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INCH POUND

MIL-DTL-32157
19 JAN 2004

DETAIL SPECIFICATION

PARKA, ALL-PURPOSE ENVIRONMENTAL, CAMOUFLAGE

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 waterproof, moisture-vapor-permeable parka and a detachable (optional) hood. The parka is a component of the All-Purpose Environmental Clothing System (APECS).

Comments, suggestions, or questions on this document should be addressed to: Defense Supply Center Philadelphia, Clothing and Textiles Directorate, Attn: DSCP-COCT (Bldg 6), 700 Robbins Ave., Philadelphia, PA 19111-5092 or emailed to Colleen.M.Robinson@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at www.dodssp.daps.mil

AMSC N/A FSC 8415

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1.2 Classification. The parka will be in one type and four classes in the following sizes as specified (see 6.2).

Class 1 - Woodland MARPAT Camouflage
Class 2 - Desert MARPAT Camouflage
Class 3 – Woodland Camouflage
Class 4 – Desert Camouflage

Size	X-Short	Short	Regular	Long	X-Long	Hood
X-Small	X	X	X	X		X
Small	X	X	X	X		X
Medium	X	X	X	X		X
Large	X	X	X	X	X	X
X-Large		X	X	X		X
XX-Large					X	

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 documents cited in sections 3,4 or 5 of this specification, whether or not they are listed.

2.1.1 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 listed in the solicitation or contract.

FEDERAL

A-A-50083 - Bag, Plastic, Folded Garment
A-A-50186 - Cloth, Buckram, Woven and Non-Woven
A-A-52110 - Cloth, Plain Weave, Polyester/Cotton
A-A-55126 - Fastener, Tapes, Hook and Loop, Synthetic
A-A-55634 - Fasteners, Slide, Interlocking
A-A-50199 - Thread, Polyester-Core, Cotton- or Polyester-Covered

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-32142 - Cloth, Waterproof and Moisture Vapor Permeable
MIL-C-43701 - Cord, Elastic, Nylon
MIL-F-10884 - Fasteners, Snap
MIL-DTL-32075 - Label: For Clothing, Equipage, and Tentage, (General Use)
MIL-C-43701 - Cord, Elastic

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MIL-PRF-5038 - Tape, Textile and Webbing, Textile, Reinforcing Nylon
MIL-T-3530 - Thread and Twine: Mildew Resistant Or Water Repellent Treated
MIL-DTL-32072 - Thread, Polyester

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-129 – Marking for Shipment and Storage

(Copies of these documents are available online at http://assistdaps.dla.mil/quicksearch/ or www.dodssp.daps.mil or from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following document(s) 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.

ASTM International

D 1974-1998 - Boxes, Shipping, Fiberboard
D 2582 - Puncture Propagation Tear
D 3776 - Mass Per Unit Area (Weight) of Woven Fabric
D 3884 - Abrasion Resistance of Textile Fabrics
D 3951 - Standard Practice for Commercial Packaging
D 5034 - Breaking Strength of Textile Fabrics
D 5118 - Practice for Fabrication of Fiberboard Shipping Boxes
D 6193 - Stitches and Seams

(Copies of these documents are available from www.astm.org or American Society For Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.)

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

AATCC-8 - Colorfastness to Crocking: AATCC Crockmeter Method
AATCC-15 - Colorfastness to Perspiration
AATCC-16 - Colorfastness to Light
AATCC-22 - Water Repellency: Spray Test
AATCC-61 - Colorfastness to Laundering, Home and Commercial: Accelerated
AATCC-96 - Dimensional Changes in Commercial Laundering of Woven and Knitted Fabrics Except Wool
AATCC-118 - Oil Repellency: Hydrocarbon Resistance Test
AATCC-119 - Resistance to Frosting
AATCC-135 - Dimensional Changes in Automatic Home Laundering of Woven and Knit Fabrics Procedure 1 - Gray Scale for Color Change

(Copies of these documents are available from http://www.aatcc.org or American Association of Textile Chemists and Colorists (AATCC), P.O. Box 12215, Research Triangle Park, NC 27709-2215.)

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AMERICAN NATIONAL STANDARDS INSTITUTE

ANSI/ASCQ Z1.4- SAMPLING PROCEDURES AND TABLES FOR INSPECTION OF ATTRIBUTES

(For all inquires please contact the American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036). Website address http://www.ansi.org

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY (TAPPI)

(Applications for copies of referenced documents should be addressed to TAPPI Press, Technology Park/Atlanta, P.O. Box 105113, Atlanta, GA 30348-5113.)

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

2.3 Order of precedence. In the event of a conflict between the text of this 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, in accordance with 4.3.

3.2 Guide sample. Samples, when furnished, are solely for guidance and information to the contractor (see 6.2). Variations from this specification may appear in the sample, in which case this specification shall govern.

3.3 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.

3.3.1 Disposal of rejected garments. Rejected garments shall be disposed in one of the following manners: 1) contact the USMC (through the Contracting Officer) to determine if there is an alternate use for rejected parkas; or 2) if the USMC does not identify any alternate uses, the contractor may sell the parkas on the secondary market. Rejected parkas shall be labeled or indelibly marked on label as "Seconds/Rejected by USMC" and the embroidered label "Made Expressively For USMC" shall be cut out of the parka.

3.3.2 Basic material. The basic material for the parka shall be a waterproof and moisture vapor permeable cloth conforming to MIL-PRF-32142. The color of the face side of the base cloth shall be Woodland MARPAT Camouflage, Class 1; Desert MARPAT Camouflage, Class 2; Woodland Camouflage, Class 3 or Desert Camouflage, Class 4 as required (see 6.2). The color of the back side

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of the base cloth shall be Camouflage Green 483 for the Classes 1and 3 base cloth and Tan 492 for Classes 2 and 4 base cloth.

3.3.3 Upper pocket material. The upper chest pockets of the parka shall be made from cloth, plain weave, Black (Woodland MARPAT, Class 1 and Woodland Camouflage, Class 3) or Coyote 476 (Desert MARPAT, Class 2 and Desert Camouflage, Class 4), polyester/cotton conforming to A-A-52110.

3.3.4 Reinforcement material. The reinforcement cloth used in the elbow patches shall be Woodland MARPAT Camouflage, Class 1; Woodland Camouflage, Class 3; Desert MARPAT Camouflage, Class 2 or Desert Camouflage, Class 4, as required (see 6.2), water repellent treated, resist fraying and conform to the following requirements when tested in accordance with 4.4.1.1.

Table I – Reinforcement Cloth Requirements

Characteristic	Requirement
Weight	6.0 oz/sq. yd Max
Breaking strength: Warp Fill	 200 lbs. (min) 155 lbs. (min)
Colorfastness to: Crocking Laundering Light Perspiration Alkaline/Acid	 Dry and wet: 3.5 min. except for Black 477 & 357, 1.5 min. for Black Equal to or better than "3-4" rating on AATCC Gray Scale For Color Change Equal to or better than "3-4" rating on AATCC Gray Scale For Color Change Woodland: Lt. Green 354 and Khaki 475 – Good. Black 477 & 357, Coyote 476, Green 474, Dk. Green 355, and Brown 356 – Fair Desert: Lt. Khaki 494, Lt. Coyote 481, Urban Tan 478, Highland 480, Lt. Brown 493 and Lt. Tan 479 & 492 – Good.
Spray rating: Initial After 1 Laundering	 100, 100, 90 min. 90, 90, 80 min.
Stiffness (cm)	Warp - 11.0 max. Filling - 11.0 max.

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Characteristic	Requirement
Puncture Propagation Tear	Warp – 7.0 kgf min. Filling – 6.0 kgf min.
Resistance to Organic liquid	No wetting by N-Tetradecane
Resistance to Frosting	Equal to or better than the standard sample
Dimensional Stability: Warp Fill	 4.0% (max) 4.0% (max)
Abrasion Resistance	800 cycles (min)

Table II – Reinforcement Cloth Classes 1 & 3 Spectral reflectance requirements
Reflectance Values (percent)

Wavelength,	Black 477& Black 357		Coyote 476, Khaki 475& Light Green 354		Green 474, Dark Green 355 & Brown 356	
Nanometers (nm)	min	max	min	max	min	max
600	-	-	8	20	3	9
620	-	-	8	20	3	9
640	-	-	8	20	3	9
660	-	-	8	20	3	12
680	-	-	10	30	3	16
700	-	20	18	50	5	32
720	-	30	22	54	7	44
740	-	33	30	56	12	52
760	-	33	35	58	18	56
780	-	34	40	62	26	56
800	-	34	55	80	34	56
820	-	35	55	80	42	60
840	-	35	55	84	44	60
860	-	35	60	84	44	60

Table III – Reinforcement Cloth Classes 2 & 4 Spectral reflectance requirements
Reflectance Values (percent)

Wavelength,	Light Tan 479 & Light Tan 492		Lt Coyote 481, Highland 480 & Light Brown 493		Urban Tan 478 & Light Khaki 494	
Nanometers (nm)	min	max	min	max	min	max
700	38	53	19	36	25	48
720	38	58	20	36	25	52
740	39	62	20	36	25	54
760	40	66	21	36	26	56
	Light Tan 479 &		Lt Coyote 481, Highland 480 &		Urban Tan 478 &	

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Wavelength,	Light Tan 492		Light Brown 493		Light Khaki 494	
Nanometers (nm)	min	max	min	max	min	max
780	41	72	21	38	27	57
800	43	76	22	43	28	58
820	45	76	23	45	30	58
840	48	78	24	46	33	58
860	50	78	25	46	36	59

3.3.5 Inside collar, parka hood tunnel, optional hood tunnel and lower inside pocket. The cloth for the inside collar, parka hood tunnel, optional hood tunnel, lower inside pocket, parka hood tunnel and optional hood tunnel shall be a three layer-knit laminate conforming to the following requirements when tested in accordance with paragraph 4.4.1.1.

Table IV – Knit laminate requirements

Characteristic	Requirement
Weight, oz/sq. yd.	4.0 ± 0.4
Stiffness, cm	8.0 Max.
Hydrostatic Resistance, psi Initial Taffeta Restraint After deet	 220 Min 120 Min
Puncture Propagation Tear, kgf Warp Fill	 3.5 Min 3.5 Min
Water permeability Initial After Synthetic Perspiration	 No leakage No leakage
Moisture Vapor Transmission Rate (g/sq. m/24 hours): Procedure B - Initial Procedure BW - Initial	 600 Min 5000 Min
Physical surface appearance after laundering	No change after 20 launderings

3.3.6 Interlining. The interlining for the attached hood visor and optional hood visor shall be buckram cloth, natural or bleached, conforming to type I of A-A-50186, except that the minimum breaking strength in the warp direction shall be 60 lbs.

3.3.7 Seam sealing tape. The tape for covering and sealing all designated seams and stitching shall be cut in 1 ± 1/16 inch wide strips from material that is compatible with the back side of the cloth

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specified in MIL-PRF-32142. As an alternate, 1-1/2 ± 1/16 inch wide strips of tape as specified above may be used on the top and bottom of the sleeve pockets and sleeve flaps.

3.3.8 Hood draw cord and hanger tape. The hood draw cord and hanger tape shall be a flat l/2 inch wide nylon tape, Black or Camouflage Green 483 in color conforming to type III, class 2 of MIL-PRF-5038. The cut lengths for the hood draw cord and hanger tapes are listed in the following table:

Table V - Cut Lengths for Hood Draw cords and Hanger Tapes (in inches)

Size	Hood Draw cords	Hanger Tape
X-Small	33	4-1/2 ± 1/4" for all sizes
Small	35	
Medium	36	
Large	36	
X-Large	36	
XX-Large	37	
Tolerance	± 1	

3.3.9 Collar, waist and hem draw cord. The waist and hem draw cords shall be 3/16 inch in diameter multi-strand rubber elastic with braided nylon or polyester covering, Black conforming to type II of MIL-C-43701. The cut lengths for the waist draw cords are listed in the following table:

Table VI - Cut Lengths for Collar, Waist & Hem Draw cord (in inches)

Size	Collar	Waist	Hem
X-Small	30	41-1/2	48
Small	31	45-1/2	52
Medium	31	49-1/2	56
Large	32	53-1/2	**60**
X-Large	32	57-1/2	64
XX-Large	**34**	**59-1/2**	**66**
Tolerance	± 1	± 1	± 1

3.3.10 Fastener tape, hook and loop. The nylon fastener tapes shall conform to type II, class 1 of A-A-55126. The color shall be Camouflage Green 483 for classes 1 and 3 and Tan 380 for classes 2 and 4. The widths and lengths are listed in the table below:

Table VII – Hook and Loop Tape Requirements

Location	Quantity	Length and Width	
		Hook	Pile
Outer Collar	3		3 - 1" x 2"
Insignia tab	1	1" x 1"	
Wrist tab	2	1-1/2" x 1-1/2"	
Sleeve pocket flap	4		1-1/2" x 1"
Sleeve pocket	4	1-1/2" x 1"	

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Lower pocket flap	4		1” x 2”
Lower pocket	4	1” x 2”	
Hood	3	3 - 1” x 2”	
Sleeve	2		1” x 6”
Parka (right front)	1		1” x 1”
Tolerance		± 1/4”	± 1/4”

3.3.11 Fastener, slide, interlocking. All slide fasteners shall be black, in the lengths specified and conform to A-A-55634.

3.3.11.1 Front closure slide fastener. The front closure slide fastener shall be a Type III, style 8, size 8, continuous element polyester monofilament coil, equipped with a single long tab pull, automatic locking reverse bale slider with a hole large enough to accommodate a thong. The front closure slide fastener must meet 200 pounds minimum crosswise strength as specified in A-A-55634. The tape side of the fastener tape shall be coated with a polyurethane coating not less than 2.5 mils thick and the tape side with a film laminate allowing seam sealing of the slide fastener to the garment. The slide fastener thong either be made from the basic material or a 3/8 inch width black webbing in accordance with paragraph 2.2.7 of A-A-55634.

Table VIII - Front Slide Fastener Lengths (in inches)

Garment Size	**Length**
X-Small-X-Short	26-1/2
X-Small-Short	27-1/2
X-Small-Regular	29
X-Small-Long	30-1/2
Small-X-Short	27
Small-Short	28
Small-Regular	29-1/2
Small-Long	31
Medium-X-Short	27-1/2
Medium-Short	28-1/2
Medium-Regular	30
Medium-Long	31-1/2
Large-X-Short	28
Large-Short	29
Large -Regular	30-1/2
Large -Long	32
Large-X-Long	**33-1/2**
X-Large-Short	29-1/2
X-Large -Regular	31
X-Large -Long	32-1/2
XX-Large-Long	**33**
Tolerance	± 1/8

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3.3.12.2 Underarm and upper pocket slide fasteners. The underarm and upper pocket slide fasteners shall conform to A-A-55634, Type I, style 7, size 5, continuous element polyester monofilament coil equipped with a single reverse bale slider. The tape side of the fastener chain shall be coated with a polyurethane coating not less than 2.5 mils thick. The minimum crosswise breaking strength must be 175 pounds. The underarm slide fastener length shall be 15 ± 1/8 inches and be equipped with a non-locking, short tab pull slider. The upper pocket slide fastener length shall be 9 ± 1/8 inches and be equipped with a short tab pull, automatic locking slider. The slide fastener thong either be made from the basic material or a 3/8 inch width black webbing in accordance with paragraph 2.2.7 of A-A-55634. Sliders shall have a hole large enough to accommodate a 3/8 inch wide thong.

3.3.13 Barrel lock. The barrel lock for the collar, waist and hem draw cords shall be a black, toaster ellipse conforming to ITW NEXUS part # 350-2000 or equal.

3.3.14 Thread. The thread for all seaming and stitching shall be polyester, size B, 2 or 3 ply, conforming to type I, class 1, subclass B of MIL-DTL-32072. As an alternate, size 40, 2 or 3 ply polyester core thread conforming to A-A-50199 may be used. All thread shall be water-repellent treated as specified in MIL-T-3530. The thread color shall be Camouflage Green 483 (approximating color chip 34094 of FED-STD-595) for classes 1 and 3 and Khaki P-1 (C.A. 66019 or approximating color chip 30277 of FED-STD-595) for classes 2 and 4.

3.3.15 Fastener, snap (for optional hood only). The stud and post part of the snap fastener shall be style 2, finish 2 male and female complete, consisting of stud and eyelet size 1 or 2 with button size 1 or 2, conforming to MIL-F-10884 with the exception that the socket shall conform to Scoville style #93XB-10224 – Easy Action or equal.. An uncapped button may be used in areas where the surface will be concealed by a layer of base cloth.

3.3.16 Labels. Each parka shall have a class 1 identification label, a class 2 size label, a class 3 instruction label, or a class 4 combination identification and size label conforming to the type VI requirements of MIL-DTL-32075. The label color shall be Medium Green, C.A. 70034, 70130, or 70131 for classes 1 and 3 and Khaki, Cable No. 70188 for classes 2 and 4.. The labels shall show fastness to laundering.

3.3.16.1 USMC label. All class 1 and class 2 parkas shall have a woven “Made Expressly for USMC” label. The USMC label shall have a black satin broadloom background with the USMC emblem woven in red, gold and grey threads in the center of the label. At the top of the label, the words “Made Expressly for” will be woven in gold. At the bottom of the label, below the emblem, the contractor’s name shall be in gold. The USMC label shall be cut single, fused edge with a finished size of 50 mm wide by 76 mm to 82 mm in height – Minnewawa Style number LR5398 or equal.

3.3.16.2 Identification label. The identification label shall read as follows:

"PARKA, ALL-PURPOSE ENVIRONMENTAL, CAMOUFLAGE"

3.3.16.2 Size label. The size label information shall be as follows:

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X-Small X-Short
Height: Up to 63 in.
Chest Mn: Up to 33 in.
Chest Wn: Up to 36 in.
NSN: 8415-XX-XXX-XXXX

X-Small Short
Height: From 63 to 67 in.
Chest Mn: Up to 33 in.
Chest Wn: Up to 36 in.
NSN: 8415- XX-XXX-XXXX

X-Small Regular
Height: From 67 to 71 in.
Chest Mn: Up to 33 in.
Chest Wn: Up to 36 in.
NSN: 8415- XX-XXX-XXXX

X-Small Long
Height: From 71 in. and up
Chest Mn: Up to 33 in.
Chest Wn: Up to 36 in.
NSN: 8415- XX-XXX-XXXX

Small X-Short
Height: Up to 63 in.
Chest Mn: From 33 to 37 in.
Chest Wn: From 36 to 40 in.
NSN: 8415- XX-XXX-XXXX

Small Short
Height: From 63 to 67 in.
Chest Mn: From 33 to 37 in.
Chest Wn: From 36 to 40 in.
NSN: 8415- XX-XXX-XXXX

Small Regular
Height: From 67 to 71 in.
Chest Mn: From 33 to 37 in.
Chest Wn: From 36 to 40 in.
NSN: 8415- XX-XXX-XXXX

Small Long
Height: From 71 in. and up
Chest Mn: From 33 to 37 in.
Chest Wn: From 36 to 40 in.
NSN: 8415- XX-XXX-XXXX

Medium X-Short
Height: Up to 63 in.
Chest Mn: From 37 to 41 in.
Chest Wn: From 40 to 44 in.
NSN: 8415- XX-XXX-XXXX

Medium Short
Height: From 63 to 67 in.
Chest Mn: From 37 to 41 in.
Chest Wn: From 40 to 44 in.
NSN: 8415- XX-XXX-XXXX

Medium Regular
Height: From 67 to 71 in.
Chest Mn: From 37 to 41 in.
Chest Wn: From 40 to 44 in.
NSN: 8415- XX-XXX-XXXX

Medium Long
Height: From 71 in. and up
Chest Mn: From 37 to 41 in.
Chest Wn: From 40 to 44 in.
NSN: 8415- XX-XXX-XXXX

Large Short
Height: Up to 67 in.
Chest: From 41 to 45 in.
NSN: 8415- XX-XXX-XXXX

Large Regular
Height: From 67 to 71 in.
Chest: From 41 to 45 in.
NSN: 8415- XX-XXX-XXXX

Large Long
Height: From 71 in. and up
Chest: From 41 to 45 in.
NSN: 8415- XX-XXX-XXXX

Large X-Long
Height: Over 75 in.
Chest: From 41 to 45 in.
NSN: 8415- XX-XXX-XXXX

X-Large Regular
Height: From 67 to 71 in.
Chest: From 45 in. and up
NSN: 8415- XX-XXX-XXXX

X-Large Long
Height: From 71 in. and up
Chest: From 45 in. and up
NSN: 8415- XX-XXX-XXXX

XX-Large-Long
Height: From 71 in. and up
Chest: Over 49 in.
NSN: 8415- XX-XXX-XXXX

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3.3.16.3 Care label. The care label information shall be as follows:

PARKA, ALL-PURPOSE ENVIRONMENTAL, CAMOUFLAGE

WARNING!!
DO NOT STARCH, BLEACH, DRY CLEAN OR PRESS THE APECS PARKA

A. Home laundering (machine/hand): Use a permanent press or normal cotton machine setting, or hand wash using a detergent. Rinse thoroughly in warm water.
NOTE: Any residual detergent on the parka will decrease the water repellency.
Home drying: Tumble dry on permanent press or cotton setting, remove immediately from dryer. To drip dry, place on rust proof hanger.
B. Post Laundry: Parka shall be laundered utilizing **"Formula II"** of FM 42-414.
C. Field Laundry/Restoration of Water Repellent Finish: Parka shall be laundered utilizing "Formula XII" of FM 42-414.
Post/Field Drying: Tumble dry at low temperature setting. Remove immediately from dryer. Do not overheat or over dry. For Restoration of Water Repellent Finish, dry at a temperature not to exceed 150°F.

3.3.16.4 Label for optional hood. The optional hood shall have a combination identification/size label conforming to type IV, class 14 of MIL-DTL-32075. The information contained shall be as follows:

Size:
NSN:
HOOD, COLD WEATHER, CAMOUFLAGE
Contract No.
Fabric Content:
Contractor's Name:
SEE PARKA FOR WASHING INSTRUCTIONS

3.3.16.5 Label/tag. Each parka and optional hood shall be individually barcoded with a type VIII, class 17 label/tag of MIL-DTL-32075. The parka label/tag shall be attached to the slide fastener pull tab of the front closure and the optional hood label/tag shall be attached to the right side of the draw cord.

3.3.17 Non-wicking buffer. The non-wicking buffer shall be a polyurethane adhesive, 2 inches wide and a minimum of 4.5 ml thick.

3.4 Design. The parka has a collar with a draw cord for adjustment and a stowed hood, a water resistant slide fastener front closure, slide fastener underarm openings, two upper chest pockets with concealed water resistant slide fastener openings, two lower pockets with flaps and concealed hand warmer pockets, adjustable wrist tabs, an insignia tab, and waist and hem draw cord adjustments that are concealed inside the lower pockets. The parka is also designed to accommodate an optional detachable hood for use in extreme cold weather. The hood can be attached to the parka with hook and pile fastener tapes and is compatible with the fur ruff, a component of the ECWCS.

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3.5 Patterns. Standard patterns, which provide an allowance of 1/4 inch for all sealed seams and 3/8 inch for all other seams, will be furnished by the Government. 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.

3.5.1 Pattern parts. The component parts shall be cut from the material specified below and in accordance with the pattern parts indicated in Table IX.

TABLE IX - List of pattern parts

Material	Nomenclature	Cut Parts
PARKA		
Cloth, laminated	Upper back	1
	Lower back	1
	Upper front	2
	Lower front	2
	Pocket flap	2
	Lower outside pocket	2
	Insignia tab 1/	2
	Hood	2
	Upper sleeve	2
	Lower sleeve	2
	Sleeve pocket	2
	Left Pencil pocket	1
	Sleeve pocket flap	2
	Sleeve tab	2
	Visor	1
	Outside collar	1
	Waist cord casing	1
Cloth, nylon	Sleeve patch	2
Cloth, plain weave	Chest pocket	4
Cloth, cotton, buckram	Visor interlining	1
	Chest Pocket Welt	2
Cloth, three layer knit	Inside collar 2/	1
	Hood tunnel	1
	Throat tab	2
OPTIONAL HOOD		
Cloth, laminated	Side crown	2
	Crown	1
	Hood tunnel 3/	1
	Visor	1
	Hood flap	1
Cloth, cotton buckram	Visor interlining	1

1/ Insignia tab may be cut in one piece with seam allowance along one side deducted.
2/ Cloth, laminated may be substituted.

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3/ Cloth, 3-layer knit may be substituted.

3.6 Construction. The construction shall conform in all respects to the requirements specified in Table II and herein.

3.6.1 Stitches, seams, and stitching. All stitches, seams and stitching shall conform to ASTM-D-6193. The type of seam, stitching and stitches per inch shall be as specified in Table X. Seam allowances shall be maintained with seams sewn so that no raw edges, run-offs, pleats, puckers or open seams occur. When two or more methods of seams or stitches are given for the same operation, any one may be used.

3.6.1.1 Type 301 stitching. Ends of all stitching shall be backstitched or overstitched not less than 1/2 inch except where ends are turned under or caught in other seams or stitching. Ends of a continuous line of stitching shall overlap not less than 1/2 inch. Thread tensions shall be maintained so that there will 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 materials sewn. All 301 stitch and bartack thread ends shall be trimmed to a length of not more than 1/4 inch.

3.6.1.1.1 Repairs of type 301 stitching. Repairs of type 301 stitching shall be as follows:

a. When thread breaks, skipped stitches, run-offs, or bobbin run outs occur during sewing, the stitching shall be repaired by restarting the stitching a minimum of 1/2 inch back of the end of the stitching. 1/

b. Thread breaks or two or more consecutive skipped or run-off stitches noted during inspection of the item shall be repaired by overstitching. The stitching shall start a minimum of 1/2 inch beyond the defective area onto the existing stitching. Loose or excessively tight stitching shall be repaired by removing the defective stitching without damaging the materials, and re-stitching in the required manner. 1/

1/ When making the above repairs, the ends of stitching are not required to be backstitched.

3.6.1.2 Type 502, 503. 515 or 516 stitching. Thread tension shall be maintained so that there will be no loose stitching. All repairs shall be in accordance with 3.6.1. Thread tension shall be maintained so that there will be no loose or excessively tight stitching resulting in puckering of the materials sewn. All thread ends shall be trimmed to a length not less than 1/4 inch but more than 1/2 inch.

3.6.1.3 Bartacks. Unless otherwise specified, all bartacks shall be 5/8 $\pm$ 1/32 inch long and 1/8 $\pm$ 1/32 inch wide, and shall contain 21 to 28 stitches. Bartacking shall be free from thread breaks and loose stitching. All thread ends shall be trimmed to a length of not more than 1/4 inch.

3.6.1.4 Sewn eyelets. All eyelets shall be 3/16 inch in diameter with a minimum of 19 stitches per eyelet with purling on the outside.

3.6.1.5 Automatic stitching. Automatic machines may be used to perform any of the required stitch patterns provided the requirements for the stitch pattern, stitches per inch, and size and type of thread are met; and at least three tying, overlapping or back stitches are used to secure the ends of the stitching.

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3.6.2 Heat sealing. Seams and stitching as indicated in Table II shall be sealed with heat sealing tape on the inside of the parka, concealed hood and optional hood. The entire width of the seam tape shall be uniformly sealed over the seam or stitching. All seam tapes shall be applied without tension and shall be applied so that a minimum of 1/8 inch overlap is on both sides of the sewn seam and the back knit of the laminated fabric adjacent to the seam tape shall not be melted to expose the plastic film layer of the laminated fabric. All seam tapes shall overlap a minimum of 3/4 inch at joining points and all ends of seam tape or taped cross-over areas shall be spot sealed without additional repair tape in accordance with seam tape manufacturer temperature, time and pressure recommendations for application with cross-over heat sealing machine. As an alternate, spot sealing for taped ends can be eliminated if hot air machine can automatically cut and seal ends of seam tape without any loose ends. However, spot sealing for taped cross-over areas shall remain. Sealed seams, cross-over area stitchings shall show no leakage, tape ends shall show no signs of lifting, and the tape, itself, shall show no sign of lifting, curling, bubbling or separation more than 1/8 inch of tape top knit shrinkage such that the tape middle layer is exposed when tested initially and after five laundering cycles as specified in 4.4.4.

3.6.3 Appearance after laundering. After five laundering cycles as specified in 4.4.4, the base fabric shall show colorfastness in the black printed areas of the MARPAT woodland and woodland camouflage patterns equal to or better than “3-4” rating on the AATCC Gray Scale for evaluating change in color and also shall show no significant change in physical surface appearance when compared to an unlaundered parka both in the base fabric and taped areas. Minor defects not affecting appearance, such as puckering on seam line or creases around taped area due to manufacturing operations are acceptable and shall be used for comparison to laundered sample.

3.7 Manufacturing operations requirements. The parka, and optional hood shall be manufactured in accordance with operation requirements specified in Table II. The contractor is not required to follow the exact sequence of operations provided the finished parka is identical to that produced by following the sequence as listed in Table II. Any holding or basting stitch is permissible provided it is removed, does not show on the finished garment, and does not interfere with proper seam taping. Minor modifications are permitted where necessary when using automatic equipment. These modifications shall not alter the dimensional, serviceability or appearance requirements cited in the specification.

3.7.1 Repairs. Repair of the parka and hoods by mending, patching or darning is not allowed, and at no time is removal of the heat sealing tape permitted. However, up to 25 inches of heat sealing tape may be used to repair leaking seams, missing yarns in the tricot knit, and to repair areas where the original tape does not overlap the sewn seams by a minimum of 1/8 inch on both sides of the inside of parka. Up to five repair areas totaling 25 inches in length will be allowed. No more than five inches of repair using more than two layers of seam sealing tape is permitted, with the exception of the backside area of the sleeve pocket.

3.8 Use of automated apparel equipment. Automated apparel manufacturing equipment may be used to perform any of the operations specified in Table II provided that the seam and stitch type are as specified and that the finished component conforms to the required configuration.

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TABLE X. MANUFACTURING OPERATIONS REQUIREMENTS

NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR
1.	Cutting and marking. a. Cut the parka and optional hood in strict accordance with patterns furnished which show directional lines, size, placement for pockets and welt, hook and pile fastener tapes, and marks for proper assembly. The directional lines indicate the warp direction, unless otherwise specified. The directional lines may vary from the warp direction by not more than 2-1/2 inches on both front and back. Measurements shall be taken from top and bottom of directional lines on pattern to selvage edge of the fabric and the difference between the two measurements shall not exceed 2-1/2 inches. Cut all shell parts out of one piece of material except the flap facing, pocket divider, hood tunnels, visor and inside collar. As an alternate to the slide fastener thong, loops cut from the laminated cloth may be used. b. Cut draw cords, elastic cords, hanger tape and fastener tape lengths in accordance with the tables in paragraphs 3.3.7, 3.3.8, 3.3.9 and 3.3.10. NOTE: If not hot wire cut, as an alternate, draw cord ends may be dipped or impregnated with cellulose acetate or cellulose butyrate to eliminate fraying.				
2.	Replace damaged parts. Care shall be exercised during the spreading, cutting, and manufacturing operations to assure that material, defects, and damages, as classified in 4.4.2 are excluded and replaced with non-defective and properly matched material.				

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR
3.	Marking. Mark, ticket, or bundle all component parts to insure a correct shade and size throughout the parka and optional hood. Drill holes shall not be used and markings shall not be visible on the outer shell of the parka and optional hood.				
4.	Assemble collar. a. Place eyelet reinforcement piece, (1/2 inch wide by 1inch) on inside of outer collar, 1/4 inch below top raw edge at center of outer collar.				
	b. Make a 3/16 inch eyelet in center of outer collar top edge, 3/4 inch down from raw edge and centered on the reinforcement piece.		Whip or purl type	19 min	70/2 or B B
	c. Hem of bottom outer collar by turning up the bottom edge 1/4 inch and stitching 1/8 to 3/16 inch from folded edge.	301	EFa-1	10-13	B B
	d. Position three strips of loop (two horizontal and one in a vertical position) fastener tape on the tricot side of the collar in accordance with marks on pattern and stitch all four sides 1/8 to 3/16 inch from edges.	301	LSbj-1	10-13	B B
	e. Position inside collar, face to face on outside collar and stitch together along upper edge. Turn and top stitch 1/16-1/8 inch from edge.	301	SSe-2	10-13	B B
	f. Insert draw cord with barrel lock attached through the or eyelet and stitch ends to front ends of inside collar.	301	SSa-1	10 -13	B B
	g. Topstitch collar together with a second row of stitching 1/2 inch from first row of stitching. Note: Do not catch drawcord in stitching.	301	SSe-2(b)	10 -13	B B

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR
5.	Assemble throat flap.				
	a. With face sides together and edges aligned, stitch 1/4 inch from edges of flaps.	301 or 401	SSe-2(a)	10-13	B B
	b. Turn, work out corners or curves and edges. Stitch 1/8 to 3/16 inch from turned edge.	301	SSe-2(b)	10-13	B B
6.	Assemble insignia tab.				
	a. Center hook fastener tape at point of tab per marks on pattern and stitch 1/8 to 3/16 inch from folded edge.	301	LSbj-1	10-13	B B
	b. Crease sides and point of the one piece tab. With face of the creased edges aligned, stitch around tab 1/4 inch from edge.	301 or 401	SSa-1	10-13	B B
	- or –				
	d. Position tab pieces face to face with edges aligned and stitch around sides and points 1/4 inch from edge.	301 or 401	SSe-(a)	10-13	B B
	e. Turn tab, work out corners and edges. Stitch 1/16 to 1/8 inch from turned edges.	301	SSe-(b)	10-13	B B
7.	Assemble sleeve wrist tabs.				
	a. Position hook fastener tape on face of tab in accordance with marks on pattern. Stitch all four sides 1/8 to 3/16 inch from edges.	301	LSbj-1	10 -13	B B
	b. Fold tab in half, face side out, and crease side raw edges. Stitch 1/16 to 1/8 inch from folded edges.	301	EFn-2	10-13	B B
	- or -				
	c. Fold tab in half, face sides together, and stitch.	301 or 401	SSe-2(a)	10 –13	B B

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR
7. cont'd	Assemble sleeve wrist tabs. Cont'd.				
	d. Turn face side out, work out corners and edges. Stitch 1/4 inch from edges.	301	SSe-2(b)	10-13	B B
8.	Assemble sleeve pocket flaps.				
	a. Position two pile fastener tapes on face of flap in accordance with marks on pattern. Stitch around all four sides 1/8 to 3/16 inch from edges.	301	LSbj-1	10-13	B B
	b. Fold flap in half, (face sides together) and with edges aligned, stitch ends of flap.	301	SSe-2(a)	10-13	B B
	c. Turn flap, work out corners and edges. Stitch1/4 inch from edge along sides and bottom of flap.	301	SSe-2(b)	10-13	B B
9.	Assemble sleeve pockets and left sleeve pocket divider.				
	a. Fold under top raw edge of left sleeve pocket divider 3/8 inch. Stitch 1/16 to 1/8 inch from folded edge.	301 or 401	EFa-1	10-13	B B
	b. Fold under top raw edge of sleeve pocket 1/2 inch. Stitch 1/8 to 3/16 inch from folded edge.	301 or 401	EFa-1	10-13	B B
	c. Position two hook fastener tapes on face of sleeve pocket in accordance with marks on pattern. Stitch on all four sides 1/8 to 3/16 inch from edge.	301	LSbj-1	10-13	B B
	d. Form bellows by folding sides of pocket in accordance with marks on pattern and stitch l/16 to 1/8 inch from folded edge.	301 or 401	EFa-1	10-13	B B
10.	Assemble lower pocket flaps.				
	a. Position two pile fastener tapes on face of flap in accordance with marks on pattern. Stitch on all four sides 1/8 to 3/16 inch from edges.	301	LSbj-1	10-13	B B

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR
10. cont'd.	Assemble lower pocket flaps. Cont'd.				
	b. Fold flap in half, with face sides together and edges aligned, stitch ends.	301 or 401	SSe-2(a)	10-13	B B
	c. Turn flap, work out corners and edges. Stitch 3/16 to 1/4 inch from edge around sides and bottom.	301	SSe-2(b)	10-13	B B
11.	Assemble lower outside pockets.				
	a. Turn under top edge of lower pockets 1/2 inch and stitch 1/4 to 3/8 inch from folded edge.	301	EFa-1	10 -13	B B
	b. Position two strips of hook fastener tape on face of pocket in accordance with marks on pattern. Stitch all four sides 1/8 to 3/16 inch from edges.	301	LSbj-1	10-13	B B
	c. Position lower inside pocket on outside pocket, with face sides together and notches aligned, stitch to the back side of pocket 1/4 inch from edge. Turn outside pocket face side out and 1/8 inch from turned edge.	301	SSe-2	10-13	B B
12.	Assemble hood.				
	a. Position hood pieces face to face, align edges and stitch 1/4 inch from edge.	301	SSa-1	10-13	B B
	b. With joining seam facing either side, place seaming tape over seam and heat seal.				
	c. Position three strips of hook fastener tape in accordance with marks on pattern on outside bottom of hood. Stitch on all four sides 1/8 to 3/16 inch from edges. (The middle hook tape shall be centered over the hood joining seam).	301	LSbj-1	10-13	B B
	d. Place heat seaming tape over fastener tape stitching and heat seal.				

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR	
12. Cont'd	Assemble hood (cont'd)					
	e. Position interlining on inside of visor piece. Stitch to straight edge of visor 1/8 (±1/16) inch from edge..	301	SSa-1	10-13	B	B
	f. Turn under ends of hood tunnel 3/8 inch and stitch 1/4 inch from folded edge.	301 or 401	EFa-1	10-13	B	B
	g. Center draw cord on hood tunnel. Fold hood tunnel over draw cord and stitch edges together 3/16 to 1/8 inch from raw edge. At center of tunnel, vertically tack tunnel and draw cord.	301 or 401	EFa-1	10-13	B	B
	h. Position visor (face to face) on hood and stitch 1/4 inch from edge. Turn and force out curved edges and stitch 1/8 inch from turned edge of visor.	301	SSe-2	10-13	B	B
	i. Position hood tunnel to face side of hood at the front notch and stitch 1/4 inch from the raw edge up to the visor junction, continue stitching across the straight edge of visor, and along remaining raw edge of hood to opposite front notch.	301	SSa-1	10-13	B	B
	j. Turn hood tunnel to inside of hood and stitch 1/8 inch from folded edge until it overlaps the visor edge stitching. Repeat operation on opposite side of hood.	301	EFa-1 And SSe-2(b)	10 -13	B	B
	k. Place heat seaming tape over the hood tunnel stitching and heat seal.					
	l. Set barrel locks on ends of draw cord. Extend draw cord beyond barrel locks and knot cord 1 inch from edge.					

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR
13.	Assemble inside upper pocket.				
	a. Position size label and instruction label or combination label on right (as worn) upper pocket, 3-1/4 ± 1/8 inch from pocket top for all sizes and for sizes X-Small and Small 1 ± 1/8 inch, for sizes Medium – X-Large 2-1/2 ± 1/8 inches from straight raw edge (side finishing nearest the slide fastener). Position USMC woven label either adjacent to or below the label(s) used. Stitch labels to upper pocket, 1/8 inch from edges.	301	LSbj-1	10 -13	B B
	b. Overedge front edge of inside upper pocket to the center front pocket extension.	502, 503 505 or 516	Efd-1	7 - 9	70/2 70/2 or B B
	c. Position slide fastener tapes even with edges of center front pocket extension and stitch.	301	SSa-1	10-13	B B
	d. With face sides together and edges aligned, stitch around curved pocket edges 3/16 to 1/4 inch from edge.	515 or 516	SSa-2	10 -13	B B
	e. Attach two 2-inch reinforcement tape tabs to the edge of pocket. One tape shall be positioned at the top curved edge of the pocket and the other approximately 4 ± 1/4 inches lower on the back edge of the pocket. Center a 1 inch line tack through reinforcement tape and pocket (on the safety stitching).	301	SSa-1	10-13	B B
14.	Assemble sleeves.				
	a. Position elbow patches, in accordance with marks on pattern, face side up on face of upper sleeves. Fold under front side, diagonal, and top edges 1/4 inch and stitch to sleeve 1/8 to 3/16 inch from folded edge.	301	LSd-1	10 -13	B B

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR	
14. Cont'd	Assemble sleeves. (cont'd)					
	b. Position lower sleeve (face to face) on upper sleeve. Stitch sleeve together catching bottom edge of elbow patch.	301	LSq-2(a)	10 -13	B	B
	c. Turn down lower sleeve and with seam allowance facing up, stitch 1/16 to 1/8 inch from turned under edge of upper sleeve.	301	LSq-2(b)	10 -13	B	B
	d. Position a strip of pile fastener tape on lower sleeve as indicated by marks on pattern. Stitch on all four sides 1/8 to 3/16 inch from edge with 1/2 inch overlap stitching.	301	LSbj-1	10 -13	B	B
	e. Position sleeve tab on sleeve in accordance with notches and in alignment with pile fastener tape. Stitch tab to sleeve 1/8 to 3/16 inch from edge.	301	SSa-1	10 -13	B	B
	f. Position pencil pocket, in accordance with marks on pattern, onto left sleeve with back side on face side of sleeve. Turn under left raw edge only 1/4 inch and stitch 1/8 to 3/16 from edge to bottom notch.	301	LSbj-1	10 -13	B	B
	g. Place left sleeve pocket on left sleeve and align right raw edges of pocket and pencil pocket. Stitch raw edge of pockets together along right edge and across bottom.	301	LSbj-1	10 -13	B	B
	h. Position right pocket, according to marks on pattern, face side up and turn under pocket edges 1/4 inch and top stitch to sleeve 1/16 to 1/8 inch from edges. Finished pockets are to be centered above elbow patches.	301	SSb-1	10 -13	B	B
	i. Position sleeve pocket flap on sleeve in accordance with marks on pattern. Stitch to sleeve. Fold sleeve pocket flap down and topstitch 1/4 ± 1/16 inch from fold, burying raw edge.	301	LSbk-2 Or LSbl-2	10 -13	B	B

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR
14. Cont'd	Assemble sleeves. (cont'd) j. Lay heat seaming tape on inside of sleeve, covering all stitching and heat seal.				
15.	Assemble fronts – attach pockets and flaps. a. Position outside lower pocket assembly, face up, on lower front. Align pocket with bottom raw edges of front and raw edge of waist seam. Stitch around pocket at waist seam, front and bottom, 1/8 inch from edge. b. Close back of pocket and form hand opening by stitching back edge of pocket to front starting at the waist seam, coming down 1/2 to 3/4 inch below top edge of pocket and backtack, leave a 7 1/2 ± 1/4 inch opening, backtack and continue stitching to bottom of front. Bartack or linetack top and bottom of hand opening with a horizontal 3/8 inch tack. c. Stitch lower pocket flaps to upper front in alignment with upper pocket opening stitch line. Flaps shall be positioned to finish even with the back edge of pocket. d. Lay heat seaming tape over the stitching attaching the back end of pocket to lower front.	301 301 Brtck 301	SSa-1 SSa-1 SSa-1	10 -13 10 -13 28/brtk or 10-13 per linetack 10 -13	B B B B B B B B
16.	Assemble parka. a. With face sides together stitch lower fronts to lower back at side seams. b. Make a 3/16 inch eyelet at each end of waist drawcord casing in accordance with marks on pattern. Center of eyelet shall finish 1 ± 1/8 inch from finished end of casing. Thread elastic cord through eyelets and barrel locks and tie with knot.	301 	SSa-1 Whip or purl type	10-13 19 min	B B 70/2 or B B

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL	BOB/ LPR
16. Cont'd	Assemble parka shell. (cont'd)					
	c. Position waist draw cord casing on lower front in accordance with marks on pattern. Turn under ends and lower edge. Stitch 1/8 inch from folded edges.	301	SSb-1	10-13	B	B
	d. With face sides together and edges aligned, position sleeves on parka (right and left respectively) and stitch.	301	SSa-1	10 -13	B	B
	e. With face sides together and edges aligned, stitch upper parka side seams to underarm opening notch on upper sleeve and back tack. Continue seaming from lower sleeve notch to bottom of sleeve, catching sleeve tab in stitching.	301	SSa-1	10 -13	B	B
	f. With face sides together position upper parka on lower parka. Align front edges, match side seams and stitch parka together catching upper edge of waist draw cord in stitching. Do not catch waist drawcord in stitching.	301	SSa-1	10 -13	B	B
	g. Lay the heat seaming tape on the inside of parka over side seams, waist seam, sleeve attachment seams and heat seal.					
	h. Position collar on parka and with face sides together and front edges aligned, stitch collar (inner and outer) to parka as far as first notch. Insert hood and continue stitching inner collar and hood to the opposite front notch. Continue stitching collar (inner and outer) to parka.	301	SSa-1	10 -13	B	B
17.	Set underarm slide fastener.					
	a. At each end of slide fastener, clip shell under arm seam at an angle to allow a 3/4 inch opening width.					

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR
17. cont'd	Set underarm slide fastener. b. Position slide fastener face down on underarm seam outlet between notches and with back edge of fastener tape even with raw edge of outlet. Stitch 1/4 ± 1/16 inch from back edge of tape. Tack top and bottom of the angle clipping (tongue notch) to end of slide fastener tape.	301	SSa-1	10 -13	B B
	c. Turn under slide fastener to finished position and topstitch underarm seam thru all plies 3/8 ± 1/16 inch from folded edge. The slide fastener pull shall finish toward bottom of sleeve.	301	SSe-1	10-13	B B
	d. Lay heat seaming tape over top, sides and bottom of slide fastener stitching, sleeve seams and heat seal.				
18.	Attach front slide fastener. a. Position back edge of slide fastener tape even with left (as worn) front edge of parka and align with top of collar, top of throat tab and front edge. Fold under top end of slide fastener tape between tab and parka. Stitch to parka front 1/4 inch from front edge catching tab and lower pocket in the stitching.. Match opposite slide fastener tape with right front (as worn) at bottom and repeat operation.	301	SSa-1	10-13	B B
	b. Stitch upper inner pocket with slide fastener tape with a 3/8 inch seam starting at the notch and backstitch ends of seam. Repeat operation for opposite side.	301	SSa-1	10 -13	B B
	c. From the inside, seam seal stitching of slide fastener and collar.				

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR
19.	Apply non-wicking buffer inside of fronts, back, sleeves and over seams. a. Attach (heat seal) a 2 inch wide non-wicking buffer tape 1-3/4 ± 1/4 inches from the bottom raw edge of parka, no less than 1/2 inch from front edges. b. Attach (heat seal) a 2 inch wide non-wicking buffer tape 1-3/4 ± 1/4 inches from the bottom raw edge of sleeves, no less than 1/2 inch from side seams.				
20.	Hem sleeves. Turn under edge of sleeve 1/4 to 3/8 inch, fold up hem 1/2 ± 1/8 inch and stitch 1/16 to 1/8 inch from the folded edge. The hem shall finish 3/8 to 5/8 inch wide.	301	EFb-1	10 -13	B B
21.	Hem bottom of parka. Turn under bottom edge of parka 1/4 inch, fold hem up 3/4 ± 1/8 inch covering draw cord and stitch 1/16 to 1/8 inch from folded edge. The hem shall finish 5/8 to 7/8 inch wide. Thread drawcord thru barrel locks with knot.	301	EFb-1	10 -13	B B
22.	Attach insignia tab. a. Position the top edge of the insignia tab on left front, 2-3/4 inches below collar joining seam, with point towards waist, and stitch 1/8 inch from folded edge. b. Position raw edge of insignia tab on left front, 2-3/4 inches below collar joining seam with point towards collar and stitch 1/4 inch from raw edge. Turn tab down and stitch 1/8-1/4 inch from fold, tacking ends.	301 301	LSbj-1 LSbk-2(a & b)	10 -13 10 -13	B B B B

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR
23.	Heat seal reinforcement tape. Heat seal all reinforcement tapes positioned on the inside of upper and lower pocket lining to the parka.				
24.	Attach thong to slide fastener. a. Insert a material supplier thong into the front slide fastener slider. - or – b. Fold braid in half lengthwise, insert loop into end of pull, pass the free ends through loop and pull tight. Knot free ends together with an overhand knot. Thong shall finish 6 ± 1/4 inches. - or – c. As an alternate make stripping for the thong using base fabric, camouflage side up, by folding stripping with the edges abutted at center and stitch with each row of stitching not less than 1/16 inch from edge and covering stitch on the underside. The finished stripping shall measure 5/16 to 3/8 inch wide. Attach stripping to slide fastener, same as above (operation 30.a). Knot or bartack free ends of stripping.	406 Brtck	EFh-1	10 –13 28/brtck	B B B B
25.	Assemble detachable (optional) hood. a. Fold bottom edge 1/4 inch from front crown to the dart cut out and topstitch 1/8 to 3/16 inch from folded edge. b. Fold edges of cut out on side crown and stitch dart with 1/4 inch seam, extending the stitching 1/2 inch past end of cut out. c. With face sides together position side pieces to center piece with edges aligned and stitch 1/4 inch from edge.	301 301 301	EFa-1 SSa-1 SSa-1	10 -13 10 -13 10 -13	B B B B B B

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR	
25. Cont'd	<u>Assemble detachable (optional) hood</u> (cont'd)					
	d. Turn dart and joining seams toward center piece, lay heat seaming tape over seams and heat seal, extending seaming tape 1/2 inch past stitching of darts.					
	e. Hem the side edge of the crown, and side edge of the dart, and the bottom edge from dart to dart by folding the raw edges 1/4 inch and topstitch 1/8 to 3/16 inch.	301	EFa-1	10 -13	B	B
	f. Position three 1 inch wide and 2 inches (± 1/4 inch) long pile fastener tape on the inside bottom hem as indicated on pattern and stitch all four sides 1/8 to 3/16 inch from edge.	301	SSa-1	10 -13	B	B
	g. Position three 1 inch wide and 2 inch (± 1/4 inch) long hook fastener tape to the face side at bottom super imposed over the pile fastener tape and stitch all four sides 1/8 to 3/16 inch from edge.	301	LSbj-1	10 -13	B	B
	h. Position two 1 inch wide and 1-1/4 ± 1/4 inch long hook fastener tape to the inside edge opening as indicated on pattern and stitch all four sides 1/8 to 3/16 inch from edge.	301	LSbj-1	10 -13	B	B
	i. Position two 1 inch wide and 2 ± 1/4 inch long pile fastener tape to the face side of the right front opening as indicated on pattern and stitch all four sides 1/8 to 3/16 inch from edge.	301	LSbj-1	10 -13	B	B
	j. Position interlining to inside of visor piece and stitch 1/8 to 3/16 inch at the straight edge of visor.	301 or 401	SSa-1	10 -13	B	B
	k. Hem ends of hood tunnel by folding the inside edge over the face side 1/2 inch and stitch 1/4 inch from folded edge.	301	EFa-1	10 -13	B	B

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR	
25. Cont'd	Assemble detachable (optional) hood. (cont'd)					
	l. Fold hood tunnel at center and stitch the raw edges together 3/16 to 1/8 inch from raw edge.	301	EFu-1	10 -13	B	B
	m. Position the visor piece (face to face) on the hood and stitch 1/4 inch from the raw edge. Turn visor right side out.	301	SSa-1	10 -13	B	B
	n. Position hood tunnel to face side of hood at the front notch and stitch 1/4 from the raw edge up to the visor junction, continue stitching on the straight edge of visor, and continue to stitch the tunnel to the front notch.	301	SSa-1	10 -13	B	B
	o. Fold the front raw edge of the hood 1/4 inch to the inside and edge stitch 1/8 inch from folded edge, continue 1/8 inch edge stitching at tunnel joining seam up to the visor joining seam, back-tack and continue stitching at the top edge of the visor 1/4 inch from the edge. Continue stitching 1/4 inch from edge and repeat operation on other side.	301	EFa-1 LSq-2(b)	10 -13	B	B
	p. Place heat seaming tape over the front edge and tunnel stitching (over the entire hood opening) and heat seal.					
	q. Set barrel locks to both ends of drawcord, length appropriate to size. Extend drawcord 2 to 2-1/2 inches beyond barrel locks and tack drawcord ends to the hood and pile fastener tape stitching.	301	SSv-1 or Brtck	10 -13	B	B
26.	Assemble hood flap.					
	a. Fold hood flap, face side together, and stitch both ends.	301 or 401	SSe-2(a)	10 -13	B	B

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NO.	OPERATION	STCH TYPE	SEAM/ STCH TYPE	STCH PER IN	THREAD NDL BOB/ LPR
26. Cont'd	Assemble hood flap. (cont'd) b. Turn ends right side out and top stitch along folded and stitched edges 1/16 inch from edge. c. Position eight strips of 1 inch wide pile fastener tape (length as indicated on pattern ± 1/8 inch) to flaps as indicated on pattern, and stitch through both layers of flap 1/8 to 3/16 inch from edge on all four sides. d. Set nine snap caps to flap as indicated on pattern.	301 or 401 301	SSe-2(a) and OSf-1 LSbj-1	10 -13 10 -13	B B B B
27.	Set flap to hood. a. Center hood flap on the outside of parka as indicated on pattern with pile fastener tape side facing up and stitch 1/16 to 1/8 inch from edge. The pile fastener tape shall face the front when the flap is attached to the hood. b. Turn flap down and top stitch 1/4 (± 1/16) inch from folded edge. On the inside of the garment, seam seal tape the seam that attaches the flap to the hood.	301 301	LSbl-2(a) LSbl-2(a)	10 -13 10 -13	B B B B
28.	Combination size, identification and instruction label. The label for the optional hood shall be applied on the inside center of the right side panel.				

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3.9 Finished measurements. The measurements of the parka shall conform to the requirements specified in Table XI.

TABLE XI. Finished measurements (inches).

	1/2 Chest 1/	Back length 2/	Sleeve length 3/	Optional hood flap length 4/
X-Short				
X-Small	22-1/4	29	23-1/2	26-1/2
Small	24-1/4	29-1/2	23-3/4	27
Medium	26-1/4	30	24	27-1/2
Large	28-1/4	30-1/2	24-1/4	28
Short				
X-Small	22-1/4	29-1/2	24	26-1/2
Small	24-1/4	30	24-1/4	27
Medium	26-1/4	30-1/2	24-1/2	27-1/2
Large	28-1/4	31	24-3/4	28
X-Large	30-1/4	31-1/2	25	28-1/2
Regular				
X-Small	22-1/4	30	25	24-1/2
Small	24-1/4	30-1/2	25-1/4	25
Medium	26-1/4	31	25-1/2	25-1/2
Large	28-1/4	31-1/2	25-3/4	26
X-Large	30-1/4	32	26	26-1/2
Long				
X-Small	22-1/4	32-1/2	26	26-1/2
Small	24-1/4	33	26-1/4	27
Medium	26-1/4	33-1/2	26-1/2	27-1/2
Large	28-1/4	34	26-3/4	28
X-Large	30-1/4	34-1/2	27	28-1/2
XX-Large	32-1/4	35	27-1/4	29
X-Long				
Large	28-1/4	35-1/2	28	30
Tolerance (Inch)				
Plus/Minus	3/4	3/4	1/2	1/2

1/ With slide fastener closed and parka smooth and flat, measure 1/2 chest from folded edge to folded edge at base of armhole seams.

2/ Measure center back length from neck seam to bottom of hem.

3/ Measure sleeve length from armhole seam to bottom of sleeve along underarm seam.

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4/ Measure seam joining hood flap to hood, from end to end, following the curve of the hood.

3.9 Slide fastener finished measurements. After stitching, the front slide fasteners shall measure not less than 1/4 inch less than the minimum specified length in paragraph 3.3.11.1.

3.10 Workmanship. The finished parka and hood shall conform to the quality of product established by this specification. The occurrence of defects shall not exceed the applicable acceptable quality level.

4. VERIFICATION

4.1 Classification of inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as other wise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements

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

4.1.2 Responsibility for dimensional requirements. Unless otherwise specified in the contract or purchase order, the contractor is responsible for ensuring that all specified dimensions have been met. When dimensions cannot be examined on the end item, inspection shall be made at any point, or at all points in the manufacturing process necessary to ensure compliance with all dimensional requirements.

4.1.3 Certificate of compliance. Where certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.

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

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

4.3 First article inspection. The first article, submitted in accordance with 3.2, shall be inspected as specified in 4.4.2 and 4.4.3 for compliance with design, construction, workmanship and dimensional requirements and tested in accordance with 4.4.4.

4.4 Quality conformance inspection. Sampling for inspection shall be performed in accordance with ANSI/ASQC Z1.4, except where otherwise indicated.

4.4.1 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

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standards unless otherwise excluded, amended, modified, or qualified in this specification or applicable procurement documents.

4.4.1.1 Component testing. The components specified in paragraphs 3.3.4, 3.3.5 and 3.3.7 shall be tested for the characteristics listed in Table XII in accordance with the test method cited.

TABLE XII. Component tests requirement.

Characteristic	Reference Paragraph	Test method
Cloth, Reinforcement		
Weight	3.3.4	ASTM D-3776 (Method C)
Breaking strength	3.3.4	ASTM D-5034
Colorfastness to:		
Crocking	3.3.4	AATCC-8
Laundering	3.3.4	AATCC-61-1A
Light	3.3.4	AATCC-16 Opt. A (after 40 fading units) or E (after 75 kilojoules)
Perspiration	3.3.4	AATCC-15
Spray rating initial	3.3.4	AATCC-22
Spray rating after one laundering	3.3.4	AATCC-135 & AATCC-22
Stiffness	3.3.4	TAPPI-T-451 7/
Puncture Propagation		
Tear (kgf)	3.3.4	ASTM D-2582 8/
Resistance to organic liquid	3.3.4	AATCC-118
Resistance to Frosting	3.3.4	AATCC 119
Dimensional stability	3.3.4	AATCC-96 Opt.1C/ AATCC-135
Abrasion Resistance	3.3.4	ASTM-D-3884
Infrared reflectance	3.3.4	9/
Cloth, three-layer knit		
Weight	3.3.5	ASTM D-3776 (Method C)
Stiffness	3.3.5	TAPPI -T-451 7/
Hydrostatic Resistance (initial taffeta restraint)	3.3.5	ASTM D-751
Hydrostatic Resistance (after deet taffeta restraint)	3.3.5	ASTM D-751 1/
Puncture Propagation		
Tear (kgf)	3.3.5	ASTM D-2582 8/
Water permeability		
Initial	3.3.5	AATCC-127 2/
Water Permeability after synthetic perspiration	3.3.5	AATCC-127 3/

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Cloth, three-layer knit (cont'd.)		
Moisture Vapor Transmission Rate (g/m2/24 Hrs) (B)	3.3.5	ASTM E-96 4/
(BW)	3.3.5	ASTM E-96 5/
Physical Surface Condition changes after laundering	3.3.5	6/
Reinforcement tape		
Water permeability after seam tape	3.3.7	4.5.2.1 (b)
Weight	3.3.7	ASTM D-3776

1/ Five 4 x 4 inch specimens shall be laid flat, face side up on a glass plate, 4 x 4 inches by 1/4 inch thick. Three drops of diethyltoluamide shall be applied to the center of each specimen. A glass plate shall be placed on each specimen and a four pound weight placed on top. After 16 hours, remove the specimen and test immediately for water permeability.

2/ The water permeability shall be measured as specified in AATCC No. 127, except that a fixed hydrostatic head of 50 centimeters shall be held for 10 minutes, the face side of the test cloth shall contact the water and five specimens shall be tested. The report shall only include measurement of the appearance of water droplets. Leakage is defined as one (1) or more droplets any place within the 4-1/2 inch diameter area.

3/ The specimen, 8 inches by 8 inches, shall be cut and exposed to synthetic perspiration as follows: the synthetic perspiration solution shall be made by combining 3.0 grams sodium chloride, 1.0 gram trypticase soy broth powder, 1.0 gram normal propyl propionate, 0.5 gram of liquid lecithin and 500 ml of distilled water. Cover the solution and stir while heating to 50°C until all ingredients are dissolved. Then, cool the solution to 35°C, remove cover and dispense it immediately with a pipette or other suitable measuring device. Dispense 2 ml of perspiration solution at 35°C, onto the center of an 8 inch by 8 inch by 1/4 inch glass plate. Place the specimen on the glass plate with the knit side contacting the glass. Dispense an additional 2 ml of the synthetic perspiration solution onto the center of the specimen. Place second 8 inch by 8 inch by 1/4 inch glass plate on top of the specimen and then place a 4 pound weight on top of and in the center of the assembly. After 16 hours, remove the specimen (do not rinse) and air dry the specimen before testing. Test the specimen for water permeability as specified in AATCC-127.

4/ The back side of the test cloth shall face the water, the free stream air velocity shall be 550 ± 50 FPM as measured 2 inches above the fabric specimen. The air flow shall be measured at least 2 inches from any other surface. The specimen cups shall be conditioned in the air stream for not less than 4 hours, nor more than 16 hours, before the initial weighing to start the test. The test shall be run for 24 hours and weight measurements shall be taken at only the start and completion of the test. At the start of the 24 hour test period, the air gap between the water surface and the back of the specimen shall be 3/4 ± 1/16 inch. Five (5) initial specimens shall tested.

5/ The back side of the test cloth shall face the water. The free stream air velocity shall be 550 ± 50 FPM as measured two (2) inches from any other surface. The specimen cups shall be inverted such

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that the water inside each cup contacts the back side of the specimen. The cups shall be examined for water seepage/leakage of the specimen or the cup seal; specimen cups exhibiting water seepage/leakage shall be replaced. The test shall run for two (2) hours and weight measurements shall be taken at the start and completion of the test. Five (5) initial specimens shall be tested. The specimens shall be sealed in any manner which prevents water wicking and/or leaking out of the cup.

6/ Conduct 20 laundering and drying cycles in accordance with 4.5.2. Each sample, 48 inches in length by full width shall be cut in half across the width of the cloth. One half of the sample (24 inches in length) shall be laundered and the remaining half retained as the unlaundered portion for the final evaluation, as necessary. After each drying cycle, examine both sides of the cloth for changes in physical surface appearance when compared to the unlaundered sample.

7/ Preferred Procedure (1) except that five specimens shall be tested under standard textile test conditions as specified in ASTM D-1776.

8/ Five warp and five filling specimens shall be tested. Specimen size shall be 8 inches by 8 inches. Only one tear shall be made on a single specimen. The specimen shall be positioned with the face side toward the probe and with the designated yarns of the face fabric at right angles to the direction of the tear. The test shall be conducted using the standard drop height of 508 $\pm$ 2 mm. If the tear is not straight on the face side of the specimen, the result shall be considered invalid and another specimen shall be tested. The thickness of the specimen is not measured.
Note: **This test will be performed at least once at the beginning of each new contract**. The government reserves the right to test this characteristic when samples are sent for verification testing.

9/ Infrared reflectance data shall be determined on the face side of the material and shall be obtained from 600 to 860 nanometers (nm), at a 20 nm intervals on a spectrophotometer relative to a barium sulfate standard, the preferred white standard. Other white reference materials may be used, provided they are calibrated to absolute white, e.g., magnesium oxide, or vitrolite tiles. The spectral band width shall be less than 26 nm at 860 nm. Reflectance measurements may be made by either the monochromatic or polychromatic mode of operation. When the polychromatic mode is used, the spectrophotometer shall operate with the specimen diffusely illuminated with the full emission of a source that simulates either CIE Source A or CIE Source D65. The specimen shall be measured as a single layer, backed with six layers of the same fabric and shade. Measurements shall be taken on a minimum of two different areas and the data averaged. The measurement areas should be at least 6 inches away from the edges of the finished cloth. The specimen shall be viewed at an angle no greater than 10 degrees from normal, with the specular component included. Photometric accuracy of the spectrophotometer shall be within 1 percent and wavelength accuracy within 2 nm. The standard aperture size used in the color measurement device shall be 1.0 to 1.25 inches in diameter. Any color having infrared reflectance values falling outside the limits at four or more of the wavelength specified shall be considered a test failure.

4.4.1.2 Component and material certification. Unless otherwise specified, a certificate of compliance will be acceptable as evidence that the heat sealing tape conforms to the requirements specified in 3.3.5.

4.4.2 End item visual examination. The end items shall be examined for defects listed in Table XIII. The lot size shall be expressed in units of parkas or units of hoods. The sample unit shall be one parka and or one hood. The inspection level shall be II and the acceptable quality level (AQL) shall be 1.5

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for major defects and 10 for (major and minor combined) defects expressed in terms of defects per hundred units.

TABLE XIII. End item visual defects.

Examine	Defect	Classification Major	Minor
Material defects and damages	Any smash, multiple float or loose slub	101	
	Cut, tear, mend, burn, needle chew, or hole	102	
	Misweave, area of poor dye penetration, dyestreak, broken or missing yarn, visible mend, thin place, or shade bar 1/	103	201
Cleanliness	Any spot, streak, or stain of a permanent nature on any portion of a garment which would be visible when parka or hood is worn		202
	Removable spot, streak, or stain on outside of parka or hood		203
	Thread ends not trimmed throughout parka and hood		204
	Any holding or basting threads visible on outside of the finished parka and hood when applicable		205
Component and assembly	Any defective component 1/	104	206
	Any component part omitted	105	
	Any required operation omitted or improperly performed 1/	106	207
Drawcord	Any drawcord caught in hem, casing or tunnel stitching restricting use of drawcord	107	
	Any end not heat seared		208
	Any drawcord omitted	108	
	Any end not knotted		209
	Any drawcord insufficient in length	109	
	Any barrel lock omitted		210
	Not caught in center bartack when specified		211
Slide fastener	Any part of slide fastener bent, broken, otherwise defective	110	
	Not closing as specified	111	
	Length not as specified	112	
	Color not as specified		212
	Thong not as specified		213
Snap fastener (Optional hood only)	Any part of assembly missing, mismated, broken, cracked, bent, not securely clinched, affecting function: - two or more snap fasteners	113	

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TABLE XIII. End item visual defects (cont'd)

Examine	Defect	Classification Major	Minor
Snap fastener (cont'd.)			
- one snap fastener			214
	One or more clinched too tightly cutting surrounding fabric	114	
	Loose, i.e., socket or stud spins freely or wobbles in connection portions		215
	One or more having rough or sharp edge	115	
Wrist tabs	Missing	116	
	Improperly located 1/	117	216
Labels	Missing, illegible, or incorrect	118	
	Incorrectly placed or attached		217
Accuracy of seaming and seam tape	Seam twisted, pleated, or puckered 1/	119	218
	Part of parka, hood caught in any unrelated operation or stitching 1/	120	219
	Thread break secured by stitching back of the break less than 1/2 inch		220
	Ends of all seams and stitches, when not caught in other seams or stitching, uneven or backtack less than 1/2 inch		221
	Thread color not as specified		222
	Gage of stitching uneven or not as specified		223
	Edge of seam tape less than 1/8 inch from seam allowance	121	
	Seam tape lifting off fabric	122	
Open seams	More than 1/8 inch up to 1/4 inch		224
	More than 1/4 inch	123	
	NOTE: One or more broken or two or more continuous skipped or run-off stitches constitute an open seam. On double stitched seams, a seam is considered open when one or both sides of the seam is open. Raw edge not securely caught in stitching shall be classified as an open seam.		
Seams and stitchings	Not specified seam or stitch type		225
	Missing, broken or skipped stitches 1/	124	226
Stitch tension	Loose tension in any area:		
	- more than 1 inch but not more than 2 inches		227

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TABLE XIII. End item visual defects (cont'd)

Examine	Defect	Classification Major	Minor
	- more than 2 inches	125	
	Tight tension (stitches break when normal strain is applied to the seam or stitching)	126	
	Missing, broken, or skipped stitches 1/	127	
Stitches per inch (to be scored only when the condition exists on major portion of the seam)	Less than minimum specified:		
	- one stitch		228
	- two or more stitches	128	
	More than maximum specified		229
Pockets, flaps and insignia tab	Flap attached crookedly, i.e., distance between sides of pocket and underside of opened flap varies more than 1/4 inch		230
	Pocket or flap poorly shaped		231
	Flap not covering front or back edge of pocket by 3/16 or more		232
	Insignia tab set crookedly		233
	Pocket divider not properly placed		234
Heat sealed seams and non-wicking buffer	Any seam tape not located as specified		235
	Non-wicking buffer missing	129	
	Non-wicking buffer not properly placed	130	
	Any seam tape not 1/8 inch overlap on each side of sewn seam	131	
	Any seam tape not overlapped 3/4 inch minimum	132	
	Any required stitching not covered by seam tape		236
	Any needle punctures that have not been repaired using heat sealing tape		237
	Any area of the laminate knit fabric bordering the seam tape that is melted exposing laminate film	133	
Repairs	Any heat sealing repairs extending beyond 25 inches in length	134	
	More than five repairs on any one item 1/	135	
Seam tape adhesion	Seam tape lifting off fabric within 3/4 inch of seam 1/	136	
	Visible scorching (heat degradation of the fabric on the laminate) in excess of 3/16 inch in width or 1/2 inch in length at any location along a taped seam	137	
Shaded part	Variation in shade within an outside part 1/	138	238
	Any part required to be cut from one piece of material shaded 1/	139	239

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TABLE XIII. End item visual defects (cont'd)

Examine	Defect	Classification Major	Minor
NOTE: Parts suspected as being shaded shall be examined at a distance of 3 feet against the background of the other parts and colors of the garment. When the shade difference is readily discernible under these examining conditions, it shall be scored as a shaded part.			
Length of fronts	Hem uneven by 1/4 inch or more at bottom of fronts when slide fastener is closed		240
	Uneven by 1/4 inch or more at top of collar neck when slide fastener is closed		241
Bartacks	Bartack omitted	140	
	Any bartack not in specified location, insecure, or not serving intended purpose:		
	- more than two	141	
	- two or less		242
	Any loose stitching, incomplete or broken		243
	Length or width not as specified		244
Hood flap	Loop fasteners not in locations specified	142	
	Not heat sealed	143	
Label/tag	Barcode omitted or not readable by scanner		245
	Human-readable-interpretation (HRI) omitted or illegible		246
	Not attached to location specified		247
	Causes damage to the parka	144	
Fastener tape hook & pile	Not properly placed	145	
	Not specified length		248

1/ This defect shall be scored as major when seriously affecting serviceability and as a minor when affecting serviceability but not seriously.

4.4.3 End item dimensional examination. The end items shall be examined for conformance to the dimensions specified in Table III. Any dimension not within the specified tolerance shall be classified as a defect. The lot size shall be expressed in units of one parka or one hood. The sample unit shall be one parka (or one hood). The inspection level shall be S-3 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.

4.4.4 End item testing. The end items shall be tested as specified in 4.5 for conformance to the requirements for the black print color of the camouflage pattern, hydrostatic resistance of seam tape, tape end lifting, tape integrity and physical surface appearance changes specified in 3.6.2, and 3.6.3. The lot size shall be expressed in units of parkas or of hoods. The sample unit shall be one parka (or

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one hood). The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 4.0 for test failures.

4.4.5 Packaging examination. The fully packaged end items shall be examined for the defects listed below. The lot size shall be expressed in units of shipping containers. The sample unit shall be one shipping container fully packaged. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 1.0.

Examine	Defect
Marking (exterior and interior)	Omitted, incorrect, illegible, of improper size, location, sequence, or method of application.
Materials	Any component missing, damaged, or not as specified.
Workmanship	Inadequate application of components such as: incomplete closure of container flaps, loose strapping, improper taping, inadequate stapling. Bulged or distorted container.
Content	Number of items per shipping container is more or less than required. Size shown on one or more items not as specified on shipping container. 1/

1/ For this defect, one item from each shipping container in sample shall be examined.

4.4.6 Palletization examination. An examination shall be made to determine that palletization complies with the section 5 requirements. Defects shall be scored in accordance with the list below. The sample unit shall be one palletized unit load fully packaged. The lot size shall be the number of palletized unit loads in the end item, inspected lot. The inspection level shall be S-1, and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 4.0 in accordance with ANZI/ASQC Z 1.4.

Examine	Defect
Finished dimensions	Length, width, or height exceeds specified maximum requirements.
Palletization	Pallet pattern not as specified. Load not bonded with required straps specified.
Weight	Exceeds maximum load limits.
Marking	Omitted, incorrect, illegible, of improper size, location, sequence, or method of application.

4.5 Methods of testing.

4.5.1 Hydrostatic resistance test. The hydrostatic resistance of sealed seam areas of the parka, before and after five laundering cycles (see 4.5.2), shall be tested in accordance with AATCC 127, except for

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the following: The test specimen need not be conditioned and does not need to be tested in a conditioned environment (ambient conditions may be used). The test may be performed on any device which tests the same specimen area at the equivalent pressure. The hydrostatic head shall be 50 centimeters pressure for 3 minutes. The parka shall be tested at four different locations as follows: one on hood seam, one on juncture of hood and neck seam, one on corner of left sleeve pocket, and one on straight torso seam. The water shall contact the outside of the garment. The sealed seam shall be centered in the 4-1/2 inch diameter test area of the testing machine. Evidence of leakage in one or more seam locations shall be considered a test failure. Leakage is defined as the appearance of one droplet of water anywhere in the 4-1/2 inch diameter test area. In cases of dispute the apparatus described in AATCC 127 shall be used.

4.5.2 Parka laundering test. Select parkas in accordance with the criteria specified in paragraph 4.4.4. Prior to laundering, one parka shall be retained for use as the unlaundered sample in evaluating the parkas after laundering. Place two (2) parkas, (one parka may be ballast) (approximately 4 pounds total load), in an automatic washing machine set on permanent press cycle, high water level and warm (100 + 10, - 0° F) wash temperature. Taped areas of the parka shall be visually examined prior to laundering for physical surface appearance characteristics and initial tape end and integrity conditions. The sliders, hook/loop tapes and snap fasteners of each parka shall be closed with the right side of each parka out during the wash and drying cycles. Place 28 grams of detergent conforming to 1993 AATCC Standard Reference Detergent (non-phosphate) without optical brighteners into the washer. The duration of each laundering cycle shall be 30 to 35 minutes. After laundering, place parkas in an automatic tumble dryer set on permanent press cycle, high heat setting (150-160° F) and run approximately for 45 minutes. Conduct five laundering and drying cycles. After the fifth laundering and drying cycle, test and evaluate the parkas for conformance to the required characteristics in 4.5.2.1. The laundering equipment (washer and dryer) shall be in accordance with AATCC 135.

NOTE: The above test shall be used to launder the optional hood. When hoods are laundered, a 3-inch X 5-inch swatch containing black printed areas shall be cut from a hood prior to laundering and retained for comparison with the laundered hoods.

4.5.2.1 Appearance after 1aundering.

a. Tape ends integrity test. After five laundering cycles, the test parka (or hood) shall be examined for any sign of tape ends lifting, within 3/4 inch of sewn seam; tape ends lifting more than 1/8 inch when tape extends beyond 3/4 inch of the sewn seam, tape curling, bubbling, separation along tape edges or across the tape width, or tape outer layer more than 1/8 inch. The occurrence of any of these defects shall be considered a test failure. Tape ends lifting more than 1/8 beyond 3/4 inch of the sewn seam shall be tested for hydrostatic resistance in accordance with paragraph 4.5.1 and are acceptable with no leakage.

b. Color loss in black print areas of woodland camouflage pattern. After five laundering cycles, the color loss shall be determined by comparing the test parka (or hood)and the unlaundered sample. Any black color change on any area of the parka (or hood) less than the required rating (see 3.6.3) on the AATCC Gray Scale for evaluating change in color shall be considered a test failure. Any physical surface appearance characteristic noted in a taped area on the unlaundered parka (see 4.5.2) shall not be considered a test failure on the laundered parka if there is no adverse change in the characteristic. Puckering and creases within taped areas, not adversely affecting appearance shall not be considered a test failure.

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c. Physical surface appearance changes of the laminated fabric. After five laundering cycles, the woodland camouflage printed side of the test parka (or hood) shall be visually examined on all visible pattern parts for any evidence of physical surface appearance changes as compared to the unlaundered sample (see 3.6.3). Any physical surface appearance change shall be considered a test failure. Any physical surface appearance characteristic noted in a taped area on the unlaundered parka, (see 4.5.2) shall not be considered a test failure on the laundered parka (or hood) if there is no adverse change in the characteristic. Puckering and creases within taped areas, not adversely affecting appearance shall not be considered a test failure.

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 parka and optional hood are intended for use by Marine Corps personnel when weather conditions dictate and as the outer layer of the Extended Cold Weather Clothing System when used during cold weather operations. The APECS parka will replace the Marine Corps (Gen 2) Extended Cold Weather Clothing System (ECWCS) parka procured under MIL-P-44188.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number and date of this specification.
b. Class and size (see 1.2).
c. Issue of DODISS to be cited in the solicitation and, if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
d. When first article inspection is required (see 3.1, 4.3, and 6.3).
e. Packaging requirements (see 5.1 and 5.1.1).

6.3 First article. When a first article is required, it will be inspected and approved under the appropriate provisions of FAR 52.209. 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 also include specific instructions in acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.4 Standard samples. For access to standard samples, address the contracting activity issuing the invitation for bids or request for proposal.

Downloaded from http://www.everyspec.com

6.5 Alternative seam tape set-up procedures. As with any seam tape, it is always best to consult the seam tape manufacturer for recommended settings depending on type of taping machine utilized. However, it has been determined that the following set-up procedures offer the best results for taping the polyolefin based material with the alternative tape:

Set the seam tape machine nozzle as close to 1/16 inch and evenly aligned as possible to the edges of the seam tape without touching the adhesive layer. Adjust the heat setting and run at the desired roller speed without exceeding 20 feet per minute. Place an unseamed sample of option material face down into the rollers. Set the roller pressure as to create a positive feed with no slippage. While bonding tape onto the material knit backing, adjust the nozzle air pressure such that only the fabric knit backing is scorched within a 3/8-5/8 inch center area relative to heat reflected off the tape. This condition can be achieved using a very low nozzle pressure. Under no circumstances can the option material knit backing be scorched a full 1 inch width, otherwise leakage will occur. Also, any change in heat setting vs. roller speed will create varying reflected heat scorching patters and therefore the nozzle pressure would be expected to be changed. Record the setting to achieve the correct reflected scorching pattern.

NOTE: CONTRACTOR USING THE ALTERNATE TAPE SHOULD VERIFY THAT SEAM SEAL MACHINE SETTINGS FOR APPLYING THE SEAM SEAL TAPE ARE OPTIMIZED TO PRODUCE A PRODUCT THAT PASSES HYDROSTATIC PRESSURE TESTS ON STRAIGHT, CURVED AND CROSSOVER SEAMS.

6.6 Subject term (key word) listing.

APECS Garment Outerwear Wet/dry

6.7 Or equal. Prior to the use of an "or equal" item, the supplier will submit the item with supporting data to the contracting officer for subsequent approval or disapproval by the responsible military agency.

6.8 Suggested Sources of supply.

6.8.1 Slide Fasteners conforming to the requirements of this document may be obtained from YKK USA, Inc. through Diversified Marketing Group, 109 Forrest Avenue, Narberth, PA 19072.

6.8.2 Cord locks conforming to the requirements of this document may be obtained from ITW Nexus USA, 194 E. Algonquin Road, Des Plaines, IL 60016. (630) 595-1888.

Custodians:

Navy - MC

Preparing activity:
DLA- CT

Project 8415-0257

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 http://www.dodssp.daps.mil.