

INCH - POUND

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PURCHASE DESCRIPTION

CAP, BOONIE, WORKING, U.S. NAVY, DESERT AND WOODLAND

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

1. SCOPE

1.1 Scope. This document covers the requirements for the US Navy working uniform boonie cap in desert and woodland camouflage.

1.2 Classification. The cap is available in the following types and sizes.

Type I – See 6.6

Type II–Desert camouflage NWU II

Type III –Woodland camouflage NWU III

Schedule of sizes

XX-Small

Medium

X-Small

Large

Small

X-Large

DISTRIBUTION STATEMENT: This notice is to advise you that the Government possesses intellectual property / trademark rights in the following Navy patterns and logos: Desert and Woodland digitized pattern; and the anchor / Constitution / eagle (ACE) logo (hereafter collectively referred to as “intellectual property”). The Government claims exclusive ownership of the above-mentioned intellectual property. Therefore, no entity other than the Government, or those contracted by or having obtained proper permission or licenses from the Government to do so, are permitted to produce, sell, or transfer in any manner any items (clothing or non-clothing) containing or copying, in whole or in part, the intellectual property. Doing so will be considered an infringement on the Government’s intellectual property rights and will be subject to legal action.

NCTRF CAGE CODE: 32263

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this purchase description. 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 cited in sections 3 and 4 of this document, 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 purchase document to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the solicitation or contract.

FEDERAL STANDARDS

FED-STD-4	Glossary of Fabric Imperfections
FED-STD-595/20180	Brown, Semi gloss
FED-STD-595/27041	Black, misc
FED-STD-595/34094	Green, Pigment

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-DTL- 32075 Label: For Clothing, Equipage, and Tentage,
(General Use)

COMMERCIAL ITEM DESCRIPTIONS

A-A-50128	Cloth, Interlining, Nonwoven
A-A-50199	Thread, Poly Core: Cotton- or Polyester-Covered
A-A-55093	Laces, Footwear

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or www.dodssp.daps.mil or from the Standardization Document Order Desk, 700 Robbins Ave. Philadelphia, PA 19111-9054.)

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 are those specified in the solicitation or contract.

SPECIAL OPERATIONS FORCE SURVIVAL, SUPPORT AND EQUIPMENT SYSTEMS

PM-SOF SSEC SPEC 07-11 Camouflage Print Performance Specification For AOR 1, AOR 2, NWU II And NWU III

(Copies of this document are available U. S Army, Research, Development and Engineering Command, PM-Special Operations Forces Survival, Support and Equipment Systems, Kansas Street, BLDG 4, Natick, MA 01760.) (See 6.3)

2.3 Non-Government publications. The following document(s) form a part of this purchase description to the extent specified herein. Unless otherwise specified, the issues of the documents are those cited in the solicitation (see 6.3).

AMERICAN SOCIETY FOR QUALITY (ASQ)

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

(Copies of this document are available online at <http://www.asq.org/> or from American Society for Quality, P.O. Box 3005, Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue, Milwaukee, WI 53203.)

ASTM INTERNATIONAL

ASTM-D-737	Standard Test Method for Air Permeability of Textile Fabrics
ASTM-D-1424	Strength of Cloth, Tearing: Falling Pendulum Method
ASTM-D-3775	Standard Test Method for Fabric Count of Woven Fabrics
ASTM-D-3776	Standards Test Methods for Mass Per Unit Area (Weight) of Fabric
ASTM-D-5034	Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)
ASTM-D-6193	Standard Practices for Stitches and Seams
ASTM-D-6775	Standard Test Method for Breaking Strength and Elongation of Textile Webbing, Tape and Braided Material

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

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

Evaluation Procedures

AATCC Evaluation Procedure 1, Gray Scale for Color Change
AATCC Evaluation Procedure 2, Gray Scale for Staining
AATCC Evaluation Procedure 8, Nine Step Chromatic Transference Scale Rating
AATCC Evaluation Procedure 9, Visual Assessment of Color Differences of Textiles

Test Methods

AATCC 8 Colorfastness to Crocking; AATCC Crockmeter Method
AATCC 15 Colorfastness to Perspiration
AATCC 16 Colorfastness to Light

AATCC 20 Fiber Analysis: Qualitative
AATCC 61 Colorfastness to Laundering, Home and Commercial: Accelerated
AATCC 81 pH of the Water-Extract from Bleached Textiles
AATCC 135 Dimensional Change of Fabric After Home Laundering

(Copies of these documents are available from the American Association of Textile Chemists and Colorists online at www.aatcc.org or AATCC, P.O. Box 12215, Research Triangle Park, NC 27709.)

OTHER PUBLICATIONS

Principles and Methods of Toxicology (fourth edition), A. Wallace Hayes (editor), pp 1057-1060, 2001

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

2.4 Order of precedence. In the event of a conflict between the text of this purchase description and the references cited herein, the text of this purchase description shall take precedence. Nothing in this purchase description, however, supersedes applicable laws and regulations unless a specified exemption has been obtained.

3. REQUIREMENTS

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

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 Design and construction.

3.3.1 Design. The boonie cap shall have a soft crown, with a 2-3/8 inch wide brim, a webbing band around the outside circumference of the cap side crowns and a chinstrap. The boonie cap shall have a front sweatband and top crown lining. The cap shall have vents on each side crown. (See Figure 1).

3.3.1.1 Brim. The brim shall have be interlined and finished with quilt stitch pattern with parallel lines of stitching. The brim shall finish with an upward curl and have a bound edge. The brim edge binding shall be bias-cut, not less than 1-1/8 inches wide, from the basic material. The binding on the top of the brim shall finish not more than 3/8 inch in width. The binding shall be attached so that the brim shall curve upward 3/4 to 1 inch. Ends of the binding shall start and finish at the center back of the cap and shall overlap not less than 1/2 inch.

3.3.1.2 Side Crown. The side crown shall be lined.

3.3.1.3 Top crown lining. The top crown shall be lined.

3.3.1.4 Webbing band. The webbing band shall be positioned on the side crown with the bottom edge of the webbing 1/2 (\pm 1/8) inch above the brim. Bartacks on the webbing shall be vertically positioned in the center of webbing, forming loops around the circumference of the cap. The loops shall be 1-1/4 (\pm 1/8) inch long and extend 1/8 (\pm 1/16) inch out from the sides of the cap. The ends of the webbing shall be caught in the center back seam of the side crowns.

3.3.1.5 Vents. Two vents shall be positioned on each side crown. Vents shall be attached in pre-punched holes through side crown and lining, as indicated by marks on pattern, with washers on inside of cap.

3.3.1.6 Chinstrap. The chinstrap lacings shall be attached to the inside facing of the cap. Chin strap ends shall be tacked to the underside of the brim at each side notch and caught in the brim joining seam. A barrel lock shall be attached to the lacing for adjustment. The lacings shall have an overhand knot below the barrel lock.

3.4 Figure. Figure 1 is furnished for informational purposes only. When inconsistencies exist between the written purchase description and the figures, the purchase description shall govern.

3.5 Material and components.

3.5.1 Basic Material. The basic material for the cap shall be a nylon/cotton twill cloth which shall meet the requirements listed in Table I when tested as specified in 4.3.2.1. The cloth shall be dyed a ground shade with a printed Anchor, Constitution and Eagle (ACE) logo and shall be printed in accordance with PM-SOF SSESS SPEC 07-11 except the authorized testing facility shall be the DLA Product Testing Center – Analytical (see 6.7). The cloth shall have no functional finishes. The prints shall be as follows:

Boonie Cap Type	Basic Material
Type II	Type II Desert camouflage NWU II
Type III	Type III Woodland camouflage NWU III

3.5.1.1 Nylon. The nylon fiber shall be first quality, high tenacity, semi-dull staple and meet the requirements listed in Table I when tested in specified in 4.3.2.1. It shall have a nominal cut length of 1-1/2 inches and a round cross-section. The use of any form of nylon waste is prohibited, such as undrawn fiber, mixtures of deniers, lusters or cross sections, and waste from any stage of fiber production: whether drawn, undrawn, or mixed or garnetted fiber.

TABLE I. Basic material physical requirements

Characteristic	Requirement
Weight (oz. per square yard)(min)	7.0
Fiber Identification Nylon, denier Cotton	2.25 - 2.5 Carded
Fiber Content ($\pm 5\%$) Nylon content Cotton content	50% Nylon 50% Cotton
Yarn Ply Warp Fill	Singles Singles
Yarns per inch (min) Warp Fill	86 54
pH	5.0 - 8.5
Colorfastness (min)	
Light (after 40 hrs or 170 KJ)	3
Laundering (after 4 cycles)	3-4
Crocking (min) All colors except Green(518) & Black	4
Green(518) & Black	3.5
Perspiration (acid & alkaline)	4
Breaking Strength (lbs.) (min.) Warp Fill	200 125
Tear Strength (lbs.) (min.) Warp Fill	11.0 8.0
Air Permeability ($\text{ft}^3/\text{min}/\text{ft}^2$) (max)	25.0

3.5.1.2 Weave. The weave shall be a 2/1 left-hand twill.

3.5.1.3 Dimensional stability. The shrinkage or elongation both in the warp and filling direction of the finished cloth shall be no greater than 3.5 percent for individual sample unit and not greater than 3.0 percent for the lot average when tested as specified in 4.3.2.1.

3.6 Color.

3.6.1 Desert camouflage NWU II with ACE logo, Type II. The colors for the Type II caps shall be desert camouflage, NWU II print in accordance with the NWU II requirements specified in PM-SOF SSEC SPEC 07-11.

3.6.2 Woodland camouflage NWU III with ACE logo, Type III. The colors for the Type III caps shall be woodland camouflage, NWU III print in accordance with the NWU III requirements specified in PM-SOF SSEC SPEC 07-11.

3.6.3 Visual shade matching. The color and appearance of the camouflage printed cloth and webbing shall conform to the requirements in PM-SOF SSEC SPEC 07-11, **except the testing for visual shade examination shall be in accordance with 4.3.2.2.**

3.7 Pattern execution. The pattern on the printed finished cloth and webbing shall match the standard sample in respect to design, colors and registration of the respective areas. The pattern repeat shall conform to PM-SOF SSEC SPEC 07-11.

3.8 Spectral reflectance. The spectral reflectance values for Type II Desert and Type III Woodland basic material and webbing shall conform to the requirements specified in PM-SOF SSEC SPEC 07-11.

3.9 Standard sample. The basic material shall match the NWU Type II Desert and NWU Type III Woodland standard sample for shade and appearance, and shall match the standard sample with respect to all characteristics for which the standard sample is referenced. Visual shade matching and spectral reflectance requirement shall be in accordance with PM-SOF SSEC SPEC 07-11 except the authorized testing facility shall be the DLA Product Testing Center – Analytical (see 6.7).

3.10 Interlining. The brim interlining shall be white or charcoal grey, nonwoven, continuous filament polyester cloth conforming to Type II of A-A-50128.

3.11 Components. The cap components shall conform to applicable specifications and standards when tested in accordance with 4.3.

3.11.1 Component colors. The color of the components for the cap shall be a good match to the color chip numbers specified in Table II and in accordance with FED-STD-595. (see 6.5)

TABLE II. Component Colors

Component	Ref. Para	Type II Cap Color Chip Number	Type III Cap Color Chip Number
Sweat band & Crown Liner	3.11.2	20180	20180
Chin strap	3.11.4	20180	34094
Barrel lock	3.11.5	20180	27041
Thread	3.11.6	20180	34094

3.11.2 Brushed tricot knit. The material for the sweatband and top crown lining shall be a100 % polyester brushed tricot knit. The fabric shall conform to the requirements in Table III. (see 6.4.1)

TABLE III. Brushed tricot knit requirements

Characteristic	Requirement
Weight (oz/yd ²)(± 0.5)	4.0
Colorfastness:	
Laundering (after 4 cycles)	3-4
Crocking (min)	3-4
Perspiration(acid & alkaline)	3-4
Light(after 40 hrs or 170 KJ)	3-4
Dimensional Stability (% avg)(max)	5

3.11.3. Webbing. The webbing band shall be printed. The webbing for the Type II caps shall conform to AOR1 and the webbing for Type III caps shall conform to AOR 2 in accordance with PM-SOF SSEC SPEC 07-11. The printed webbing shall be printed on both side and shall meet the performance requirements of Table IV. As an alternate for Type III caps, a jacquard woven webbing that meets the requirements of Table V shall be allowed. (See 6.4.2 and 6.4.3.)

TABLE IV. Printed webbing requirements

Characteristic	Requirement
Weight (oz/yd ²) (± .01)	.05
Width (±1/16 inch)	3/4
Thickness (inches) (± .010)	.040
Breaking Strength (lbs) (min)	650
Yarns/inch	
Binder (min)	14
Warp (min)	57
Colorfastness:	
Laundering (after 4 cycles)	3-4
Light(after 40 hrs or 170 KJ)	3-4

TABLE V. Woven webbing requirements

Characteristic	Requirement
Weight (lbs/cyds)	2.87
Width (± 1mm)	19
Thickness (inches)	.05
Breaking Strength (lbs) (min)	700
Yarns per inch (filling) (±.007)	42
Colorfastness:	
Laundering (after 4 cycles)	3-4
Light(after 40 hrs or 170 KJ)	3-4

3.11.4 Laces, nylon. The nylon lace for the chinstrap shall conform to Type II, class 2 of A-A-55093. The requirements for length and tipping shall not apply. The cut length for the chinstrap shall be 25 (\pm 1) inch and the ends shall be fused.

3.11.5 Barrel lock. The barrel lock for the chin strap shall be 1/2-inch x 3/8-inch toaster elliptical shape with a push-button, and have a 3-pound minimum holding strength on the nylon laces (3.11.4) at -40°F , 70°F and 140°F when tested in accordance with 4.4.4.1 and meet the infrared reflectance requirements in Table VI when tested as specified in 4.4.4.2. Barrel locks known to meet these requirements are ITW NEXUS part #350-2000-XXXX , or YKK's Cord Lock #69150 LC05SHDM GOV CORD STOPPER. (See 6.4.4)

TABLE VI. Barrel lock infrared spectral reflectance requirements.

Wavelengths (nanometers)	Minimum	Maximum
600	16	26
620	18	26
640	20	30
660	22	34
680	26	38
700	30	40
720	32	46
740	36	50
760	36	54
780	38	58
800	40	59
820	42	60
840	44	60
860	48	60

3.11.6 Thread. The thread for seaming and stitching the cap shall conform to Type I or II of A-A-50199. Thread for needle and bobbin (looper) shall be Tex size range from 36 to 45. As an alternate, Tex size range 31 to 35 may be used for the bobbin (looper) thread. All visible thread shall be the same shade.

3.11.7 Vents and washers. The vents for the side crown shall be a brass screen type with washers, have an antique brass finish for Type II caps and a black chemical finish for Type III caps. The washer shall have a 9/16 inch outside rim diameter, and a 7/16 inch outside diameter screening with a No. 50-70 mesh and a 40 to 60% opening (see 6.4.5).

3.12 Labels.

3.12.1 Personal/Identification/instruction label. Each cap shall have a combination size, identification, personal and care label. The size, identification, personal and care label shall conform to Type VI, classes 4 and 10 of MIL-DTL-32075. Label color shall be off white. Label information may be combined. The labels shall be centered in the top lining of the cap. The label shall be sewn on all four sides and the stitching shall not cap the printing or shall not show on outside of the cap. The inscription legibility, label, and label attachment shall last the expected life of the cap. The identification and care label shall include the following information, as applicable:

SIZE: SMALL (example)

NAME:

Cap, Boonie, NWU, Type II or Cap, Boonie, NWU, Type III (as applicable)
50% Cotton/50% Nylon

Contract #:

NSN:

Contractor Name:

Name of Manufacturer: (If other than contractor)

Initial Loose Fit required for continued Comfort

LAUNDERING INSTRUCTIONS:

Machine Wash, Warm Water (120°F Max), Permanent Press Cycle

or

Hand Wash Using Mild Detergent, Rinse Completely.

DO NOT USE CHLORINE BLEACH.

DO NOT STARCH.

Tumble Dry Medium Heat and Remove Immediately From Dryer.

To Drip Dry, Remove From Water and Place on Hanger.

DO NOT WRING OR TWIST.

Light ironing if needed.

DO NOT COMMERCIALY HOT PRESS.

or

FOLLOW SHIPBOARD FORMULA II

DO NOT REMOVE THIS LABEL

3.12.2 Bar code label. Each item shall be individually bar-coded with a paper tag for personal clothing items. The paper used for the tags shall be a standard bleached sulfate having a basis weight of 100 pounds with a smooth finish to accept thermal transfer and direct printing. The tags shall have a hole and be attached to the side of the cap near the ventilator washer by a fastener, clearly legible and readable by scanner. The bar code element shall be a 13 digit national stock number (NSN). There shall be a twelve digit Universal Product Code (UPC) assigned for all NSNs by the Government. The initials "UPC" shall appear beneath code. The bar codes for NSN and UPC shall be a medium to high

density and shall be located so that they are completely visible on the item when it is folded and or packaged as specified. The label’s location shall cause no damage to the item.

3.13 Patterns. The Government patterns, which show directional lines markings for proper assembly, shall not be altered in any way and are to be used as a guide for cutting contractor's working patterns. The working patterns shall be identical to the Government patterns except that additional notching to facilitate manufacture is permissible. Also, minor modifications are permitted where necessary to accommodate manufacturers’ processes and using automatic equipment. These modifications shall not alter the serviceability, or appearance requirements. 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 seam allowance for all other seams shall be furnished to the contractor. The pattern list is provided to insure that the pattern set is complete.

3.13.1 List of pattern parts. The component parts of the cap shall be cut from the materials as specified and in accordance with the number of parts specified in the pattern list.

Pattern Parts List

Material	Nomenclature	Pattern Abbreviation	Cut Number
Basic Material	Top Crown	PD1010-TOP_CROWN	1
	Side Crown	PD1010-SIDE_CROWN	1
	Top and Bottom Brim	PD1010-TP_BTM_BRM	2
	Side Crown Lining	PD1010-SIDE_CRWN_LN	1
Brushed Tricot	Top Crown Lining	PD1010-TOP_CRWN_LN	1
	Sweatband	PD1010-SWEATBAND	1
Interlining	Brim Interlining	PD1010-BRM_INTRLN	1

3.14 Stitches, Seams, and Stitching. All the stitching and seam types shall conform to ASTM- D-6193 and the stitch and seam types listed in Table VII. The backside of all seams (inside cap) shall be flat with no protruding seam allowance or raw edges to create irritation or discomfort. The seams shall be sewn with 10-14 stitches per inch for all outside visible stitching. Overedge or pre-hemming shall be 6-10 stitches per inch. All bartacks shall be 1/2 to 5/8 inch in length with 27-28 stitches per bartack. The finished cap shall have no exposed raw edges.

TABLE VII. Seam and Stitches

Seam Placement	Seam Type	Gage	Stitch Type
Center back seam, join side crown to top crown lining, make brim & quilt stitching on brim	SSa-1	3/16 to 1/4 inch apart for quilt stitching	301
Bind brim and raise stitch	BSg-2	1/16 to 3/32 inch from turned edge	301
Join sides to crown, & raise stitch	SSa-1 & LSq-2	1/4 inch seam and 1/16 to 3/32 inch	301

TABLE VII. Seam and Stitches (continued)

Join crown sides and sweatband to brim	LSq-2	3/8 inch	301
Attach labels	LSbj-1	1/16 to 3/32 inch from edges	301

3.14.1 Thread breaks and ends of seams. Thread breaks and ends of stitching not caught in another line of stitching shall be backstitched at least 1/2 inches. The ends of a continuous line of stitching (except label) shall be overlapped not less than 1/2 inch. The ends of the label stitching shall be overlapped not less than 3 stitches. Thread breaks (all stitch types) shall be secured by stitching back of break not less than 1/2 inch.

3.15 Shade and size marking. The component parts of the caps shall be marked or ticketed to ensure a uniform shade and size throughout the item. Any method may be used except those listed below. The use of ink pad numbering machine, rubber stamp, or pencil is allowed, provided the numbering does not show on the outside of the item and is covered by the seam allowance wherever possible.

1. Corrosive metal fastening devices
2. Sew-on shade tickets
3. Adhesive-type tickets which discolor or adhere to the material upon removal of tickets.

3.16 Finished measurements. The finished measurements shall conform to the measurements specified in Table VIII.

Table VIII. Finished measurements for cap boonie (inches)

Size	Inside circumference A	Crown height at center front B	Crown height at center back C	Brim width D
XX-Small	20-7/8	3-1/4	4	2-3/8
X-Small	21-5/8	3-1/4	4	2-3/8
Small	22-1/2	3-1/4	4	2-3/8
Medium	23-1/8	3-1/4	4	2-3/8
Large	23-7/8	3-1/4	4	2-3/8
X-Large	24-5/8	3-1/4	4	2-3/8
Tolerance	± 1/4	± 1/4	± 1/4	± 1/8

A. Inside Circumference. On inside of cap measure along brim and side crown lining attachment seam. Use an appropriate cap measuring device for measuring headwear circumference.

B. Crown height at center front. At center front measure from brim and side crown joining seam on outside.

C. Crown height at center back. At center back measure from brim and side crown joining seam on outside.

D. Brim width. On the top of the brim measure from side crown joining seam to outer bound edge of brim.

3.17 Disposal of rejected garments. All scraps, seconds, irregulars, extra material, and garments containing the basis material or webbing band, which are not utilized for government contracts or a purpose authorized in writing by the Government, shall be destroyed and not sold or transferred in any manner. This restriction applies to the prime contractor, as well as all subcontractors, and shall be incorporated into all agreements with subcontractors.

3.18 Toxicity. The finished cloth shall not present a health hazard and shall show compatibility with prolonged, direct skin contact when tested as specified in 4.4.5. Chemicals recognized by the Environmental Protection Agency (EPA) as human carcinogens shall not be used (see 6.2).

3.19 Workmanship. The finished cap shall be uniform in quality and free from defects that adversely affect form, fit, or function, and those specified in Table X.

4. VERIFICATION.

4.1 Classification of inspection. 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. The first article, submitted in accordance with 3.1, shall be inspected as specified in 4.4.2, 4.4.3 and 4.4.4 for compliance with design, construction, workmanship and dimensional requirements and tested in accordance with 4.3.2.1.

4.2.1 First article samples. Unless otherwise specified in the contract or purchase order (see 6.2), the number of samples for first article inspections shall be as specified in the procurement document. The sample unit shall be one cap and the lot size shall be expressed in units of caps.

4.3 Conformance inspection. Conformance inspection shall include the inspection and testing specified in 4.3.2 through 4.4.5. Requests for use of equivalent items shall be accompanied with test results and submitted to the procuring agency.

4.3.1 Conformance inspection samples. Sampling for inspection shall be performed in accordance with ANSI/ASQ Z1.4 except where otherwise indicated. The sample unit shall be one cap and the size shall be expressed in units of caps.

4.3.2 Component and material inspection. In accordance with 4.1 above, components and materials shall be tested in accordance with all the requirements of referenced specifications, drawings, and standards unless otherwise excluded, amended, modified, or qualified in this purchase description or applicable procurement documents.

4.3.2.1 Component testing. The components specified in Tables I, III, IV, and V shall be tested for the characteristics listed in Table IX and in accordance with the test methods cited.

TABLE IX. Requirements testing

Material	Characteristic	Requirement	Test Method
Basic Material	Weight	Table I	ASTM D 3776, opt. C
	Fiber Identification		
	Nylon	Table I & 3.5.1.1	AATCC 20A
	Cotton	Table I	
	Weave	3.5.1.2	Visual
	Fiber Content	Table I	AATCC 20A 1/
	Yarn Ply	Table I	Visual
	Yarns per inch	Table I	ASTM D 3775
	pH	Table I	AATCC 81
	Colorfastness:	Table I	
	Light		AATCC 16 Opt 1 or 3 2/
	Laundrying		AATCC 61 Test 3A 3/ 4/
	Cocking		AATCC 8 5/
	Perspiration		AATCC 15 3/ & 4/
	Breaking Strength	Table I	ASTM D 5034
	Tear Strength	Table I	ASTM D 1424
Air Permeability	Table I	ASTM D 737	
Dimensional Stability	3.5.1.3	AATCC 135 6/	
Sweatband & Top Crown Lining 1/	Weight	3.11.2	ASTM D3776
	Colorfastness:	3.11.2	
	Laundrying		AATCC 61,IIA
	Cocking		AATCC 8
Perspiration		AATCC 15	
Light		AATCC 16E	
Dimensional Stability	3.11.2	AATCC 135, IIIA	
Woven Webbing	Weight	3.11.3	ASTM-D-3776
	Width	3.11.3	
	Thickness	3.11.3	ASTM-D-1777
	Yarns per inch	3.11.3	ASTM-D-3775
	Breaking Strength	3.11.3	ASTM-D-6775
	Colorfastness:	3.11.3	
	Light		AATCC 16 Opt 1 or 3 2/
	Laundrying		AATCC 61 Test 3A 3/ 4/
	Weight	3.11.3	ASTM-D-3776
	Printed Webbing	Width	3.11.3
Thickness		3.11.3	ASTM-D-1777
Yarns per inch		3.11.3	ASTM-D-3775
Breaking Strength		3.11.3	ASTM-D-6775
Colorfastness:		3.11.3	
Light			AATCC 16 Opt 1 or 3 2/
Laundrying		AATCC 61 Test 3A 3/ 4/	

1/ The cotton content shall be calculated as follows:

Cotton content, percent = $R/S \times 100$

R = Weight of residual fibers

S = Weight of dry desized specimen

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

3/ Only the stain on the nylon and cotton fibers of the color transfer cloth shall be evaluated.

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

5/ Rated using the AATCC Nine-Step Chromatic Transference Scale Evaluation Procedure 8

6/ The dimensional stability shall be performed after 1 cycle. The cloth shall not be pressed after tumble drying prior to measurement.

4.3.2.2 Visual shade examination. Each roll in the lot shall be examined visually for shade match and finish. The finished cloth shall be viewed using AATCC Evaluation Procedure 9, Option A, under filtered tungsten lamps which approximate artificial daylight D75 illuminant having a correlated color temperature of $7500^{\circ} (\pm 200^{\circ})$ Kelvin, with illumination of $100 (\pm 20)$ foot candles and under incandescent A lamplight at $2856^{\circ} (\pm 200^{\circ})$ Kelvin to determine if it is a good match to the standard sample. A roll shall be unacceptable if it fails to meet the requirements for shade match and finish. The sample unit shall be a 4 inch by 20 inch swatch of cloth. A sample unit shall be drawn from each roll in the lot. The results shall be reported as pass or fail.

4.4 Inspection methods.

4.4.1 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 requirements specified in Section 3. Materials and components, which can be classified as having a defect in accordance with Table X, shall be removed from production.

4.4.2 Boonie cap dimensional examination. The boonie caps shall be examined for conformance to the dimensions specified in Table VIII. Any dimension not within the specified tolerance shall be classified as a major defect. The sample units shall be one cap.

4.4.3 Boonie cap visual examination. Boonie caps shall be examined for defects specified in Table X. The lot size shall be expressed in units of caps.

Table X. End item visual defects.

Examination	Defect	Classification	
		Major	Minor
Components and assembly	Any component caught in any unrelated operation of stitching	101	
	Any component part omitted or not as specified	102	
	Any exposed drill hole	103	
Basic Material 1/	Any hole, cut, or tear	104	
	Any broken or missing yarns or multiple floats	105	
	Any mend, darn, or patch	106	
	Any needle chew	107	
	Any run, thin place, dye streak, misweave, knot or slub affecting appearance or serviceability		201
	Any permanent fold, pleat, or crease affecting appearance or serviceability		202
	Not as specified	108	
	Not cut in accordance with furnished pattern	109	
Vents & Washer	Omitted, not specified type or color, broken, improperly clinched, bent or washer on outside of cap	110	
Brim	Wrinkled or puckered	111	
Webbing	Not properly attached; bartacks positioned less than 1-1/8 or more than 1-3/8 inches apart	112	
Chin Strap	Missing; ends of chin strap not fused, chin strap not properly functioning, barrel lock missing affecting closure	113	
Seams and stitching:			
Open seams <i>NOTE: A seam shall be classified as an open seam when one or more stitches joining a seam are broken, or when two or more consecutive skipped or runoff stitches occur.</i>	Up to and including 1/2-inch		203
	More than 1/2-inch	114	

Table X. End item visual defects. (continued)

Examination	Defect	Classification	
		Major	Minor
Raw edges NOTE: Raw edges not securely caught in stitching shall be classified as open seams.	More than 1/4-inch when securely caught in stitching		204
Seam and stitch type	Incorrect seam or stitch type	115	
	Seam pleated or excessively puckered, distorted, pleated, wavy, or twisted		205
Stitch tension	Tension loose, resulting in loose bobbin or top thread		206
	Tension excessively tight, resulting in puckering of material		207
Stitches per inch (all types of stitching)	One stitch less than minimum specified		208
	Two or more stitches less than minimum specified	116	
	One or more stitches in excess of maximum specified		209
Rows of stitching	Any row omitted	117	
Thread breaks, Skipped stitches or runoffs NOTE: On all types of stitching, thread breaks or two or more consecutive skipped or run-off stitches not overstitched shall be classified as open seams.	Overstitched less than 3/4 inch in each direction beyond the defective stitching area		210
Stitching ends	Ends of stitching not secured as specified		211
Bartacks	Missing, insecure, misplaced, not specified size, stitches loose or broken, backtack not serving intended purpose.	118	
Shade	Shade variation within a part or between parts	119	
	Any component not specified shade	120	

Table X. End item visual defects. (continued)

Cleanness	Spot, stain, excessive thread ends not trimmed or removed, odor, affecting appearance or serviceability	121	
Labels	Omitted, incorrect, illegible, not as specified, or not attached where specified		212
	Attachment causes damage to the item	122	
Barcode	Omitted or not readable by scanner		213
	Human readable interpretation (HRI) omitted		214
	Not visible on folded, packaged item		215
	Causes damage to the end item	123	

1/ As defined in FED STD 4B Glossary of Fabric Imperfections

4.4.4 End item testing.

4.4.4.1 Barrel lock test. Thread the barrel lock with nylon lacing tape (see 3.11.4) and load into tensile tester as specified in ASTM D5034. Pull cord up at 2 inches/minute. The average of three pull strength values less than 3 lbs is considered a failure. (see 3.11.5).

4.4.4.2 Infrared Reflectance. The spectral reflectance for the barrel locks shall be evaluated. Calibration of the instruments shall be traceable to the National Institute of Standards and Technology Perfect Reflecting Diffuser Calibration as stated in a Certificate of Traceability supplied by the instrument calibration standards. 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 viewed at an angle no greater than 10 degree from normal, with the specula 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 unless the size of the item dictates a smaller aperture is required. When the measured reflectance values at four or more wavelengths do not meet the limits specified in Table VI it shall constitute a test failure.

4.4.5 Toxicity. 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 (end item) 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 3.18) can be demonstrated with historical use data, 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 purchase order (see 6.2). When actual packaging of material is to be performed by DoD 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 activity within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department 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 boonie caps are for wear by male and female military personnel of the United States Navy as part of the working uniform.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number and date of this purchase description, including any amendments.
- b. Types and sizes required
- c. National stock numbers
- d. Applicable Government patterns
- e. Specific issue of individual documents referenced
- f. When first article inspection is required
- g. Number of first article inspection samples
- h. Name and address of the first inspection facility; and the name and address of the Government activity responsible for conducting the first article inspection program
- i. When toxicity testing is required.
- j. Inspection conditions
- k. Conformance inspection and acceptance quality limits.
- l. Packaging required

6.3 Contact information. The contact information to obtain PM-SOF SSEC SPEC 07-11 Camouflage Print Performance Specification for AOR 1, AOR 2, NWU II and NWU III is as follows:

U. S Army, Research, Development and Engineering Command
Charlotte Jennings, Project Officer
PM-Special Operations Forces Survival, Support and Equipment Systems
Kansas Street, BLDG 4
Natick, MA 01760
(508) 233-6298
Email: charlotte.a.jennings2@us.army.mil

6.4 Suggested Material Sources.

6.4.1 Brushed tricot knit. The lining material known to meet the requirements of paragraph 3.11.2 is available from may be obtained from Collins & Aikman, P.O. Box 208, Hwy 264 Alt., Farmville, NC 27828, (252) 753-6642/7400. ThermaStat® knit fabric

6.4.2 Printed Webbing. The printed webbing known to meet the requirements of paragraph 3.11.3 is available from Texcel, P.O. Box 201, and 18 Meeting Street, Cumberland, RI 02864

Style #63401 AOR1 (desert)

Style # 63401 AOR2 (woodland)

6.4.3 Woven Webbing. The woven webbing known to meet the requirements of paragraph 3.11.3 is available from Murdock Textile, 27 Foundry St., Central Falls, RI 02863 401-722-9730.

Style J6577AP19mm (woodland)

6.4.4 Barrel locks. Barrel locks known to meet the requirements of paragraph 3.11.5 are available from:

ITW Nexus USA, 194 E. Algonquin Road, Des Plaines, IL 60016

ITW NEXUS part # 350-2000-XXXX (XXXX represents color)

Or

YKK Corporation of America, 1300 Cobb Industrial Ave, Marietta, GA 30066 - Main office 770-427-5521

YKK's Cord Lock #69150 LC05SHDM GOV CORD STOPPER

6.4.5 Vents with washers. The vents known to meet the requirements of paragraph 3.11.7 are available from Stimpson Company, 900 Sylvan Avenue, Bayport, NY 11705.

Style # D53 – Screen type vents with washers

6.5 Colors. Color names known to correspond with the Fed-Std-595 Color Chip numbers are as follows:

Color Chip Number	Color Name
20180	Tan 499
27041	Black
34094	Camo Green 483

6.6 Type I. This document does not cover the requirements for Type I cap.

6.7 DLA Product Testing Center – Analytical. The address for the DLA Product Testing Center is as follows.

DLA Product Testing Center – Analytical

700 Robbins Ave.

Building 5-D

Philadelphia, PA 19111

6.8 Subject term (key word) listing.

Twill

NWU II

NWU III

Digital

Camouflage

Custodian:

Navy-NU

DLA- CT

Preparing Activity:

Navy-NU

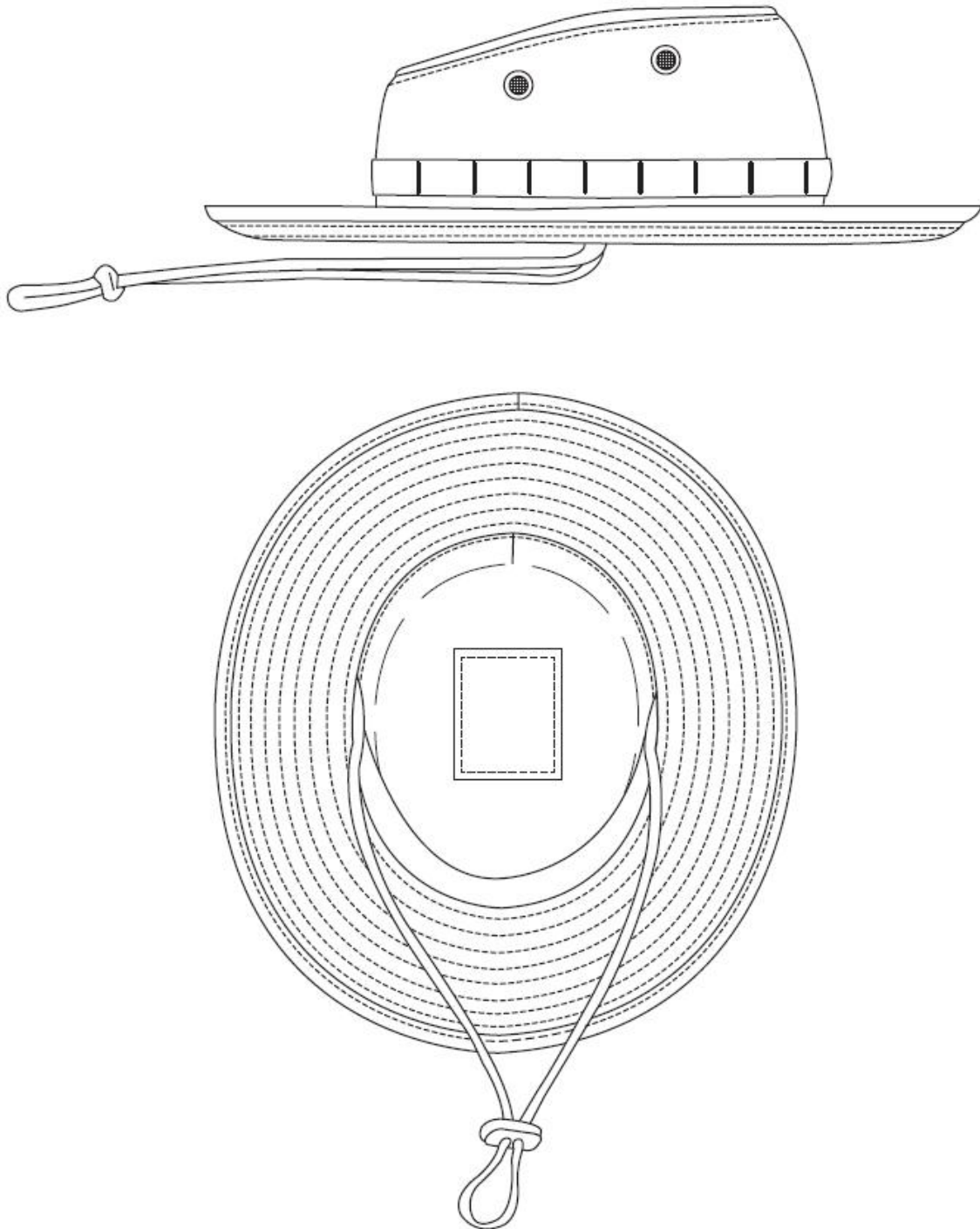


Figure 1 – Cap, Boonie, All Types