

K-P-146E

February 13, 1979

SUPERSEDING

Fed. Spec. K-P-146D

September 6, 1968

## FEDERAL SPECIFICATION

### TARPAULINS, COTTON DUCK, FWWMR

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

#### 1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers uncoated cotton duck tarpaulins (see 6.1).

#### 1.2 Classification.

1.2.1 Types. Tarpaulins shall be of the following types, as specified (see 6.3):

Type I - With loops.

Type II - With grommets and tie ropes.

1.2.2 Classes and sizes. Tarpaulins shall be of the following classes and sizes as specified (see 6.3):

Class 1 - Cloth, duck, cotton, No. 6 hard texture, olive drab.

#### Size

5 feet by 5 feet (1.5 by 1.5 m)  
10 feet by 6 feet (3.0 by 1.8 m)  
12 feet by 10 feet (3.7 by 3.0 m)  
17 feet by 12 feet (5.2 by 3.7 m)  
20 feet by 20 feet (6.1 by 6.1 m)  
23 feet by 15 feet (7.0 by 4.6 m)  
26 feet by 22 feet (7.9 by 6.7 m)  
40 feet by 20 feet (12.2 by 6.1 m)

FSC 8340

K-P-146E

Class 2 - Cloth, duck, cotton, No. 6 hard texture, deck gray Navy shade 3104.

Size

8 feet by 8 feet (2.4 by 2.4 m)  
15 feet by 15 feet (4.6 by 4.6 m)  
20 feet by 20 feet (6.1 by 6.1 m)

Class 3 - Cloth, duck, cotton, No. 10 hard texture, unbleached.

Size

7 feet by 15 feet (2.1 by 4.6 m)  
7 feet by 16 feet (2.1 by 4.9 m)  
7 feet by 18 feet (2.1 by 5.5 m)  
16 feet by 16 feet (4.9 by 4.9 m)

## 2. APPLICABLE DOCUMENTS

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

Federal Specifications:

T-R-605	- Rope, Manila and Sisal.
T-T-616	- Treatment: Mildew Resistant, for Rope and Cord.
T-T-871	- Twine, Cotton, Wrapping.
T-T-911	- Twine, Fibrous, Jute.
V-T-285	- Thread, Polyester.
TT-P-595	- Preservation Coating, Canvas.
CCC-C-419	- Cloth, Duck, Cotton, Unbleached, Plied-Yarns, Army and Numbered.
CCC-C-428	- Cloth, Duck, Cotton; Fire, Water, Weather, and Mildew Resistant.
CCC-C-429	- Cloth, Osnaburg, Cotton.
CCC-C-467	- Cloth, Burlap, Jute (or Kenaf).
DDD-L-20	- Label: for Clothing, Equipage, and Tentage (General Use).
PPP-B-576	- Boxes, Wood, Cleated, Veneer, Paper Overlaid.
PPP-B-585	- Boxes, Wood, Wirebound.
PPP-B-601	- Boxes, Wood, Cleated-Plywood.
PPP-B-621	- Boxes, Wood, Nailed and Lock-Corner.

K-P-146E

Federal Standards:

- FED-STD-123 - Marking for Shipment (Civil Agencies).
- FED-STD-751 - Stitches, Seams, and Stitchings.

(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 Federal specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Philadelphia, Washington, DC, Atlanta, Chicago, Kansas City, MO, Fort Worth, Houston, Denver, San Francisco, Los Angeles, and Seattle, WA.

(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.)

Military Specifications:

- MIL-W-530 - Webbing, Textile, Cotton, General Purpose, Natural or in Colors.
- MIL-G-16491 - Grommet, Metallic.
- MIL-T-40625 - Tubing, Bias Sewn (Burlap or Osnaburg), Cloth.

Military Standards:

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

Drawing:

US Army Natick Research and Development Command

- 5-10-9 - Tarpaulins: Duck, Cotton: FWWMR.

(Copies of Military Specifications, Standards and Drawings required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

K-P-146E

## LAWS AND REGULATIONS

Department of the Army Field Manual FM 10-16 - General Repair of Tents, Canvas and Webbing

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

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise identified, the issue in effect on date of invitation for bids or request for proposal shall apply:

National Motor Freight Traffic Association, Inc., Agent

National Motor Freight Classification

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

Uniform Classification Committee, Agent

Uniform Freight Classification

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

## 3. REQUIREMENTS

3.1 First article. When specified (see 6.3), the contractor shall furnish a sample for first article inspection and approval (see 4.3).

3.2 Materials and components (see 6.7).

3.2.1 Cloth, duck, cotton, olive drab No. 7. The cloth for class 1 tarpaulins shall be type I, No. 6, hard texture of CCC-C-419, finished to conform to type I, class 1 of CCC-C-428.

3.2.2 Cloth, duck, cotton, deck gray Navy shade 3104. The cloth for class 2 tarpaulins shall be type I, No. 6, hard texture of CCC-C-419, finished to conform to type II, class 1 of CCC-C-428.

K-P-146E

3.2.3 Cloth, duck, cotton, unbleached. The cloth for class 3 tarpaulins shall be type I, No. 10, hard texture duck of CCC-C-419, except for weight which shall be 12.75 ounces per square yard ( $432 \text{ g/m}^2$ ) minimum and 14.35 ounces per square yard ( $486 \text{ g/m}^2$ ) maximum. Air permeability requirements shall not be applicable. The unbleached cloth shall be finished to conform to class 1 of CCC-C-428, except that the flexibility requirements shall not apply.

3.2.4 Webbing, textile, cotton. Webbing shall conform to type III, class 4, 1-inch (25 mm) width of MIL-W-530, dyed shade Olive Drab 7 for class 1 tarpaulins and dyed deck gray Navy shade 3104 for class 2 tarpaulins. When type I, class 3 tarpaulins are required, webbing shall conform to type III, class 1b of MIL-W-530.

3.2.5 Thread, polyester. Thread shall conform to type I, class 1, subclass B of V-T-285. Sizes shall be as follows:

For all stitching except zig-zag stitching and stitching indicated by "Z" on drawing.	-	Size FF for needle and bobbin.
For zig-zag stitching.	-	Size F for needle and bobbin.
For stitching indicated by "Z" on drawing	-	Size FF for needle and Size F for looper.

3.2.5.1 Color and treatment. Thread for the class 2 and 3 tarpaulins shall be natural color. Thread for the class 1 tarpaulins shall be dyed Olive Drab S-1 (C.A. 66022). Dyed thread shall show colorfastness to weathering equal to or better than the standard shade sample. When no standard shade sample is available, the dyed thread shall show good colorfastness to weathering.

3.2.6 Twine, cotton. Twine shall conform to type II, class 1, 5-ply of T-T-871.

3.2.7 Rope, manila. Rope shall conform to type M, class 2 of T-R-605, 1-1/8 inch (29 mm) circumference, mildew-resistant treated in accordance with T-T-616.

3.2.8 Grommet, metallic. Grommets shall conform to type III, class 3, size No. 5 of MIL-G-16491.

3.3 Construction. Construction shall conform to Drawing 5-10-9 and shall be as specified herein.

3.3.1 Stitching, machine.

K-P-146E

3.3.1.1 Types. Stitch types shall conform to FED-STD-751 as follows:

For all stitching except zig-zag stitching and stitching indicated by "Z" on drawing.	-	Type 301, 5 to 7 stitches per inch (2 to 3 stitches/cm)
For zig-zag stitching.	-	Type 304, 12 to 16 stitches per inch (5 to 6 stitches/cm)
For stitching indicated by "Z" on drawing.	-	Type 401, 5 to 7 stitches per inch (2 to 3 stitches/cm)

3.3.1.2 Thread breaks. Thread breaks in stitching shall be overstitched not less than 1 inch (25 mm) on stitch type 301, not less than 3/4 inch (19 mm) on stitch type 304, and not less than 1-1/2 inches (38 mm) at each break in stitch type 401. Thread breaks in type 401 stitching may be overstitched with stitch type 301.

3.3.1.3 Stitching ends. The ends of type 301 stitching shall be overstitched not less than 1 inch (25 mm) except where ends are turned under in a hem or held down by other stitching. Where stitching is performed automatically on stitch patterns such as box, box with cross-stitch, "W" stitching, or straight line tacking; three or more tying stitches, overlapping stitches, or backstitches shall be used to secure the ends.

3.3.1.4 Skipped stitches. Two or more consecutively skipped stitches occurring in types 301 or 304 stitching shall be overstitched less than 1 inch (25 mm). Any skipped stitches in type 401 stitching shall be overstitched not less than 1-1/2 inches (38 mm). Skipped stitches in 401 stitching may be overstitched with 301 stitching.

3.3.1.5 Lubrication of thread. The addition of any lubricant to the polyester thread prior to or during the sewing operation is prohibited.

3.3.1.6 Stitching margins. All stitching margins shall be  $1/8 \pm 1/16$  inch ( $3 \pm 2$  mm).

3.3.2 Setting of grommets, type II tarpaulins. Holes punched to receive the grommets shall be smaller than the grommet barrel so that the barrel must be forced through the hole. The grommets shall be securely clinched without cutting the materials.

3.3.3 Tie ropes, type II tarpaulins. The tie ropes shall be constructed of the material specified in 3.2.7. Eye splices shall have three tucks and the ends of all strands shall be clipped to a length of not less than 1 inch (25 mm) nor more than 1-1/4 inches (32 mm). The size of the eye shall be as

K-P-146E

specified on the drawing and shall be the measurement of the inside of the loop when stretched taut. The free ends of the tie ropes shall be either machine or hand served as shown on the drawing. Hand serving shall be done with twine specified in 3.2.6, using two strands twisted together. Waxed twine shall be allowed.

3.3.4 Wicking of sewing thread (cup test). There shall be no seepage of water through the panel lap seam stitching when the tarpaulin is tested as specified in 4.4.3.4. The cup test is intended to insure that nonwicking thread has been utilized and that no lubrication has been added to the polyester thread during the sewing operation.

3.3.5 Repairs. Any necessary repairs shall be effected in accordance with Department of the Army Field Manual FM 10-16, except that handsewn patches or cemented patches will not be acceptable. Repairs required as a result of failure of the cup test shall be performed by treating with a compound conforming to type I, class 1 of TT-P-595 prior to retesting (see 6.6).

3.4 Marking. Identification marking shall be applied in the location shown on the drawing and shall conform to type IV, class 8 of DDD-L-20. The letters "US" shall be applied in the size characters and in the location shown on the drawing and shall conform to type IV, class 9 of DDD-L-20. Class 9 markings shall be clearly legible after subjection to accelerated weathering.

3.5 Workmanship. Cloth components shall be clean and free of holes, cuts, tears, or cloth defects such as multiple floats or broken or missing yarns. Webbing shall contain no frayed or scalloped edges and rope components shall be free of cuts or breaks. Thread tension shall be maintained so that there will be no loose stitching and seam allowance shall be maintained with seams properly sewed so that no runoffs, twists, pleats, or open seams will result. Care shall be taken in sewing to see that no needle chews occur. All thread ends shall be trimmed to 1/2 inch (13 mm) or less. Metal components shall be free of burrs, sharp edges, or corroded areas and shall not be broken or malformed.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, 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 the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

K-P-146E

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

1. First article inspection (see 4.3)
2. Quality conformance inspection (see 4.4)

4.3 First article inspection. When a first article is required, it shall be examined for defects listed in table I and dimensions specified and tested as specified in 4.5.1 for compliance with 3.3.4. The presence of any visual defect, any dimension not within the specified requirements, or failure to conform to the test requirements, shall be cause for rejection of the first article.

4.4 Quality conformance inspection. Except as otherwise specified herein, sampling for inspection shall be performed in accordance with MIL-STD-105.

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

4.4.2 In-process inspection. Inspection shall be made to determine that the following are as specified:

a. There shall be no lubrication of the polyester thread prior to or during the sewing operations for compliance with 3.3.1.5.

b. Holes punched to receive grommets are in compliance with 3.3.2.

Whenever nonconformance is noted, correction shall be made to the items affected and the process.

4.4.3 End item inspection. The lot shall consist of all completely fabricated tarpaulins offered for inspection at one time. The sample unit shall be one completely fabricated tarpaulin. The inspection levels and acceptable quality levels (AQLs) shall be as specified in 4.4.3.3.

4.4.3.1 Visual examination. Visual examination shall be made of the completely fabricated tarpaulin for defects listed in table I.



K-P-146E

TABLE I. Classification of defects for visual characteristics

Examine	Defect	Classification	
		Major	Minor A B
Cloth	Cut, tear, or hole (including exposed drill hole):		
	Greater than 1/8 inch (3 mm) in length or diameter.	X	
	1/8 inch (3 mm) or less in length or diameter:		
	- more than 10 holes	X	
	- more than 5 but not more than 10 holes.		X X
	- 5 holes or less.		
	Broken or missing yarn, multiple floats clearly visible at normal inspection distance, approximately 3 feet (1 m).		X
Webbing	Edge frayed or scalloped.		X
Rope components	Any cut, any break.		X
	Eye splice not as specified.		X
	Free end not finished as specified.		X
Seams and stitching	Open seam on stitch type 301:		
	- for more than 1/4 (6 mm) but not than 1 inch (25 mm).		X
	- for more than 1 inch (25 mm).	X	
	Open seam on stitch type 401:		
	- one row of stitching open for 1 inch (25 mm) or less.		X
	- one row of stitching open for more than 1 inch (25 mm).	X	
	- both rows of stitching open (not necessarily at the same location).	X	

K-P-146E

TABLE I. Classification of defects for visual characteristics (cont'd)

<u>Examine</u>	<u>Defect</u>	<u>Classification</u>	
		<u>Major</u>	<u>Minor</u>
		<u>A</u>	<u>B</u>
NOTE: A seam shall be classified as open when one or more stitches joining a seam are broken or when one or more skipped or runoff stitches occur. On double-stitched seams, a seam shall be classified as open when either one or both sides of a seam are open.			
Thread breaks:			
	- overstitched less than 1-1/2 inches (38 mm) on stitch type 401		X
	- overstitched less than 1 inch (25 mm) on stitch type 301.		X
	- overstitched less than 3/4 inch (19 mm) on stitch type 304.		X
NOTE: Thread breaks not overstitched shall be classified as open seams.			
Skipped stitches:			
	- overstitched less than 1-1/2 inches (38 mm) on stitch type 401.		X
	- overstitched less than 1 inch (25 mm) on stitch types 301 or 304 (when two or more skipped stitches occur consecutively).		X
NOTE: Skipped stitches not overstitched shall be classified as open seams.			
	Needle chews resulting in cut, tear or hole (see Cut, tear, or hole). One or more required rows of stitching omitted (except on boxstitching).	X	

K-P-146E

TABLE I. Classification of defects for visual characteristics (cont'd)

Examine	Defect	Classification	
		Major	Minor A B
Boxstitching	Incomplete:		
	- one row of stitching omitted.		X
	- two or more rows of stitching omitted.	X	
	Any boxstitching less than specified length by more than 1/8 inch (3 mm).		X
Stitching ends	Overstitched less than 1 inch (25 mm) on stitch type 301 (except where ends are held down by other stitching, turned under in a hem or where stitching is performed automatically).		X
	Secured with less than three tying, overlapping, or backstitches when automatic stitching is performed.		X
Seams	Seam pleated.		X
Seam type	Wrong seam type.	X	
Stitch type	Wrong stitch type.	X	
Stitch tension	Loose, resulting in an exposed bobbin or top thread for more than 6 inches (152 mm).		X
	Tight, as evidenced by puckering on seams for more than 6 inches (152 mm).		X
Stitches per inch	Less than minimum specified:		
	- one stitch.		X
	- two or more stitches.		X
	More than maximum specified:		

K-P-146E

TABLE I. Classification of defects for visual characteristics (cont'd)

Examine	Defect	Classification	
		Major	Minor
		A	B
Seams and stitching (cont'd)			
Stitches per inch (cont'd)			
	- one stitch.		X
	- two or more stitches.	X	
	NOTE: Variation in the number of stitches per inch, caused by the operator's speeding up the machine and pulling the cloth in order to sew over heavy places or heavy seams or in turning corners shall be classified as follows:		
	a. Within the minor "B" defect classification - no defect.		
	b. Within the minor "A" defect classification - minor "B" defect.		
Stitching gage	Not as specified.		X
Stitching margin	Larger than specified by more than 3/16 inch (5 mm):		
	- for more than 2 inches (51 mm) but not more than 4 inches (102 mm) in length.		X
	- for more than 4 inches (102 mm) in length.	X	
	Less than specified:		
	- for more than 2 inches (51 mm) but not more than 4 inches (102 mm) in length.		X
	- for more than 4 inches (102 mm) in length.	X	

K-P-146E

TABLE 1. Classification of defects for visual characteristics (cont'd)

<u>Examine</u>	<u>Defect</u>	<u>Classification</u>	
		<u>Major</u>	<u>Minor</u> <u>A</u> <u>B</u>
Components and assembly	Any component part omitted (unless otherwise classified herein).	X	
Hems	Twisted or pleated.		X
	Constructed with partial turn under when a double turn under is required.		X
Panel	Adjacent panels spliced; number of splices more than specified; spliced pieces not joined as shown on drawing.		X
Mends, darns, or patches	Not authorized by the contracting officer or not in accordance with general procedures as outlined in Department of Army Field Manual FM 10-16.	X	
Grommets	Broken	X	
	Malformed:		
	- fails to perform intended function.	X	
	- but will perform intended function.		X
	Corroded area.		X
	Burr or sharp edge which may cause injury in handling or damage to cloth.	X	
	Improperly set; two or more teeth exposed.		X
	Clinched loosely allowing grommet to rotate in hole.		X
	Clinched excessively tight, cutting cloth.		X
Marking: "US" and identification	Omitted, incorrect, illegible, or misplaced.		X
Cleanness	Grease or oil stains.		X
	Thread ends not trimmed to 1/2 inch (13 mm) or less.		X

K-P-146E

4.4.3.2 Dimensional examination. Dimensional examination of the completely fabricated tarpaulin shall be made and any dimension not within the specified tolerance shall be classified as a defect.

4.4.3.3 Inspection levels and AQLs. Inspection levels and AQLs, expressed in terms of defects per hundred units, shall be as follows:

<u>Examination</u>	<u>Inspection level</u>	<u>AQL</u>
For defects applicable to table I	II	6.5 Major 15.0 Major and minor A defects combined 40.0 Total
For defects applicable for 4.4.3.2	S-3	6.5 One class

4.4.3.4 Testing of the end item. Tarpaulin samples shall be tested as specified in 4.5.1 for compliance with 3.3.4. The sample unit shall be one completely fabricated tarpaulin. The lot shall consist of all completely fabricated tarpaulins offered for inspection. The inspection level shall be S-3. Any failure shall be cause for rejection of the lot.

4.4.4 Examination of preparation for delivery. An examination shall be made to determine that packaging, packing, and marking comply with the section 5 requirements. Defects shall be scored in accordance with table II. The sample unit shall be one shipping container fully prepared for delivery, except that it need not be closed. The lot shall be the number of shipping containers offered for inspection at one time. The inspection level shall be S-2 and the AQL shall be 2.5 expressed in terms of defects per hundred units.

TABLE II. Examination of preparation for delivery

<u>Examine</u>	<u>Defect</u>
Marking	Omitted; incorrect; illegible; of improper size, location, sequence or method of application.
Materials	Any component missing or damaged.
Workmanship	Inadequate application of components such as incomplete closure of cloth wrapping and loose stitching.
Contents	Not as specified.

K-P-146E

#### 4.5 Test methods.

4.5.1 Wicking of sewing thread (cup test). The tarpaulin shall be tested in one location on a panel lap seam.

4.5.1.1 Procedure. Suspend the seamed section of the test fabric in the center of a  $6 \pm \frac{1}{8}$  inch ( $152 \pm 3$  mm) diameter hoop and form a depression with the seamed fabric in the hoop to a depth of  $1 \pm \frac{1}{4}$  inch ( $25 \pm 6$  mm). Slowly pour 500 mL of water at  $77^\circ \pm 4^\circ\text{F}$  ( $25^\circ \pm 2^\circ\text{C}$ ) into the cupped area (depression) and observe the under surface of the fabric for water penetration. Any wicking of water along the sewing thread, identified by a discoloration or darkening of the thread within 5 minutes after water is poured, shall constitute a failure. Water leakage through the needle holes or between the plies of the lapped seamed fabric shall not be considered a failure.

#### 5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A or C, as specified (see 6.3).

5.1.1 Level A. Each tarpaulin shall be laid out flat. Tie ropes, where applicable, shall be placed toward the center of the tarpaulin. Each tarpaulin shall then be folded neatly and compactly and securely tied with twine conforming to type I or II, class 1 or 2, 16 ply of T-T-871. The portion of the tarpaulin containing identification markings, if applicable, shall be on the outside of the folded tarpaulin. Care shall be taken to expel all excess air during the folding operations.

5.1.2 Level C. Tarpaulins shall be packaged to afford adequate protection against deterioration and physical damage during shipment from the supply source to the first receiving activity. The package and the quantity per package shall be the same as that normally used by the contractor for retail distribution.

5.2 Packing. Packing shall be level A, B, or C, as specified (see 6.3).

5.2.1 Level A packing.

5.2.1.1 Cloth-covered bundles. Tarpaulins of one type, class, and size only, packaged as specified in 5.1, shall be packed in quantities as specified in table III, wrapped and sewn in cotton osnaburg cloth conforming to class 2 of CCC-C-429; or burlap cloth conforming to class 3 of CCC-C-467. The wrapping shall be securely hand sewn with type I or II, class 1 or 2,

K-P-146E

16 ply cotton twine conforming to T-T-871, or type I, size No. 2 jute twine conforming to T-T-911, with approximately one stitch to the inch and every third stitch knotted, or alternatively, the seams of the wrap may be machine sewn. In lieu of the sewn wrap, bias-sewn tubing conforming to MIL-T-40625 may be used. A minimum of 5 inches (127 mm) of wrapping material or tubing shall be gathered together on each of the four corners and securely hand sewn into ears for handles. Whenever machine sewing is used, the thread type, stitch type, and number of stitches per inch shall conform to the requirements specified in MIL-T-40625.

5.2.1.2 Rigid containers. When specified by the procuring agency, tarpaulins of one type, class, and size only, packaged as specified in 5.1, and packed in quantities as specified in table III, shall be packed in shipping containers that conform to overseas type, style A of PPP-B-601; style A, class 2, type 2 load of PPP-B-576; style 1, 2, or 2A, class 3 use, type 2 load of PPP-B-585; or class 2, style 2 or 4 of PPP-B-621. Each container shall be closed and reinforced in accordance with the appendix of the applicable box specification.

#### 5.2.2 Level B packing.

5.2.2.1 Cloth-covered bundles. Unless otherwise specified, tarpaulins shall be packed as specified in 5.2.1.1.

5.2.2.2 Rigid containers. When specified by the procuring agency, tarpaulins of one type, class, and size only, packaged as specified in 5.1 and packed in quantities as specified in table III, shall be packed in shipping containers that conform to domestic type, style A or B of PPP-B-601; style A, class 1, type 2 load of PPP-B-576; style 1, 2, or 2A, class 1 use, type 2 load of PPP-B-585; or class 1, style 2 or 4 of PPP-B-621. Each container shall be closed and reinforced in accordance with the appendix of the applicable box specification.

5.2.3 Level C packing. Tarpaulins, packaged as specified in 5.1, shall be 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 contractor for retail distribution. Containers, bundles, and packing shall comply with the Uniform Freight Classification or National Motor Freight Classification, as applicable.

5.2.4 All levels. As far as is practicable, packs shall be of such a size to lend themselves to palletization on 40 by 48 inch (1016 by 1219 mm) pallets.



K-P-146E

Finished packs will be permitted to overhang the pallet 1-1/2 inches (38 mm) on either side of the 40 inch (1016 mm) width and 2 inches (51 mm) on either side of the 48 inch (1219 mm) dimension.

TABLE III. Paulin quantity per pack

Paulin area	Class 1 and 2 (each)	Class 3 (each)
0 to 45 sq. ft. (0 to 4.2 m <sup>2</sup> )	15	-
46 to 64 sq. ft. (4.3 to 5.9 m <sup>2</sup> )	10	-
65 to 120 sq. ft. (6.0 to 11.1 m <sup>2</sup> )	5	3
121 to 225 sq. ft. (11.2 to 20.9 m <sup>2</sup> )	3	3
226 to 400 sq. ft. (21.0 to 37.2 m <sup>2</sup> )	2	2
401 sq. ft. (37.3 m <sup>2</sup> ) and over	1	-

5.3 Marking. Marking shall be in accordance with 5.3.1 or 5.3.2 as specified (see 6.2).

5.3.1 Civil agencies. In addition to any special marking required by the contract or order, cloth-covered bundles or rigid containers shall be marked in accordance with FED-STD-123.

5.3.2 Military agencies. In addition to any special marking required by the contract or order, cloth-covered bundles or rigid containers shall be marked in accordance with MIL-STD-129.

## 6. NOTES

6.1 Uncoated tarpaulins. For purpose of this specification, uncoated tarpaulins are defined as those whose surfaces are not coated with natural or synthetic rubber, resins, or other sealing compounds.

6.2 Intended use. Classes 1 and 2 tarpaulins are for heavy-duty cover, construction and general marine service use. Class 3 tarpaulins are for light-duty general tarpaulin use and for use where weight is a factor when transported by personnel.

6.3 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

K-P-146E

- (a) Title, number, and date of this specification.
- (b) Type, class, and size required (see 1.2.1 and 1.2.2).
- (c) When a first article is required (see 3.1, 4.3, and 6.4).
- (d) Selection of applicable levels of packaging and packing (see 5.1 and 5.2).
- (e) Type marking required (see 5.3).

6.3.1 Civil agency procurement. For Civil agency procurement, where level B packaging is specified in the contract or order, the requirements in 5.1.1 (level A) shall apply.

6.4 First article. When a first article is required, it shall be inspected and approved under appropriate provisions of ASPR 7-104.55. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should include specific instructions in all procurement instruments regarding arrangements for inspection and approval of the first article.

6.5 This specification covers uncoated, fire, water, weather and mildew-resistant tarpaulins (FWWMR) authorized for repetitive procurement in the Government services. All tarpaulins procured under this specification for use by military services will include webbing loops (rather than grommets) and will not include tie ropes.

6.6 Method of repair of leaking seams. A satisfactory method of applying the compound for the repair of leaking seams is as follows:

a. A suitable volume of compound conforming to type I, class 1 of TT-P-595 (NSN 8030-00-290-4383) shall be thoroughly stirred and diluted with an equal volume of petroleum solvent (Stoddard solvent or equivalent). Thoroughly stir the mixture again before use.

b. Prior to application of the compound, the tarpaulins must be dry. Special attention must be taken to insure adequate ventilation and that proper fire preventive measures are taken since the compound is flammable.

c. Two coats of the compound shall then be applied to the seams (on the outside of the tarpaulin only). A 4 inch (102 mm) wide stiff brush is recommended for use. The first coat shall be air dried for a minimum of 4 hours prior to application of the second coat. Elapsed time between coats may be reduced by providing a supply of hot air to evaporate the solvent more quickly. In this manner, a second coat may be applied as soon as the first coat is dry to the touch. After the application of the second coat, the treated tarpaulin shall be allowed to air dry for a period of at least 24 hours.

K-P-146E

6.6.1 Seams to be treated. In the event of failure of the test specified in 4.5.1, treat all panel lap seams only.

6.7 Recycled material. It is encouraged that recycled material be used when practical as long as it meets the requirements of the specification (see 3.2).

6.8 Metric equivalents. Metric equivalents, indicated in parentheses throughout this document, are based on practices, conversion factors, and symbols specified in ASTM E 380 Standard for Metric Practice, and are for information only. In each instance, the value stated in US customary units shall be controlling.

## Custodians:

Army - GL  
Navy - SA  
Air Force - 99

## Review activities:

Army - MD  
Air Force - 45

## User activities:

Navy - YD, MC, CG  
DLA - CT

## Preparing activity:

Army - GL

## Civil Agency Coordinating Activities:

GSA-FSS  
AGR-AFS  
PO  
DC  
AEC  
NAS

Project No. 8340-0411

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Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other document referenced herein.