

INCH-POUND

PPP-B-676E

December 31, 1992

SUPERSEDING

PPP-B-676D

November 2, 1974

AMENDMENT-2

August 10, 1977, and

INT. AMENDMENT-3

April 20, 1989

FEDERAL SPECIFICATION

BOXES, SETUP

The General Services Administration has authorized the use of this federal specification, for all federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers the requirements for new paperboard setup boxes and for closure of filled boxes (see 6.1).

1.2 Classification. Setup paperboard boxes shall be of the following types, varieties, classes, and styles, as specified (see 6.2 and 6.3).

- | | |
|-----------|------------------------------------|
| Type I | - Full telescope |
| Type II | - Partial telescope or shallow lid |
| Type III | - Neck or shoulder |
| Type IV | - Slide boxes |
| | |
| Variety 1 | - Plain |
| Variety 2 | - Water resistant |
| Variety 3 | - Grease resistant |
| Variety 4 | - Water and grease resistant |

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be used in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5018 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8115

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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- Variety 5 - Plain fire retardant
- Variety 6 - Water resistant and fire retardant
- Variety 7 - Grease Resistant and fire retardant
- Variety 8 - Water and grease resistant-fire retardant

- Class A - Blank, corner stayed (see figure 5)
- Class B - Blank, corners stitched or glued (see figure 5)
- Class C - Blank, corners cut without stays (see figure 5)
- Class D - Blank, end set (see figure 7)
- Class E - Blank, bottom set (see figure 8)

- Style 1 - Banded or strip stayed (see figure 9)
- Style 2 - Trimmed (see figure 10)
- Style 3 - Strip-covered (see figure 11)
- Style 4 - Tight wrapped (see figure 6)

2. APPLICABLE DOCUMENTS

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

Federal Specifications

- UU-P-268 - Paper, Kraft, Wrapping
- PPP-B-601 - Boxes, Wood, Cleated-Plywood
- PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner
- PPP-B-636 - Boxes, Shipping, Fiberboard

Federal Standards

- FED-STD-101 - Test Procedures for Packaging Materials
- FED-STD-123 - Marking for Shipment (Civil Agencies)

(Activities outside the federal Government may obtain copies of federal specifications, standards, and commercial item descriptions as outlined under General Information in the Index of Federal Specifications, Standards and Commercial Item Description. The Index, which includes cumulative bi-monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001.)

(Single copies of this specification and other federal specifications and commercial item descriptions required by activities outside the Federal Government for bidding purposes are available without charge from the General Services Administration Business Service Centers, Regional Offices in Boston, MA; New York, NY; Washington, DC; Atlanta, GA; Chicago, IL; Kansas City, MO; Fort Worth, TX; Denver, CO; San Francisco, CA; Los Angeles, CA; and Seattle, WA.)

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(Federal Government activities may obtain copies of federal standardization documents and the Index of Federal Specifications, Standards and Commercial Item Descriptions from established distribution points in their agencies.)

Military Standards

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

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

Federal Regulations

Regulations governing United States Code Congressional and Administrative News - Resource Conservation and Recovery Act of 1976 (Public Law 94-580)

U.S. Department of Health and Human Services (HHS)

Federal Food, Drug, and Cosmetic act and regulations promulgated thereunder (21 CFR Parts 1-199)

U.S. Department of Commerce (USDC)

R 44 Boxboard Thickness, Simplified Practice Recommendations

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001.)

(The code of Federal Regulations (CFR) and the Federal Register (FR) are for sale on a subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. When indicated, reprints of certain regulations may be obtained from the federal agency responsible for issuance thereof.)

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:

American Society for Testing and Materials (ASTM)

- D 3951 - Standard Practice for Commercial Packaging
- E 162 - Surface Flammability of Materials Using Radiant Heat Energy
Source
- E 662 - Specific Optic Density of Smoke Generated by Solid Materials

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(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

American Paper Institute (API)

Combination Paperboard Standards

(Application for copies should be addressed to American Paper Institute, 260 Madison Avenue, New York, NY 10016.)

Technical Association of the Pulp and Paper Industry (TAPPI)

- T 411 - Thickness of Paper and Paperboard
- T 433 - Water Resistance of Paper and Paperboard
(Dry-Indicator Method)
- T 441 - Water Absorptiveness of Non-Bibulous Paper and Paperboard
- T 454 - Turpentine Test for Grease Resistance of Paper

(Application for copies should be addressed to the Technical Association of the Pulp and Paper Industry, One Dunwoody Park, Atlanta, GA 30341.)

(Federal Government activities may obtain copies of those non-Government documents which have been indexed in the Department of Defense Index of Specifications and Standards from the DoD Single Stock Point, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

3. REQUIREMENTS

3.1 Materials.

3.1.1 All varieties. Paperboard used to fabricate boxes shall be clean commercial nonbending grades conforming to the density characteristics and bursting strength requirements in table I, as specified (see 6.2). The paperboard shall have a minimum of 80 percent post-consumer recovered materials and manufacturer waste (see 6.5). The offeror/contractor is encouraged to use recovered materials in accordance with Public Law 94-580 to the maximum extent practicable.

TABLE I. Paperboard gage list and bursting strength -
nonbending boards 1/

Regular number 50-pound bundle 25 x 40 inches	Thickness of individual sheets 2/ (Inch)			Basic weight 3/ per 100 square feet (Pounds)	Minimum burst- ing strength 4/ (applicable to Nos. 2, 3, and 4 finishes average) (Points)
	No. 2 finish	No. 3 finish	No. 4 finish		
Quantity					
40	—	—	0.046	180	160
45	0.048	0.045	0.041	160	145
50	0.043	0.040	0.037	144	130
55	0.038	0.036	0.033	131	115
60	0.035	0.033	0.030	120	105
65	0.032	0.030	0.028	111	95
70	0.030	0.028	0.026	103	90
75	0.028	0.026	—	96	85
80	0.026	—	—	90	80

- 1/ Simplified Practice Recommendation R44, U.S. Department of Commerce; and Boxboards Standards, National Paperboard Association.
- 2/ A tolerance of ± 0.001 inch will be permitted in thickness from 0.026 through 0.032 inch and ± 0.0015 inch for greater thicknesses.
- 3/ See 3.1.1.2 for lines, strip banded or tight wrapped boxes. Basis weight tolerance shall be ± 5 percent.
- 4/ See 3.1.1.1 for lined, strip banded or tight wrapped boxes.

3.1.1.1 Bursting strength of the combined components of style 3 and style 4 boxes. In addition to the bursting strength requirements in table I, the bursting strength of the banded area of strip banded boxes, and the combined material of tight wrapped boxes designed for contents of $3/4$ pound or less in weight shall be 14 points greater than the bursting strength requirements of table I. For boxes designed for contents greater than $3/4$ pound, the bursting strength of combined material shall be 24 points greater than the bursting strength requirements of table I.

3.1.1.2 Basis weight of the combined components of boxes. The combined basis weight of strip band and tight wrap boxes shall be 13.5 pounds per 1000 square feet greater than the basis weight requirements specified in table II for boxes designed for contents of $3/4$ pound or less in weight, and 16.0

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pounds per 100 square feet for boxes designed for content weight greater than 3/4 pound. The basis weight of glassine or greaseproof lined paperboard shall be 12.0 pounds per 1000 square feet greater than the values specified in table I.

3.1.2 Variety 2, 3, 4, 5, 6, 7 and 8; water resistant, grease resistant, water and grease resistant, fire retardant, water resistant and fire retardant, grease resistant and fire retardant and water resistant, grease resistant and fire retardant. Paperboard may be treated chemically to obtain the water or grease resistance, water or grease resistant and fire retardant and water and grease resistance with fire retardant characteristics required, or may be combined with a sheet of lining paper or film, with an applicable adhesive to provide the resistance requirement. The adhesive shall not penetrate through the lining material. Materials used in laminating or coating shall show no rupture along the score lines after the box is formed. The resistant side of the paperboard shall form the inside surfaces of the box. Varieties 2, 3, 4, 5, 6, 7 and 8 paperboard shall show no tendency to block when tested as specified in table III at 120 degrees \pm 5 degrees F and at 75 \pm 3.5 percent relative humidity. When boxes are used for packaging food products, the materials used shall conform with the Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder. The paperboard from which boxes will be fabricated shall lie flat to the extent that the edge curl shall not exceed 3/16 inch when tested as specified in 4.5.1. The paperboard shall contain recovered materials as specified in 3.1.1.

3.1.2.1 Variety 2, water resistant and variety 6, water resistant and fire retardant boxes. Paperboard used to fabricate water resistant and water resistant and fire retardant boxes shall conform to the requirements in table I, and shall have the inner surface of the box treated, coated, or laminated with a plastic sheet, to provide the resistant feature required. Weatherproof paperboard is not required. Linings and coatings shall remain continuously bonded to the paperboard. The boxes shall be water resistant to the extent that there shall be no discoloration of the dye after not less than 2 hours when tested as specified in table III. Variety 6 boxes treated for fire retardant shall also meet the test of 4.2.2.

3.1.2.2 Variety 3, grease resistant and variety 7, grease resistant and fire retardant boxes. Paperboard used to fabricate grease resistant and grease resistant and fire retardant boxes shall conform to the requirements in table I, and shall be treated or processed for grease resistance to the extent that the average time of penetration of turpentine is not less than 24 hours when tested as specified in table III. Variety 7 shall meet the fire retardant test of 4.2.2.

3.1.2.3 Variety 4, water and grease resistant and variety 8 water, grease resistant and fire retardant boxes. Paperboard used to fabricate grease and water resistant and grease and water and grease resistant and fire retardant boxes shall conform to the requirements in table I, and shall be treated or

processed for grease and water resistance to the extent that the penetration of turpentine from the barrier side of the paperboard to the reverse side is not less than 24 hours and water resistance shall be not less than 2 hours when tested as specified in table III. Variety 8 shall also meet the fire retardant test of 4.2.2.

3.1.3 Stay and cover papers.

3.1.3.1 Stay paper for variety 1 and 5 boxes. The stay paper used in the fabrication of setup boxes shall have a minimum basis weight of 80 pounds (24 by 36 inches - 500 sheets) conforming to grade B of UU-P-268. The width of the stay paper shall be not less than 3/4 inch and shall be centered with the stayed corner \pm 1/8 inch.

3.1.3.2 Stay paper for variety 2, 3, 4, 6, 7 and 8 boxes. Stay paper for variety 2 and 6 boxes shall be water resistant to the extent that there shall be no discoloration of the die after not less than 2 hours when tested as specified in table III. Stay paper for variety 3 and 7 boxes shall have a grease resistant requirement of 24 hours when tested as specified in table III. Stay paper for variety 4 and 8 boxes shall meet the requirements for water and grease resistant stays specified herein when tested as specified in table III. The basis weight (24 by 36 inches - 500 sheets) of kraft stay paper shall be not less than 60 pounds. The water resistant and grease resistant quality of the stay may be effected by a laminate of grease resistant paper or a flow coat or laminate of plastic film which shall not delaminate during test. Stay paper variety 6, 7 and 8 shall meet the fire retardant test of 4.2.2.

3.1.3.3 Cover and banding papers. The paper used for tightwrap, banding, and trimming shall be kraft paper conforming to grade B of UU-P-268. The basis weight (24 by 36 inches - 500 sheets) of cover and banding kraft papers for boxes designed for contents weighing 3/4 pound or less shall be not less than 30 pounds, and not less than 40 pounds for boxes designed for contents greater than 3/4 pound (see table II).

3.1.4 Adhesives.

3.1.4.1 Adhesive for cover, banding and stay paper. The adhesive used in applying cover, banding and stay paper specified in 3.1.3 to boxes shall be that which is commercially used by the setup box industry.

3.1.4.2 Adhesive for applying lining paper to the surface of paperboard for varieties 2, 4, 6 and 8 boxes. The adhesive can be any type of waterproof adhesive that will meet the requirements of 3.1.2.3. When microcrystalline wax is used as a waterproof adhesive the melting point of the wax shall be not less than 150° F when tested as specified in 4.5.2.

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3.1.5 Color.

3.1.5.1 Civil agencies. The color of the paperboard from which boxes are fabricated for civil agencies shall be the commercial shade of the type of paperboard specified (see 6.2).

3.1.5.2 Military agencies. Paperboard from which boxes for military agencies are fabricated shall be a dull, low reflecting color on both sides of the sheet. Top and bottom liner coloring for shades of olive, dark gray, or kraft shall be done in the stock preparation process.

3.2 Construction.

3.2.1 Selection of paperboard for box construction. The thickness of paperboard, before lining or coating, used in the construction of boxes shall be the thickness specified in the No. 2 finish column in table II for the applicable box volume for content size, or content weight, whichever is greater.

3.2.1.1 Basis weight of paperboard for supporting loads (see 6.1.1). The basis weight shall be as indicated by the thickness requirement in the No. 2 finish column in table II.

3.2.1.2 Basis weight of paperboard for semisupporting loads (see 6.1.2). After obtaining thickness as specified in 3.2.1, the basis weight shall be that which is indicated by the same, or next greater thickness, as applicable, in the No. 3 finish column in table II.

3.2.1.3 Basis weight of paperboard for nonsupporting items (see 6.1.3). After obtaining thickness specified in 3.2.1, the basis weight shall be that which is indicated by the same, or the next greater thickness, as applicable, in the No. 4 finish column in table II.

3.2.2 Dimensions. Dimensions shall be as specified (see 6.2). The first two dimensions for each size box shall be the dimensions of the open face of the body of the box. The larger first dimension shall be the length, the second width, and the depth of the box shall be the third dimension, given in that order. All dimensions shall be inside measurements. A tolerance of $\pm 1/16$ inch shall be permitted on all dimensions.

3.2.2.1 Type I, full telescope (see fig. 1). When specified, full telescope boxes, type I, shall be made with thumb notches (see 6.2).

3.2.2.2 Type II (partial telescope or shallow lid) boxes (see fig. 2). For partial telescope or shallow lid boxes, the depth of the lid or cover shall be specified in addition to the dimensions of the body of the box (see 6.2).

TABLE II. Relationship of volume and weight content to thickness of paperboard for the fabrication of setup paperboard boxes

Volume of box (Cubic Inches)	Weight contents (Pounds)	Thickness (Inch)			Basis weight per 1000 square feet (Pounds)
		No. 2 finish	No. 3 finish	No. 4 finish	
10 or less	1/4 or less	0.026	—	—	90
over 10 - 20	over 1/4 - 1/2	0.028	0.026	—	96
over 20 - 40	over 1/2 - 3/4	0.030	0.028	0.026	103
over 40 - 60	over 3/4 - 1-1/2	0.032	0.030	0.028	111
over 60 - 80	over 1-1/2 - 3	0.035	0.033	0.030	120
over 80 - 110	over 3 - 5	0.038	0.036	0.033	131
over 110 - 150	over 5 - 7-1/2	0.043	0.040	0.037	144
over 150	over 7-1/2 - 10	0.048	0.045	0.041	160
over 150	over 10	—	—	0.046	180

3.2.2.3 Type III (neck or shoulder) boxes (see fig. 3). For neck or shoulder type boxes, the dimensions shall be inside measurements of the neck or collar. The base and lid of type III boxes shall be of equal depth and the sum of their depths shall equal the depth of the neck or collar, $\pm 1/16$ inch. The neck or collar shall be made from the same caliper of board as the base and lid, and shall be scored and stayed with a flange, and may be stripped or edged as specified (see 6.2).

3.2.2.4 Type IV. Type IV boxes shall be in accordance with figure 4.

3.3 Printing. Printing shall be as specified (see 6.2).

3.4 Workmanship. The surfaces of boxes shall contain no dust, lint or foreign dirt. Dimensions of the boxmakers blank shall be cut and scored so that the packaged material fits without bulging. Scoring shall be uniform and of such depth as to prevent inside surface breaks of the box after fabrication. Edges shall be in accordance with commercial practice except the turn-in or turnover shall be not less than 3/8 inch.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed

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4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 Responsibility for dimensional requirements. Unless otherwise specified in the contract or purchase order, the contractor is responsible for ensuring that all specified dimensions have been met. When dimensions cannot be examined on the end item, inspection shall be made at any point, or at all points in the manufacturing process necessary to ensure compliance with all dimensional requirements.

4.2 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

4.2.1 Component and material examination. In accordance with 4.1 above, components and materials shall be examined in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified or qualified in this specification or applicable purchase document.

TABLE III. Component testing

Characteristic	<u>Specification reference</u>		Number determinations per sample unit	<u>Results reported as 1/</u>	
	Requirement	Test method		Pass or fail	Numerically to nearest
Thickness	3.1.1	T 411*	20 (2 on 10 specimens)	-	0.0001 inch
Basis weight: Paperboard - lbs. per 1000 sq. ft.	3.1.1	5022 5/	1	-	1 pound
Bursting strength	3.1.1	2007 5/	10 (5 on each side)	-	point
Water resistance: 2/ 5/ Variety 2 and 6, paperboard	3.1.2.1	T 433*	1	-	1 minute
Variety 4 and 8, paperboard	3.1.2.3	T 433*	1	-	1 minute
Stay material	3.1.3.2	T 433*		-	1 minute
Grease resistance: 3/ Variety 3 and 7, paperboard	3.1.2.2	T 454*	1	-	1 minute
Variety 4 and 8, paperboard	3.1.2.3	T 454*	1	-	1 minute
Stay material	3.1.3.2	T 454*		-	1 minute
Blocking 1/	3.1	3003 5/	1	X	degree
Curl	3.1	4.5.1	1	-	1/64 inch

*TAPPI standards.

- 1/ Test results shall include all values upon which results are based.
- 2/ The time required for complete color change of the dye shall be not less than 2 hours.
- 3/ Grease-resistant papers or films may be tested before lamination with a minimum average penetration time of 1650 + seconds. When testing combined specimens, the bond paper transfer indicator of the test method shall not be used, instead place the specimen so that the underside of the specimen can be observed.

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4/ When the water resistant characteristic is obtained by hard sizing the sheet throughout of variety 2 and 5 boxes, use TAPPI Test Method T 441, water absorptiveness on nonbibulous paper and paperboard (Cobb Test). The maximum absorptiveness shall be not more than 1.0 gram in 5 minutes.

5/ FED-STD-101.

6/ Stay paper shall be tested as specified in 4.5.1.

7/ Failure of any test specimen shall be cause for rejection.

4.2.2 Fire performance testing. The fire retardant varieties 5, 6, 7 and 8 shall be tested as specified in a and b.

a. Flame spread test. Variety 5, 6, 7 and 8 shall be tested in accordance with ASTM E 162. A flame spread of over 20 is cause for rejection.

b. Smoke density test. Variety 5, 6, 7 and 8 shall be tested in accordance with ASTM E 662. A specific optic density of over 100 shall be cause for rejection of the lot.

4.3 Inspection of the end item.

4.3.1 End item appearance and workmanship examination. The applicable boxes shall be examined for the defects listed below. The lot size shall be expressed in units of boxes. The sample unit shall be one box. The inspection level shall be S-3, and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 2.5. Not more than one sample unit shall be selected from any one container or bundle. The inside and outside of the box lid shall be examined.

<u>Examine</u>	<u>Defect</u>
Appearance	Not type, variety, class, or style specified. Not color specified.
Workmanship	Tears, scuffs, distorted, score lines ragged, broken. Edges not clean cut. Surfaces not clean, indentations, blisters. Lid, as applicable, not a snug fit.
Varieties 2, 3, 4, 6, 7 and 8 Stay paper	Resistant side not inside of box and lid or sleeve. Resistance barrier ruptured along score lines. Adhesive penetrating lining paper, as applicable. Stay paper not as specified.

Components	Improperly applied, missing, not material specified. Not fully and securely bonded over contact area.
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4.3.2 End item dimensional examination. The end items shall be examined for conformance to the dimensions specified in applicable figures. Any dimensions not within the specified tolerance shall be classified as a defect. The lot size shall be expressed in units of boxes. The sample unit shall be one box. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 6.5.

4.3.3 Examination of preparation for delivery. The end items shall be examined for the defects listed below. The lot size shall be expressed in units of shipping containers. The sample unit shall be one shipping container. The inspection level shall be S-1 and the AQL, expressed in terms of defects per hundred units, shall be 4.0.

<u>Examine</u>	<u>Defect</u>
Packing (as applicable)	Unlike boxes packed together in same shipping container. Contents do not fit snugly in shipping containers. Weight of contents greater than container limitations.
Waterproofing	Any seam or joint of fiberboard containers not covered with waterproofing tape.
Marking	Omitted, incomplete, incorrect, illegible, or not in accordance with specification (see 5.2).

4.3.4 Examination of shipping containers. When shipping containers are required to be in accordance with PPP-B-636, PPP-B-601 or PPP-B-621 examinations for closure and reinforcement shall be in accordance with that specification.

4.4 End item testing. The end item shall be tested for the characteristics listed in table III. Each variation shall be tested separately. The lot size shall be expressed in units of boxes with lids. The sample unit shall be one complete box and lid. Five sample units shall be selected from each lot. The lot shall be rejected if the lot average of one or more unit requirements fail to meet requirements applicable.

4.5 Tests.

4.5.1 Curl test. Two 12 by 12 inch specimens shall be placed on a smooth, dry plane, one with the wire side up and the other with the wire side down. The amount of maximum edge curl shall be reported to the nearest 1/32 inch when measured from the surface of the plane to the bottom surface of the specimen.

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4.5.2 Wax adhesive melting point test. The test specimen shall be not less than 4 by 4 inches of an unscored area of the box. The specimen shall be placed in an oven at a temperature of $140^{\circ} \pm 5^{\circ}\text{F}$. After 30 minutes remove the specimen, allow it to cool and examine for any delamination.

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. Unless otherwise specified, boxes of one description shall be packed in a snug-fitting shipping container constructed, closed, and waterproofed by means of tape and reinforced in conformance with class weather-resistant grade V2s or V3s, of PPP-B-636. Gross weight of contents in each shipping container shall not exceed 70 pounds for V2s shipping containers, and 40 pounds for grade V3s shipping containers. When specified (see 6.2) boxes of one description shall be packed in a snug-fitting shipping container conforming to PPP-B-601, overseas type or PPP-B-621, class 2. The gross weight of contents shall not exceed 200 pounds.

5.1.2 Level B. Unless otherwise specified, boxes of one description shall be packed in a close fitting shipping container constructed in conformance with PPP-B-636, type CF, class domestic. Gross weight of contents in each shipping container shall not exceed 70 pounds. Closures shall be in accordance with method II of the appendix of PPP-B-636.

5.1.2.1 Weather-resistant fiberboard containers. When specified (see 6.2), the weather-resistant fiberboard shipping containers shall be grade V3c, V3s, or V4s, fabricated and closed in accordance with PPP-B-636. The weight of contents shall not exceed 70 pounds.

5.1.3 Level C. Boxes shall be bundled or packed in a manner to insure carrier acceptance and safe delivery at destination at the lowest transportation rate for such supplies. The quantity per shipping container shall be the same as that normally used by the supplier for retail distribution. Containers shall comply with ASTM D 3951.

5.2 Marking.

5.2.1 Civil agencies. Shipments shall be marked in accordance with FED-STD-123.

5.2.2 Military requirements. In addition to any special marking specified in the contract or order, shipping containers shall be marked in conformance with MIL-STD-129.

5.2.3 Nomenclature. The nomenclature on each shipping container shall be as follows:

Box	Setup		Paperboard
Style	Type	Variety	Class
Length	Width		Depth

6. NOTES

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

6.1 Intended use. Setup paperboard boxes are used for interior packing and are used to give added protection to the article packed and for convenience in handling. Boxes may require over-packing since they are not weather-resistant. Table II provides for weight of contents not over ten pounds. This should not prohibit the use of this document for boxes, intended to carry greater content weights when, in the judgment of the specifying activity, the nature of the article or material to be packed justify its use.

6.1.1 Supporting load. An item which extends along one full dimension of the box, or intermediate packages that completely fill the box, some of which are:

Books	One or more rectangular inner packages.
Bars of soap	

6.1.2 Semisupporting rectangular loads. A rigid or semirigid item whose surface is partially supported by the box some of which are:

Cans	Small arms ammunition
Jars	Bottles

6.1.3 Nonsupporting items. A powdered, flaked or small dense item, some of which are:

Rice	Bearings
Sugar	Nuts and bolts

6.1.4 Uses listed by varieties.

6.1.4.1 Variety 1 and 5 box. Boxes that are not water or grease-resistant are intended for use in packaging dry items free from liquids or grease.

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6.1.4.2 Variety 2 and 6 boxes. Water-resistant boxes are intended for use in packaging items such as detergents, starch, flour or metal parts that can corrode. Water-resistant boxes are not weather-resistant since the water-resistant characteristic may be a thin continuous film or coating, and the remainder of the box will be absorbent, and may require over-packing.

6.1.4.3 Variety 3 and 7 boxes. Grease-resistant boxes are intended for use in packing items that are lightly coated with grease or oil as a corrosion protection. Variety 3 and 7 boxes are not intended for use in the packaging of items from which a large amount of free grease or oil will accumulate.

6.1.4.4 Variety 4 and 8 boxes. Water- and grease-resistant boxes are intended for use in the packaging of items that contain grease as an ingredient, and which will be affected if the item loses its moisture content, such as bakery goods and dog foods. The weatherproof limitations of 6.1.4.2 are applicable to variety 4 and 8 boxes.

6.1.4.5 Fire retardant varieties. Variety 5, 6, 7 and 8 are recommended for use by the Navy in accordance with NAVSUPINST4030.47.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Type, variety, class, and style of box required (see 1.2.1, and table II).
- c. Thickness, basis weight, and bursting strength of the paperboard required (see table I).
- d. Color required (see 3.1.5).
- e. Required dimensions of the box in inches in the following sequence: Length, width, and depth (see 3.2.2).
- f. When thumb notches are required for type I boxes (see 3.2.2.1).
- g. Depth of lid or cover (see 3.2.2.2).
- h. Basis weight of cover paper, when applicable (see 3.1.3.3).
- i. When stripping or edging is required for type III box (see 3.2.2.3).
- j. Printing when required (see 3.3).
- k. Applicable level of packing (see 5.1).
- l. When cleated plywood and wood boxes are required for navy shipments (see 5.1.1).
- m. When weather-resistant grade fiberboard shipping containers are required for level B packing (see 5.1.2.1).
- n. When closures, other than specified, are required (see 30.1).
- o. When full telescope boxes are to be perimeter taped (see 30.1).

6.3 Setup paperboard boxes. Setup boxes may be specified in a variety of irregular shapes for specific applications. These odd shapes may be round, triangular, truncated, and other dimensional arrangements. They may also be specified with interior blocks, forms, trays, or partitions for additional protection of materials packaged (see figures 12, 13, and 14).

6.4 Printing. Printing may be provided directly on the inside or outside surface of the base or lid or on the covering material. Labels may also be applied to ends, tops, or sides. Printing should not be specified on covering material applied by banding, trimming, or strip covering methods.

6.5 Definition. Post Consumer Recovered Material - Paper, paperboard and fibrous wastes from factories, retail stores, office buildings, homes, etc. after they have passed through their end usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage. All paper, paperboard, and fibrous waste that enter and are collected from municipal solid waste. Also cut scrap paperboard remnants of the manufacturing process may be used.

6.6 Subject term (key word) listing.

Blank
Basis weight
Corner cut
Full telescope box
Neck and shoulder
Paperboard
Slide box
Stay paper
Strip stayed
Tight wrap
Variety
Water, grease resistant and fire retardant

6.7 Changes from previous issue. Asterisks (or vertical lines) are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

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MILITARY INTERESTS

Custodians

Army - GL
Navy - SA
Air Force - 69

Review Activities:

Army - SM, WC, MI, EA
Navy - AS, MS

User Activities:

Army - PA, MJ, EL
Navy - MC, OS, SH, ES
Air Force - 71

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FSS

PREPARING ACTIVITY:

Army - GL

Project 8115-0530

APPENDIX

BOXES, SETUP

10. SCOPE

10.1 Scope. This appendix covers the assembly of setup boxes and the requirements for closure and inspection of closure of filled boxes.

20. APPLICABLE DOCUMENTS

20.1 The following specifications, of the issues in effect on date of invitation for bids or request for proposal, form a part of this appendix to the extent specified herein.

Federal Specifications:

- PPP-T-76 - Tape, Pressure-Sensitive Adhesive, Paper,
 (For Carton Sealing)
- PPP-T-97 - Tape: Packaging/Industrial, Filament Reinforced

30. REQUIREMENTS

30.1 Closures. Unless otherwise specified (see 6.2), closure of setup boxes shall be secured by means of paper tape of 2-inch minimum width conforming to PPP-T-76. Unless otherwise specified telescoping type boxes shall be closed by applying a strip of tape girthwise around the center of the box and overlapping not less than 2 inches or, when specified (see 6.2) by applying a strip of tape that will securely cover the full perimeter seam of the box. Neck or shoulder type boxes shall be closed in the same manner as specified for the telescoping types. Slide type boxes shall be closed by applying a strip of tape centered lengthwise around the box and overlapping not less than 2 inches, or by applying strips of tape over each end of the base (tray) and extending not less than 2 inches over the top and bottom of the slide (shell) on each end. Alternatively, setup boxes may be securely closed with strips of 1/2 inch minimum width pressure sensitive, filament reinforced tape conforms to type II class B of PPP-T-97. A minimum of two strips of pressure sensitive tape shall be used. Each strip shall extend not less than 2 inches onto each box panel adjacent to the seams of the box.

40. INSPECTION

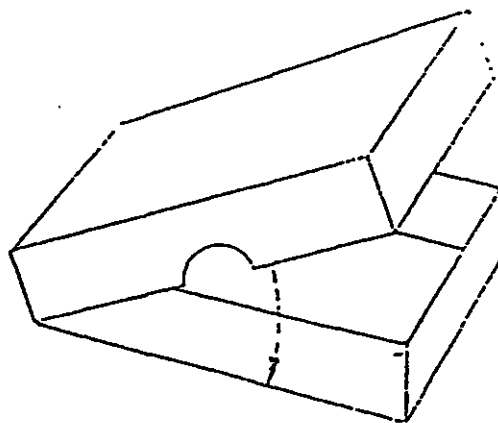
40.1 Box inspection. Boxes shall be inspected to determine compliance with the closure requirements of the appendix. Sampling shall be performed in accordance with MIL-STD-105.

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40.1.1 Inspection for closure. Boxes shall be inspected for closure in accordance with the defects set forth below. The lot size shall be expressed in units of boxes. The sample unit shall be one box with setup and closure complete. The inspection level shall be S-3 with an AQL, expressed in terms of defects per hundred units, shall be 6.5.

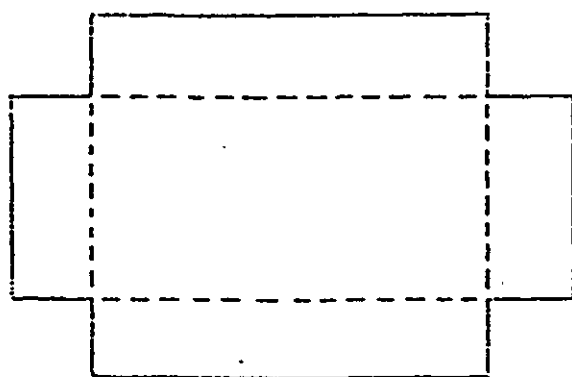
<u>Examine</u>	<u>Defect</u>
Setup (when box is supplied flat)	Any damage impairing appearance or serviceability by manual or automation setup. Wrong sequence of flaps; wrong side out.
Closure	Underclosure - failure to full close box prior to taping or other fastening operation. Overlapping - with bending, distortion, creasing of box causing poor stacking and fit in overpack.
Tape closure	Us of narrower width tape than specified. Overlap less than specified. Torn, curling or loose on container. Incorrect placement of tape.

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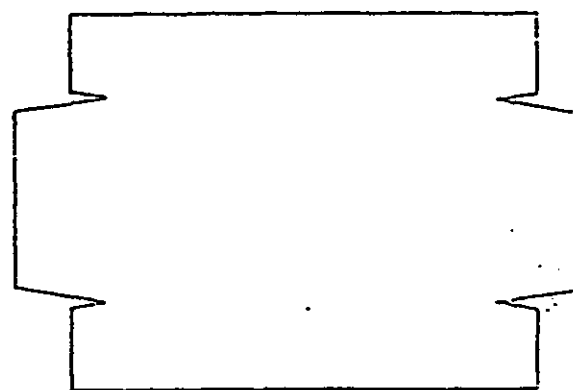


*FULL TELESCOPE COVER
WITH THUMB NOTCHES*

BASE AND COVER ARE SAME DEPTH



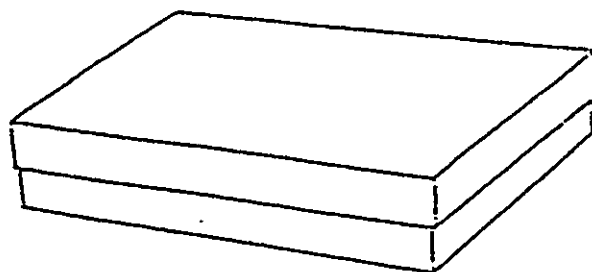
*BASE AND COVER
CORNER CUT BLANKS*



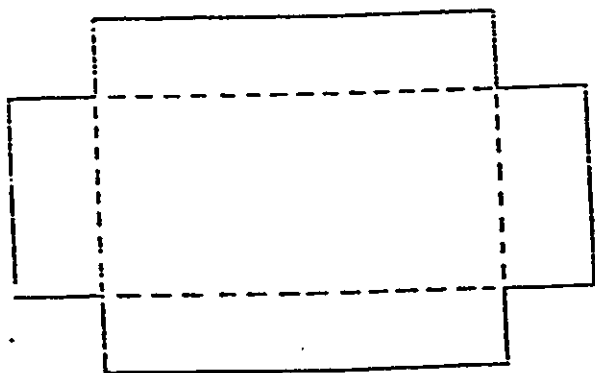
*BASE AND COVER
ONE PIECE WRAP*

FIGURE 1-TYPE I, FULL TELESCOPE

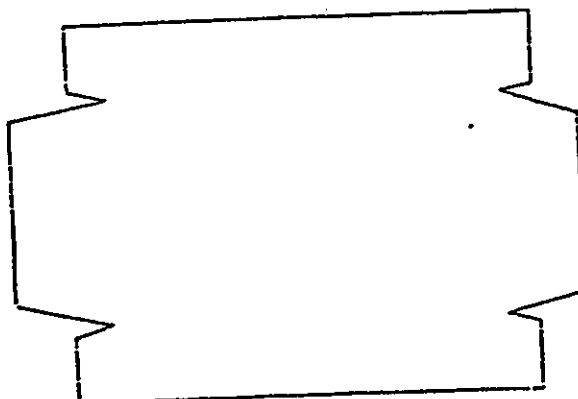
PPP-B-676E



PARTIAL TELESCOPE COVER

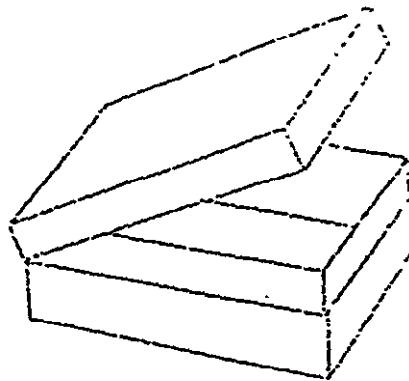


*BASE AND COVER
CORNER CUT BLANKS*

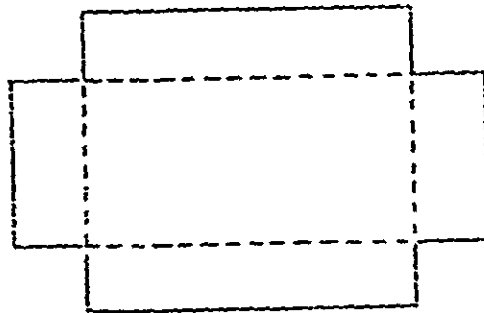


*BASE AND COVER
ONE PIECE WRAP*

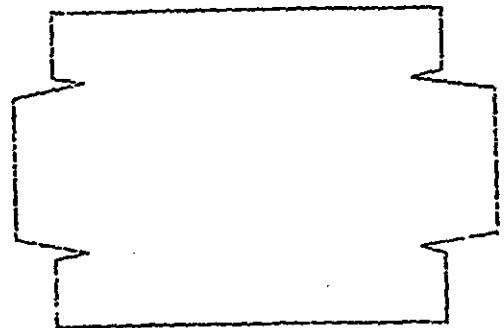
FIGURE 2-TYPE II, PARTIAL TELESCOPE OR SHALLOW LID



BASE AND COVER EQUAL OR UNEQUAL DEPTHS



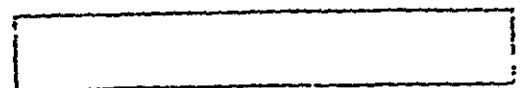
*BASE AND COVER
CORNER CUT BLANKS*



*BASE AND COVER
ONE PIECE WRAPS*



*NECK, ONE PIECE BLANK WITH OR
WITHOUT FLANGE*

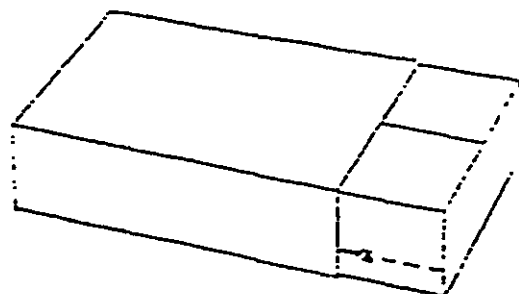


NECK WRAP ONE PIECE

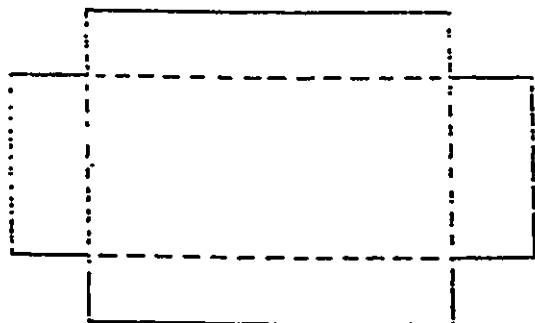
NECK MAY BE FORMED BY MEANS OF A SCORED, ONE PIECE BLANK AS SHOWN OR BY INSERTING COMPLETE ONE PIECE BASE (OR COVER) BLANK AS SHOWN ABOVE. SUCH A BLANK WHEN USED FOR THIS PURPOSE IS CALLED A TRAY AND MAY BE STRIP BANDED OF ONE PIECE TIGHT WRAPPED

FIGURE 3-TYPE III, NECK OR SHOULDER

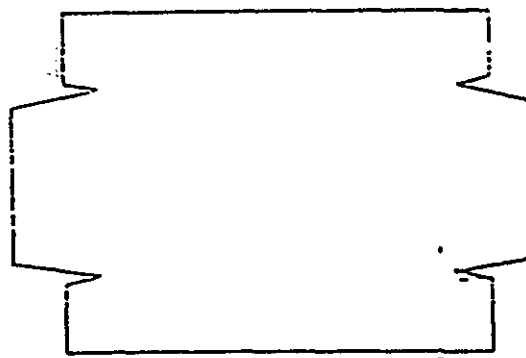
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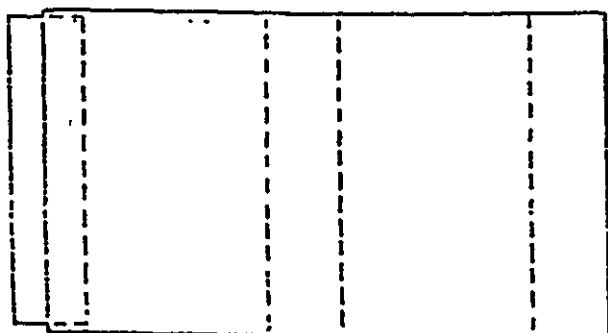
SLIDE COVER BOX



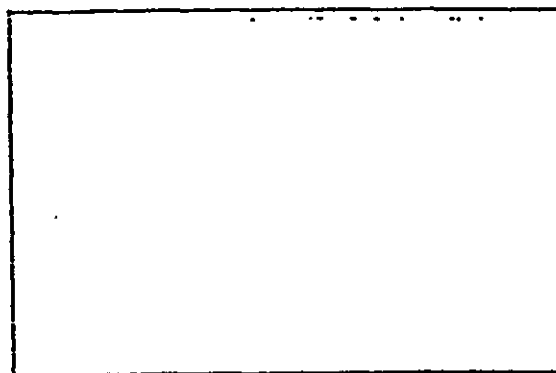
BASE CORNER CUT BLANK



BASE ONE PIECE WRAP



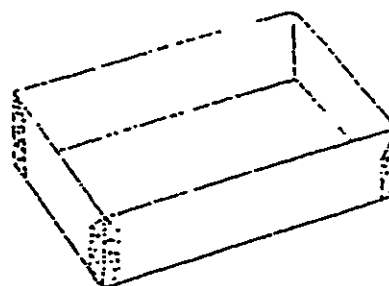
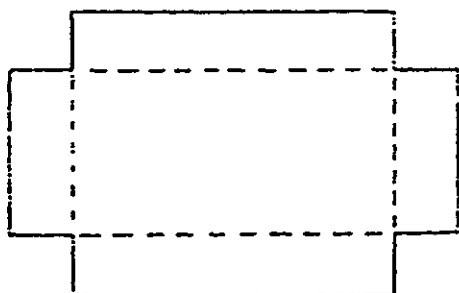
SLIDE ONE PIECE BLANK WITH FLANGE



SLIDE ONE PIECE WRAP

FIGURE 4, TYPE IV, SLIDE BOXES

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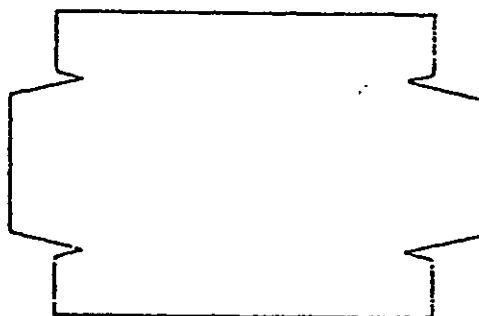
CLASS A, B (WIRE STITCHED) OR C
CORNER CUT BLANK

CLASS A CORNER CUT BLANK
SET UP WITH FOUR CORNER STAYS

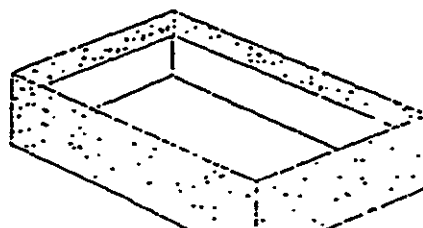
CLASS B WIRE STITCHED OR GLUED ONE PIECE BLANK, CORNER MATERIAL
MAY BE FOLDED OVER TO FORM SELF STAY IF GLUED, OR MATERIAL MAY BE
CUT OUT IF THE BLANK IS TO BE SET UP BY WIRE STITCHING

CLASS C CORNER CUT BLANK, WITHOUT STAYS IS TO BE SET UP WITH
COVERING MATERIAL

FIGURE 5-CLASS A OR B, CORNER STAYED, CLASS C, WITHOUT STAYS

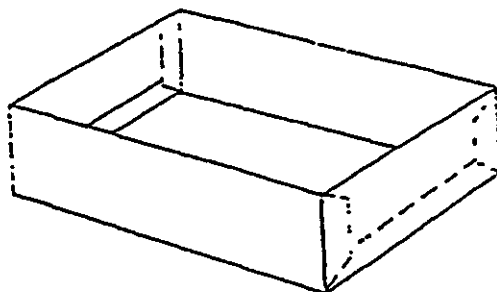


COVERING MATERIAL ONE PIECE WRAP

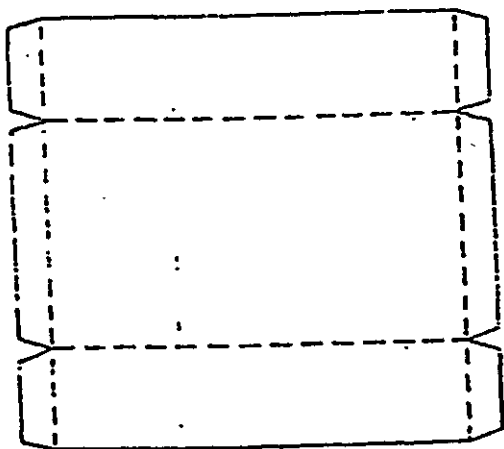


ONE PIECE WRAP
TIGHT WRAPPED ON
ONE PIECE BLANK FOLDED
WITH OR WITHOUT
CORNER STAYS

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*ENDS ARE SET ON A ONE PIECE BLANK
CONSERVES MATERIAL IN BOXES OF UNUSUAL DEPTH*



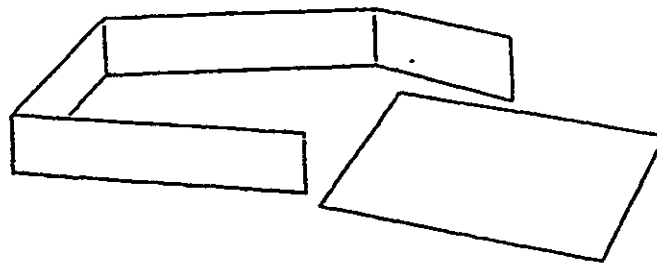
*BLANK FOR THE BOTTOM AND SIDES
IS A ONE PIECE BLANK*



ENDS ARE ONE PIECE

FIGURE 7,-CLASS D, END SET ONE PIECE BLANK

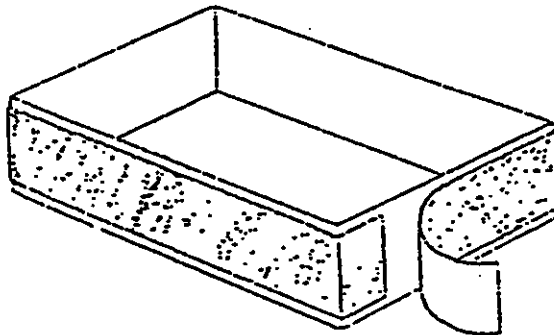
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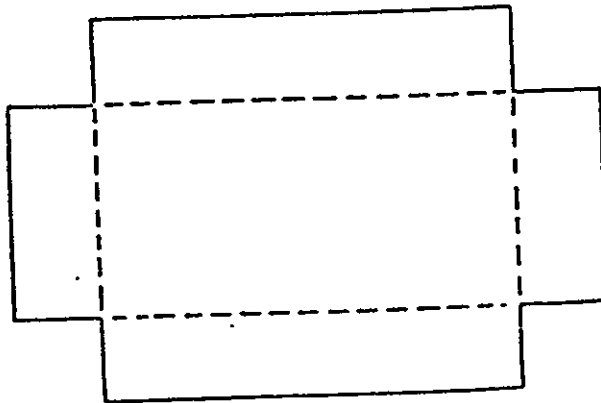
*THE FOUR SIDES ARE ONE CONTINUOUS STRIP AND
THE BOTTOM IS A RECTANGULAR PIECE*

FIGURE 8-CLASS E, BOTTOM SET ONE PIECE BLANK

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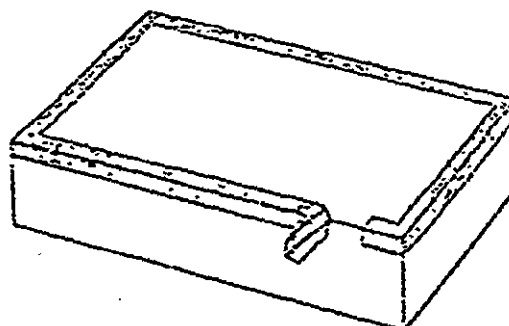


*METHOD OF COVERING SIDES AND ENDS OF BOX WITH PAPER OR
OTHER MATERIAL WITHOUT TURNING THE COVERING IN*

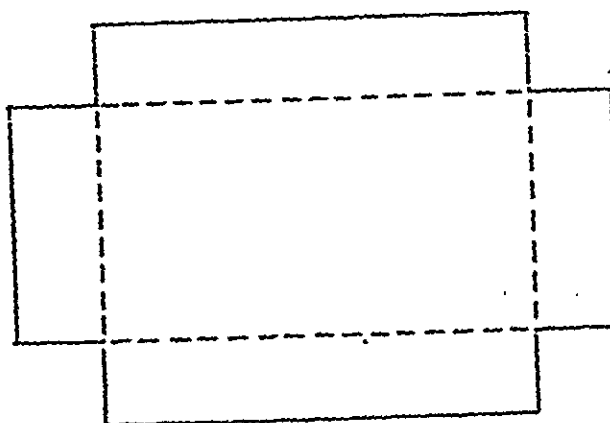


*BLANK IS CORNER CUT
COVERING MATERIAL IS A CONTINUOUS STRIP*

FIGURE 9-STYLE 1. BANDING OR STRIP STAYING

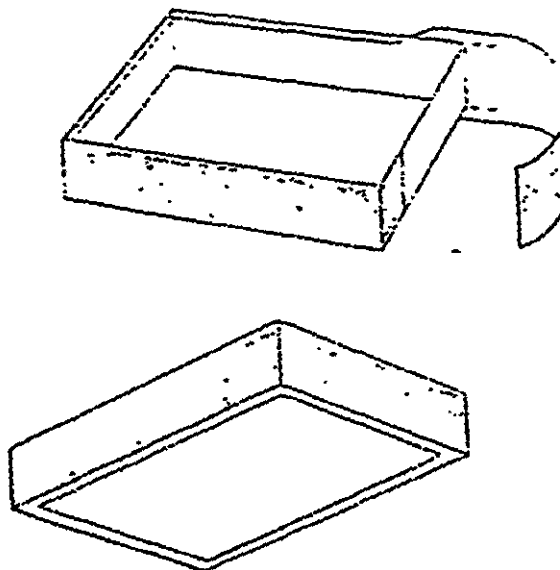


METHOD OF REINFORCING SCORES WITH PAPER OR CLOTH IN ORDER TO OBTAIN ADDED STRENGTH

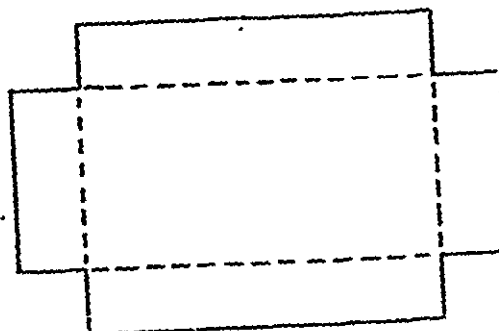


*BLANK IS CORNER CUT AS ABOVE
COVERING MATERIAL IS A CONTINUOUS STRIP*

FIGURE 10-STYLE 2, TRIMMED



*METHOD OF COVERING SIDES AND ENDS OF THE BOX
WITH PAPER OR OTHER MATERIAL WITH A TURN IN
AT TOP AND BOTTOM OF APPROXIMATELY $\frac{1}{2}$ INCH*



*BLANK IS CORNER CUT AS ABOVE
COVERING MATERIAL IS A CONTINUOUS STRIP THAT TURNS
ONTO THE BOTTOM AND TURNS IN AT THE TOP OF THE BLANK*

FIGURE 11, STYLE 3, STRIP COVERING

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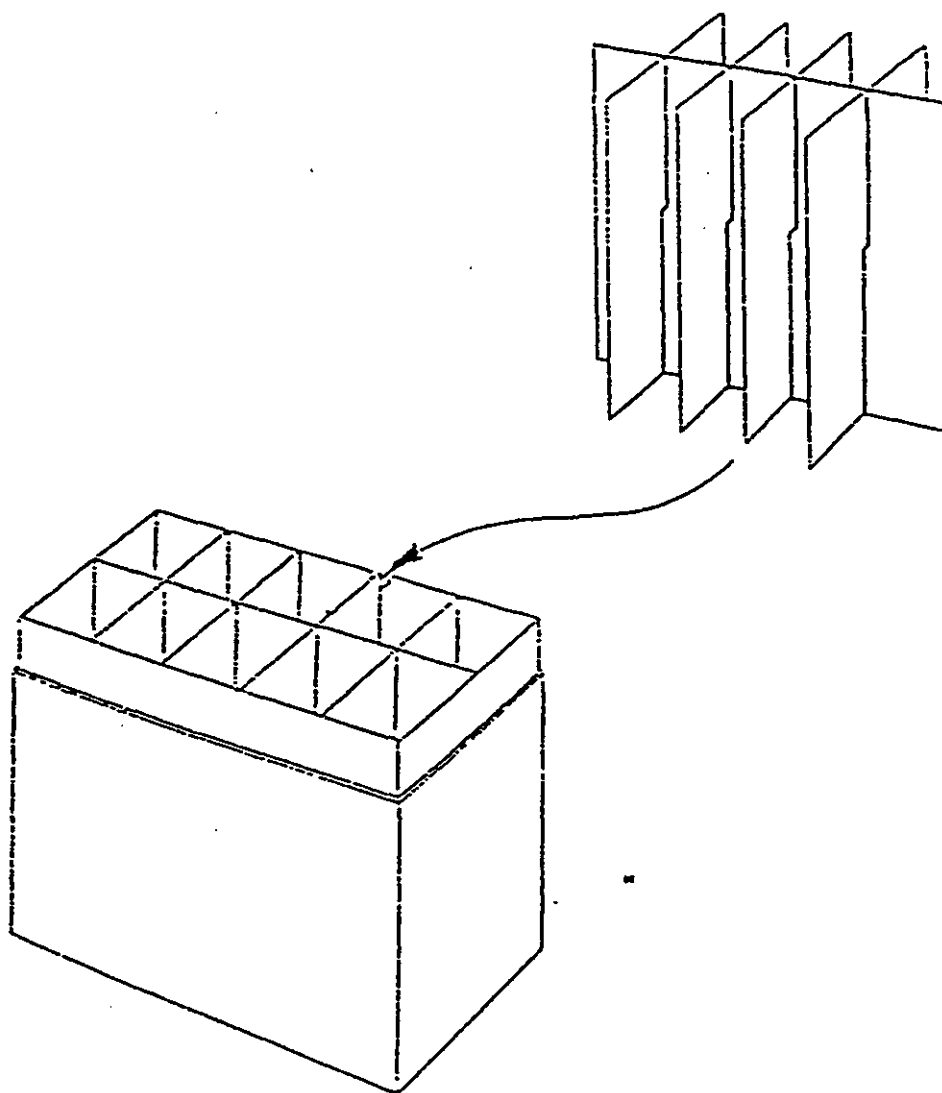


FIGURE 12-EXAMPLE OF SLOTTED PARTITIONS TO PROVIDE
ADDITIONAL PROTECTION FOR CONTENTS OF BOX

PPP-B-676E

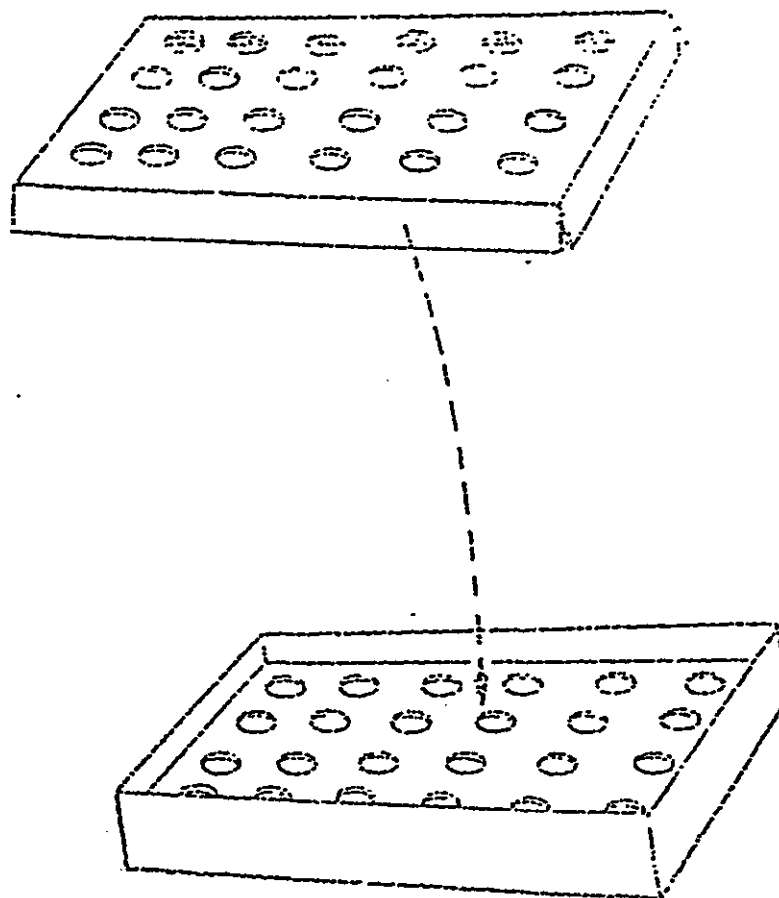


FIGURE 13-EXAMPLE OF INTERIOR DIE CUT PLATFORM TO PROVIDE
ADDITIONAL PROTECTION FOR CONTENTS OF BOX.

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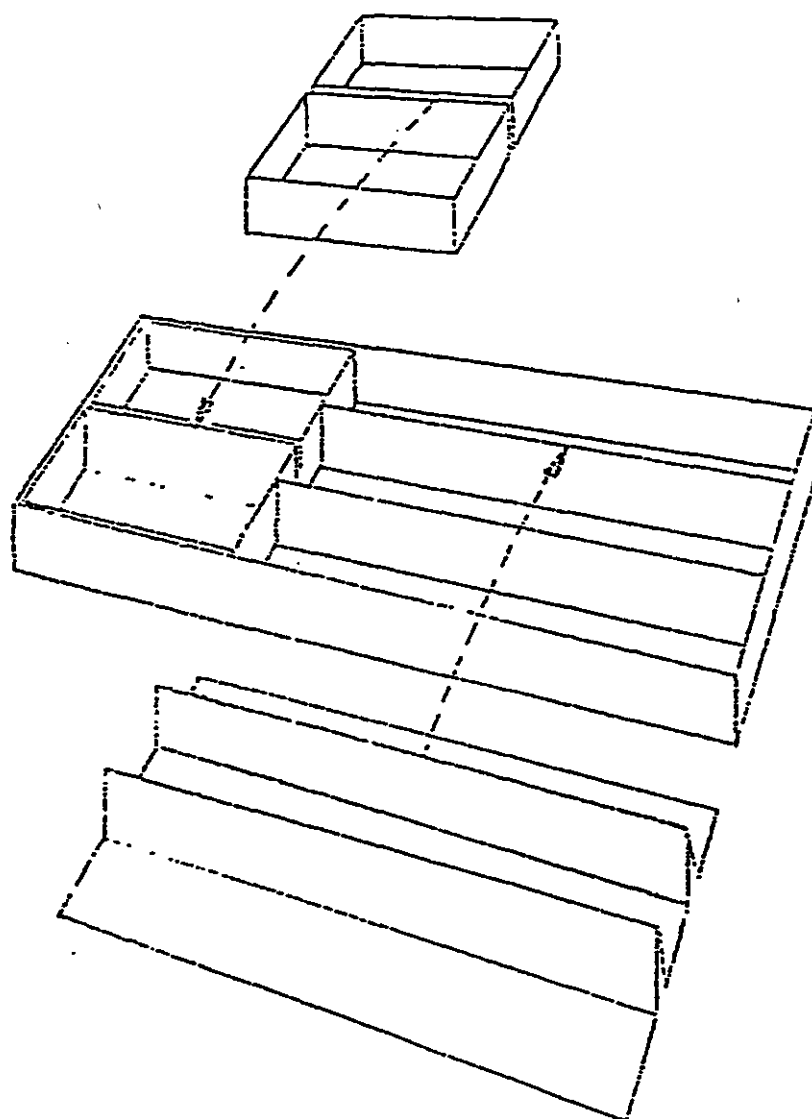


FIGURE-14-EXAMPLE OF SEPARATE INTERIOR TRAYS AND REVERSIBLE PARTITIONS
TO PROVIDE ADDITIONAL PROTECTION FOR CONTENTS OF BOX

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

1. RECOMMEND A CHANGE		1. DOCUMENT NUMBER PPP-B-676E		2. DOCUMENT DATE (YYMMDD) 1992 December 31	
3. DOCUMENT TITLE BOXES, SETUP					
4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)					
5. REASON FOR RECOMMENDATION					
6. SUBMITTER					
a. NAME (Last, First, Middle, Initial)			b. ORGANIZATION		
c. ADDRESS (Include Zip Code)			d. TELEPHONE (Include Area Code)		7. DATE SUBMITTED (YYMMDD)
			(1) Commercial		
			(2) AUTOVON		
			(If applicable)		
8. PREPARING ACTIVITY					
a. NAME U.S. Army Natick RD&E Center			b. TELEPHONE (Include Area Code) (1) Commercial 508-651-4501 (2) AUTOVON/DSN 256-4501		
c. ADDRESS (Include Zip Code) Commander, U.S. Army Natick RD&E Center ATTN: SATNC-WTP Natick, MA 01760-5018			IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340		