

INCH-POUND
MIL-DTL-44105C
7 February 2008
SUPERSEDING
MIL-H-44105B
4 March 1992

DETAIL SPECIFICATION

HAT, SUN, HOT WEATHER

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

1. SCOPE

1.1. Scope. This specification covers hot weather sun hats.

1.2 Classification. The sun hats will be available in the following types and sizes as specified (see 6.2).

1.2.1 Types.

- Type I - Discontinued (see 6.6)
- Type II - Desert Camouflage Pattern
- Type III - Woodland Camouflage Pattern, Water Repellent Treated
- Type IV - Universal Camouflage Pattern, Water Repellent Treated
- Type V - Digital Tiger Stripe Print Camouflage Pattern, Water Repellant Treated (Quarperl type)

1.2.2 Sizes.

Schedule of sizes

6-3/8	7	7-5/8
6-1/2	7-1/8	7-3/4
6-5/8	7-1/4	7-7/8
6-3/4	7-3/8	8
6-7/8	7 1/2	

Comments, suggestions, or questions on this document should be addressed to: Defense Supply Center Philadelphia, Clothing and Textiles Directorate, Attn: DSCP Standardization Team , 700 Robbins Avenue, Philadelphia, PA 19111-5096. Since contact information can change, you may want to verify the currency of the address information using Acquisition Streamlining and Standardization Information System (ASSIST) online database <http://assist.daps.dla.mil/>

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2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in Sections 3, 4 or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in Sections 3, 4 or 5 of this specification whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract (see 6.2).

COMMERCIAL ITEM DESCRIPTIONS

A-A-50128	- Cloth, Interlining, Non-woven
A-A-50199	- Thread, Polyester Core, Cotton- or Polyester-Covered
A-A-55093	- Laces, Footwear
A-A-55301	- Webbing, Textile, Textured or Multifilament Nylon

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-T-3530	- Thread and Twine, Mildew Resistant or Water Repellent Treated
MIL-DTL-32068	- Leather, Cattlehide, Strap, Vegetable Tanned
MIL-DTL-32075	- Label: For Clothing, Equipage, and Tentage (General Use)
MIL-DTL-44436	- Cloth, Camouflage Pattern, Wind Resistant Poplin, Nylon/Cotton Blend

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or <http://assist.daps.dla.mil/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

FEDERAL ACQUISITION REGULATIONS (FAR)

52.209-4 -First Article Approval – Government Testing

(Copies are available online at <http://acquisition.gov/far/index.html> or by contacting the Superintendent of Documents at 202-512-1800.)

2.2.2 Other Government documents, drawings, and publications: The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract. (see 6.2)

YACL 05-01, Cloth, Twill, Air Force, Digital Tiger Stripe Print, Camouflage Pattern
(Copies of this document are available from the Defense Supply Center Philadelphia (DSCP), Clothing and Textiles Directorate, ATTN: DSCP Standardization Team, 700 Robbins Ave., Philadelphia PA 19111-5096.)

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2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract (see 6.2).

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC):

AATCC Test Method 8 - Colorfastness to Crocking: AATCC Crockmeter Method
AATCC Test method 15 - Colorfastness to Perspiration
AATCC Test Method 16 - Colorfastness to Light
AATCC Test Method 61 - Colorfastness to Laundering: Accelerated
AATCC Evaluation Procedure 1, Gray Scale for Color Change
AATCC Evaluation Procedure 2, Gray Scale for Staining
AATCC Evaluation Procedure 8, AATCC 9-Step Chromatic Transference Scale
AATCC Evaluation Procedure 9, Visual Assessment of Color Difference of Textiles

(Copies are available on line at www.aatcc.org or from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709-2215.)

AMERICAN SOCIETY FOR QUALITY

ANSI/ASQ Z1.4 - Sampling Procedures and Tables for Inspection by Attributes

(Copies are available online at <http://www.asq.org> or from the American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203.)

ASTM INTERNATIONAL

ASTM D 6193 - Standard Practice for Stitches and Seams

(Copies of documents are available online at www.astm.org or from the ASTM INTERNATIONAL, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

OTHER DOCUMENTS

Repeat Insult Patch Test – Modified Draize Procedure - Principles and Methods of Toxicology, (fourth edition) A Wallace Hayes (editor), pp 1057 – 1060, 2001.

(Copies are available online at <http://www.taylorandfrancis.co.uk/> or from Taylor and Francis, 325 Chestnut Street, Philadelphia PA 19106.)

(Copies of documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First Article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.3) in accordance with 4.2.

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3.2 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.3 Material.

3.3.1 Basic Material.

3.3.1.1 Type II. The basic material for the Type II sun hat shall be a blended cotton/nylon ripstop poplin cloth conforming to Class 3 of MIL-DTL-44436.

3.3.1.2 Type III. The basic material for the Type III sun hat shall be a blended cotton/nylon ripstop poplin cloth conforming to Class 2 of MIL-DTL-44436.

3.3.1.3 Type IV. The basic material for the Type IV sun hat shall be a blended cotton/nylon ripstop poplin cloth conforming to Class 7 of MIL-DTL-44436.

3.3.1.4 Type V. The basic material for the Type V sun hat shall be cotton twill nylon, conforming to Type III, Class 1 of Purchase Description, YACL 05-01.

3.3.1.5 Side lining. For Type II, IV and V hats, the side lining shall be basic material or printed seconds cloth. For Type III hats, the side lining shall be cut from ground shade cloth. Printed seconds cloth shall be a cloth rejected only for defects pertaining to color, infrared reflectance, or camouflage print pattern.

3.3.2 Brim binding. The brim binding shall be bias-cut from the basic material (see 3.3.1).

3.3.3 Brim interlining and headband stay piece. The brim interlining and headband stay piece shall be a white or charcoal grey, non-woven, continuous filament of polyester cloth conforming to Type II of A-A-50128, except that the breaking strength of the non-woven in the machine direction shall be 45 pounds minimum and the breaking strength in the cross machine direction shall be 25 pounds.

3.3.4 Webbing, nylon. The nylon webbing for the camouflage band for Types III, IV and V sun hats shall be bulked nylon, Type IV, 3/4 inch wide, conforming to A-A-55301. The webbing shall be dyed Camouflage Green 483 for Type II, Foliage Green 504 for Type IV and Foliage Green 504 or Sage Green 1641 for Type V.

3.3.4.1 Spectral Reflectance. The Foliage Green 504 webbing shall meet the spectral reflectance values as specified in TABLE I when tested as specified in A-A-55301.

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TABLE I Spectral Reflectance Value Foliage Green 504

Wavelength (nm)	Threshold		Objective	
	<u>min</u>	<u>max</u>	<u>min</u>	<u>max</u>
600	8	18	8	18
620	8	18	8	18
640	8	20	8	20
660	10	26	10	26
680	12	32	10	26
700	20	40	12	28
720	22	46	16	30
740	24	46	16	30
760	26	48	18	32
780	30	48	18	34
800	34	50	20	36
820	34	54	22	38
840	36	54	24	40
860	38	56	26	42

3.3.5 Laces, nylon. The nylon lace of the chinstrap shall conform to Type II Class 2 of A-A-55093. The color for Type II shall be Tan 380, for Type III the color shall be Camouflage Green 483, for Type IV the color shall be Foliage Green 504, and for Type V the color shall be Foliage Green 504 or Sage Green 1641.

3.3.5.1 Visual shade matching. The color and appearance of the laces shall match the standard sample when viewed using AATCC Evaluation Procedure 9, Option A, with sources simulating artificial daylight D75 illuminant with a color temperature 7500 ± 200 K, with illumination of 100 ± 20 foot candles, and shall be a good match to the standard sample under incandescent lamplight at 2856 ± 200 K.

3.3.5.2 Colorfastness. The nylon laces shall conform to the colorfastness requirements listed below in Table II when tested as specified in 4.5.1.

TABLE II Colorfastness requirements.

Colors Evaluation	Laundering (4 cycles) <u>1/</u> (min.)	Light (40 hrs or 170 KJ) <u>2/</u> (min.)	Perspiration (acid & alka- line) <u>1/</u> (min.)	Crocking <u>3/</u> (min.)
All colors	3-4	3-4	3-4	3.5

1/ Rated using the AATCC Evaluation Procedure 1, Gray Scale for Color Change and AATCC Evaluation Procedure 2, Gray Scale for Staining.

2/ Rated using the AATCC Evaluation Procedure 1, Gray Scale for Color Change.

3/ Rated using the AATCC Evaluation Procedure 8, AATCC9-Step Chromatic Transference Scale

3.3.6 Keeper. The leather chinstrap keeper shall be natural in color and 6/64 to 8/64 inches thick. The leather keeper shall conform to Types I, II, III, or IV, Class 2 of MIL-DTL-32068, except that the

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requirements for colorfastness (resistance to rubbing), cracking, breaking force, elongation, chloroform-soluble material, water-soluble material and total ash shall not apply. The finish shall be smooth and have a natural gloss appearance. A plastic fixlock keeper may be substituted for the leather keeper. The plastic fixlock keeper shall be Tan 380 for Type II, Camouflage Green 483 for Type III and Foliage Green 504 for Type IV.

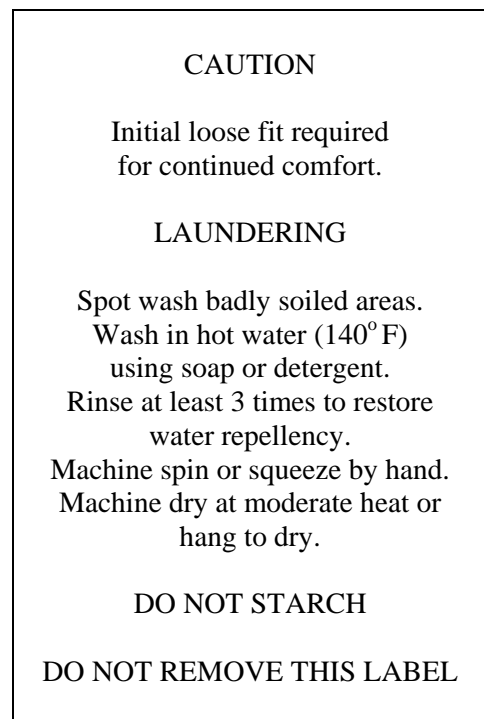
3.3.7 Thread. The thread for stitching and seaming the hat shall be polyester core, cotton-or polyester-covered, Tex Size 36-45, 2-ply and 31-35, 2-ply conforming to Type I and II for, A-A-50199. The thread color for Type II sun hat shall be Tan 380, for the Type III sun hat it shall be Camouflage Green 483; for the Type IV sun hat shall be Foliage Green 504; and for the Type V sun hat shall be foliage Green 504 or Sage Green 1641. The threads for Types III, IV and V shall be water repellent treated to conform to Type II, Class 3 of MIL-T-3530.

3.3.8 Labels. Each sun hat shall have a combination identification-size label and an instruction label or a combination identification size instruction label. The labels shall meet the colorfastness requirements of MIL-DTL-32075.

3.3.8.1 Combination identification-size label. The combination identification-size label shall conform to Type IV, Class 4 of MIL-DTL-32075.

3.3.8.2 Instruction label. The instruction label shall conform to Type IV, Class 3 of MIL-DTL-32075. The instruction label shall measure not more than 2 inches by 2 inches.

3.3.8.2.1 For Types III and V. Instruction labels for Types III and V sun hats shall include the following information:



3.3.8.2.2 For Type II and IV. The instruction label for Types II and IV shall include the following information:

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1. Initial loose fit required for continued comfort.
2. Hand or machine wash using permanent press cycle, cold water and mild detergent without chlorine bleach.
3. Do not wring or twist. Rinse in clean, cold water.
4. Dry at low heat (do not exceed 130°F) or hang dry.

CAUTION

Chlorine bleach or starch will damage the hat

Suspend headnet from top of brim, drape headnet over shoulders.

DO NOT REMOVE THIS LABEL

3.3.8.2.3 Combination identification-size-instruction label. As an alternate, a combination identification-size-instruction label may be used. The label shall conform to Type IV, Class 14 of MIL-DTL-32075, and shall contain the information specified in 3.3.8.2.1 or 3.3.8.2.2, as applicable.

3.3.8.2.4 Bar coding. Bar coding labels shall be applied as specified in the contract or order. (see 6.2)

3.4 Ventilators, with washers. The screen-type ventilators with washers shall be brass, tan in color for Type II, have a black chemical finish for the Type III hat, and an antique brass finish for the Type IV and V hat. The hat ventilators shall have a $9/16 \pm 1/16$ inch opening with a No. 50-70 mesh and a 40 to 60% opening (see 6.5).

3.5 Design. Types II, III, IV and V hat shall be a lightweight, soft crowned model with a quilt-stitched brim and chin strap. The hat shall be lined with self material. Type II, IV and V hats shall have a camouflage band and shall be water repellent (see Figures 1 and 2).

3.5.1 Toxicity. The finished sun hat shall not present a health hazard and shall show compatibility with prolonged, direct skin contact when tested as specified in 4.5.4 Chemicals recognized by the Environmental Protection Agency (EPA) as human carcinogens shall not be used.

3.6 Patterns. Patterns which provide a $3/16$ inch allowance for seaming side lining to crown, $3/8$ inch allowance for seaming brim to sides, and $1/4$ inch allowance for all other seams, will be furnished by the Government to the contractor for cutting working patterns. The Government patterns shall not be altered in any way and are to be used only as a guide for cutting the contractor's working patterns. The working patterns shall be identical to the Government patterns.

3.6.1 List of pattern parts. The components of the sun hat shall be cut from the materials specified and according to the number of parts listed in Table III.

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TABLE III Pattern parts

Material	Pattern Nomenclature	Cut parts
Basic material		
	Top of crown	1
	Top side	1
	Bottom side	1
	Top and bottom side crown (Alternate construction)	1
	Side lining <u>1/</u>	1
	Top brim <u>2/</u>	1
	Bottom brim <u>2/</u>	1
Non-woven material	Brim interlining	1
	Headband stay	1

1/ Type III may be cut from ground shade fabric.

2/ The top brim and bottom brim are the same pattern part.

3.7 Construction.

3.7.1 Assembly and configuration requirements. Assembly and configuration requirements shall be as specified in Table IV.

TABLE IV Assembly and configuration requirements

CUTTING REQUIREMENTS
a. All parts shall be cut according to pattern requirements including directional lines, notches, and size.
b. Except for side lining and brim binding, all parts made from basic material shall be cut from one piece.
c. The brim binding shall be cut on a bias.
d. Chin strap lace ends shall be fused.
DAMAGED PARTS
a. Parts identified during manufacturing as damaged shall be removed and replaced with non-defective and properly matched material.
MARKING AND BUNDLING
a. Parts and materials may be marked, bundled or ticketed to ensure a uniform shade, color pattern and size throughout the hat. The following methods of marking shall not be used. <ol style="list-style-type: none"> 1. Corrosive metal fastening devices 2. Sew-on tickets 3. Adhesive tickets which leave residue when removed
CHIN STRAP KEEPER AND CHIN STRAP
a. The chin strap shall thread through two equally-spaced holes in the chin strap keeper. The holes shall be such that the chin strap shall not move without slight pressure.
BRIM FABRICATION
a. The finished brim shall consist of two plies of basic material interlined with one ply of non-woven material, quilted, with parallel lines of stitching, and finished without twists or puckers.
b. The bottom brim outside edges, top brim edges and interlining edges shall be superimposed on one another and notches shall match.
c. The brim edge binding shall be attached so that the brim will curve upward.
SIDE SEAM AND CAMOUFLAGE BAND
a. The front notches of topside and bottom side shall match after seaming..

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TABLE IV Assembly and configuration requirements

<p>b. When the top and bottom sides are joined using the alternate construction (mock seam) provided in Table VI it shall be uniform in width and without distortion.</p> <p>c. The side piece shall interface with the folder as specified in the applicable pattern.</p> <p>d. The mock seam outside folded edge shall face the top of the crown for the basic and alternative methods.</p> <p>e. For Types III and IV only webbing shall be bartacked around the circumference of the hat with one bartack located at the center front, and the webbing shall be centered on the bottom side piece. Bartacks shall not extend off edges of webbing. The webbing shall be attached to the side piece with fullness between bartacks forming loops. Bartacks shall extend widthwise across the webbing.</p> <p>f. The ends of the webbing for Types III and IV shall be caught in the center back seam of the top and bottom sides.</p> <p>g. Instruction labels shall be stitched on four sides to the inside side lining on the left side of the hat. Stitching shall not pass over printing.</p>
SIDES TO CROWN SEAMS
<p>a. The top side piece shall finish on top of the crown and shall be free of twists, puckers, pleats or raw edges.</p> <p>b. Front notches shall match and the back seam shall be in line with the back notch on the crown.</p> <p>c. Stitching of side lining to inside of crown shall not show on the outside. Stitching of top side to outside of crown shall not show on the inside of the hat.</p>
SIDES TO BRIM
<p>a. Chin strap ends shall be tacked to the underside of the brim at each side notch.</p> <p>b. Side piece and brim front notches shall match, and the back seam shall line up with the brim back notch. Joining seam for bottom side piece and top of brim shall not be stitched through interlining. The bottom side piece shall be turned up and edge stitched.</p> <p>c. Headband stay piece shall be positioned to inside of side lining with bottom edge of stay piece $\frac{1}{2}$ inch from bottom edge of lining and even with back seam of lining. Bottom edge of side lining shall be turned up over bottom edge of stay piece before joining lining to bottom brim, catching bottom edge of size label in the stitching.</p> <p>d. Size label shall extend upward into the crown and be positioned to the right side of the center back seam.</p> <p>e. The finished hat lining shall not be full, twisted or extend below the brim.</p>
FINISHING
<p>a. All loose threads, spots, stains, markings shall be removed and all thread ends trimmed.</p> <p>b. As an option for forming the hat, the following blocking procedure may be utilized: Block crown on proper sized heated blocks and flange brims with metal dies on hydraulic press with heat and pressure to properly set brims.</p> <p>c. Ventilators shall be attached in pre-punched holes through side and lining, as indicated by marks on pattern, with washers on inside of hat.</p>

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3.7.2 Manufacturing cut and finish dimensions. Manufacturing cut and finish dimensions shall be as specified in Table V.

TABLE V Manufacturing cut and finish dimensions

Item	Dimension Description	Dimension and tolerance (inches)
CUT LENGTHS		
1	Chin strap cut length after fusing lace ends, for use with plastic fix lock keeper	27±1
2	Chin strap cut length after fusing lace ends, for use with leather keeper	25 ± 1
3	Chin strap leather keeper length	3/4 ±1/8
4	Chin strap leather keeper width	1/2 ± 1/8
BRIM		
1	Finished brim	2-3/8 ± 1/8
2	Brim binding start and finish aligned to center back	± 1/2
3	Brim binding end overlap no less than	1/2
4	Binding finish width on top of brim no more than	3/8
5	Finished brim upward curvature	3/4 - 1
SEAMING OF SIDE TO CAMOUFLAGE BAND		
1	Webbing bartack spacing	1-1/4 ± 1/8
2	Fullness between bartacks (webbing to side piece) forming loops	1/8 (-0/ + 1/8)
3	Webbing bartack to back seam spacing – No less than	1/2
4	Webbing bartacks – finished length	1/2 - 5/8
5	Webbing bartacks – finished width, no more than	3/32
6	Instruction label or combination label distance from raw edge of side lining	3/4 -1

3.7.3 Stitches and seams. Stitches and seams specified in Table VI shall conform to ASTM-D-6193. Where two or more stitch or seam types are given for the same part of the operation, any one of them may be used. When stitch Type 401 is used, the looper (underthread) shall be on the inside of the hat. Seams shall be sewn so that no raw edges, open seams, run-offs, twists, pleats or puckers will result. Seams shall start and finish evenly.

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TABLE VI Stitch and seam requirements

Stitch Location/Placement	Stitch Type	Gage/Margin (inches)	Seam Type	Stitches Per Inch	Thread	
					Needle	Bobbin/ Looper
BRIM CONSTRUCTION						
Brim bottom outside edges to interlining And Brim top outside edges superimposed on interlining; through all plies – Notches matching Or Brim bottom outside edges superimposed on interlining through all plies– Notches matching – Stitched through all plies	101 or 301 or 401 101 or 301 or 401 101 or 301 or 401	1/16 – 1/8 Edge margin 1/16 – 1/8 Edge margin 1/16 – 1/8 Edge margin	SSa-1 SSa-1 SSa-1	6-14 6-14 6-14	36-45 36-45 36-45 36-45 36-45 36-45 36-45	36-45 31-35 36-45 31-35 36-45 31-35
Bottom brim to top brim at inner edges	301		SSa-1	8-10	36-45	36-45
Brim plies single or double stitched rows over the brim width shall be spaced 3/16 to 1/8 inch apart.	301	3/16 – 1/4 Gage		8-10	36-45	36-45
Binding to brim outside edge And Binding over edge of brim Or Binding attached to brim using a folder	301 or 401 301	3/16 – 1/4 Edge margin 1/16 – 1/32 Edge margin	BSg-2 (b) BSg-2 (b)	10-14 10-14	36-45 36-45 36-45	36-45 31-35 36-45
SIDES AND CAMOUFLAGE BAND						
Top side to bottom side And Bottom side raise stitch OR Top side to bottom side mock seam made with use of a folder	301 or 401 301 301 or 401	1/16-3/32 Fold edge margin 1/16-3/32 Fold edge margin	LSq-2 (a) LSq-2 (b) OSe-1	10-14 10-14 10-14	36-45 36-45 36-45	36-45 31-35 36-45 36-45

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TABLE VI Stitch and seam requirements

Stitch Location/Placement	Stitch Type	Gage/Margin (inches)	Seam Type	Stitches Per Inch	Thread	
					Needle	Bobbin/Looper
Circumference webbing bartacks	Bartack or 701	-----	-----	28/Bartack 28/ tack		
Webbing ends to back seam allowance	101 or 301 or 401	-----	-----		36-45 36-45 36-45 36-45	36-45 36-45 36-45 31-45
Center back seam of top and bottom sides	301 or 401 and 301	1/16 – 3/32 Margin from each seam line side	SSz-3(b)	10-14 10-14	36-45 36-45	36-45 31-35
Instruction label to left inside side lining And Center back side lining seam joining	301 301 or 401	3/4 - 1 From back raw edge margin	LSbj-1 SSa-1	10-14 10-14	36-45 36-45 36-45	36-45 36-45 31-35
SIDES TO CROWN						
Side lining to crown inside	101 or 301 or 401		SSa-1 SSa-1 SSa-1	10-14 10-14 10-14	36-45 36-45 36-45	36-45 36-45 36-45
Top side to outside crown	301 or 401		LSbp-2 (a)	10-14	36-45 36-45	36-45 31-35
Raise stitching of top side	301		LSbp-2 (b)	10-14	36-45	36-45
SIDES TO BRIM						
Tack stitching of chin strap ends to brim underside	301 or 401 or bartack			6-14	36-45 36-45	36-45 31-35
Side piece to brim	301 or 401		LSq-2 (a)	10-14	36-45 36-45	36-45 31-35

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TABLE VI Stitch and seam requirements

Stitch Location/Placement	Stitch Type	Gage/Margin (inches)	Seam Type	Stitches Per Inch	Thread	
					Needle	Bobbin/Looper
Raise stitching of brim joining seam	301 or 401	1/16 – 3/32 Edge margin	LSq-2 (b)	10-14	36-45 36-45	36-45 31-35
Top edge of headband stay piece to inside side lining	301 or 401	1/16 – 1/8 Stay piece edge margin	LSq-2 (b)	10-14	36-45 36-45	36-45 31-35

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3.7.3.1 Type 301 stitching. Ends of all stitching shall be backstitched or overstitched not less than 1/4 inch except where ends are turned under or caught in other stitches or seams. Ends of a continuous line of stitching shall overlap not less than 1/2 inch. There shall be no loose stitching resulting in loose bobbin or top thread or excessively tight stitching resulting in puckering of the materials sewn. The lock shall be embedded in the material sewn.

3.7.3.1.1 Repairs of Type 301 stitching. Repairs of Type 301 stitching (backstitching of ends not required) shall be as follows:

- a. When thread breaks or bobbin run-outs occur during stitching (except, pre-stitching), the stitching shall be repaired by restarting the stitching a no less than 1/2 inch back of the end of the stitching.
- b. Except for pre-stitching, thread breaks or two or more consecutive skipped or run-off stitches, noted during inspection shall be repaired by overstitching. The stitching shall start no less than 1/2 inch in back of the defective area and continue over the defective area to a point no less than 1/2 inch beyond the defective area onto the existing stitching. Loose or excessively tight stitching shall be repaired by re-stitching after careful removal of the defective stitching to avoid material damage.

3.7.3.2 Type 101, 401, and 701 stitching. There shall be no loose or excessively tight stitching resulting in puckering of the materials sewn. All repairs shall be in accordance with 3.7.3.1.1. Repairs of stitch Type 401 may be accomplished by use of stitch Type 301.

3.7.4 Stitches per inch. The number of stitches per inch shall be as specified in Table VI.

3.7.5 Bartacks. Bartacks shall be as specified in Table VI. Bartacks shall be free from thread breaks and loose stitching.

3.7.6 Repairs. Repairs such as mends, darns, patches, or splices shall not be permitted on hats.

3.8 Use of automated apparel equipment. Automated apparel equipment may be used to manufacture Sun Hats to this specification, provided that the stitch and seam types are as specified and the finished component conforms to the required configuration. When a Government furnished shaper pattern is forwarded, the component shall conform to that pattern.

3.9 Manufacturing operations requirements. The contractor is not required to follow the exact sequence of operations listed, unless otherwise specified. Seam allowances required to be turned and seam turn-up of side and lining may be pre-creased. Any additional basting or holding stitches used to facilitate manufacture are permissible provided the thread does not show on the finished hat.

3.10 Figures. Figures 1 and 2 are furnished for guidance and information purposes only. This specification shall take precedence over figure information.

3.11 Finished measurements. The finished hats shall conform to measurements for each respective size as shown in Table VII.

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TABLE VII Finished measurements (inches)

Size	Finished Measurements in inches			
	Inside hat (head mea- surements) <u>1/</u>	Crown height At center Front <u>2/</u>	Crown height At center Back <u>3/</u>	Brim width <u>4/</u>
6-3/8	20-1/2	2-3/4	3-1/2	2-3/8
6-1/2	20-7/8	2-3/4	3-1/2	2-3/8
6-5/8	21-1/4	2-3/4	3-1/2	2-3/8
6-3/4	21-5/8	2-3/4	3-1/2	2-3/8
6-7/8	22	2-3/4	3-1/2	2-3/8
7	22-3/8	2-3/4	3-1/2	2-3/8
7-1/8	22-3/4	2-3/4	3-1/2	2-3/8
7-1/4	23-1/8	2-3/4	3-1/2	2-3/8
7-3/8	23-1/2	2-3/4	3-1/2	2-3/8
7-1/2	23-7/8	2-3/4	3-1/2	2-3/8
7-5/8	24-1/4	2-3/4	3-1/2	2-3/8
7-3/4	24-5/8	2-3/4	3-1/2	2-3/8
7-7/8	25	2-3/4	3-1/2	2-3/8
8	25-3/8	2-3/4	3-1/2	2-3/8
Tolerance	± 1/4	± 1/4	± 1/4	± 1/8

1/ Measure along bottom edge of side lining.

2/ Measure from base of side to crown seam on outside of center front.

3/ Measure from base of side to crown seam on outside of center back.

4/ Measure from base of side to outer bound edge of brim.

3.12 Workmanship. The finished hat shall conform to the quality of product established by this specification. The occurrence of defects shall not exceed the applicable acceptable quality levels.

4. VERIFICATION

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

- a. First article inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2 First article inspection. A first article, submitted in accordance with 3.1, shall be inspected, examined for appearance, color and finished defects as specified in 4.5.2 and tested for the characteristics as specified in 4.5.3. The sample size will be specified in the procurement document (see 6.2). The sample unit shall be one hat and the lot size shall be expressed in units of hats.

4.3 Conformance inspection. Conformance inspection shall include the examination of 4.5 through 4.5.4 and the dimensional verifications of 4.5.3. Sampling for inspection shall be performed in accordance with ANSI/ASQ Z1.4 and with acceptance quality limit as specified in the contract and/or order, except where otherwise indicated. The sample unit shall be one hat and the lot size shall be expressed in units of hats.

4.4 Inspection Conditions. Unless otherwise specified, all inspections shall be performed in accordance with all the requirements of referenced documents, unless otherwise excluded, amended, modified or qualified in this specification or applicable procurement documents

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4.5 End item examination. The finished examination sample size, acceptance quality limit (AQL) and acceptance criteria shall be as specified in the solicitation or contract (see 6.2).

4.5.1 Laces. The laces for the chin strap shall be tested as specified in Table VII.

TABLE VII Lace colorfastness tests

Characteristics	Requirement Paragraph	Test method
Colorfastness:		
Light (after 40 hrs or 170 kilojoules)	3.4.5.2	AATCC-16 Opt 1 or 3
Laundering (after 4 cycles)	3.4.5.2	AATCC-61 Test 3A
Crocking	3.4.5.2	AATCC-8
Perspiration (acid & alkaline)	3.4.5.2	AATCC-15

4.5.2 End item visual examination. The finished sun hat shall be examined for compliance to the defects listed in Table VIII. The lot size shall be expressed in units of hats.

4.5.3 End item dimensional examination. The finished sun hat shall be examined for the dimensions specified in 3.11. Any dimension not within the specified tolerance shall be scored as a defect. The lot size shall be expressed in units of hats.

TABLE VIII End item visual defects

Examine	Defect Description	Classification	
		Major	Minor
Blocking (When this option is selected)	Poorly blocked, causing distortion on crown or brim; Hat not symmetrical, affecting appearance.	101	201
Cleanliness	Any spot or stain on outside. Thread ends not trimmed, loose threads, or one or more shade or size marking not removed		202 203
Component and assembly	Any component part or required operation omitted (unless otherwise specified herein)	102	
Cutting	Any component part not cut in strict accordance with directional lines indicated on pattern or not cut in accordance with document requirements.	103	
Ventilators	One or more omitted or added	104	
	Broken or bent	105	
	One or more improperly clinched (loose or raw edges exposed around edges of ventilator) - on outside - on inside	106	204
	Side puckered, pleated or full in clinching one or more ventilators		205
	One or more ventilators with washer on outside of hat	107	

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TABLE VIII End item visual defects

Examine	Defect Description	Classification	
		Major	Minor
	Ventilator or washer splits		206
Label (identification, size or instruction)	Missing, incorrect, or illegible	108	
	Not securely attached		207
Material defects and workmanship damages	Any hole or shade bar	109	
	Any defect such as a smash, multiple float, or slub	110	
	Cut, tear, rip, mend or burn	111	
	Needle chew	112	
Stitching and seams, general	Seam or component twisted, puckered or pleated		208
	Part or material caught in unrelated operation or stitching	113	
	Ends of stitching not secured as specified		209
	Thread break (all stitch types) stitched less than 1/2 inch beyond end of break		210
Gage of stitching and seam allowances	Irregular, unevenly gaged or corresponding stitchings not uniformly gaged		211
	Width not as specified or not within range of gage specified or varies more than 1/16 inch when no range is specified. NOTE: The above defects are to be scored only when the condition exists on one-half or more of seam		212
	Edge or raised stitching sewn too close to edge resulting in damage to cloth	114	
Open seams	Any seam open on outside:		
	- Up to 1/4 inch inclusive		213
	- More than 1/4 inch	115	
	Any seam open on inside of hat:		
	- Up to 1 inch inclusive		214
	NOTE: An open seam is defined as one or more broken or two or more consecutive skipped or runoff stitches	116	
Raw edges	Any raw edge on outside of hat:		
	- 1/4 to 1/2 inch inclusive		215
	- More than 1/2 inch	117	
	Any raw edge on inside of hat more than 1/4 inch.		216
	NOTE: Raw edges not securely caught in the stitching shall be classified as an open seam		
Runoffs	On joining seams, when resulting in an open seam, score as "open seam"		
	On binding stitching 1/4 inch or more		217
Stitch and seam types	Not as specified		218
	Looper thread on outside (when 401 stitch is used)	118	
	Chain of Type 101 stitch exposed on outside of hat	119	
Stitch tension	Loose tension resulting in a loose seam		219
	Loose tension on top quilting stitches or edge stitching,		

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TABLE VIII End item visual defects

Examine	Defect Description	Classification	
		Major	Minor
	resulting in loosely exposed lower thread on top thread Tight tension (stitches break when strain is applied to the direction of seam)	120	220
Stitches per inch	Less than minimum specified More than maximum specified NOTE: This defect is to be scored only when the condition exists on one half or more of the stitching or seam		221 222
Shaded parts	Badly shaded parts (except those cut from ends) Parts permitted to be cut from ends, badly shaded	121	223
Brim	Twisted, stretched, or poorly shaped Rows of quilting stitches less than 3/16 inch or more than 1/4 inch apart Needle thread of quilting stitching finished on underside of brim Fullness between rows of quilting stitches Binding twisted, puckered or pleated Outside end of binding not turned under or not within 1/2 inch of center back of brim Binding finished more than 3/8 inch wide on top of brim for a distance of 2 inches or more Irregular in width by more than 1/2 inch inclusive Ends of binding lapped less than 1/2 inch Brim curving upward less than 3/4 inch or more than 1 inch	122 123	 224 225 226 227 228 229 230 231
Crown and sides	Crown twisted or distorted Side twisted or distorted Side lining twisted or distorted Lining extending below edge of brim Side back seam and side lining back seam, not seam on seam, by more than 1/8 inch Stitches joining top side to crown exposed on inside of hat Stitches joining side lining to crown exposed on outside of hat Joining seams of top side to bottom side out of alignment by more than 1/16 inch at back seam Camouflage band bartacks positioned less than 1- 1/8 or more than 1-3/8 inches apart <u>1</u> / Camouflage band attached to side with less than 1/8 inch or more than 1/4 inch fullness <u>1</u> / Ends of camouflage band not caught in back seam stitching <u>1</u> / Camouflage band bartacks insecure <u>1</u> / Camouflage band bartacks not positioned across width	124 125	232 233 234 235 236 237 238 239 240 241

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TABLE VIII End item visual defects

Examine	Defect Description	Classification	
		Major	Minor
	of band $\frac{1}{2}$ / Camouflage band bartack measuring less than $\frac{1}{2}$ inch or more than $\frac{5}{8}$ inch $\frac{1}{2}$ / Camouflage band bartack measuring more than $\frac{3}{32}$ inch wide $\frac{1}{2}$ / Camouflage band bartack extending beyond edge of webbing $\frac{1}{2}$ / Camouflage band off center of bottom side piece by more than $\frac{1}{8}$ inch $\frac{1}{2}$ / 		242 243 244 245 246
Chin strap and keeper	Chin strap missing End of chin strap not fused Keeper missing Keeper less than $\frac{5}{8}$ inch or more than $\frac{7}{8}$ inch long; or less than $\frac{3}{8}$ inch or more than $\frac{5}{8}$ inch wide Holes in keeper too small or too large not permitting chin strap to function properly (falls freely from set position or keeper immovable Chin strap length not within tolerance Chin strap twisted	126 127 128	247 248 249 250

$\frac{1}{2}$ / This defect pertains to Types II, IV, and V Sun Hats only.

4.5.4 Toxicity test. When required, (see 6.2), an acute dermal irritation study and a skin sensitization study shall be conducted on laboratory animals. When the results of these studies indicate the sun hat is not a sensitizer or irritant, a Repeat Insult Patch Test shall be performed in accordance with the Modified Draize Procedure. (See 2.3). If the toxicity requirement (see 3.5.1) can be demonstrated with historical use data, toxicity testing may not be required (see 6.2).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Department or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use. The sun hats are intended for special purpose wear by Department of Defense military personnel. The Type II sun hats are to be worn in desert areas, Types III and V are to be worn in tropical and semi-tropical areas, and the Type IV sun hat shall be worn in all environments.

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6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number and date of this specification.
- b. Type and size required (see 1.2).
- c. The specific issue of individual documents referenced (see 2.2 and 2.3).
- d. When a first article is required (see 3.1, 4.2, and 6.3).
- e. Bar coding requirements (see 3.3.8.2.4.)
- f. When toxicity testing is required (see 4.5.4).
- g. Number of First Article Samples (see 4.2)
- h. Conformance inspection acceptance quality limit (see 4.3).
- i. Inspection conditions (if applicable) (see 4.4)
- j. Packaging (see 5.1).

6.3 First article. When a first article inspection is required (see 3.1), it will be inspected and approved under the appropriate provisions of FAR 52.209-4. The first article should be a pre-production 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 acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.4 Standard sample. For access to samples and pattern drawings, address the contracting activity issuing the invitation for bids or request for proposal. Standard samples are also available at DSCP through <http://warfighter.dla.mil> under tab "Vendor Info" then "General vendor info" "Specifications/Pattern/Drawing Requests" under "Special Instructions" provide color, shade and solicitation/contract number.

6.5 Source for ventilators. No. D53, screen-type ventilators with washers (see 3.5) by Stimpson Company 900 Sylvan Avenue, Bayport, N.Y. 11705 are known to meet this requirement

6.6 Supersession data.

Type I of this specification is no longer required and is deleted.

Type II of this specification replaces the Type II hat that was covered by MIL-H-43577.

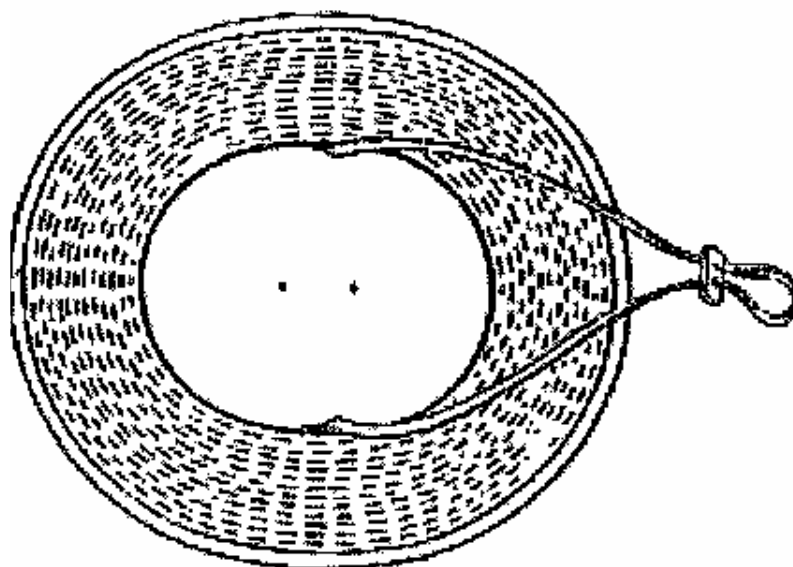
Type III of this specification replaces Type III of MIL-H-43577.

6.7 Subject term (key word) listing.

Head gear
Heat protection
Protective clothing
Protective covering
Universal Camouflage

6.8 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issues, due to the extensiveness of the changes.

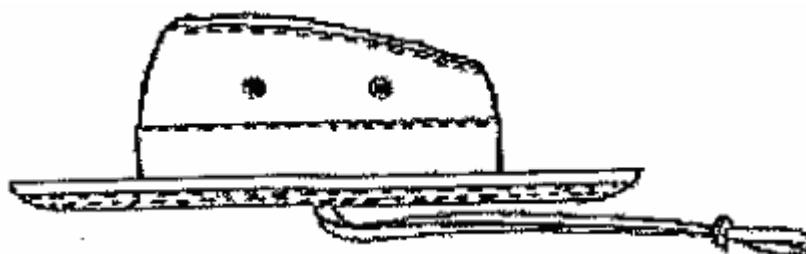
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REAR

INSIDE VIEW

FRONT



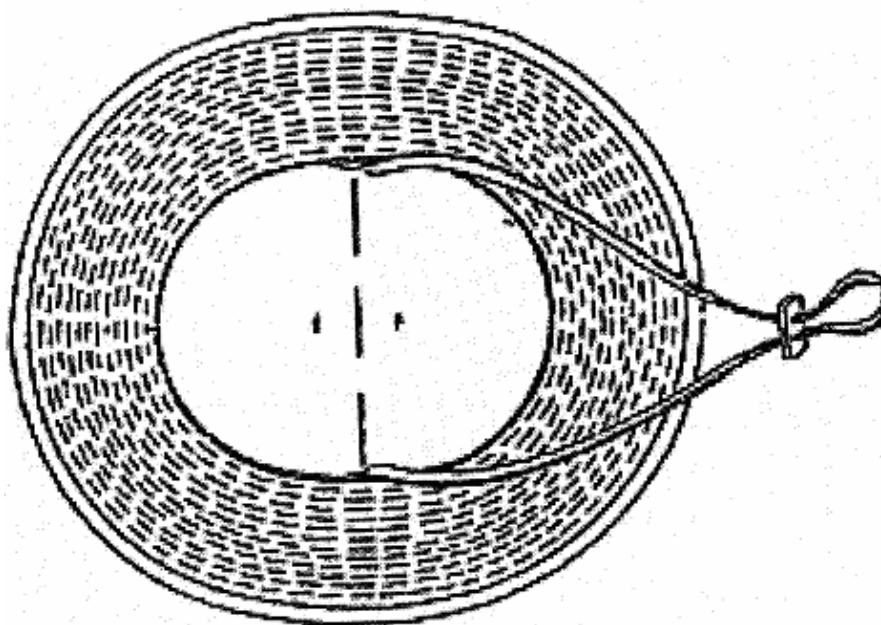
REAR

SIDE VIEW

FRONT

FIGURE 1. Hat, Sun, Hot Weather (Type II)

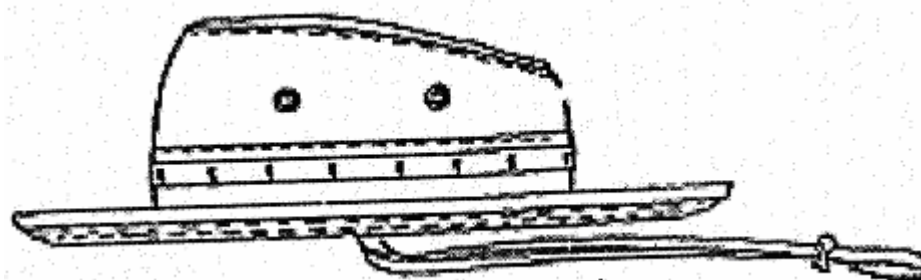
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REAR

INSIDE VIEW

FRONT



REAR

SIDE VIEW

FRONT

FIGURE 2. Hat, Sun, Hot Weather (Types II, IV and V)

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Custodian:

Army – GL
Navy – NU
Air Force – 11

Preparing activity:

DLA-CT

Project 8415-2007-002

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using ASSIST Online database at <http://assist.daps.dla.mil/> .