 inch strip of tape shall be applied to both ends and both sides so that 6 inches of each strip is attached to the center of the side or end panel of the cover and 6 inches of each strip extends onto the bottom surface of the bottom as shown in figure 24.

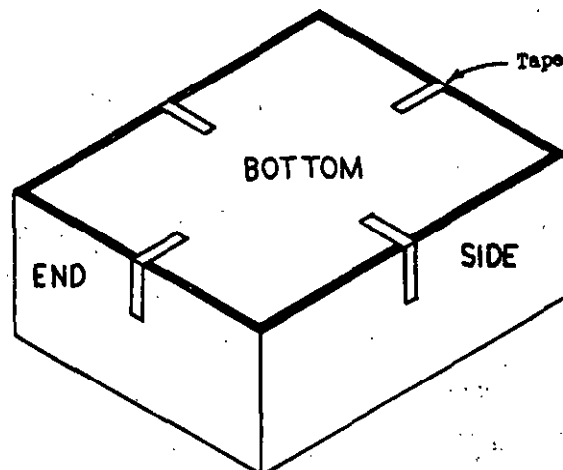


Figure 24

31  
32

Method 116  
July 28, 1972

**CLOSURE OF TRIPLE WALL FIBERBOARD BOXES, STYLE G (0312), CLASS 2 (WEATHER-RESISTANT)**

A style G box shall be closed with adhesive, steel strapping, nonmetallic strapping or filament reinforced tape conforming to the material requirements of Method 114. Edge protectors as specified in Method 110 shall be used with steel strapping.

The bottom flaps shall be closed with adhesive, staples, stitches or tape as outlined in Method 114.

The cover shall be secured to the box body with steel strapping or nonmetallic strapping. Two straps shall be applied around the top, sides and bottom and shall be located no more than 3 inches from the ends of the box as shown in figure 25. One strap shall be centrally applied around the top, ends and bottom when the width of the box is 24 or more inches as shown in figure 25.

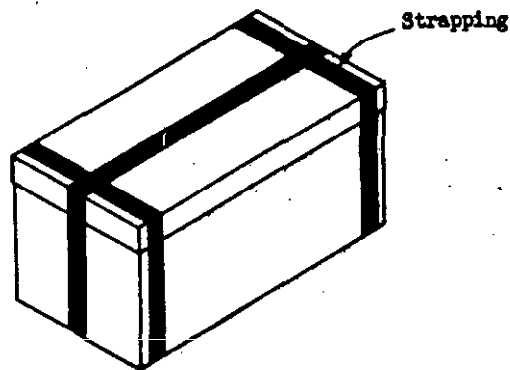


Figure 25

Method 120  
July 28, 1972

CLOSURE OF FIBERBOARD BOXES, STYLES RSC (0201), OSC (0202), FOL (0203), SFF (0206), CSOSC (0205), CSSC (0204), AND DSC, CLASS DOMESTIC, WITH ADHESIVE OR STAPLES

Inner and outer flaps of slotted style boxes shall be drawn together as closely as possible to insure proper closure. The lengthwise flaps shall meet (RSC, CSSC, DSC) or overlap (OSC, CSOSC, FOL, SFF) as specified. The flaps shall not project over the side or end edges and the application of adhesive or metal stitches shall be such as to prevent lifting of free edges and corners of outer flaps on assembled boxes.

Domestic fiberboard boxes shall, as a minimum, be closed in conformance with the requirements of Rule 41 of the Uniform Freight Classification.

When adhesive is used, the top and bottom flaps of slotted style domestic fiberboard boxes shall be firmly glued together over not less than 50 percent of each surface area of contact between the flaps. The bottom flaps or the top flaps may be fastened with metal stitches or staples prior to filling of the container, when not the final closure. The metal stitches or staples shall conform with the requirements of PPP-B-636. The metal stitches or staples shall pass through all the flaps to be fastened and shall be clinched on the inside of the box, drawing the flaps firmly together. The metal stitches or staples shall be distributed over the areas where flaps overlap and where outer flaps overlap inner flaps and shall be spaced not more than 2-1/2 inches apart along the edges of the outer flaps. The metal stitches or staples shall be placed not less than 1/2 inch nor more than 1 inch from the lengthwise edge of outer flaps and not more than 1-1/4 inches from the end edges or scores of the flaps.

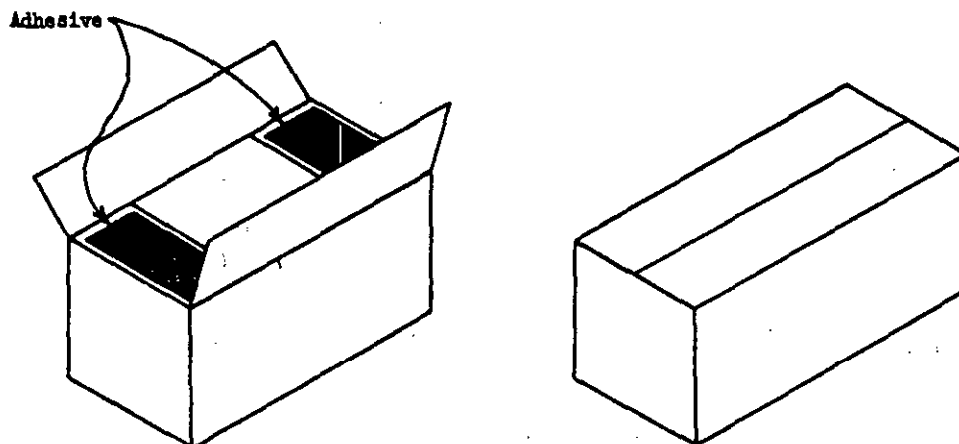


Figure 26

Method 121  
July 28, 1972

**CLOSURE OF FIBERBOARD BOXES, STYLES RSC (0201) AND CSSC (0204), CLASS DOMESTIC, WITH TAPE**

Styles RSC and CSSC boxes shall have the top and bottom flaps closed by application of minimum 2 inch wide tape conforming to PPP-T-60 or PPP-T-76; or minimum 3 inch wide tape conforming to PPP-T-45, type II. The tape shall be centered over the seam formed by the closure of the outer flaps of the top and bottom and shall extend down over the end panels not less than 2-1/2 inches as shown in figure 27. When the bottom flaps of these boxes are closed as specified in Method 120, taping of the top flaps only is required.

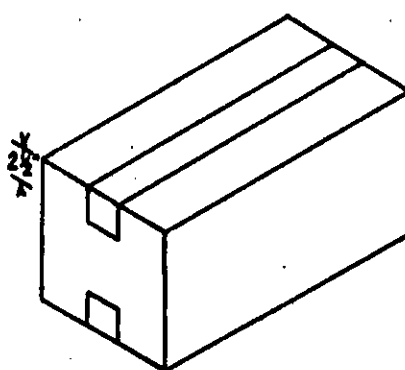


Figure 27

When tape conforming to PPP-T-76 is used and the box is not sealed in accordance with Method 160, four additional strips of tape conforming to PPP-T-76, minimum 2 inch width shall be centered over the seam formed by the edges of the outer flaps and the end panels, and shall extend the full outside width of the box as shown in figure 28.

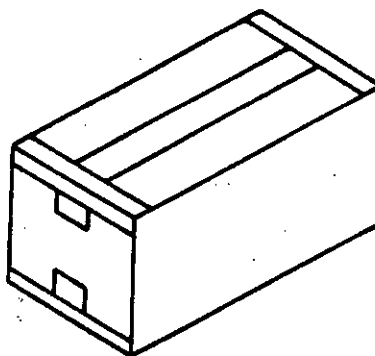


Figure 28

Method 122  
July 28, 1972

CLOSURE OF FIBERBOARD BOXES, STYLE DBLCC (0310), CLASS DOMESTIC

A style DBLCC box shall be closed as specified in Method 105 except when tape is used, it shall conform to PPP-T-97, type III.

39  
40

Method 123  
July 28, 1972

**CLOSURE OF FIBERBOARD BOXES, STYLE HSC (0312), CLASS DOMESTIC**

A style HSC box shall have the bottom flaps closed in accordance with Method 120 or Method 121. The top shall be closed with tape or strapping as specified in Method 122.

7/2

Method 124  
July 28, 1972

**CLOSURE OF FIBERBOARD BOXES, STYLE IC (0325), CLASS DOMESTIC**

A style IC box shall be closed as specified in Method 104 except when tape is used, it shall conform to PPP-T-97, type III.

End of  
Page 1

43  
44

Method 125  
July 28, 1972

**CLOSURE OF FIBERBOARD BOXES, STYLES FTC (0301), OPF (0401), SFF (0206), FOL (0203), PPF (0410) AND TS, CLASS DOMESTIC**

Styles FTC, OPF, PPF, SFF, FOL and TS boxes shall be closed by taping all seams as shown in figures 29 and 30 with minimum 3 inch wide tape conforming to PPP-T-45, type II or PPP-T-76, or minimum 2 inch wide tape conforming to PPP-T-60; or styles FTC, PPF, SFF, FOL and TS boxes may be closed with strapping or filament reinforced tape as outlined in Method 210.

Style FTC

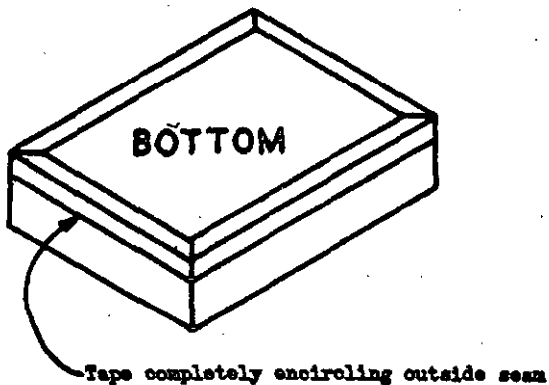


Figure 29

Style TS

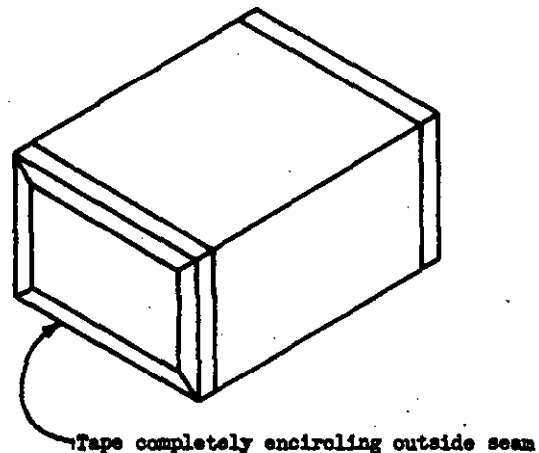


Figure 30

Alternatively, style OPF boxes may be closed with a single strip of tape as specified above. The tape shall be centered over the seam formed by the outer flaps and extend down the end panels of the box a distance equal to the outside depth of the box as shown in figure 31.

Style OPF

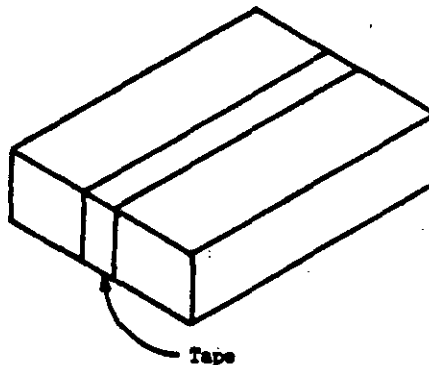


Figure 31

45  
46

Method 130  
July 28, 1972

CLOSURE OF TRIPLE WALL FIBERBOARD BOXES, CLASS 1 (NONWEATHER-RESISTANT)

A class 1 - nonweather-resistant triple wall fiberboard box shall be closed in the manner as the corresponding style class 2 weather resistant box except when tape is specified, it shall conform to PPP-T-97, type III, minimum width 3/4 inch except for styles E and F boxes which shall be closed with tape conforming to PPP-T-97, type III, minimum width 1 inch.

42  
48

Method 150  
July 28, 1972

**SEALING OF FIBERBOARD BOXES, CLASS WEATHER-RESISTANT (EXCEPT TRIPLE WALL FIBERBOARD BOXES)**

Packed and closed class weather-resistant boxes shall be sealed by having all seams, corners and joints taped with minimum 2 inch wide tape conforming to PPP-T-60 or PPP-T-76. The tape applied to the manufacturer's joint shall cover the joint but shall not extend over the corners of the box onto the adjacent panels as shown in figure 32. The tape applied to the seams shall be centered over the seams and shall extend over all corners and edges of the box a minimum of 2-1/2 inches onto the adjacent box panels as shown in figure 33.

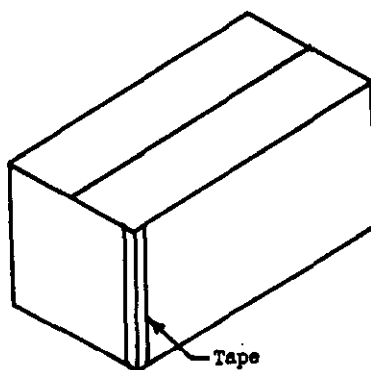
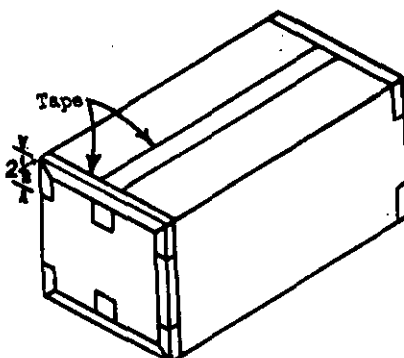


Figure 32



NOTE: For all styles of boxes, apply tape over all seams and joints.

Figure 33

Method 151  
July 28, 1972

# SEALING OF TRIPLE WALL FIBERBOARD BOXES, CLASS 2 (WEATHER-RESISTANT)

Packed and closed class 2 weather-resistant triple wall fiberboard boxes shall be sealed by having all seams, corners and body joints taped with minimum 3-inch wide tape conforming to PPP-T-60 or PPP-T-76. When steel or nonmetallic strapping is used for closures, tape sealing shall be accomplished prior to the application of strapping. The tape applied to the body joints shall cover the joint but shall not extend over the corners of the box onto the adjacent panels as shown in figure 34. The tape applied to the seams shall be centered over the seams and extend over all corners and edges of the box a minimum of 2-1/2 inches onto the adjacent box panels. The sealing tape shall be applied over the lengthwise seams of the outer flaps closing the opening of the box and over the body joints prior to being applied to the end seams of the box as shown in figure 35.

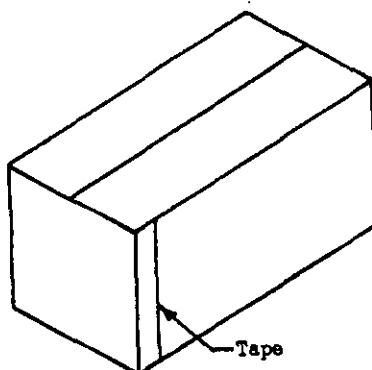
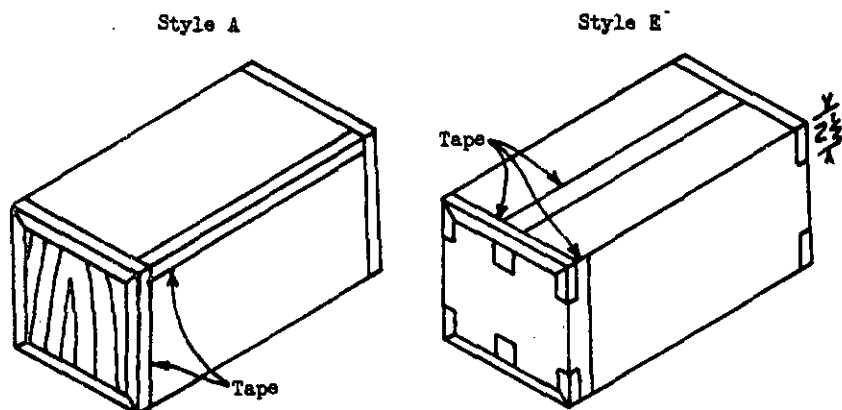


Figure 34



NOTE: For all styles of boxes, apply tape over all seams and joints.

Figure 35

Method 160  
July 28, 1972

# SEALING OF FIBERBOARD BOXES, CLASS DOMESTIC (EXCEPT TRIPLE WALL FIBERBOARD BOXES)

Packed and closed class domestic fiberboard boxes shall be sealed by having all seams, corners and joints taped with minimum 2 inch wide tape conforming to PPP-T-60 or PPP-T-76; or minimum 3 inch wide tape conforming to PPP-T-45, type III. The tape applied to the manufacturer's joint shall cover the joint but shall not extend over the corners of the box onto the adjacent panels as shown in figure 36. The tape applied to the seams shall be centered over the seams and shall extend over all corners and edges of the box a minimum of 2-1/2 inches onto the adjacent box panels as shown in figure 37.

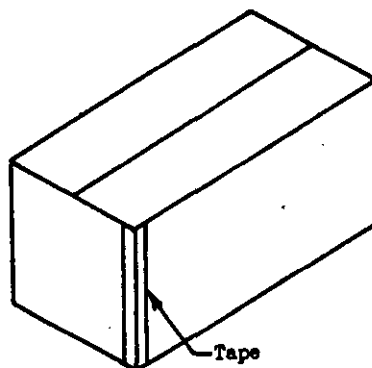
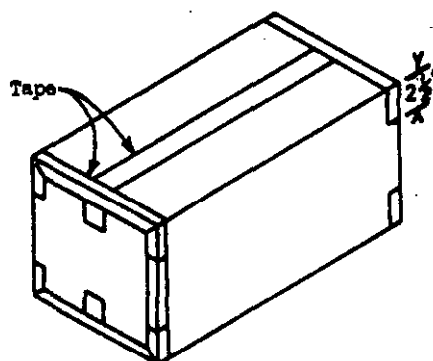


Figure 36



NOTE: For all styles of boxes, apply tape over all seams and joints.

Figure 37

Method 161  
July 28, 1972

SEALING OF TRIPLE WALL FIBERBOARD BOXES, CLASS 1 (NONWEATHER-RESISTANT)

Packed and closed class 1 nonweather resistant triple wall fiberboard boxes shall be sealed as specified in Method 151 for class 2 weather resistant triple wall fiberboard boxes.

55  
56

Method 200  
July 28, 1972

REINFORCING FIBERBOARD BOXES, CLASS WEATHER-RESISTANT (EXCEPT TRIPLE WALL FIBERBOARD BOXES)

Packed, closed and sealed class weather-resistant fiberboard boxes shall be reinforced with flat steel or twist tie wire strapping conforming to QQ-S-781; round wire strapping conforming to QQ-S-790; nonmetallic strapping conforming to PPP-S-760, type II or III, except that buckles (connectors) shall not be used; or tape conforming to PPP-T-97, type IV, except when the content of the box is perishable subsistence or a non-extendible shelf life item with a shelf life not exceeding 6 months, tape conforming to PPP-T-97, type I, II, III or IV may be used. The size of steel and nonmetallic strapping to be used shall be in accordance with table II for type, class and grade required. When tape is used, it shall be applied in strips which shall be of sufficient length to allow a minimum of 3 inches of tape to contact a box panel. The width of the tape to be used shall be in accordance with table III. Banding and strips shall not be applied so as to cover, obliterate or interfere with markings on the shipping container.

TABLE II. Metal and nonmetallic strapping requirements

TABLE II. Metal and nonmetallic strapping requirements							
Gross weight of container and contents	QQ-S-781, size of flat steel strapping, class A or B, grade 2 standard			PPP-S-760, size on nonmetallic strap		QQ-S-790, size (gage) of round steel strap, finish 2, zinc coated	
						Classes	
Pounds	Type I	Type III	Type IV	Type II	Type III	A	B
Up to 35, incl.	1/4 x 0.015 5/16 x 0.012 3/8 x 0.010	0.138 x 0.025 0.063 x 0.024 1/	1/4 x 0.015	3/8 x 0.015 or 1/4 x 0.027	7/16 x 0.017 or 1/2 x 0.015	16-1/2	16-1/2
Over 35 to 70 incl.	3/8 x 0.015 2/	0.138 x 0.025	3/8 x 0.015 2/	3/8 x 0.015 or 1/4 x 0.027	7/16 x 0.017 or 1/2 x 0.015	16	15
Over 70 to 110 incl.	3/8 x 0.020	-----	3/8 x 0.020	1/2 x 0.015 or 3/8 x 0.020	1/2 x 0.015 or 7/16 x 0.017	14	13
Over 110 to 225 incl.	1/2 x 0.015 1/2 x 0.020	-----	1/2 x 0.015 1/2 x 0.020 or 5/8 x 0.015	1/2 x 0.020 or 5/8 x 0.015	7/16 x 0.023 or 1/2 x 0.020	13	12

1/ 0.063 x 0.024 inch strapping shall be allowed only for V2s sleeve boxes and shall conform to QQ-S-781 except that it shall have a tensile strength of 135,000 psi, a breaking strength of 205 pounds and a joint strength of not less than 170 pounds.

2/ 1/4 x 0.015 inch may be used for type I loads and FTC boxes of frozen foods.

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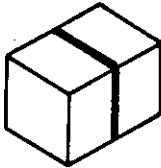
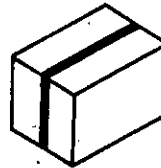
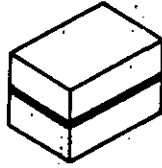
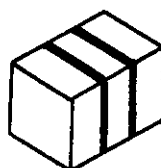
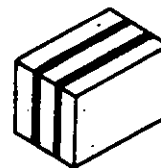
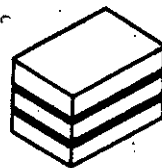
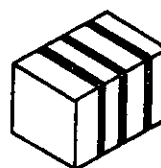
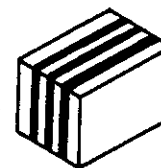
TABLE III. Tape requirements

Gross Weight of container and contents Pounds	Number of bands and sizes in inches							
	1	2	3	4	5	6	7	8
Up to 35 inclusive	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Over 35 up to 70 inclusive	3/4	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Over 70 up to 110 inclusive	1	3/4	3/4	1/2	1/2	1/2	1/2	1/2
Over 110 up to 140 inclusive	1	1	3/4	1/2	1/2	1/2	1/2	1/2
Over 140 up to 180 inclusive	-	1	1	3/4	1/2	1/2	1/2	1/2
Over 180 up to 220 inclusive	-	-	1	1	3/4	3/4	1/2	1/2
Over 220	-	-	-	1	1	1	3/4	3/4

Tables IV and V shall govern the number and direction of reinforcing bands required on boxes and table VI shall govern the number of reinforcing strips required on boxes. When only one band or strip is required on the box in a given direction, it shall be centered except in the case where lengthwise bands or strips shall be applied slightly offset from the seam formed by the top and bottom flaps in the closed position. When two or more bands or strips are used on the box in the same direction, they shall divide the box into units of equal length, except when snap together tongue or tuck lock corners are used for style FTC, OPF, FPF and TS boxes, the two girthwise straps or bands shall be positioned over the tongue or tuck locks at each end of the box. Cross banded boxes shall have the longer band applied first. Boxes carrying loads having restricted points of contact shall be reinforced, whenever practicable, over these points of contact. Bands and strips shall be applied straight and be sufficiently tensioned. Metal bands shall be imbedded into the edges of the box but shall not cut or tear the fiberboard or crush the contents. When a sleeve is specified, the bands or strips shall be applied after the sleeve is placed on the box.

Method 200  
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TABLE IV  
Reinforcing pattern for slotted style and style FTC, OPP, FPP and TS boxes

Dimension (length) (inches)	Girthwise <u>1/</u>	Dimension (Width) (Inches)	Lengthwise	Dimension (Height) (inches)	Horizontal <u>1/ 2/</u>
-----	-----	up to 9 in.	None	up to 18 in.	None
Up to 20 in. <u>3/</u>		Over 9 to 18 in. <u>3/</u>		Over 18 to 30 in.	
Over 20 to 30 in. <u>3/</u>		Over 18 to 30 in. <u>3/</u>		Over 30 to 40 in.	
Over 30 to 40 in. <u>3/</u>		Over 30 to 48 in.			
Over 48 <u>4/</u>		Over 48 <u>5/</u>		Over 48 <u>6/</u>	

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July 28, 1972

1/ Lengthwise - Encircling top, bottom and ends. Girthwise - Encircling top, bottom and sides. Horizontal - Encircling sides and ends. See PPP-B-636 for designation of top, bottom, side and end faces. Note that the location of the openings determines the designation of the panels, rather than the normal storage position.

2/ Horizontal bands are only occasionally required. When contents exert severe pressure on vertical score lines, they should be used.

3/ Full telescope style boxes, having covers not otherwise sealed to bodies, will usually require use of one or more additional bands, both lengthwise and girthwise when dimensions approach the upper range of the size brackets listed in above table.

4/ Add one girthwise band for each additional 12 inches of length past 48 inches.

5/ Add one longitudinal band for each additional 12 inches of width past 48 inches.

6/ Add one horizontal band for each additional 18 inches of depth past 48 inches.

TABLE V. Metal straps required for DBLCC, IC or HSC boxes

Box length (inches)	Number of straps		
	Up to 18 (incl.)	Over 18 to 30 (incl.)	Over 30 to 48 (incl.)
0 to 20 incl.	2	3	4
Over 20 to 38 incl.	3	4	5
Over 38 to 56 incl.	4	5	6
Over 56 to 72 incl.	5	6	7
Over 72	6	7	8

1/ One centered lengthwise strap required.

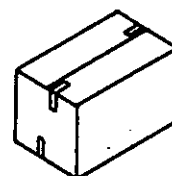
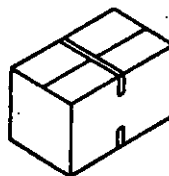
2/ Two equally spaced lengthwise straps required.

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July 28, 1972

TABLE VI Minimum number of tape strips which must cross a seam or scoreline  
Length of seam or  
scoreline (inches)      Number of strips      Length      Width

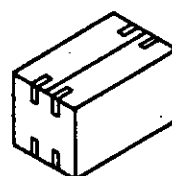
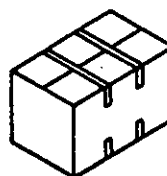
Up to 15 inclusive

1



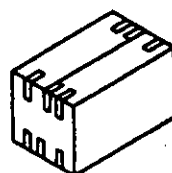
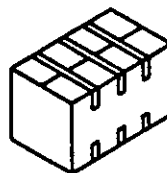
Over 15 to 30 inclusive

2



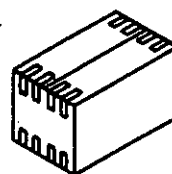
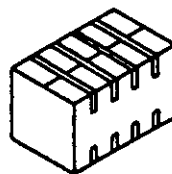
Over 30 to 60 inclusive

3



Over 60

4



Method 201  
July 28, 1972

# REINFORCING TRIPLE WALL FIBERBOARD BOXES, CLASS 2 (WEATHER-RESISTANT)

Class weather-resistant triple wall fiberboard boxes shall be reinforced with steel strapping, nonmetallic strapping or filament reinforced tape.

Steel strapping may be either flat or round. When flat strapping is used, it shall be in accordance with QQ-S-781, type I or IV, class A or B, minimum size  $5/8 \times .018$  inch. When round strapping is used, it shall be in accordance with QQ-S-790, class A or B, finish 2 (zinc coated). The minimum diameter for class A strapping shall be 0.0990 inch (12-1/2 gage) and for class B strapping shall be 0.1205 inch (11 gage). Metal edge protectors as specified in Method 110 shall be used with flat or round steel strapping.

Nonmetallic strapping shall be in accordance with PPP-S-760, type I, II or III. When type I is used, it shall be grade B and have a nominal width of  $5/8$  inch. When type II is used, it shall be either  $1/2 \times 0.025$  inch or  $5/8 \times 0.020$  inch. When type III is used, it shall be either  $7/16 \times 0.029$  or  $1/2 \times 0.025$  inch.

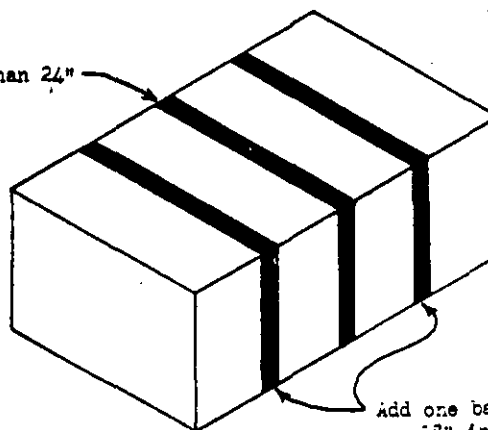
Filament reinforced tape shall be in accordance with PPP-T-97, type IV, minimum width  $3/4$  inch except for styles E and F boxes. For styles E and F boxes, the tape shall conform to PPP-T-97, type IV, minimum width 1 inch.

A box with a length greater than 24 inches shall be encircled with one girthwise band which shall be centered along the length of the box as shown in figure 38. For each additional 18 inch increment of length, an additional reinforcing band shall be added as shown in figure 38. These shall be evenly spaced along the length of the box. Bands shall be applied straight and be sufficiently tensioned.

For style F boxes, the same reinforcements shall be added for width as those required for length.

63  
64

Reinforce with one band  
when length is greater than 24"



Add one band for each additional  
18" increment of length.

Figure 38

Method 210  
July 28, 1972

REINFORCING FIBERBOARD BOXES, CLASS DOMESTIC (EXCEPT TRIPLE WALL FIBERBOARD BOXES)

Packed and closed class domestic fiberboard boxes shall be reinforced with encircling bands of flat steel or twist tie steel wire strapping, nonmetallic strapping or strips of filament reinforced tape.

Steel strapping material requirements, number and location shall be as specified for class weather-resistant fiberboard boxes in Method 200.

When filament reinforced tape is used, it shall conform to PPP-T-97, type I, II or III. The width and location of the tape shall be as specified for class weather-resistant fiberboard boxes in Method 200. The length of the tape strips shall be sufficient to allow a minimum of 2 inches of tape to contact box panels adjacent to the scoreline or seam.

Nonmetallic strapping shall conform to PPP-S-760, type I, II, or III, except that buckles (connectors) shall not be used. Number and size of bands shall be as specified in table VII.

Gross weight of box and contents (lbs.)	TABLE VII Size of nonmetallic banding (minimum)			Number and position of bands
	Type I, grade A Size in inches	PPP-S-760 Type II Size in inches	Type III Size in inches	
Up to 70 inclusive	1/4	1/4 x 0.020	7/16 x 0.017	1 girthwise (centered)
Over 70 to 110 inclusive	3/8	3/8 x 0.020	7/16 x 0.017	2 girthwise 1/
Over 110 to 225 inclusive	1/2	1/2 x 0.020	7/16 x 0.017	2 girthwise 1/

1/ Bands shall divide box into units of equal length.

Method 211  
July 28, 1972

REINFORCING TRIPLE WALL FIBERBOARD BOXES, CLASS 1 (NONWEATHER-RESISTANT)

Class 1 nonweather resistant triple wall fiberboard boxes shall be reinforced in the same manner as specified in Method 201 for class 2 weather-resistant triple wall fiberboard boxes except when filament reinforced tape is used, it shall conform to PPP-T-97, type III, minimum width 3/4 inch except for styles E and F boxes. For styles E and F boxes, the tape shall conform to PPP-T-97, type III, minimum width 1 inch.

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