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SUPERSEDING
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MILITARY SPECIFICATION

WEBBING, TEXTILE, COTTON, GENERAL PURPOSE, NATURAL OR IN COLORS

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

1. SCOPE

1.1 Scope. This document covers various types of cotton webbing.

1.2 Classification. The webbing shall be of the following types and classes as specified (see 6.2):

Type II	- Medium weight webbing (hard texture)
Type IIa	- Medium weight webbing (soft texture)
Type IIb	- Medium heavyweight webbing
Type III	- Heavyweight webbing
Type IV	- Webbing, special use
Type V	- Webbing, multiple weave
Type VI	- Webbing, special (appliances and wicks)
Class 1	- Natural
Class 1a	- Natural, water repellent, mildew resistant, 2, 2' methylenebis-(4-chlorophenol) (see 6.5)
Class 1b	- Natural, water repellent, mildew resistant (copper-8-quinolinolate)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 8305

Class 2 - Bleached
Class 2a - Bleached, water repellent, mildew resistant 2, 2' methylenebis-(4-chlorophenol) (see 6.5)
Class 3 - Dyed
Class 4 - Dyed, water repellent, mildew resistant (copper 8-quinolinolate)
Class 7 - Dyed, water repellent, mildew resistant, 2, 2' methylenebis-(4-cholorophenol) (see 6.5)
Class 8 - Dyed, water repellent

2. APPLICABLE DOCUMENTS

2.1 Government documents.

* 2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

MILITARY

MIL-P-43334 - Packaging of Textile Webbing and Tape

STANDARDS

FEDERAL

FED-STD-191 - Textile Test Methods

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes

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

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

FEDERAL TRADE COMMISSION

Rules and Regulations Under the Textile Fiber Products Identification Act

(Copies may be obtained from the Federal Trade Commission, Pennsylvania Avenue at Sixth Street, N.W., Washington, DC 20580-0001.)

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

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issues of the nongovernment documents which are current on the date of the solicitation.

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

Chromatic Transference Scale

(Copies should be obtained from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709-2215.)

(Nongovernment standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Standard sample. The dyed webbing shall match the standard sample for shade and appearance and shall be equal to or better than the standard sample with respect to all characteristics for which the standard sample is referenced (see 6.3).

* 3.2 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.3, 6.2, and 6.4).

3.3 Material.

* 3.3.1 Yarns. The yarns shall be made from cleaned and carded cotton or combed cotton, except that the catch-cord utilized on the shuttleless loom shall be combed peeler cotton yarn or as specified in the applicable table. The yarns shall be spun and twisted into ply yarns as specified in 3.9.

* 3.4 Color. Webbing shall be unbleached, bleached white, or dyed Olive Drab 7, Camouflage Green 483, black, or other color as specified (see 6.2).

* 3.4.1 Dyeing. Dyed webbing shall be stock or yarn dyed, except type IIa, which may be piece dyed. The IIb, class 4, webbing may also be piece dyed (see 3.4.1.1). Except for type IV, 1-1/4 inch webbing, only those warps of stock or yarn dyed webbing specifically listed as "stuffer warps" may, if properly covered, be undyed. Type IV, 1-1/4 inch webbing "stuffer warps" shall be dyed the same shade as the standard sample. When webbing conforming to classes 4, 7, and 8 is required, the shade of the dyed webbing prior to the application of the finish shall, unless otherwise specified, match the standard sample. The shade of the webbing after finishing (classes 4, 7, and 8) shall be that resulting from the combination of the base shade and the color imparted by the specified finish. Unless specifically authorized by the contracting officer, the use of coloring matter as a component of the finish is not permitted. The dyed webbing shall show good dye penetration, and the dye shall be oxidized. The webbing shall be well soaped and washed after dyeing.

3.4.1.1 Piece dye. In addition to the requirements of 3.4.1, the type IIb, class 4 webbing, when piece dyed, shall be equal to or better than the piece dyed standard sample for determination of dye penetration. This shall be done by comparing warp and filling yarns separated from the submitted piece dyed webbing to the warp and filling yarns from the piece dyed standard sample. The piece dyed submitted webbing shall also be equal to or better than the yarn dyed standard sample when tested for scrubbing resistance. Testing shall be as specified in 4.4.3.

3.4.2 Labile sulfur. The use of dyes and compounds containing elementary sulfur capable of oxidation to sulfuric acid is prohibited. The dyestuff shall be chosen and applied so that the dyed and finished webbing shall contain no more labile sulfur than shown by the standard sample when tested as specified in 4.4.3. When a standard sample is not available, the dyed and finished webbing shall show no more than a slight trace of labile sulfur as defined in the test method specified in 4.4.3.

* 3.4.3 Matching. The color of the finished webbing shall match the standard sample when viewed under filtered tungsten lamps that approximate artificial daylight and that have a correlated color temperature of 7500 ± 200K, with illumination of 100 ± 20 foot candles. The color shall be a good match to the standard sample under incandescent lamplight at 2300 ± 200K.

3.4.4 Colorfastness.

3.4.4.1 Class 3. The class 3 dyed webbing shall show fastness to accelerated weathering equal to or better than the standard sample or shall be equal to or better than a rating of "fair" when tested as specified in 4.4.3. The class 3 dyed webbing shall show fastness to crocking equal to or better than the standard sample or shall be equal to or better than an AATCC Chromatic Transference Scale rating not lower than 3.5 for all shades except for Vat Black 174 and Dark Blue 1089, which shall be not lower than 1.5 when tested as specified in 4.4.3. In addition, the type IV, class 3, 1 inch and 1-1/4 inch webbing shall show fastness to laundering (after 3 cycles) equal to or better than the standard sample or shall be equal to or better than a rating of "good" when tested as specified in 4.4.3.

3.4.4.2 Classes 4 and 7. The classes 4 and 7 dyed and finished webbing shall show fastness to accelerated weathering equal to or better than the standard sample or shall be equal to or better than a rating of "fair" when tested as specified in 4.4.3. The classes 4 and 7 dyed and finished webbing shall show fastness to crocking equal to or better than the standard sample or shall have an AATCC Chromatic Transference Scale rating not lower than 1.5 when tested as specified in 4.4.3.

3.4.4.3 Class 8. The class 8 dyed and finished webbing shall show fastness to accelerated weathering and laundering (after 3 cycles) equal to or better than the standard sample or shall be equal to or better than a rating of "fair" for accelerated weathering and "good" for laundering (after 3 cyles), when tested as specified in 4.4.3. The class 8 dyed and finished webbing shall show fastness to crocking equal to or better than the standard sample or shall have an AATCC Chromatic Transference Scale rating not lower than 3.5 when tested as specified in 4.4.3.

* 3.5 Spectral reflectance for Camouflage Green 483. When color 483 is specified, all finished webbing greater than 1-1/4 inches in width shall meet the spectral reflectance factors (in percent) for the visible/near infrared wavelength range 600 to 860 nanometers (nm) as specified below, when tested as specified in 4.4.3.

TABLE I. Spectral reflectance requirements for Camouflage Green 483

Wavelength (nm)	Reflectance (%) Max	Min	Wavelength (nm)	Reflectance (%) Max	Min
600	10	4	740	40	14
620	10	4	760	49	18
640	11	4	780	55	23
660	13	4	800	60	29
680	15	4	820	64	34
700	20	6	840	67	39
720	30	9	860	69	45

3.6 Nonfibrous materials. The starch and protein content, including chloroform-soluble and water-soluble material, of types II, IIa, IIb, III, IV, and V webbing shall not exceed 5.0 percent and of type VI shall not exceed 3.0 percent, when tested as specified in 4.4.3. For treated webbing, determination shall be made after dyeing and prior to application of the finish.

3.7 Finish. When specified (see 6.2), the webbing shall be treated for resistance to mildew, water, or combination thereof.

3.7.1 Water repellency. Classes 1a, 1b, 2a, 4, 7, and 8 webbing shall be given one of the following water-repellent treatments. The water repellent shall consist of aluminum salts of saturated carboxylic acid (such as formate, acetate, palmitate, or stearate) zirconium salts of such saturated carboxylic acids, or a combination of both mixed with refined mineral and vegetable waxes, titanate esters, or a combination of both. The water repellent shall be applied either in the form of an aqueous emulsion or in the form of a water-free solvent solution. The dynamic absorption of the treated material shall be no more than 40 percent when tested as specified in 4.4.3.

3.7.2 Mildew inhibitors.

3.7.2.1 Copper-8-quinolinolate. Classes 1b and 4 webbing shall be treated for mildew resistance by evenly depositing within the webbing a minimum of 0.13 percent to a maximum of 0.40 percent copper as metal from copper-8-quinolinolate using the method of application specified in 3.7.2.1.1. The test for copper content shall be as specified in 4.4.3.

3.7.2.1.1 Application. The method of application shall be a one-bath solvent process containing a solubilized form of copper-8-quinolinolate. The finished webbing shall be free from residual solvent.

3.7.2.2 2, 2' methylenebis-(4-chlorophenol). The classes 1a, 2a, and 7 webbing (see 6.5) shall be mildew resistant treated with 1.1 to 1.9 percent of 2, 2' methylenebis-(4-chlorophenol) using the method specified in 3.7.2.2.1. The concentration of the inhibitor shall be determined as specified in 4.4.3.

3.7.2.2.1 Application. The following method of application shall be used: Apply the inhibitor for classes 1a, 2a, and 7 webbing from a solvent solution of such concentration as to deposit the specified concentration on webbing so treated. The webbing shall be dried so that no residual solvent shall be present.

3.8 pH. The pH value of the water extract of classes 1a, 1b, 2a, 4, 7, and 8 shall be not less than 5.5 nor more than 8.5 when tested as specified in 4.4.3.

3.9 Physical requirements. The physical requirements of the unfinished (not treated) and finished webbing shall be as shown in tables II to VIII inclusive. Webbings shall be furnished in the widths shown in tables II to VIII inclusive, as specified (see 6.2). The tolerances in width for webbing (except type IV, 1-1/4 inches and 1-inch webbing), tables II to VI inclusive, shall be -1/32 and +1/16 inch for webbing up to and including 1-1/2 inches in width; ±1/16 inch for webbing over 1-1/2 inches and up to and including 2-3/4 inches; and ±3/32 inch for webbing over 2-3/4 inches in width. The type IV, 1 inch and 1-1/4 inches webbing shall have a width tolerance of ±1/32 inch.

TABLE II. Physical requirements for type II, medium weight webbing (hard texture)

Width (inches)	Weight per linear yard, minimum (ounces)	Yarns, minimum: Full width total warp	Yarns, minimum: Yarns per inch filling 1/	Breaking strength, minimum (pounds): Warp: Full width	Warp: Per inch	Filling jaws 1 inch apart: Per inch	Yarn sizes (±5 percent): Warp 2/	Yarn sizes (±5 percent): Filling 1/
3/8	0.20	48	40 or 80	100	--	--	16/2	16/2 or 36/2
1/2	0.32	24	14 or 28	160	--	--	8/4	8/4 or 16/4
5/8	0.40	30	14 or 28	200	--	--	8/4	8/4 or 16/4
3/4	0.48	36	14 or 28	235	--	--	8/4	8/4 or 16/4
1	0.65	48	14 or 28	315	--	--	8/4	8/4 or 16/4
1-1/4	0.81	60	14 or 28	385	--	--	8/4	8/4 or 16/4
1-1/2	0.97	72	14 or 28	460	--	--	8/4	8/4 or 16/4
2	1.30	96	14 or 28	585	--	--	8/4	8/4 or 16/4
2-3/4	1.78	132	14 or 28	760	--	--	8/4	8/4 or 16/4
3	1.95	144	14 or 28	810	--	140	8/4	8/4 or 16/4
3-3/4	2.43	180	14 or 28	--	315	140	8/4	8/4 or 16/4
5	3.25	240	14 or 28	--	315	140	8/4	8/4 or 16/4
5-5/8	3.65	270	14 or 28	--	315	140	8/4	8/4 or 16/4

1/ 40 yarns per inch (1 yarn per shed) of 16/2 ply, or 80 yarns per inch (2 yarns per shed) of 36/2 ply; 14 yarns per inch (1 yarn per shed) of 8/4 ply or 28 yarns per inch (2 yarns per shed) of 16/4 ply.

2/ The catch-cord for the bobbin type edge shall be 24/4 ply combed peeler cotton yarn and 40/2 combed peeler cotton yarn. The color of the catch cord (either type) shall be the color of the webbing for the latch-needle type edge.

TABLE III. Physical requirements for type IIa, medium weight webbing (soft texture)

Width (inches)	Weight per linear yard, minimum (ounces)	Yarns, minimum Full width: Face and back warp	Yarns, minimum Full width: Binder warp	Yarns, minimum Full width: Stuffer warp	Yarns per inch filling 1/	Breaking strength, minimum (pounds) Warp, full width	Yarn sizes (± 5 percent): Warp except stuffer 2/	Yarn sizes (± 5 percent): Filling 1/	Yarn sizes (± 5 percent): Stuffer warp
3/8	0.25	41	5	10	36 or 72	130	12/2	12/2 or 24/2	8/3
1/2	0.33	47	6	12	36 or 72	160	12/2	12/2 or 24/2	8/3
5/8	0.41	53	7	14	36 or 72	195	12/2	12/2 or 24/2	8/3
3/4	0.49	65	9	18	36 or 72	230	12/2	12/2 or 24/2	8/3
1	0.65	83	12	24	36 or 72	300	12/2	12/2 or 24/2	8/3
1-1/4	0.81	101	15	30	36 or 72	370	12/2	12/2 or 24/2	8/3
1-1/2	0.97	119	18	36	36 or 72	440	12/2	12/2 or 24/2	8/3
2	1.30	155	24	48	36 or 72	580	12/2	12/2 or 24/2	8/3
2-1/4	1.47	173	27	54	36 or 72	645	12/2	12/2 or 24/2	8/3

1/ 36 yarns per inch (1 yarn per shed) of 12/2 ply or 72 yarns per inch (2 yarns per shed) of 24/2 ply.

2/ The catch-cord for the bobbin type edge shall be 24/2 ply combed peeler cotton yarn and 40/2 ply combed peeler cotton yarn. The color of the catch-cord (either type) shall be the color of the webbing for the latch-needle type edge.

TABLE IV. Physical requirements for type IIb, medium heavyweight webbing

Width (inches)	Weight per linear yard, minimum (ounces)	Yarns, minimum Full width: Face and back warp	Yarns, minimum Full width: Binder warp	Yarns, minimum Full width: Yarns per inch filling 1/	Breaking strength, minimum (pounds) Warp full width	Yarn sizes (± 5 percent): Warp 2/	Yarn sizes (± 5 percent): Filling 1/
5/8	0.60	49	5	24 or 48	310	8/4	10/3 or 20/3
3/4	0.72	57	6	24 or 48	365	8/4	10/3 or 20/3
1	0.96	73	8	24 or 48	475	8/4	10/3 or 20/3
1-1/4	1.20	89	10	24 or 48	590	8/4	10/3 or 20/3
1-1/2	1.44	105	12	24 or 48	700	8/4	10/3 or 20/3
2	1.92	137	16	24 or 48	925	8/4	10/3 or 20/3
2-1/4	2.25	161	19	24 or 48	1050	8/4	10/3 or 20/3
3	2.88	201	24	24 or 48	1375	8/4	10/3 or 20/3

1/ 24 yarns per inch (1 yarn per shed) of 10/3 ply or 48 yarns per inch (2 yarns per shed) of 20/3 ply.

2/ The catch-cord for the bobbin type edge shall be 24/4 ply combed peeler cotton yarn and 40/2 ply combed peeler cotton yarn. The color of the catch-cord (either type) shall be the color of the webbing for the latch-needle type edge.

TABLE V. Physical requirements for type III, heavy weight webbing

Width (inches)	Weight per linear yard, minimum (ounces)	Yarns, minimum Full width				Breaking strength, minimum (pounds)	Yarn sizes (± 5 percent)		
		Face and back warp	Binder warp	Stuffer warp	Yarns per inch filling 2/	Warp, full width	Warp (except stuffer) 3/	Filling 2/	Stuffer warp 4/
5/8	1.00	57	5	12	24 or 48	380	8/4	8/4 or 16/4	8/4
3/4	1.20	65	6	14	24 or 48	460	8/4	8/4 or 16/4	4/4
1	1.33	81	8	18	24 or 48	550	8/4	8/4 or 16/4	8/4
1-1/4 1/	1.50	89	10	11	24 or 48	650	8/4	8/4 or 16/4	8/4
1-1/4 1/	2.00	97	10	22	24 or 48	720	8/4	8/4 or 16/4	4/4
1-1/2	2.40	113	12	26	24 or 48	860	8/4	8/4 or 16/4	4/4
2	2.65	145	16	34	24 or 48	1100	8/4	8/4 or 16/4	8/4
2-1/2	4.00	177	20	42	24 or 48	1360	8/4	8/4 or 16/4	4/4
3	4.80	209	24	50	24 or 48	1560	8/4	8/4 or 16/4	4/4

1/ Acquistion document should specify in addition to width, weight per linear yard to identify each of the 1-1/4 inch webbings (see 6.2).
2/ 24 yarns per inch (1 yarn per shed) of 8/4 ply or 48 yarns per inch (2 yarns per shed of 16/4 ply).
3/ The catch-cord for the bobbin type edge shall be 24/4 ply combed peeler cotton yarn and 40/2 ply combed peeler cotton yarn. The color of the catch-cord (either type) shall be the color of the webbing for the latch-needle type edge.
4/ When 4/4 ply yarn is specified, two ends of 8/4 ply yarn may be substituted for each end of 4/4 ply yarn.

* TABLE VI. Physical requirements for type IV, webbing (special use)

Width (inches)	Weight per linear yard, minimum (ounces)	Yarns, minimum Full width: Face, middle, and back warp 4/	Yarns, minimum Full width: Binder warp	Yarns, minimum Full width: Stuffer warp	Yarns, minimum Full width: Yarns per inch filling	Breaking strength, minimum (pounds) Warp full width	Yarn sizes (±5 percent): Warp (except stuffer) 7/	Yarn sizes (±5 percent): Filling	Yarn sizes (±5 percent): Stuffer warp
5/8	0.90	48	7	--	40	255	8/4	8/4	--
1 1/	1.05	78	22 (2 as 1)	--	40	370	8/3	8/3	--
1-1/4 1/ 5/	1.90	94 or 64 6/	15	56 6/	46 or 36 6/ 8/	500	8/4 or 9/4 6/	8/4 or 8/2 6/	9/4 6/
1-3/8	2.25	119	18	--	40	800	10/5	10/5	--
2-1/4 2/	3.40	167	10	99	28	1200	8/4	8/4	8/4
2-1/4 2/ 3/	4.30	196	32	--	38	1100	8/4	8/7	--

1/ The thickness of the 1-1/4 inch webbing shall be not more than 0.135 inch; the thickness of the 1 inch webbing shall be 0.095 to 0.105 inch.
2/ Acquisition documents should specify, in addition to width, the weight per linear yard to identify each of the 2-1/4 inch webbings (see 6.2).
3/ The thickness of the webbing shall be not more than 0.155 nor less than 0.135 inch.
4/ Yarns minimum, for the 2-1/4 inch, 3.40 ounce webbing shall be for face and back warp.
5/ Except that the width tolerance specified in 3.9 for the 1-1/4 inch webbing shall be ± 1/32 inch.
6/ Applicable to shuttleless loom construction only.
7/ The catch-cord for the latch-needle type edge shall be 420 denier nylon dyed the same shade as the standard sample, except that for unbleached and bleached white webbing, the catch-cord shall be natural.
8/ 46 yarns per inch (1 yarn per shed) of 8/4 ply or 72 yarns per inch (2 yarns per shed) of 8/2 ply.

TABLE VII. Physical requirements for type V, webbing multiple weave

Width (inches)	Weight per linear yard, minimum (ounces)	Yarns, minimum		Thickness (inches)	Breaking strength, minimum (pounds) (full width)	Yarn sizes (±5 percent	
		Warp total yarns	Yarns per inch filling			Warp	Filling
1-3/4 ± 1/32	2.75	333	100	1/8 ± 1/64	1,000	12/3	12/3

TABLE VIII. Physical requirements for type VI, webbing special (appliances and wicks)

Width (inches)	Thickness (inches) ± 0.55	Weight per linear yard, minimum (ounces)	Yarns, minimum			Yarn sizes (±5 percent)		Breaking strength, minimum (pounds)
			Face and back warp	Binder warp	Yarns per inch filling	Warp	Filling	
1 ± 1/16	0.080	0.53	49	11	18	5/2	10/2	350

3.9.1 Curvature. The finished webbing shall show no more lateral curvature than 1/4 inch within a yard when tested as specified in 4.4.3.

3.10 Weave. The weave of the webbing shall be as specified in 3.10.1 through 3.10.7.

3.10.1 Type II. Webbing shall be a single fabric consisting of one warp and one filling, and weaving shall be plain weave. Two warp ends shall weave as one, except that at the selvages there shall be four warp ends weaving singly in each selvage edge. When latch type shuttleless looms are utilized, the filling yarn shall traverse the full width of the webbing and shall be held at the edge by an extra catch-cord end, interlacing with the filling yarn, in a method depicted in figure 1 or 3. When bobbin type shuttleless looms are utilized, interlacing of the catch-cord and filling shall occur within the first four ends of warp yarn at the edge (see figure 2).

3.10.2 Type IIa. Webbing shall be a double fabric consisting of two warps bound together by a single filling and a binder warp. The face warp shall weave plain weave with the picks showing on the face. The back warp shall weave plain weave with the picks showing on the back. The binder-warp ends shall weave plain weave. There shall be two stuffer-warp ends between each binder warp and, in addition, one stuffer on each edge. One selvage shall consist of nine ground-warp ends, and the other selvage shall consist of eight ground-warp ends. The filling shall weave alternately on the face and on the back. When latch needle type shuttleless looms are utilized, the filling yarn shall traverse the full width of the webbing and shall be held at the edge by an extra catch-cord end, interlacing with the filling yarn, in a method depicted in figure 1 or 3. When bobbin type shuttleless looms are utilized, interlacing of the catch-cord and the filling shall occur within the selvage area before the first binder end (see figure 2).

3.10.3 Type IIb. Webbing shall be a double fabric consisting of two warps bound together by a single filling and a binder warp. The face warp shall weave plain weave with the picks showing on the face. The back warp shall weave plain weave with the picks showing on the back. The binder-warp ends shall weave plain weave. One selvage shall consist of nine ground-warp ends, and the other selvage shall consist of eight ground-warp ends. The filling shall weave alternately on the face and on the back. When latch-needle type shuttleless looms are utilized, the filling yarn shall traverse in the full width of the webbing and shall be held at the edge by an extra catch-cord end, interlacing with the filling yarn, in a method depicted in figure 1 or 3. When bobbin type shuttleless looms are utilized, interlacing of the catch-cord and the filling shall occur within the selvage area before the first binder end (see figure 2).

3.10.4 Type III. Webbing shall be the same as type IIa, except that there shall be 2 ends of ground-warp weaving as one: there shall be 2 stuffer-warp ends between each binder warp and on each edge, 13 ground-warp ends weaving singly on one edge, and 12 ground-warp ends weaving singly on the other edge. The 1-1/4 inch, 1.50 ounce webbing shall be woven with one stuffer-warp end between each binder warp and on each edge, 9 ground-warp ends weaving singly on one edge and 8 ground-warp ends weaving singly on the other edge. When latch needle type shuttleless looms are utilized, the filling yarn shall traverse the full width of the webbing and shall be held at the edge by an extra catch-cord end, interlacing with the filling yarns, in the method depicted in figure 1 or 3. When bobbin type shuttleless looms are utilized, interlacing of the catch-cord and the filling shall occur within the selvage area before the first binder end (see figure 2).

3.10.5 Type IV.

3.10.5.1 Type IV 5/8 inch, 0.90 ounce; 1 inch, 1.05 ounce; 1-1/4 inch, 1.90 ounce; 1-3/8 inch, 2.25 ounce; and 2-1/4 inch, 4.30 ounce. Webbing shall be composed of three ground-warps (face, middle, and back), one binder warp, and one filling. The face warp shall weave plain weave with the picks that show on the face. The back warp shall weave plain weave with the picks that show on the back. The middle warp shall weave plain weave with the picks that weave in the middle. The binder warp shall weave three up (one face, one middle, one face) and three down (one back, one middle, one back). Each binder shall weave the same so as to form a filling rib effect on both face and back of webbing. The selvage on the 2-1/4 inch and 1-1/4 inch webbing shall be five ground-warp ends on each side, for the 5/8 inch, six ground-warp ends on each side; and for the 1-3/8 inch, nine ground-warp ends on one side and eight ground-warp ends on the other. For the 1-inch type IV webbing, there shall be nine ground ends on each selvage. The filling shall weave as follows:

1 pick on face
1 pick in middle
1 pick on face
1 pick on back
1 pick in middle
1 pick on back

3.10.5.2 Type IV 2-1/4 inch, 3.40 ounce. Webbing shall be the same as for type IIa, except that there shall be two ends of ground-warp weaving as one: 11 warp ribs formed by having 9 stuffer-warp ends in each rib with at least one binder between each rib, 8 ground-warp ends weaving singly on one edge, and 7 ground-warp ends weaving on the other edge.

* 3.10.5.3 Type IV 1-1/4 inch, 1.90 ounce shuttleless loom webbing. Webbing shall be a double fabric consisting of two warps bound together by a single filling and binder warp. The face warp shall weave plain weave with the picks showing on the face. The back warp shall weave plain weave with the picks showing on the back. The binder-warp ends shall weave 2 up and 2 down.

There shall be 4 stuffer-warp ends between each binder warp and no stuffer on each side. Each selvage shall consist of 4 ground-warp ends. The filling shall weave 2 picks on the face and 2 picks on the back. When latch needle type shuttleless looms are utilized, the filling yarn shall traverse the full width of the webbing and shall be held at the edge by an extra catch-cord end, interlacing with the filling yarn, in a method depicted in figures 1 or 3.

3.10.6 Type V. The weave shall be as shown on figure 5.

3.10.7 Type VI weave. The webbing shall be a double fabric consisting of two warps bound together by a binder warp and a filling. The face warp shall weave plain with the picks that show on the face, and the back warp shall weave plain with the picks that show on the back. The binder-warp ends shall weave plain throughout.

3.11 Length and put-up. The webbing shall be put up in rolls. Unless otherwise specified, each roll shall contain not more than three pieces and the minimum length of any piece shall be 3 yards. One end of each piece in the roll shall be marked with paper or other means to reveal the number of pieces in the roll. The length of the rolls shall be as follows:

a. Type II: Not more than 100 yards nor less than 80 yards per roll, except that, for widths narrower than 5/8 inch, the minimum roll length may be 50 yards, with not more than two pieces per roll.

b. Type IIa: Not more than 80 yards nor less than 60 yards per roll, except that, for widths narrower than 5/8 inch, the minimum roll length may be 40 yards, with not more than two pieces per roll.

c. Type IIb: Not more than 80 yards nor less than 60 yards per roll, except that the 5/8-inch width shall be furnished in rolls not less than 35 yards nor more than 40 yards in length, with not more than two pieces per roll; or not less than 41 yards to a maximum length roll of 50 yards, with not more than three pieces per roll.

d. Type III: Not more than 60 yards nor less than 50 yards per roll, except that the 5/8-inch width shall be furnished in rolls not less than 35 yards nor more than 40 yards in length, with not more than two pieces per roll; or not less than 41 yards to a maximum length roll of 50 yards, with not more than three pieces per roll.

e. Type IV: For 5/8 inch, 0.90 ounce, not more than 40 yards nor less than 35 yards per roll with not more than two pieces per roll, or not less than 41 yards to a maximum length roll of 50 yards with not more than three pieces per roll.

f. Type IV: For 1-1/4 inches, 1.90 ounces; 1-3/8 inches, 2.25 ounces; and 1 inch, 1.05 ounces not more than 60 yards nor less than 52 yards per roll in multiples of 1-1/3 yards, and the shortest piece shall be not less than 4 yards for the 1-3/8 inch width and 1-1/2 yards for the 1-1/4 width. The use of adhesive tape, staples, butt sewing, or other devices to fasten adjoining ends of pieces of the 1-1/4 inch and 1 inch width in the same roll is prohibited.

g. Type IV: For 2-1/4 inches, 3.40 and 4.30 ounces to be furnished in 36 to 78 yard rolls. No more than 10 percent of rolls furnished are to be rolls of no more than three pieces. When a roll contains more than one piece of webbing, adjacent end of pieces shall be overlapped a distance of approximately 24 inches and not butted end to end. No single piece shall be less than 50 inches in length.

h. Type V: Not more than 60 yards nor less than 50 yards per roll. No roll shall contain more than two pieces, and no piece shall be less than 10 yards in length.

i. Type VI: To be furnished in rolls, the roll shall be in one continuous piece, with a minimum of 30 yards and a maximum of 35 yards per roll.

3.12 Identification tickets. Each roll of webbing shall have an identification ticket attached to the roll in accordance with MIL-P-43334.

3.13 Fiber identification. Each roll of webbing shall be labeled, ticketed, or invoiced for fiber content in accordance with the Textile Fiber Products Identification Act.

3.14 Workmanship. The finished webbing shall conform to the quality of product established by this document and the occurrence of defects shall not exceed the applicable acceptable quality levels.

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 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 document where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

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

4.1.2 Certificates of compliance. When certificates of compliance are submitted, the Government reserves the right to inspect such items to determine the validity of the certification.

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

a. First article inspection (see 4.3).
b. Quality conformance inspection (see 4.4).

* 4.3 First article inspection. When a first article is required (see 3.2), it shall be examined for the defects specified in table X, and tested for the characteristics specified in table XII. The presence of any defect or failure to pass any test shall be cause for rejection of the first article.

4.4 Quality conformance inspection. Unless otherwise specified, 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 documents unless otherwise excluded, amended, modified, or qualified in this document or applicable purchase document.

* 4.4.1.1 Component and material certification. Unless otherwise specified, a certificate of compliance will be acceptable as evidence that the characteristics listed in table IX conform to the specified requirements when tested by the specified methods.

TABLE IX. Component and material tests

Characteristic	Requirement paragraph	Test method
Cotton yarn:		
Cotton identification	3.3.1	1200 1/
Catch-cord yarn count	3.9	Visual
Catch-cord yarn dyed (when specified)	3.9	Visual
Yarn count (warp, binder, stuffer, filling)	3.9	4021 1/
Ply	3.9	Visual

1/ Methods of FED-STD-191.

4.4.2 End item examination.

* 4.4.2.1 Yard-by-yard examination. The webbing shall be examined on both sides for the defects listed in table X. All defects found shall be counted regardless of their proximity to each other, except where two or more defects represent a single local condition, in which case only the more serious defect shall be counted. A continuous defect shall be counted as one defect for each warpwise yard or fraction thereof in which it occurs. The lot size shall be expressed in yards. The sample unit shall be 1 yard of webbing. The number of rolls from which the sample is to be selected shall be in accordance with table XI. The sample yardage shall be apportioned equally among the selected rolls. The inspection level shall be II, and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be as listed below:

For widths up to and including 1-1/2 inches	- 0.40 for major defects 1.50 for total defects
For widths over 1-1/2 inches and up to and including 3 inches	- 0.65 for major defects 2.50 for total defects
For widths over 3 inches	- 1.00 for major defects 4.00 for total defects

TABLE X. Webbing visual defects

Defects	Classification	
	Major	Minor
Abrasion mark - resulting in a weak place	X	
Broken or missing end or picks:		
Two or more contiguous	X	
Single		X
Any cut, hole, or tear	X	
Fine or light filling bar	X	
Fine yarn or drop ply, less than 1/2 the thickness of the normal yarn		X
Float:		
Multiple, more than 1/2 inch in combined warp and filling directions	X	
Multiple, 1/2 inch or less in combined warp and filling directions		X
Single, more than 1/2 inch in length		X
Heavy filling bar or heavy place 1/		X
Knot on surfaces or edges 1/		X
Slack or tight end or ends 1/		X
Slub, slug, jerked-in filling, or slough-off more than three times the thickness of the normal yarn		X
Smash	X	
Weak or soft spot	X	
Wrong draw more than 9 inches in length		X
Spot, stain, or streak 1/		X
Edges:		
Cut, frayed, or torn	X	
Slack, not firmly or tightly woven	X	
Shade (when colors are specified):		
Shade bar 1/		X
Dye streak 1/		X
Undyed stuffer warp yarn showing through 1/		X
Untrimmed filling yarn ends 1/		X
Width beyond specified tolerances		X
Dropped knitted stitch on edge (applicable to shuttleless looms)	X	
Catch-cord missing (applicable to shuttleless looms only)	X	
Twisted or wavy, will not lay flat upon application of manual pressure 2/	X	
Catch-cord not interlacing with filling (bobbin looms only)	X	

1/ Clearly visible at normal inspection distance (approximately 3 feet).

2/ A 3-yard length of webbing shall be laid on a flat and smooth surface without tension. If the webbing does not lie flat or if the webbing is wavy or ridgy, it shall be counted as a defect.

* 4.4.2.2 Overall examination. The webbing shall be examined for the defects listed below. Each defect listed shall be counted not more than once in each roll examined. The sample shall consist of the applicable number of rolls indicated in table XI. The lot shall be rejected if the total number of defects in the sample exceeds the applicable acceptance number specified in table XI. In addition, the presence of any color or uniformity of shade defect listed below shall be cause for rejection of the lot.

Defects

Ends of pieces of webbing joined by adhesive tape, staples, butt sewing, or other means (type IV, 1-1/4 inches and 1 inch only)
Off shade, not within established tolerances (class 3)
Cloudy, mottled, or streaky throughout
Poorly constructed, not firmly and tightly woven
Poor color penetration
Objectionable odor
Overall uncleanness
Unevenness of application of treatment (classes 1a, 1b, 2a, 4, 7, and 8)
Not completely dry (classes 1a, 1b, 2a, 4, 7, and 8)
Clearly noticeable crystallization of mildew inhibitor (classes 1a, 1b, 2a, 4, and 7)
Not labeled in accordance with Textile Fiber Products Identification Act

TABLE XI. Sample size

Lot size (yards)	Same size in rolls	Acceptance number 2/
1,200 or less 1/	3	0
1,201 up to and including 3,200	5	0
3,201 up to and including 10,000	8	0
10,001 up to and including 35,000	13	0
35,001 up to and including 150,000	20	1
150,001 and over	32	2

1/ If a lot contains fewer than 3 rolls, each roll in the lot shall be examined.

2/ Applicable to overall and length examinations only.

* 4.4.2.3 Length examination. The webbing shall be examined for the defects listed below. The sample shall consist of the applicable number of rolls indicated in table XI. If the total number of defects in the sample rolls exceeds the applicable acceptance number specified in table XI, or if the total of the actual gross lengths of rolls in the sample is less than the total of the gross lengths marked on the roll tickets, the lot shall be rejected.

Defects

Gross length less than specified minimum length or more than specified maximum length
Gross length more than 2 yards less than gross length marked on piece ticket
Any piece less than the allowable minimum length of piece
Any roll containing more than the allowable number of pieces permitted for the applicable type of webbing

* 4.4.3 End item testing. The end item shall be tested for the characteristics listed in table XII. The methods of testing specified in FED-STD-191, wherever applicable, and as listed in table XII shall be followed. The physical and chemical values specified in section 3 apply to the results of the determinations made on a sample unit for test purposes as specified in the applicable test methods. All test reports shall contain the individual values utilized in expressing the final results. The sample size shall be as follows:

Lot size (yards)	Sample size
800 or less	2
801 up to and including 22,000	3
22,001 and over	5

The lot shall be unacceptable if one or more sample units fail to meet any requirement specified. The sample unit for testing shall be as follows:

a. Classes 1, 2, and 3 webbing - 6 linear yards.

b. Classes 1a, 1b, and 2a - 9 linear yards of the finished webbing, and 1/2 linear yard of the webbing prior to treatment.

c. Classes 4, 7, and 8 - 30 linear yards of the dyed and finished webbing, and 1/2 linear yard of the dyed webbing prior to treatment.

TABLE XII. End item tests

Characteristic	Requirement reference	Test method
Color prior to treatment for classes 4, 7, and 8	3.4.1	Visual 1/ 2/
Type IIb class 4, OD-7 webbing when piece dyed:		
Degree of penetration	3.4.1.1	Visual 1/ 2/
Scrubbing resistance	3.4.1.1	4.5.2 1/ 2/
Labile sulfur	3.4.2	2020
Colorfastness for classes 3, 4, 7, and 8, all types:		
Weathering	3.4.4.1 thru 3.4.4.3	5671 3/
Crocking	3.4.4.1 thru 3.4.4.3	5651
Colorfastness for class 3, type IV 1-1/4 inch and 1 inch, and class 8, all types:		
Laundering (after 3 cycles)	3.4.4.1 and 3.4.4.3	5610 4/ 5/
Spectral reflectance (Camouflage Green 483)	3.5	4.5.3
Nonfibrous material 6/	3.6	2611
Water repellent material and add on for classes 1a, 1b, 2a, 4, 7, and 8	3.7.1	7/
Dynamic absorption for classes 1a, 1b, 2a, 4, 7, and 8	3.7.1	4500

TABLE XII. End item tests - Continued

Characteristic	Requirement reference	Test method
Copper-8-quinolinolate for classes 1b and 4	3.7.2.1	2060 8/
Copper content, percent for classes 1b and 4	3.7.2.1	2050
Methylenebis content for classes 1a, 2a, and 7	3.7.2.2	2011
pH for classes 1a, 1b, 2a, 4, 7, and 8	3.8	2811
Weight	Tables II thru VIII	5041
Texture warp:		
Total	Tables II and VII	5050
Face and back	Tables III, IV, V, and VIII	5050 1/
Face, middle, and back	Table VI	5050 1/
Binder	Tables III, IV, V, VI, and VIII	5050 1/
Stuffer	Tables III, V, and VI	5050 1/
Filling:		
Yarns per inch	Tables II thru VIII	5050 1/
Breaking strength	Tables II thru VIII	4108 9/

TABLE XII. End item tests - Continued

Characteristic	Requirement reference	Test method
Thickness	Tables VI, VII, and VIII	5030
Curvature	3.9.1	4.5.1
Weave	3.10	Visual 1/ 2/

1/ One specimen shall be tested for each sample unit.

2/ Results shall be reported as pass or fail.

3/ Time of exposure shall be 40 hours.

4/ The specimens must be dried after each of the 3 laundering cycles.

5/ On the color transfer cloth evaluation, only the stain on the cotton fibers of the color transfer cloth shall be evaluated.

6/ Performed prior to treatment on classes 1a, 1b, 2a, 4, 7, and 8.

7/ A certificate of compliance shall be submitted and will be acceptable for the stated requirement.

8/ The contractor shall certify that only copper-8-quinolinolate was used in the treatment of the classes 1b and 4 webbings.

9/ During the breaking strength test, it shall be observed whether the nonconventional edge of the shuttleless loom webbing ruptures prior to the body of the webbing. When the edge ruptures at a breaking strength value less than the minimum requirement specified, the webbing shall be rejected.

4.4.4 Packaging examination. The examination shall be in accordance with the quality assurance provisions of MIL-P-43334.

4.4.5 Palletization examination. The examination shall be in accordance with the quality assurance provisions of MIL-P-43334.

4.5 Methods of inspection.

4.5.1 Measurement of lateral curvature.

4.5.1.1 Test specimen. The test specimen shall be a length of webbing, full width, measuring a minimum of 40 inches. The specimen shall not be stretched, smoothed, or otherwise changed from its original condition prior to testing.

4.5.1.2 Number of determinations. Five specimens shall be tested from each sample unit. Each specimen shall not exceed 1/4 inch maximum.

4.5.1.3 Apparatus.

a. A sheet of polymethyl methacrylate (PMMA) weighing approximately 35 ounces with dimensions of 45 inches by 5 inches by 1/4 inch.

b. A rigid straight edge measuring 36 inches in length.

c. A roller 1 inch in diameter and weighing 1-1/2 pounds.

4.5.1.4 Procedure. Place the specimens flat on a smooth, horizontal flat surface without tension and allow them to reach moisture equilibrium as defined in section 4 of FED-STD-191. After equilibrium is reached, place a weight at one end of the webbing. Place the roller on the specimen at the end of the webbing where the weight is located. The specimen should be approximately in the center of the roller. Roll the roller along the length of the specimen, taking care to keep the specimen in the center of the roller and not to exert any pressure on the roller. When the roller has passed the length of the webbing, place the PMMA on the specimen for a period of 1 hour. Without moving the PMMA on the specimen, place the straight edge on the PMMA so that both ends of the straight edge are aligned perpendicular to the outermost edge of the specimen. Determine the highest degree of curvature of the specimen from the straight edge by measuring to the nearest 1/32 inch perpendicular to the straight edge. Record the highest measurement (see figure 4).

4.5.1.5 Report. The results of each determination from each sample unit shall be recorded.

4.5.2 Test for scrubbing resistance. Scrubbing tests shall be performed on both the standard yarn dyed sample and the piece dyed submitted webbing for 25 and 100 cycles.

4.5.2.1 Apparatus. The scrubbing unit shall consist of a device with a hand or motor-driven reciprocating arm, operating on a horizontal plane at a stroke length such that an area 2 inches by 4 inches is uniformly scrubbed. The reciprocating arm is fitted with a nylon bristled brush, having a bristle length of 1/2 inch minimum to 5/8 inch maximum, bristles to be composed of 0.008 black, nylon bristle or equal. Bristle surface of brush shall consist

of 8 rows of 18 holes lengthwise and 7 rows of 17 holes lengthwise staggered tufting, making a total of 15 rows on a width of 2-1/8 inches. Overall length of bristle area shall be approximately 3-3/4 inches. Drill size for tufts shall be 0.1160 ± 0.001 inch. Arm loading shall be such as to exert a pressure of 1 pound per square inch. (Effective weight of arm plus added loading to be 7.75 to 8 pounds for the bristle area.) The rate of scrubbing shall be approximately 100 to 120 strokes (50-60 cycles) per minute.

4.5.2.2 Wetting agent. Two grams per liter (active ingredient) of a commercial wetting agent such as dioctyl sodium sulfosuccinate or its equal shall be used. The wetting agent shall be one of known high wetting and low detersive characteristics.

4.5.2.3 Procedure. Cut a specimen of the material 3 inches in width and of sufficient length for rigid mounting on a scrubbing platform of the equipment used along the warp direction. In the case of narrow fabrics, such as webbings and tapes, that are narrower than the scrubbing platform, use a sufficient number of lengths of material so that when placed side by side they will fully cover the 2 inches by 4 inches scrubbing area. Wet out the specimen in the solution of wetting agent and squeeze so as to retain approximately 100 percent of moisture. Mount the sample on the equipment platform and suitably anchor it so that it will not move or curl during the scrubbing cycle. Set up a separatory funnel in such a manner that the solution can be dripped on to the surface of the fabric at a rate of 10 mL of the solution per minute. Remove the specimen from the scrubbing machine; then, rinse it in free-flowing water from the tap, squeeze, and dry at a temperature not exceeding 180°F. Allow the sample to condition for 4 hours before evaluation. The test specimen shall be equal to or better than the standard sample with respect to residual color when scrubbed for the number of cycles specified in 4.5.2.

* 4.5.3 Spectral reflectance measurements in the visible/near infrared. Spectral reflectance data shall be obtained from 600 to 860 nm, at 20 nm intervals on a spectrophotometer (see 6.7) relative to a barium sulfate standard, the preferred white reference standard. Other white reference materials may be used, provided they are calibrated to absolute white; e.g., Halon, magnesium oxide, or vitrolite tiles (see 6.8). The spectral bandwidth shall be less than 26 nm at 860 nm. Reflectance measurements may be made by either the monochromatic or polychromatic mode of operation. When the polychromatic mode is used, the spectrophotometer shall operate with the specimen diffusely illuminated with the full emission of a source that simulates either CIE Source A or CIE Source D65. The specimen shall be measured as a single layer, backed with three layers of the same fabric and shade. Measurements will be taken on a minimum of two different areas, and the data averaged. The specimen shall be viewed at an angle no greater than 10° from normal, with the specular component included. Photometric accuracy of the spectrophotometer shall be within 1 percent and wavelength accuracy within 2 nm. The standard aperture size used in the color measurement device

shall be 1.0 to 1.25 inches in diameter. When the measured reflectance values for any color at four or more wavelengths do not meet the limits specified in 3.5, it shall be a test failure.

5. PACKAGING

* 5.1 Preservation. Preservation shall be level A or Commercial as specified (see 6.2).

* 5.1.1 Levels A and Commercial. Webbing, put up as specified, shall be preserved in accordance with the applicable requirements of MIL-P-43334.

5.2 Packing. Packing shall be level A, B, or Commercial as specified (see 6.2).

5.2.1 Levels A, B, and Commercial packing. Webbing shall be packed in accordance with the applicable requirements of MIL-P-43334.

5.3 Palletization. When required, palletization shall be in accordance with the applicable requirements of MIL-P-43334.

5.4 Marking. In addition to any special marking required by the contract or purchase order, shipments shall be marked in accordance with MIL-P-43334.

6. NOTES

6.1 Intended use. The webbing is for use in the manufacture of tentage, clothing, and equipage items. Class 7 webbing is specified when intended for end use in contact with natural or synthetic rubber. The type VI webbing is used as understraps in the manufacture of prosthetic appliances and for lamp wicks.

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

a. Title, number, and date of this document.
b. Type and class required (see 1.2).
c. Color required (see 3.4).
d. Treatment required (see 3.7).
e. Width required (tables II thru VIII), weight per linear yard to identify the type III, 1-1/4 inch webbing (table V), and weight per linear yard to identify the type IV, 2-1/4 inch webbing (table VI).
f. Selection of applicable levels of preservation and packing (see 5.1 and 5.2).
g. When palletization is required (see 5.3).

6.3 Sample. For access to samples, address the contracting activity issuing the invitation for bids.

* 6.4 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample. 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 acquisition instruments regarding arrangements for selection, inspection, and approval of the first article.

6.5 Dye combinations.

6.5.1 Olive Drab 7 dye formulation. A suggested but not mandatory dye stuff formulation for Olive Drab 7 is as follows (see 3.4):

Vat Black 25, C.I. 69525
Vat Green 3, C.I. 69500 or Vat Green 19
Vat Green 8, C.I. 71050
Shaded with either or both of the following
Vat Brown 3, C.I. 69015 or Vat Brown 1, C.I. 70800
Vat Yellow of suitable fastness

* 6.5.2 Camouflage Green 483 dye formulation. A suggested but not mandatory dyestuff formulation for Camouflage Green 483 is as follows (see 3.4):

Vat Yellow 33
Vat Green 1
Vat Brown 57

6.6 Mildew inhibitor agent. The use of the mildew inhibitor agent, 2, 2' methylenebis-(4-chlorophenol) has not been approved for use where intimate skin contact is involved.

6.7 Black catch-cord. The vat dyed black catch-cord is provided for the purpose of facilitating the detection for its absence as cited in table X.

* 6.8 Spectrophotometers. Suitable spectrophotometers for measuring spectral reflectance in the visible/near infrared are the Diano Hardy, Diano Match Scan, Hunter D54P-IR, Hunter Vis/NIR spectrocolorimeter, and Macbeth 1500 with IR option.

* 6.9 White standard. Barium sulfate of suitable quality for use as a white reference standard is available from the Eastman Kodak Company. The same source has available magnesium reagent (ribbon) and Halon. Suitable tiles can be obtained from the National Bureau of Standards or the instrument manufacturers.

* 6.10 Approval of treatments. Approval of finishes, components, and combinations is the responsibility of the U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014, and is based on more extensive tests, including those for toxicity, which are not set forth in this document. Because of the time necessary to conduct full evaluation (approximately 6 months), only those chemical treatments already approved and so listed in the invitation for bids or request for proposal shall be considered acceptable for the related procurement.

* 6.11 Subject term (key word) listing.

Cotton
Webbing

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

Custodians:

Army - GL
Navy - NU
Air Force - 99

Review activities:

Army - EA, MD, AR
Navy - MC
Air Force - 82
DLA - CT

User activities:

Army - MI
Air Force - 45

Preparing activity:

Army - GL

Project No. 8305-0192

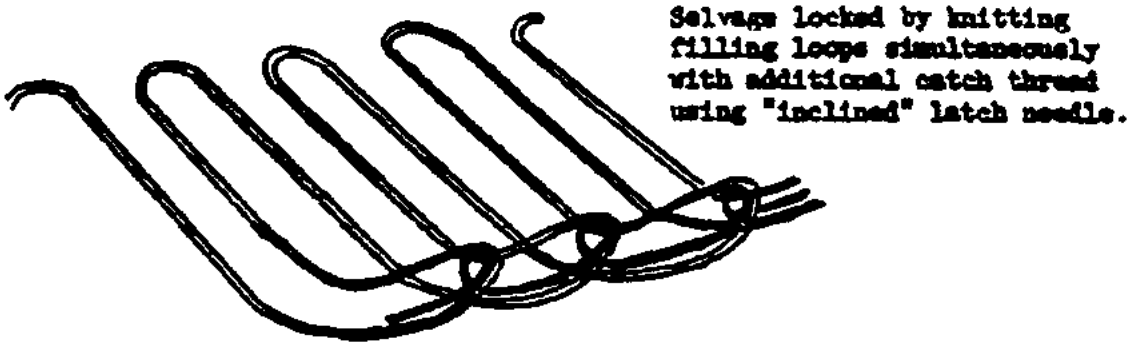


FIGURE 1. Catch-cord diagram.

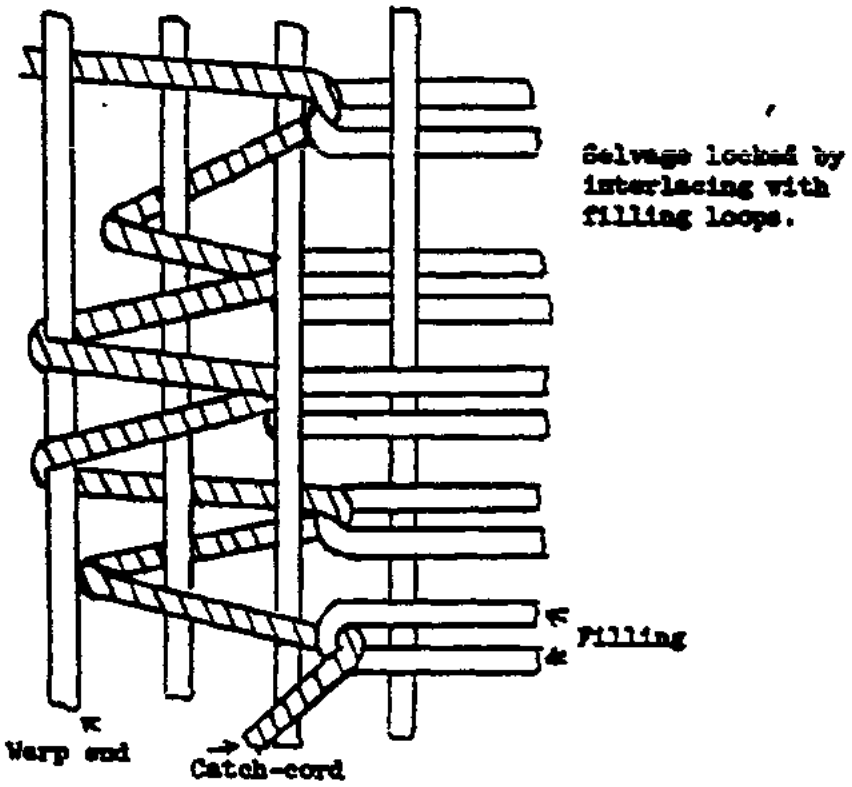


FIGURE 2. Catch-cord diagram.

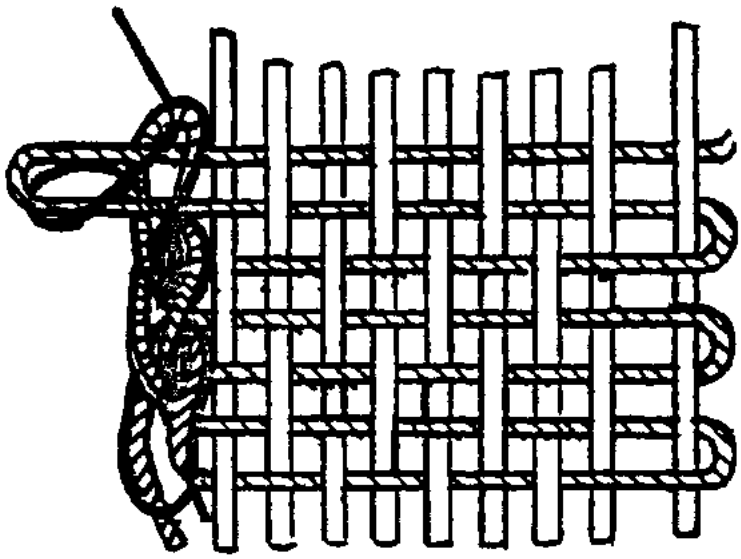


FIGURE 3. Catch-cord diagram.

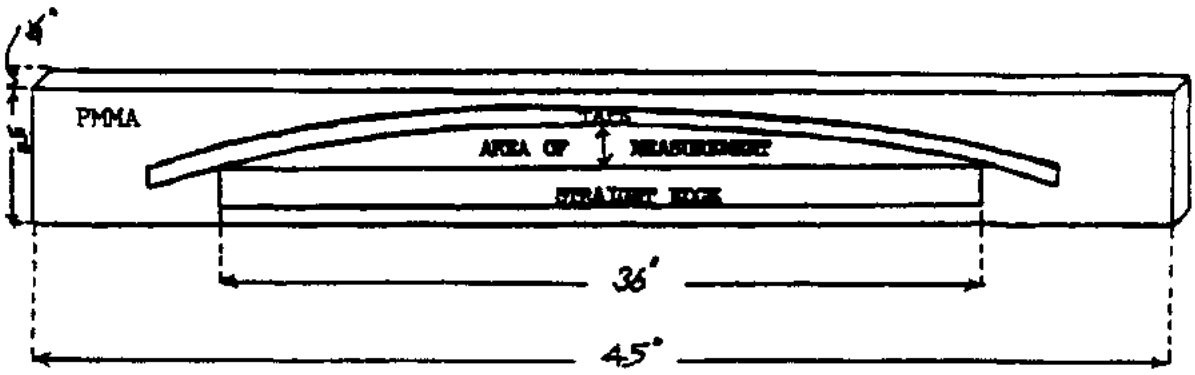
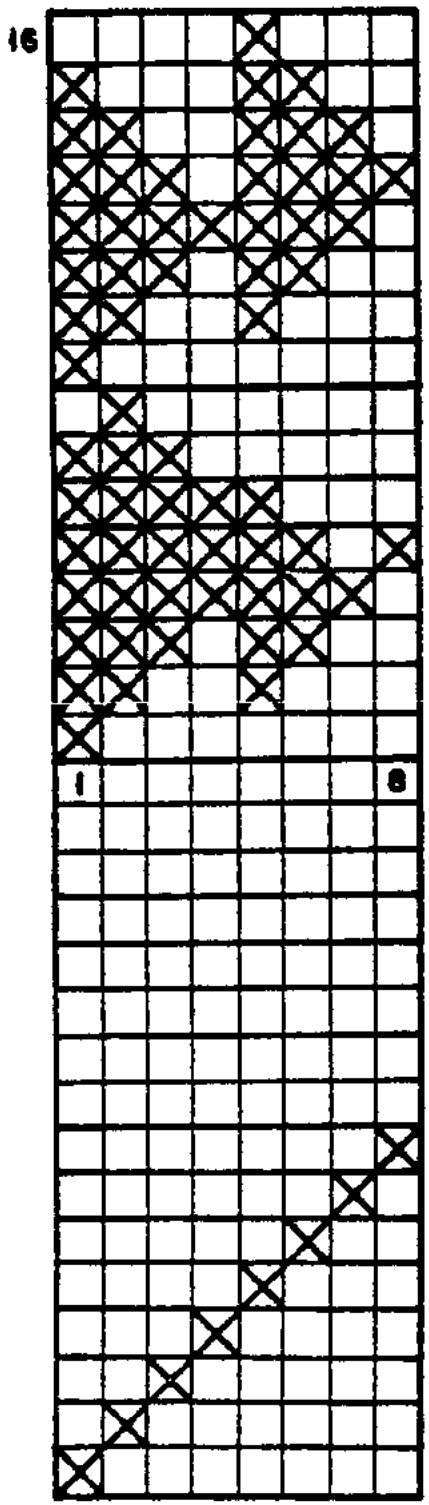
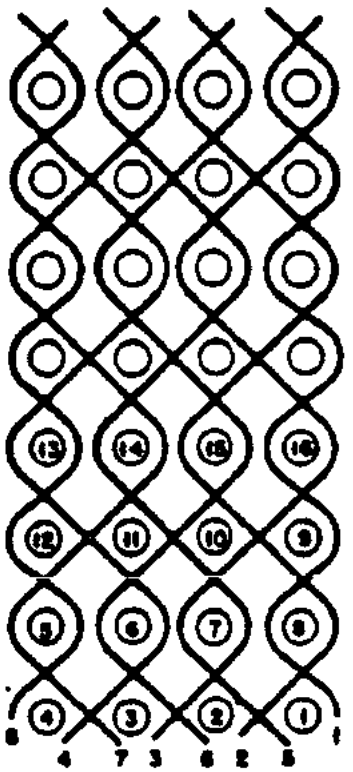


FIGURE 4. Diagram curvature measurement.





SECTION CUT PARALLEL TO WARP

FIGURE 5. Weave of webbing for type V.

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(See Instructions – Reverse Side)

1 DOCUMENT NUMBER	2 DOCUMENT TITLE
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3a. NAME OF SUBMITTING ORGANIZATION	4 TYPE OF ORGANIZATION *(Mark one)*
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