

DETAIL SPECIFICATION
CAP, COLD 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 a fully lined and insulated cold weather cap.

1.2 Classification. The cold weather cap will be available in one type and one class in the following sizes, as specified (see 6.2).

1.2.1 Types.

Type I – Cold weather cap with full ear extension flaps

1.2.2 Classes.

Class 1 – Coyote 498 (color chip 20150 of SAE AMS-STD-595)

Class 2 – Olive Drab Green 522 (color chip 24119 of SAE AMS-STD-595)

Class 3 – White (color chip 27925 of SAE AMS-STD-595)

1.2.3 Schedule of sizes. The cap is available in the sizes listed below.

Small Medium Large Extra Large

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 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 and 4 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.

COMMERCIAL ITEM DESCRIPTIONS

A-A-50199 - Thread, Polyester Core, Cotton or Polyester-Covered
A-A-55126 - Fastener Tapes, Hook and Loop, Synthetic
A-A-52095 - Thread, Polyester Textured

Comments, suggestions, or questions on this document should be addressed to Marine Corps Systems Command, 2200 Lester Street, Quantico, VA 22134 ATTN: SEAL-SE-STDS or emailed to USMC_STDZ@usmc.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.dla.mil>.

DEPARTMENT OF DEFENSE SPECIFICATIONS

- MIL-W-5664 - Webbing, Textile Elastic
- MIL-DTL-32075 - Label: For Clothing, Equipage, and Tentage, (General Use)

(Copies of these documents are available online at <https://quicksearch.dla.mil/>.)

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.

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

- AATCC EP9 - Evaluation Procedure for Visual Assessment of Color Difference of Textiles
- AATCC TM8 - Test Method for Colorfastness to Crocking: Crockmeter Method
- AATCC TM16.3 - Test Method for Colorfastness to Light: Xenon-Arc
- AATCC TM20A - Test Method for Fiber Analysis: Quantitative
- AATCC TM22 - Test Method for Water Repellency: Spray Test
- AATCC TM61 - Test Method for Colorfastness to Laundering: Accelerated
- AATCC TM79 - Absorbency of Textiles
- AATCC TM135 - Test Method for Dimensional Changes of Fabrics after Home Laundering

(Copies of these documents are available online at www.aatcc.org.)

AMERICAN SOCIETY FOR QUALITY (ASQ)

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

(Copies of this document are available online at www.asq.org.)

ASTM INTERNATIONAL

- ASTM D737 - Standard Test Method for Air Permeability of Textile Fabrics
- ASTM D1424 - Standard Test Method for Tearing Strength of Fabrics by Falling-Pendulum (Elmendorf-Type) Apparatus
- ASTM D1776/D1776M - Standard Practice for Conditioning and Testing Textiles
- ASTM D1777 - Standard Test Method for Thickness of Textile Materials
- ASTM D2594 - Standard Test Method for Stretch Properties of Knitted Fabrics Having Low Power
- ASTM D3512/D3512M - Standard Test Method for Pilling Resistance and Other Related Surface Changes of Textile Fabrics: Random Tumble Pilling Tester
- ASTM D3776/D3776M - Standard Test Methods for Mass Per Unit Area (Weight) of Fabric
- ASTM D3787 - Standard Test Method for Bursting Strength of Textiles—Constant-Rate-of-Traversal (CRT) Ball Burst Test
- ASTM D5034 - Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)
- ASTM D6193 - Standard Practice for Stitches and Seams
- ASTM E96 - Standard Test Method for Water Vapor Transmission of Materials

(Copies of these documents are available online at www.astm.org.)

INFORMA HEALTHCARE

Repeat Insult Patch Test - Modified Draize Procedure –
Principles and Methods of Toxicology, A Wallace Hayes (editor).

(Copies of this document are available online at <https://www.crcpress.com>.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, 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 Inspections.

3.1.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.3.

3.1.2 Conformance inspection. When specified (see 6.2), a sample shall be subjected to a conformance inspection in accordance with 4.4.

3.2 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased 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 Materials and components.

3.3.1 Materials.

3.3.1.1 Basic material. The basic material for the cold weather cap shall be a nylon woven fabric conforming to the physical requirements specified in [table I](#) when tested as specified in 4.5.1. The color of the fabric shall be a good approximation to the reference standard furnished by the Government (see 6.2) for the class specified (see 1.2.2 and 6.2). The fabric shall have a durable water resistant (DWR) finish applied prior to being used in the fabrication of the caps. The fabric shall show no toxicity when used as intended (see 6.1) and when tested as specified in 4.5.6.

TABLE I. Basic material physical requirements.

Material Characteristic	Requirement	Verification Reference
Construction	Plain Weave	Table IX
Fiber content	Nylon	Table IX
Weight, ounces per square yard	3.5 - 4.25	Table IX
Break strength, pounds, percent elongation (minimum)		
Warp	190, 55%	Table IX
Fill	200, 40%	Table IX
Tear Strength, pounds (minimum)		
Warp	7	Table IX
Fill	6	Table IX
Water Repellency, rating, initial (minimum)	100	Table IX

TABLE I. Basic material physical requirements. – Continued.

Material Characteristic	Requirement	Verification Reference
Colorfastness (minimum)		
Laundering (3 cycles)	4	Table IX
Crocking		
Wet	4	Table IX
Dry	4	Table IX
Light, Xenon	4	Table IX
Dimensional stability, percent (3 cycles), (maximum)		
Warp	3.0	Table IX
Fill	2.0	Table IX
Pilling, rating (minimum)		
Initial	5	Table IX
After laundering (3 cycles)	5	Table IX
Thickness (inches)	0.012 (± 0.002)	Table IX
Visual shade matching	Good approximation to Standard Sample	Table IX

3.3.1.2 Insulation. The insulation material for the cold weather cap shall be polyester knit (see 6.4.2) with a velour/loft back and face. The color shall approximate the reference standard furnished by the Government (see 6.2) for the specified color. The fabric shall show no toxicity when used as intended (see 6.1) and when tested as specified in 4.5.6. The material shall conform to the requirements in [table II](#) when tested as specified in 4.5.1.

TABLE II. Insulation physical requirements.

Material Characteristic	Requirement	Verification Reference
Construction	Velour/loft back and face	Table X
Fiber content	Polyester	Table X
Weight, ounces per square yard	6.0 – 8.0	Table X
Air permeability, CFM, (minimum)	300	Table X
Burst Strength, pounds (minimum)	85	Table X
Thickness, (minimum)	0.10	Table X
MVTR, grams per square meter in 24 hours (minimum)	2400	Table X
Absorbency (rating)	Intermediate	Table X
Dry Time, minutes (maximum)	120 <u>1/</u>	Table X
Fabric Stretch, percent, (minimum)		
Courses	30	Table X
Wales	10	Table X
Dimensional stability, percent, (maximum) (3 cycles)		
Courses	3.5	Table X
Wales	3.5	Table X
Visual shade matching	Good approximation to Standard Sample	Table X

1/ No more than one (1) sample exceeding 120 minutes.

3.3.1.3 Visor interfacing. The visor interfacing used to construct the brim shall be a multilayer non-woven interlining attached to a woven, consisting of 94% polyester/ 6% cotton cloth, and shall be a white shade. The weight shall be 15 (± 1.5) ounces per square yard when tested in accordance with table VIII.

3.3.2 Components.

3.3.2.1 Thread. Thread for needle and bobbin (looper) shall be 100% textured, 2 or 3 ply, polyester thread, approximate Tex size 35, conforming to A-A-52095; or 2 or 3 ply cotton or polyester covered polyester core thread, approximate Tex size 35, conforming to A-A-50199. The thread color shall be Coyote 498.

3.3.2.2 Low profile hook and loop fastener tape. The hook and loop fastener tapes for the extended ear flaps shall conform to the requirements of A-A-55126, Type III, Class 6, when verified in accordance with paragraph 4.5. The length and width of the hook and loop shall be 1 by 4 ($\pm 1/8$) inches for sizes small and medium and 1 by 4-1/2 ($\pm 1/8$) inches for sizes large and extra-large. Cut edges shall be finished to ensure no raveling for the life of the cap. The color of the hook and loop shall approximate Coyote 498.

3.3.2.3 Elastic. There shall be elastic at the back of the cap (see Figure 2), positioned approximately 1/4 inch above the finished seam at the neck. The elastic shall be three inches in length, secured between the shell and liner fabric with two 3/4 inch vertical bartacks at each end according to marks on the pattern. The elastic shall conform to the requirements of Type II of MIL-W-5664 except that it shall be 3/4 inch width and may be in any shade that does not show through the shell fabric.

3.3.2.4 Labels.

3.3.2.4.1 Identification label. The identification label shall be in accordance with Type VI, Class 4 of MIL-DTL-32075. The label shall contain the item description, contract number, NSN, fiber content information, the contractor's name and size. The inscription shall have a minimum font size of 10 points. The color of the label shall approximate coyote 498. The inscription legibility, label, and label attachment shall last the expected life of the cap. The label shall include the following information:

Identification Information:

COLD WEATHER CAP
CONTRACT NO.:
NSN:
FIBER CONTENT:
CONTRACTOR'S NAME:
SIZE:

3.3.2.4.2 Instruction label. The instruction label shall be in accordance with Type VI, Class 3 of MIL-DTL-32075. The color of the label shall approximate coyote 498. If available, a basic material supplier care label and hang tag may be used, but must contain the information listed below. The instruction label shall include the following information:

Instruction Information:

Cold Wash
Tumble dry low heat or air dry
Do Not Use Fabric Softeners
DO NOT BLEACH, DRY CLEAN, OR IRON

3.3.2.4.3 Combination size, identification, and instruction label. A combination label may be used in place of separate identification and instruction labels. The label shall be in accordance with type VI, class 14 of MIL-DTL-32075 when tested as specified in 4.5.1. The color of the label shall approximate coyote 498. The label shall be centered on the face side of the inner earflap piece according to marks on pattern.

3.3.2.4.4 Barcode label. Each cap shall have a barcode label/hangtag conforming to Type VIII, Class 17 of MIL-DTL-32075. The bar coding element shall be a 13 digit National Stock Number (NSN). There shall be a 12 digit Universal Product Code (UPC) number assigned for all NSNs by the contracting activity. The initials “UPC” must appear beneath the code. The barcode for NSN and UPC type shall be a medium to high density and shall be located so that it is completely visible on the cap when it is folded and/or packaged as specified and so it causes no damage to the cap.

3.4 Design. The cap shall have an outer shell, using basic material (see 3.3.1.1), composed of a three-panel crown and a short visor that can be worn in either the up or down position, with an inner earflap that lays flat against the forehead. The visor shall receive an additional topstitch at the joining seam through the inner earflap plies in order to hold the inner earflap in place at the forehead when the user dons the cap; two (2) 1/2 inch bartacks shall be sewn at both ends of the visor topstitch to secure the lining in place. The visor shall have interfacing and is finished with a quilt stitch pattern with five (5) parallel lines of stitching 1/4 ($\pm 1/16$) inches equidistance apart. The cap shall have full extension ear flaps that secure under the chin with hook and loop, and may also be worn with the ear flaps flipped up so that the hook and loop attaches at the crown of the head. When worn in this configuration, the inner ear flaps provide warmth to the user’s ears. The back of the cap shall have elastic positioned approximately 1/4 inch above the finished seam at the neck (see Figure 2) to allow a snug fit and comfort for the wearer. The 3/4 inch elastic shall be three inches long and sewn between the shell and liner fabric, and secured with two 3/4” vertical bartacks at each end according to marks on the pattern. The inside of the crown and earflaps are lined with insulation (see 3.3.1.2) for warmth and comfort. The lining fabric in the crown shall be permanently attached to the shell but construction shall allow for the two fabrics to be separated, except at the visor and inner earflap, in order to facilitate drying. Joining seams on the outer shell crown shall be towards the wearer, and all joining seams on the crown lining shall be away from the wearer.

3.4.1 Figures. [Figures 1-5](#) are furnished for informational purposes only. To the extent an inconsistency exists between the written specification and the figures, the written specification shall govern.

3.5 Patterns. Standard patterns, providing a seam allowance of 3/8 inch for all seams will be furnished by the Government (see 6.2). The Government patterns shall not be altered in any way, and shall only be used for cutting the contractor’s working patterns. The working patterns shall be identical to the Government patterns, except that additional notching, if needed to facilitate manufacture is permitted on the contractor’s working pattern. Minor modifications on the working patterns are permitted where necessary to accommodate the manufacturer’s processes and the use of automated equipment provided the modifications do not alter the dimensional, serviceability, or appearance requirements cited in this document or those governed by the Government patterns.

3.5.1 Pattern parts. Cap parts shall be cut from the materials specified and in accordance with the pattern parts listed in table III.

TABLE III. List of pattern parts.

Material	Pattern Part	Piece Name	Cut Parts
A: Basic material	Center Crown	CENTER_CROWN	1
	Side Crown	SIDE_CROWN	2
	Outer Earflap	OUTER_EARFLAP	1
	Visor	VISOR	2
	Front Inner Earflap	FRONT_INNER_EARFLAP	1
	Back Inner Visor	BACK_INNER_VISOR	1
B: Lining	Center Crown Lining	CENTER_CROWN_LINING	1
	Side Crown Lining	SIDE_CROWN_LINING	2
	Outer Earflap Lining	OUTER_EARFLAP_LINING	1
C: Interfacing	Outer Visor Interfacing	OUTER_VISOR_INTERFACING	1
D: Elastic	Elastic	ELASTIC	1
E/F: Fastener Tape	Hook	HOOK	1
	Loop	LOOP	1

3.6 Construction. The following specifics will provide caps with uniform appearance, comfort and durability for use during all operations where the cap is prescribed. End item construction and appearance shall conform to the requirements and figures provided and the finished measurements cited (see 3.7) to maintain end item configuration.

3.6.1 Seams and stitching. The seams and stitching used shall be consistent, exhibit a uniform appearance, and conform to ASTM D6193 and the requirements for the location, stitch, and seam types listed in [table IV](#). Seam allowances shall be maintained with seams sewn so that no raw edges, runoffs, twists, pleats, puckers, or open seams result. All seams shall start and finish evenly and edges shall not unravel. Edges may be turned-in, turned-under, or serged to prevent raveling. Thread tension shall be maintained so that there is no tight, loose, or unbalanced stitching. The backside of all seams, inside of cap, shall be flat with no protruding seam allowance or raw edges that could create irritation or discomfort to the wearer. Unless otherwise specified, the stitches per inch shall be 10-14 for all seams.

TABLE IV. Seams and stitching.

Seaming Areas and Operations	Stitch Type	Seam Type
Join outer shell crown	301	SSa-1
Topstitch outer shell crown	301	LSb-1
Join outer earflap and outer earflap lining	301	SSe-2
Superimpose an elastic tunnel on the joined outer earflap by applying two parallel rows of stitching 4 inches long spaced 1 inch apart according to the pattern	301	SSv-2
Attach elastic and secure with $\frac{3}{4}$ inch vertical bartacks according to the pattern	Bartack	--
Attach hook and loop to earflaps- all plies	301	LSbj-1
Join front and back inner earflap	301	SSa-1
Topstich front and back inner earflap joining seam	301	LSb-1
Join crown lining	301	SSa-1
Join front and back inner earflap to crown lining	301	SSe-2
Insert interfacing and join visor	301	SSa-1
Visor parallel topstitching	301	SSv-5
Join outer crown to assembled pieces (inner and outer earflaps and visor)	301	SSa-1
Join crown lining to assembled cap leaving a 2-inch gap along center crown seam, flip, and stitch gap closed.	301	SSc-1
Attach label to inner earflap-all plies	301	LSbj-1
Add topstitch across the top of the visor through all plies	301	LSe-1
Add two horizontal $\frac{1}{2}$ inch bartacks at each end of visor topstitching	Bartack	--

3.6.2 Tacking and backstitching. Ends of seams and rows of stitching with 301 type stitch, when not caught in other seams or stitching, shall be securely backstitched not less than $\frac{1}{4}$ inch. Thread breaks (all stitch types) shall be secured by stitching back of the break not less than $\frac{1}{2}$ inch.

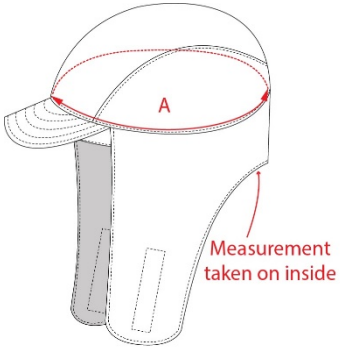
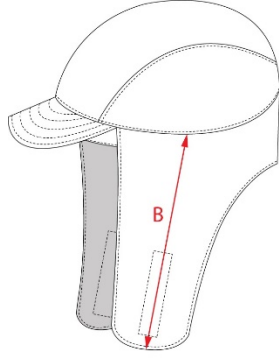
3.6.2.1 Bartacks. Bartacks for elastic attachment shall be $\frac{3}{4}$ inch in length, placed vertically, with 36 – 42 stitches per tack. Bartacks to secure lining at visor topstitching shall be $\frac{1}{2}$ inch in length, placed horizontally, with 30-36 stitches per tack. There shall be four (4) bartacks per garment (see table IV).

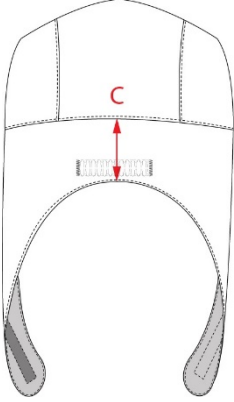
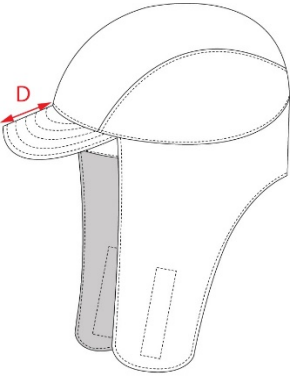
3.7 Finished dimensions. The finished cap shall conform to the measurements listed in [table V](#) as defined in [table VI](#). All measurements shall be taken in accordance with 4.5.5 with the cap laid flat. Extended flap lengths shall not be uneven by more than $\frac{1}{2}$ inch.

TABLE V. Finished measurements (inches).

	Inside Circumference (A)	Earflap Length (B)	Earflap Width (C)	Visor Width (D)
Small	23 ¼	10 ¾	3 ¼	1 ¾
Medium	24	11	3 ½	1 ¾
Large	24 ¾	11 ¼	3 ¾	1 ¾
X-Large	25 ½	11 ½	4	1 ¾
Tolerance	± 1/8	± 1/8	± 1/8	± 1/8

TABLE VI. Methods of measure.

Measurement	Method	Layout
A - Inside Circumference	Circumference at the crown joining seam, inside the cap.	
B - Outer Earflap Length	Measurement straight from bottom of earflap at center to crown joining seam.	

C - Outer Earflap Width	Measurement at center back from finished edge to crown joining seam at crown center.	
D - Visor Width	Measurement straight from finished edge at visor center to crown joining seam.	

3.8 End item insulation. The insulation, expressed in terms of clo value, shall be a minimum of 1.25 when tested as specified in 4.5.2.

3.9 Toxicity. The cap shall not present a health hazard and shall show compatibility with prolonged direct skin contact when tested as specified in 4.5.6. Chemicals recognized by the Environmental Protection Agency (EPA) as human carcinogens shall not be used.

3.10 Workmanship. The finished cap shall be free from loose thread, foreign matter, and irregular defects that can adversely affect usage or durability. The finished cap shall conform to the quality of product established by this document, be uniform, and be free from defects specified in 4.5.4 and those defects that adversely affect form, fit, or function. Defects shall not exceed the Acceptance Quality Limits (AQLs) (see 6.2) and shall not adversely affect the serviceability, appearance, and uniformity of the product.

4. VERIFICATION

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

- a. First article inspection (see 3.1.1 and 4.3).
- b. Conformance inspection (see 3.1.2 and 4.4).

4.2 Inspection conditions. Unless otherwise specified, excluded, amended, modified or qualified in this specification or applicable procurement documents (see 6.2), all inspections shall be performed in accordance with all the requirements of referenced documents.

4.3 First article inspection. A first article, in accordance with 3.1.1 shall be examined in accordance with 4.5.1 through 4.5.6 for compliance with design, configuration, workmanship, dimensional requirements, and testing as specified in this document (see 6.2).

4.3.1 First article samples and acceptance criteria. Unless otherwise specified in the contract (see 6.2), first article samples shall be provided. The sample size shall be as specified in the contract (see 6.2). The sample unit shall be one cap and the lot size shall be expressed in units of caps. The presence of excessive defects exceeding AQLs (see 6.2) or failure to pass any test shall be cause for rejection of the first article.

4.4 Conformance inspection. Unless otherwise specified in the contract (see 6.2), conformance inspection, in accordance with 3.1.2, shall consist of the examinations and tests as specified in 4.5.1 through 4.5.6.

4.4.1 Material and component sampling and acceptance criteria. Unless otherwise specified in subsidiary specifications, referenced documents, or procurement documents (see 6.2), sampling shall be in accordance with [table VII](#). The lot shall be unacceptable if one or more sample units fail to meet any test requirement specified. All requirements are applicable to the sample unit. For material testing, the sample unit shall be 5 continuous yards full width of finished cloth for all physical and chemical tests.

TABLE VII. Material sampling.

Lot Size	Sample Size (Sample Unit)
800 or less	2
801 through 22,000	3
22,001 and over	5

4.4.2 End item sampling and acceptance criteria. Unless otherwise specified in the contract (see 6.2) sampling for inspection shall be performed conforming to ANSI/ASQ Z1.4. The sample unit shall be one cap and the lot shall be expressed in units of caps. The presence of excessive defects (see 6.2) or failure of any testing as specified (see 6.2) shall be cause for rejection of the lot.

4.5 Inspection methods.

4.5.1 Component and material examinations and tests. In accordance with 4.1, components and materials shall be inspected and tested in accordance with all the requirements of this specification and those referenced specifications and standards unless otherwise excluded, amended, or modified in this specification or applicable procurement documents (see 6.2 and 6.7). In addition to testing provisions specified in referenced documents, materials and components shall be examined and tested in accordance with [table VIII](#) through [table XII](#). All requirements are applicable to the sample unit. Unless otherwise specified (see 6.2), materials shall be conditioned and tested in accordance with ASTM D1776/D1776M. All requirements are applicable to the sample unit.

TABLE VIII. Component verification. 1/

Material	Requirement	Verification
Thread	3.3.2.1	A-A-52095 or A-A-50199
Hook and loop	3.3.2.2	A-A-55126
Elastic	3.3.2.3	MIL-W-5664
Interfacing	3.3.1.3	ASTM D3776/D3776M
Combination identification and instruction label	3.3.2.4	MIL-DTL-32075
Barcode label tag	3.3.2.4	MIL-DTL-32075

1/ See 6.8

TABLE IX. Basic material verification.

Material Characteristic	Requirement	Test Method
Construction	Table I	Visual
Fiber content	Table I	AATCC TM20A
Weight	Table I	ASTM D3776/D3776M
Break strength	Table I	ASTM D5034
Tear Strength	Table I	ASTM D1424
Water Repellency	Table I	AATCC TM22
Colorfastness		
Laundering (3 cycles)	Table I	AATCC TM61, option 2A, grade polyester only
Crocking		
Wet	Table I	AATCC TM8
Dry	Table I	AATCC TM8
Light, Xenon	Table I	AATCC TM16.3, option 3 (85 kJ)
Dimensional stability (3 cycles)		
Warp	Table I	AATCC TM135, 3 cycles, (1) III, (A) ii
Fill	Table I	AATCC TM135, 3 cycles, (1) III, (A) ii
Pilling		
Initial	Table I	ASTM D3512/D3512M
After laundering (3 cycles)	Table I	AATCC TM135, (1) III, (A) ii; ASTM D3512/D3512M
Thickness	Table I	ASTM D1777
Visual shade matching	Table I	See 4.5.1.2

TABLE X. Insulation verification.

Material Characteristic	Requirement	Test Method
Construction	Table II	Visual
Fiber content	Table II	AATCC TM20A
Weight	Table II	ASTM D3776/D3776M
Air permeability	Table II	ASTM D737
Burst Strength	Table II	ASTM D3787
Thickness	Table II	ATSM D1777
MVTR	Table II	ASTM E96
Absorbency	Table II	AATCC TM79
Dry Time	Table II	4.5.1.1
Fabric Stretch		
Courses	Table II	ASTM D2594 (Loose Fit)
Wales	Table II	ASTM D2594 (Loose Fit)
Dimensional stability (3 cycles)		
Courses	Table II	AATCC TM135, 3 cycles, (1) III, (A) ii
Wales	Table II	AATCC TM135, 3 cycles, (1) III, (A) ii
Visual shade matching	Table II	See 4.5.1.2

4.5.1.1 Drying Time. Dry time test shall be run in standard textile conditions, 65 (± 2) % RH and 70 (± 2) °F on three (3) specimens. The fabric samples/specimens and blotting paper shall be conditioned at standard textile conditions for a minimum of 4 hours. The weight of the conditioned specimen shall be measured using a laboratory balance, accurate to 0.01g. A wire mesh kitchen/bathroom sink strainer may be used by placing it on the weight pan of the lab balance in an inverted manner and taring its weight before the measurement of any specimen weight. After weighing the samples/specimens, place 100 ml of distilled water into a 250 ml glass beaker. Submerge the specimen in the beaker of water for 30 minutes, make certain that the specimen is completely submerged to insure complete wetting. Remove the specimen and sandwich it between two pieces of unused blotting paper. Pass the specimen/blotting paper sandwich through a motor driven wringer (see 6.4.5). With a dead weight load of 27.2 (± 0.5) kg (60 (± 1) lbs and speed of 1 inch per second), immediately place specimen on the balance with top door of the balance open, side doors closed and record the wet weight to the nearest 0.01 grams. Manually monitor weight at set intervals until dry or use an automated balance with capability to weigh specimen until dry. Record time to dry (t). Repeat for remaining specimens. Average 3 specimens.

4.5.1.2 Visual shade matching. The color and appearance of the cap shall match the standard sample when viewed using the AATCC EP 9, Option C (see 6.7), with sources simulating artificial daylight D₇₅ illuminant with a color temperature of 7500K (± 200) illumination of 100 (± 20) foot candles, and shall be a good match to the standard sample under incandescent A illuminant with a color temperature of 2856K (± 200).

4.5.2 End item testing. Caps shall be tested for the characteristics specified in table XI. Samples that do not meet the requirements specified shall be considered failures.

TABLE XI. End item verification.

Material Characteristic	Material Requirement	Test Method
Insulation	See 3.8	4.5.2.1

4.5.2.1 Thermal insulation test. Three separate samples of the cap shall be evaluated and the average value is reported. R values can be converted to the more familiar clo unit to allow ranking order of standard for procurement purposes. Test size shall be size Large. A life-sized biophysical model of the human head that measures localized and total thermal resistance shall be used. Insulation values for the total head model and its 7 individual regions are calculated by an internal program during 30 minutes of steady state data collection. The ambient temperature shall be maintained at 5.0 (± 0.5)°C and the surface of the head model is controlled at 30 °C. The wind speed shall be maintained at 2-3 meters/sec and turbulent. Total thermal resistance (R) to heat exchange is calculated in the test conditions in the table below and using:

$R = (SA \cdot \Delta T) / P$, where:

R is the thermal resistance, m² °C/Watt

SA = total surface area of regional segments, m²

Delta T = temperature gradient between the head model surface and ambient air temperature, in °C.

P = Total power input, Watts.

If required, caps submitted will be tested by the Government. Testing at alternate facilities shall require side-by-side comparison due to chamber wind speed differences that cannot be controlled that will affect the total measured values.

4.5.3 In-process examination. Visual and dimensional examinations shall be made at any point or during any phase of the manufacturing process to determine whether construction details, which cannot be examined in the finished product, are in accordance with the requirements specified in section 3. Materials and components which contain defects and damages, as defined in the visual examination of 4.5.3, shall be removed from production. Any in-process nonconformance remaining in the finished cap shall be classified as a defect in accordance with the visual examination of 4.5.4.

4.5.4 Visual examination. The cap shall be examined for defects in color, shade, design, material, construction, workmanship, and markings, and the defects shall be classified in accordance with the list of defects specified in [table XII](#). The inspection conditions and the AQLs shall be as specified (see 6.2).

TABLE XII. Visual examination.

Examination	Defect	Classification	
		Major	Minor
Workmanship	Component part omitted, distorted, full, tight, or twisted; any part of end item caught in any unrelated stitching; the edge of any component part required to be forced out having folds of more than 1/8 inch.	101	
Material	Hole, cut, tear, smash, burn, drill hole, run, needle chew, visible mend, thin place, or misweave affecting appearance or serviceability.	102	
Shade	a. Shade variation within a part or between parts. Thread color not as specified.	103	
	b. Dye streak; color not as specified	104	
Seams and stitching	a. Seams puckered, distorted, pleated, wavy, or twisted; edge or raised stitching sewn too close to edge, resulting in damage to cloth.		201
	b. Irregular or open seam; raw edge affecting appearance or serviceability	105	
	c. Seam, seam allowance, or stitch type not as specified		202
	d. Loose or tight stitch tension; broken or missing thread or stitch		203
	e. Stitches or tack missing or not as specified	106	
Cleanliness	Spot, stain, excessive thread ends not trimmed or removed, odor.		204
Labels	a. Label omitted, incorrect type, size, or configuration; illegible, inaccurate, or not attached as specified	107	
	b. Barcodes omitted or not readable by scanner; human-readable interpretation (HRI) omitted or illegible		205
	c. Barcode not visible on folded, packaged item		206
	d. Barcode attachment causes damage to the item	108	
Packaging	Any cap not packaged in accordance with the contract or purchase order.		207

4.5.5 Dimensional examination. The cap shall be examined for conformance to the dimensions specified in [table V](#) as defined in [table VI](#). Any measurement deviating from the dimensions and tolerances specified shall be scored as a measurement defect. The inspection conditions and the AQLs shall be as specified in the contract or order (see 6.2). Place cap down on crown and use an appropriate cap measuring device (see 6.9) for measuring headwear circumference.

4.5.6 Toxicity assessment. An acute dermal irritation study and a skin sensitization study shall be conducted. When the results of the studies indicate the cap 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 3.9) can be demonstrated with historical data, then toxicity testing may not be required.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service 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 cap is intended for use with the cold weather clothing system worn by personnel of the USMC.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number and date of this specification.
- b. Sizes required (see 1.1).
- c. The specific issue of individual documents referenced (see 2.2).
- d. When first article is required (see 3.1.1, 4.3, and 6.3).
- e. When conformance inspection is required (see 3.1.2 and 4.4).
- f. Applicable Government patterns and reference standards, including revisions.
- g. Barcode/label tag location (see 3.3.2.2.4).
- h. When toxicity testing is required
- j. First article sampling and acceptance criteria (see 4.3.1).
- k. Component, material and end-item sampling and acceptance criteria (see 4.4.1).
- l. Inspection conditions (see 4.2).
- m. Packaging requirements (see 5.1).

6.3 First article. When first article inspection (see 6.2) is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be first article sample, a first production item, or a standard production item from the contractor's current inventory, and the number of items to be tested as specified in 4.3. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for pending contract. Bidders should not alternate submit bids unless specifically requested to do so in the solicitation.

6.4 Suggested sources.

6.4.1 Basic material. Brookwood style Shawnee S11764 has been shown to meet the requirements of this specification. A known source of this material is:

Brookwood Companies Incorporated
 485 Madison Ave, Suite 500
 New York, NY 10022
 (212) 551-0100

6.4.2 Insulation. Milliken & Company style 4060M has been shown to meet the requirements of this specification. A known source of insulation material is:

Milliken & Company
920 Milliken Road M-159
Spartanburg, SC 29304

6.4.3 Interfacing. Harodite Industries style Instro-475 has been shown to meet the requirements of this specification. A known source of interfacing is:

Harodite Industries, Inc.
66 South St.
Taunton, MA 02780

6.4.4 Labels. Known sources of labels meeting the requirements of this specification are:

Universal Tag
36 Hall Rd. P.O. Box 1518
Dudley, MA 01571-1518

(508) 949-2411

www.universaltag.com

Creative Labels, Inc.
6650 Silacci Way
Gilroy, CA 95020

(408) 842-0376

www.creativelabels.com

6.4.5 Low Profile Hook and Loop. Velcro® Brand High Technology Hook (HTH) 745 and Low Profile Knit Loop 3610, or equivalent, has been demonstrated to meet the requirements of this specification. Known sources of this hook and loop fastener are:

iTape Store
855 Jerusalem Road
Scotch Plains, NJ 07076
(888) 634-1908

<https://www.itapestore.com/>

Gleicher Manufacturing Corporation
851 Jerusalem Road
Scotch Plains, NJ 07076
(888) 818-5798

<https://www.gleicher.com/>

6.4.6 Elastic. A known source of ¾ inch nylon elastic is:

North East Knitting, Inc.
179 Conan Street
Pawtucket, RI 02860
(401) 724-3840

<http://nekinc.com>

6.4.7 Powered wringer. SDL Atlas Model D394 Laboratory Wringer, or equivalent, has been demonstrated to meet the requirements of this specification. A known source of this equipment is:

SDL Atlas
3934 Airway Drive
Rock Hill SC 29732
(803) 329 2110

<https://sdlatlas.com/>

6.5 NSNs. For informational purposes only, an NSN that corresponds to this specification is listed in [table XIII](#). [Table XIII](#) is not intended to be a comprehensive list of all NSNs associated with this specification.

TABLE XIII. NSN.

NSN	Size
XXXX-XX-XXX-XXXX	Medium

6.6 Supersession data. This document supersedes MC/PD 06 2011 SYSCOM, dated 20 October 2011, in its entirety.

6.7 Visual shade matching. In 2019, Option A of AATCC EP9, Visual Assessment of Color Difference of Textiles was changed to Option C. NOTE: In case of confusion, the viewing geometry should be “The specimen plane and illumination source will be parallel to each other and aligned so that the light flux is incident at the center of the specimen plane, which is set at a 35 (± 5°) angle relative to the horizontal. The observer will view the specimens at a 90° angle, relative to the plane of the specimens”.

6.8 Certificates of compliance. The contracting activity may select to accept a certificate of compliance for selected requirements. Manufacturers should consult with the contracting activity prior to using certificates of compliance to meet requirements.

6.9 Circumference measuring device. A suitable circumference measuring device must perform the two critical functions of the measuring device: 1) maintain a uniform diameter and 2) provide repeatable measurements. Several “scissor type hat calipers” have demonstrated this capability. However, any measuring device that provides these two critical functions is appropriate.

6.10 Subject term (key word) listing.

Ear flaps
Insulation

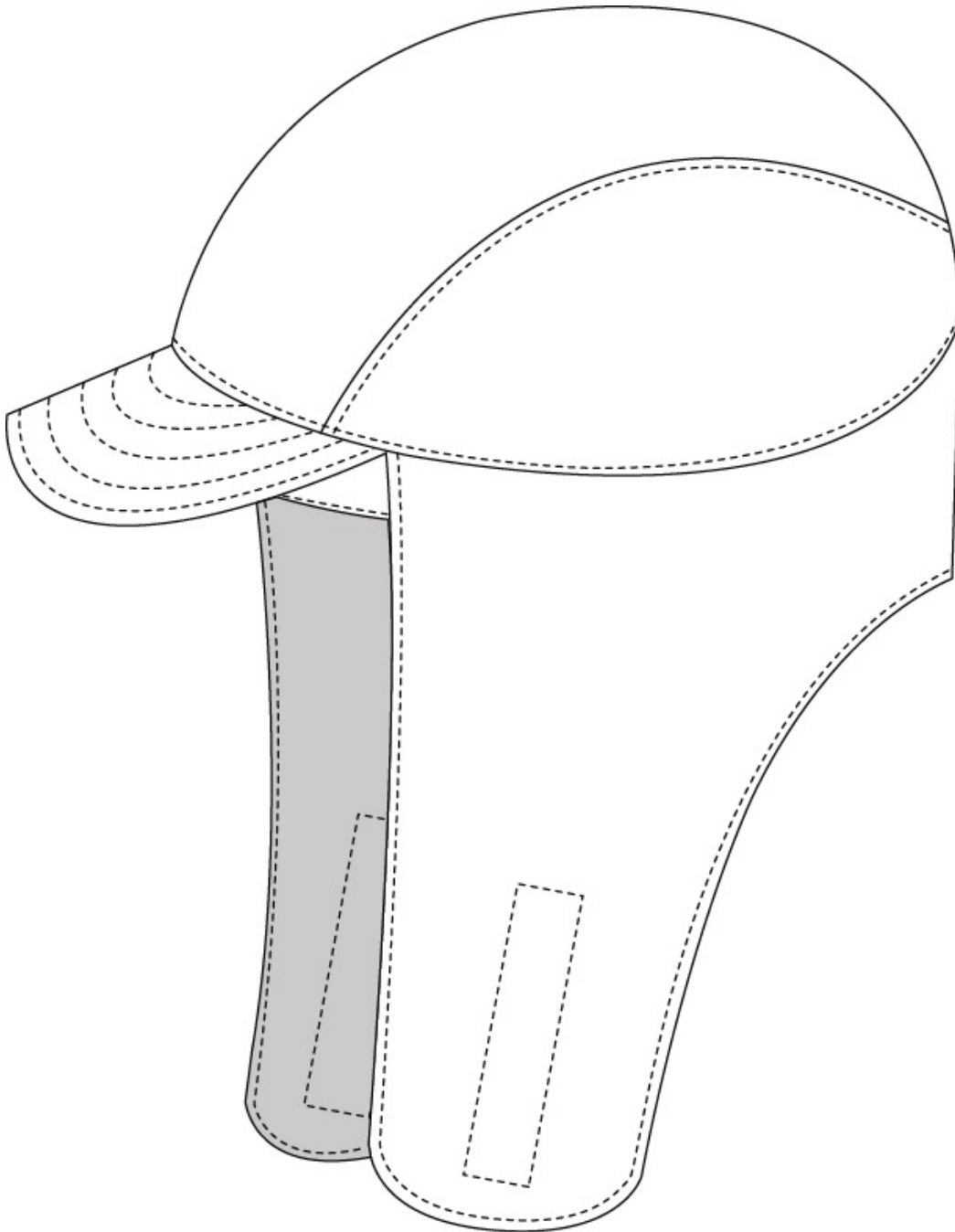


FIGURE 1. Outside - Side View.

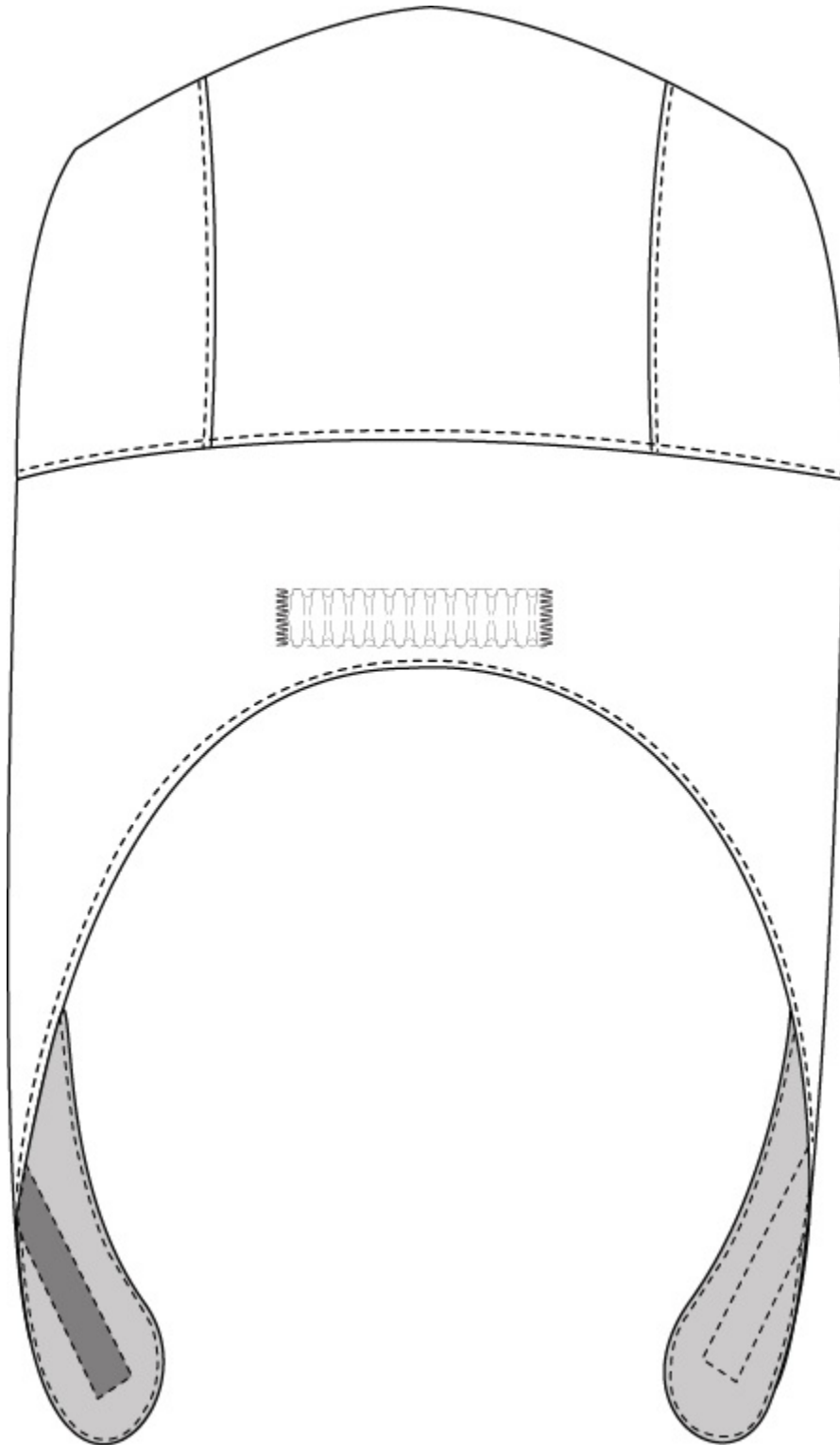


FIGURE 2. Outside - Back View.

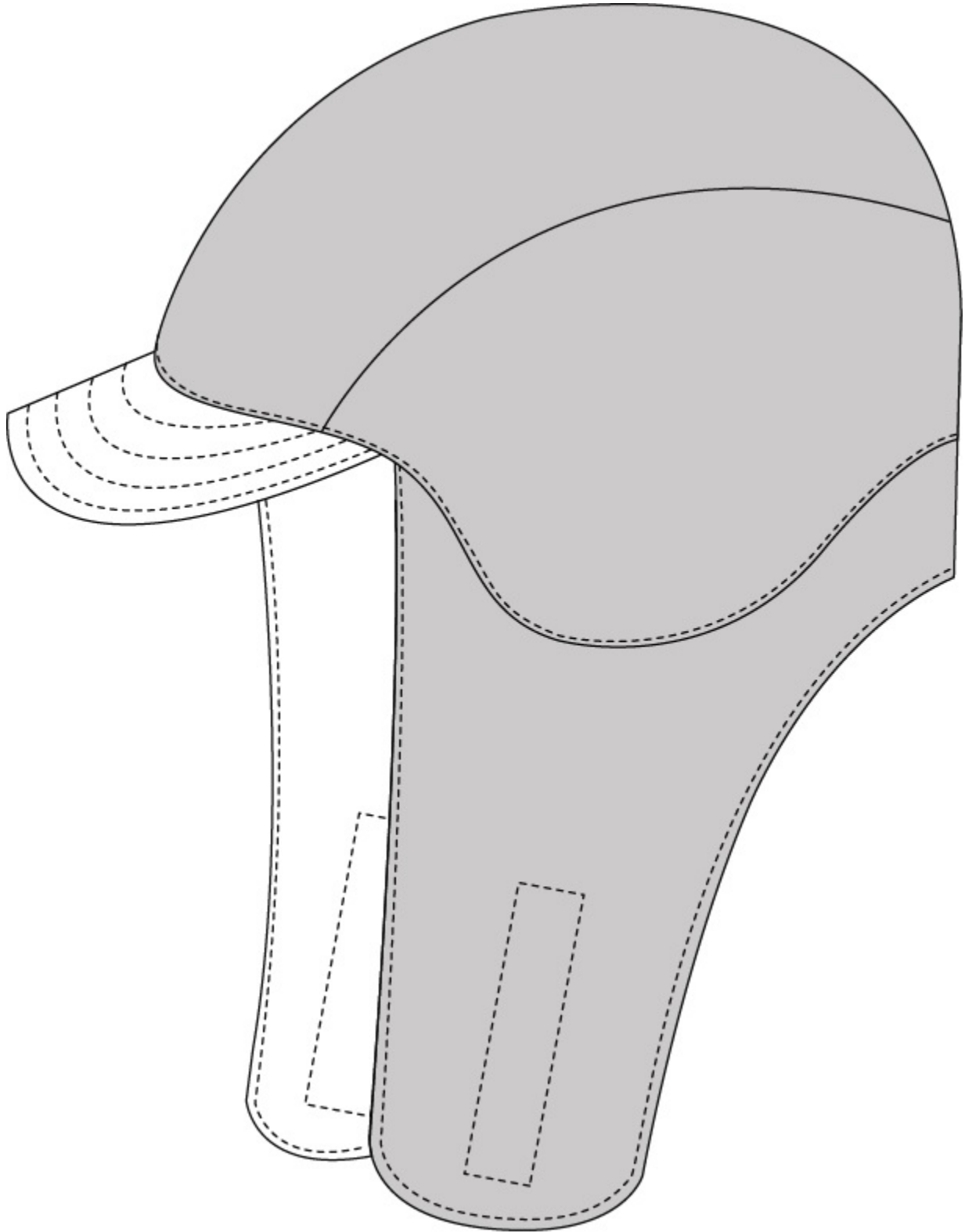


FIGURE 3. Inside - Side View.

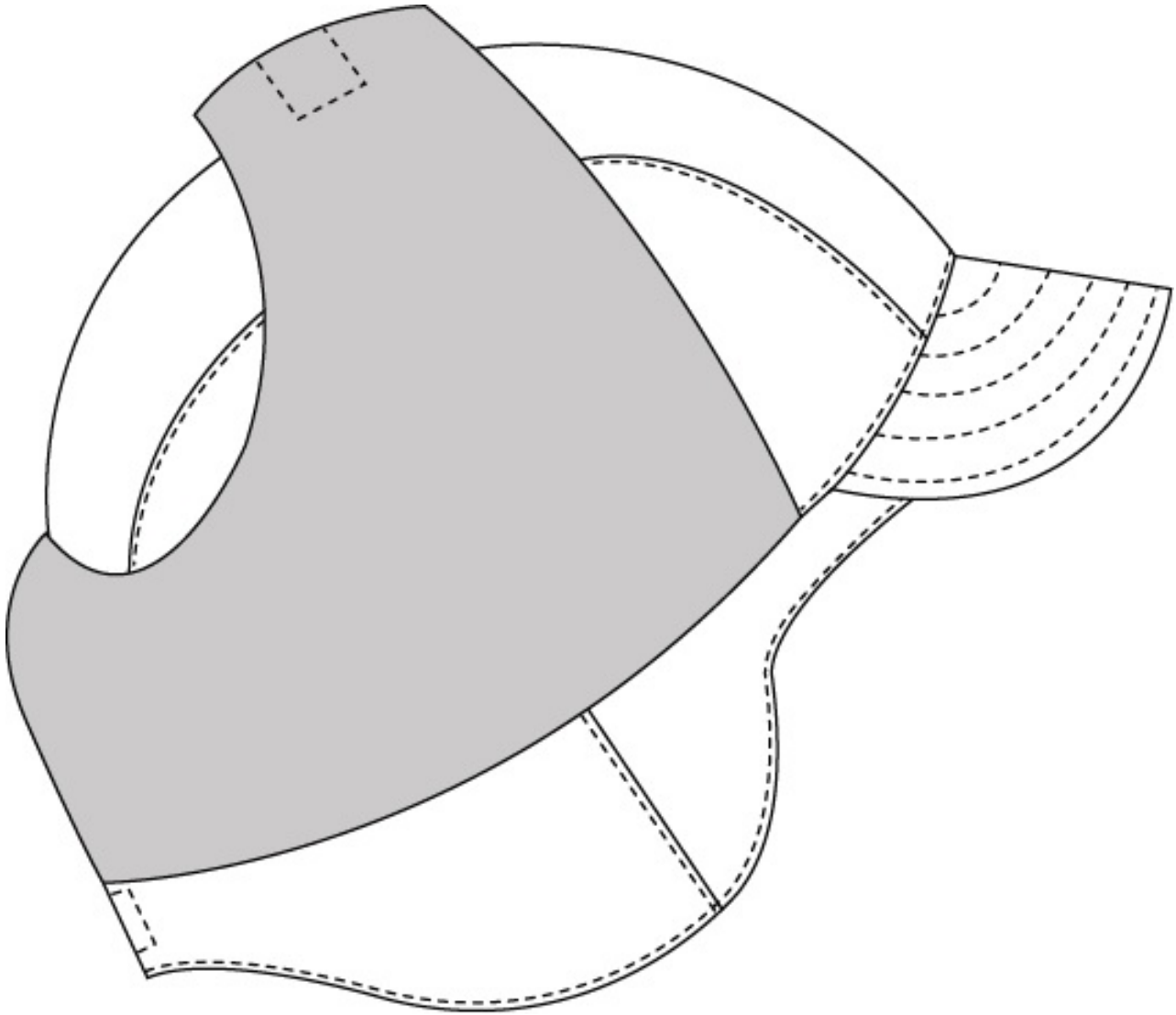


FIGURE 4. Outside - Side View (Flaps Connected).

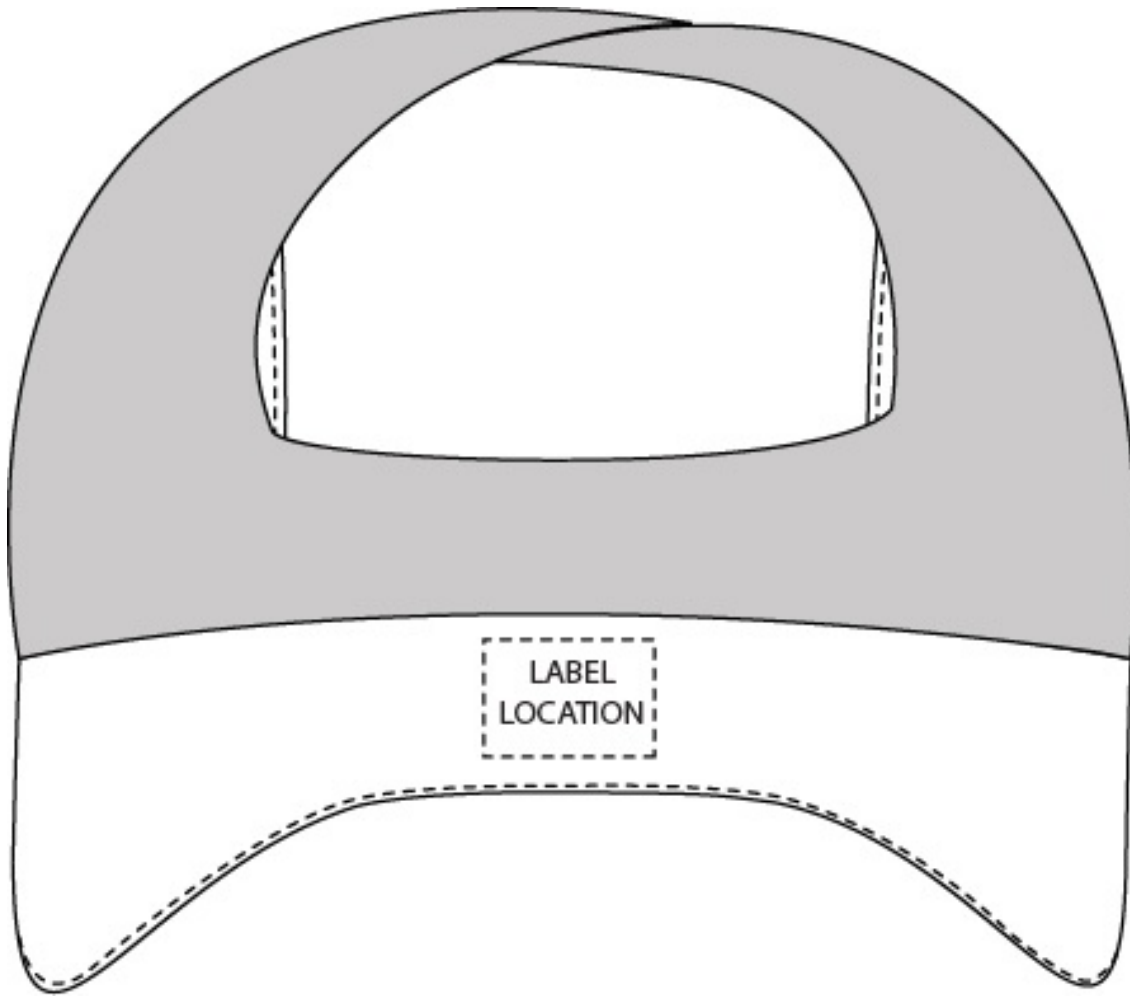


FIGURE 5. Inside - Back View.

CONCLUDING MATERIAL

Custodians:
Navy – MC

Preparing activity:
Navy – MC

Review activities:
Army – AV, MI
Navy – CG1, NU
Air Force – 03, 70
DLA – CT

(Project XXXX-XXXX-XXX)

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 the ASSIST Online database at <https://assist.dla.mil>.