

INCH-POUND

MIL-T-44189C

8 May 1991

SUPERSEDING

MIL-T-44189B

27 January 1989

MILITARY SPECIFICATION

TROUSERS, COLD WEATHER, 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 nylon, three layer laminated waterproof and moisture vapor permeable trousers used as a component of the extended cold weather clothing system.

1.2 Classification. The trousers shall be of one type in the following sizes as specified (see 6.2).

<u>Size</u>	<u>X-Short</u>	<u>Short</u>	<u>Regular</u>	<u>Long</u>
X-Small	X	X	X	X
Small	X	X	X	X
Medium	X	X	X	X
Large	-	X	X	X
X-Large	-	-	X	X

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be used in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5019, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8415

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are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

- A-A-50083 - Bag, Plastic, Folded Garment
- A-A-50199 - Thread, Polyester Core, Cotton- or Polyester-Covered
- V-F-106 - Fasteners, Slide, Interlocking
- V-T-285 - Thread, Polyester
- DDD-L-20 - Label: For Clothing, Equipage, and Tentage (General Use)
- PPP-B-26 - Bag, Plastic (General Purpose)
- PPP-B-636 - Boxes, Shipping, Fiberboard

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- MIL-T-2283 - Tape, Textile, Nylon, Woven, White or Dyed
- MIL-T-3530 - Thread and Twine: Mildew Resistant or Water Repellent Treated
- MIL-F-10884 - Fasteners, Snap
- MIL-F-21840 - Fastener, Tapes, Hook and Loop, Synthetic
- MIL-L-35078 - Loads, Unit: Preparation of Semiperishable Subsistence Items; Clothing, Personal Equipment, Equipage; General Specification For
- MIL-C-43701 - Cord, Elastic, Nylon
- MIL-C-44187 - Cloth, Laminated, Waterproof and Moisture Vapor Permeable

STANDARDS

FEDERAL

- FED-STD-191 - Textile Test Methods
- FED-STD-751 - Stitches, Seams, and Stitching

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- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
- MIL-STD-129 - Marking for Shipment and Storage
- MIL-STD-147 - Palletized Unit Loads
- MIL-STD-731 - Quality of Wood Members for Containers and Pallets

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

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2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 3951 - Standard Practice for Commercial Packaging

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

(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 (see 6.3) in accordance with 4.3.

3.2 Guide samples. Samples, when furnished, are solely for guidance and information to the contractor (see 6.4). Variations from the specification may appear in the sample in which case this specification shall govern.

3.3 Materials. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.

3.3.1 Cloth, laminated. The basic material for the trousers shall be cloth, laminated, waterproof and moisture vapor permeable, conforming to MIL-C-44187.

3.3.2 Seam sealing tape. The tape for covering and sealing all designated seams and stitching shall be cut in $1 \pm 1/16$ inch wide strips from Olive Green 106, laminated cloth fabricated in layers as follows:

- a. Nylon 6.6 tricot weighing 1.5 ± 0.3 ounces per square yard.
- b. The middle layer shall consist of microporous expanded polytetrafluoroethylene film weighing 0.6 ± 0.2 or -0.1 ounces per square yard.
- c. Adhesive, thermoplastic not less than 5.4 mils thick.

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3.3.2.1 Alternative urethane acrylic seam sealing tape. The alternative seam sealing tape shall be used only when the optional polyolefin microporous laminated basic material is utilized, and shall conform to the following characteristics:

- a. Width, inches: $1 \pm 1/16$.
- b. Nylon knit backing: Nylon 6.6 tricot fabric weighing 1.35 ± 0.2 ounces per square yard.
- c. The middle layer shall be a Thermoset crosslinked urethane acrylic barrier weighing 1.0 ounces per square yard.
- d. The outer layer shall consist of a low temperature polyurethane adhesive with 240°F (nominal) melt point not less than 7.5 mils thick (see 6.6 for recommended settings). Under no circumstances shall the tape machine utilized incorporate an independent nozzle air pressure control, or a nozzle heat output in excess of 600°C .

3.3.3 Tape, nylon. The tape for suspender loops shall be 1/2 inch flat nylon tape, black or Olive Drab 7, conforming to MIL-T-2283.

3.3.4 Drawcord, elastic. The trouser drawcord shall be 3/16 inch diameter nylon elastic conforming to type II of MIL-C-43701. All ends shall be heat seared and knotted.

3.3.5 Fastener, tape, hook and loop. The fastener tape shall be nylon Olive Green 106 conforming to type II, class-1 of MIL-F-21840 and in the widths specified in table II.

3.3.6 Fastener, slide. All slide fasteners shall be in lengths specified per size, color black, type I, style 3, size MS, nylon or polyester continuous coil or ladder configuration, conforming to V-F-106 and shall be equipped with a thong.

3.3.7 Barrel lock. The barrel locks for the ends of the drawcords shall be black, ITW Nexus Barreloc or equivalent.

3.3.8 Fastener, snap. The stud and post parts of the snap fastener shall be style 2A, finish 2 male and female complete, consisting of stud and eyelet size 1 or 2 with button size 1 or 2 and socket conforming to MIL-F-10884, except an uncapped button may be used in areas where the surface will be concealed by a layer of base cloth.

3.3.9 Thread. The thread for all seaming and stitching shall be polyester, size B, 2 or 3 ply, shade S-1, C.A. 66022 conforming to type I, class 1, subclass B, of V-T-285. As an alternate, polyester core, size 40, 2 or 3 ply, shade S-1, conforming to A-A-50199 may be used. All thread shall be water repellent treated in accordance with MIL-T-3530.

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3.3.10 Labels. Each of the trousers shall have a class 1 identification label, class 2 size label, and a class 3 instruction label conforming to type VI of DDD-L-20. The label color shall be Medium Green, C.A. 70034, 70130, or 70131. The labels shall show fastness to laundering.

3.3.10.1 Size label. The size label shall be as follows:

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<u>X-Small-X-Short</u>	<u>X-Small-Short</u>	<u>X-Small-Regular</u>	<u>X-Small-Long</u>
Inseam: Up to 26-1/2 in. Waist: Up to 27 in. Stock No: 8415-01-228-1336 NATO Size: 6067/5869	Inseam: 26-1/2 to 29-1/2 in. Waist: Up to 27 in. Stock No: 8415-01-228-1337 NATO Size: 6775/5869	Inseam: 29-1/2 to 32-1/2 in. Waist: Up to 27 in. Stock No: 8415-01-228-1338 NATO Size: 7583/5869	Inseam: 32-1/2 to 35-1/2 in. Waist: Up to 27 in. Stock No: 8415-01-228-1339 NATO Size: 8390/5869
<u>Small-X-Short</u>	<u>Small-Short</u>	<u>Small-Regular</u>	<u>Small-Long</u>
Inseam: Up to 26-1/2 in. Waist: 27 to 31 in. Stock No: 8415-01-228-1340 NATO Size: 6067/6979	Inseam: 26-1/2 to 29-1/2 in. Waist: 27 to 31 in. Stock No: 8415-01-228-1341 NATO Size: 6775/6979	Inseam: 29-1/2 to 32-1/2 in. Waist: 27 to 31 in. Stock No: 8415-01-228-1342 NATO Size: 7583/6979	Inseam: 32-1/2 to 35-1/2 in. Waist: 27 to 31 in. Stock No: 8415-01-228-1343 NATO Size: 8390/6979
<u>Medium-X-Short</u>	<u>Medium-Short</u>	<u>Medium-Regular</u>	<u>Medium-Long</u>
Inseam: Up to 26-1/2 in. Waist: 31 to 35 in. Stock No: 8415-01-228-1344 NATO Size: 6067/7989	Inseam: 26-1/2 to 29-1/2 in. Waist: 31 to 35 in. Stock No: 8415-01-228-1345 NATO Size: 6775/7989	Inseam: 29-1/2 to 32-1/2 in. Waist: 31 to 35 in. Stock No: 8415-01-228-1346 NATO Size: 7583/7989	Inseam: 32-1/2 to 35-1/2 in. Waist: 31 to 35 in. Stock No: 8415-01-228-1347 NATO Size: 8390/7989
	<u>Large-Short</u>	<u>Large-Regular</u>	<u>Large-Long</u>
	Inseam: 26-1/2 to 29-1/2 in. Waist: 35 to 39 in. Stock No: 8415-01-228-1348 NATO Size: 6775/8999	Inseam: 29-1/2 to 32-1/2 in. Waist: 35 to 39 in. Stock No: 8415-01-228-1349 NATO Size: 7583/8999	Inseam: 32-1/2 to 35-1/2 in. Waist: 35 to 39 in. Stock No: 8415-01-228-1350 NATO Size: 8390/8999
	<u>X-Large-Short</u>	<u>X-Large-Regular</u>	<u>X-Large-Long</u>
	Inseam: 26-1/2 to 29-1/2 in. Waist: 39 to 43 in. Stock No: 8415-01-228-1352 NATO Size: 8390/9909	Inseam: 29-1/2 to 32-1/2 in. Waist: Over 39 in. Stock No: 8415-01-228-1351 NATO Size: 7583/9909	Inseam: 32-1/2 to 35-1/2 in. Waist: Over 39 in. Stock No: 8415-01-228-1352 NATO Size: 8390/9909

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3.3.10.2 Identification-instruction label. The combination identification-instruction label shall be as follows:

TROUSERS, COLD WEATHER CAMOUFLAGE

a. Fixed Laundry: The trousers should be laundered utilizing "Formula K" of FM 10-17. NOTE: DO NOT STARCH, BLEACH, OR DRY CLEAN.

b. Field Laundry: The trousers should be laundered utilizing "Formula VIII" of TM 10-280. NOTE: DO NOT STARCH, BLEACH, OR DRY CLEAN.

Drying: The trousers should be finished in a tumble-dryer, loaded not more than 2/3 of rated capacity at low heat cycle (do not exceed 100°F). Remove immediately from dryer. Avoid over-drying. NOTE: DO NOT PRESS.

c. Machine/Hand Laundering. Use wash/wear/permanent press fabric cycle or wash by hand, using warm water (90° to 110°F) and mild powdered laundry detergent. Rinse thoroughly in clean warm water. NOTE: DO NOT USE CHLORINE BLEACH OR STARCH.

Drying: Tumble dry at low temperature (100°F) and remove immediately from dryer. Avoid over-drying. To drip dry, remove from water and place on rust-proof hanger. NOTE: DO NOT PRESS.

3.3.10.3 Combination size, identification, and instruction label. The identification label, size label, and instruction label may be combined into one label, conforming to class 14. The three labels shall be printed as one continuous label with the size label first and the identification and instruction labels placed below the size label. The size and identification labels may be combined and the contents placed above the instruction label. A space of 1/2 inch minimum shall be maintained between the labels. In addition, a solid line 1/16 inch minimum width shall extend across the entire label, approximately in the middle of the 1/2 inch blank space. The coating requirement shall conform to the class 3 label.

3.3.11 Eyelet metallic. The eyelet for the trouser grown-on waistband shall be Stimpson telescoping eyelet with neck washer, part numbers A1215 and A665 or equal (see 6.5).

3.4 Design. The trousers shall be camouflage to the outside with an elastic drawcord at the waist, slide fastener fly opening and ankle openings with fastener tape adjustment tabs.

3.5 Patterns. Standard patterns which provide an allowance of 1/4 inch for all 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.

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3.5.1 Pattern parts. The component parts shall be cut from the material specified and according to the number of parts listed in table I.

TABLE I. List of pattern parts

Material	Nomenclature	Parts
Cloth, laminated	Front and back	2
	Seat patch	2
	Knee patch	2
	Leg insert	4
	Pocket flap	4
	Ankle tab	2
	Pocket facing	2

3.6 Construction. The construction shall conform in all respects to the requirements specified in table II and herein. Figure 1 is furnished solely for guidance and information. Should variation from this specification appear in figure 1, this specification shall govern.

3.6.1 Stitches, seams, and stitching. All stitches, seams and stitching shall conform to FED-STD-751. The type of seam, stitching and stitches per inch shall be as specified in table II. 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 over-lap 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.

3.6.1.1.1 Repairs of type 301 stitching.

a. When thread breaks, skipped stitches, run-offs, or bobbin runouts 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. Except for prestitching, 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 in back of the defective area, continue over the defective area, and continue

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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 restitching in the required manner. 1/

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

3.6.1.2 Types 504, 515, and 516 stitching. Thread tension shall be maintained so that there will be no loose stitching. All repairs shall be in accordance with 3.6.1.1.1a and b. Thread tension shall be maintained so that there will be no loose or excessively tight stitching resulting in puckering of the materials sewn.

3.6.1.3 Bartacks. Unless otherwise specified, all bartacks shall be $3/8 \pm 1/16$ inch long and $1/8 \pm 1/32$ inch wide, and shall contain 28 stitches. Bartacking shall be free from thread breaks and loose stitching.

3.6.1.4 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.

3.6.1.5 Thread ends. All thread ends shall be trimmed to a length of not more than 1/4 inch unless otherwise specified.

3.7 Heat sealing. Seams and stitching as indicated in table II shall be sealed with heat sealing tape on the innerside of the trousers. The entire width of the seam tape shall be hot air sealed over the seam or stitching. The tape shall be applied by high temperature air blown on the thermoplastic adhesive face of the sealing tape, which is then driven through pressurized rollers, attaching the tape and sealing the seam or stitching. The machine shall operate on 1200 to 3600 watts, 115 or 220 VAC air heater with slotted pneumatically activated driven rollers which press the tape onto the seam or stitching being sealed at a maximum of 20 feet per minute. All seam tape 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. Every effort shall be made to avoid tape end joints where the tape passes over taped seams on the trouser. All seam tapes shall overlap a minimum of 3/4 inch at joining points. Sealed seams and stitchings shall show no leakage when tested as specified in 4.4.4.

3.8 Manufacturing operations requirements. The trousers shall be manufactured in accordance with operation requirements specified in table II. The contractor is not required to follow the exact sequence of operations listed. Any holding or basting stitch is permissible provided it is removed, does not show on the finished trousers, and does not interfere with proper seam taping of the trousers.

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3.8.1 Repairs. Repairing the trousers by mending, patching, or darning is not allowed. At no time is the removal of heat sealing tape permitted. However, heat sealing tape may be used for repairing leaking seams, and for repair of missing yarns in the tricot knit on the inside of the trousers up to 15 inches long. Up to three repairs totaling 15 inches in length shall be allowed. Seam tape may also be used to repair areas where the original tape does not overlap sewn seams by the minimum 1/8 inch on both sides. No more than two layers of seam sealing tape shall be permitted in any one area. The same dimensions as above shall apply.

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NO.	TABLE II. MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD																		
					NEEDLE	BOBBIN/ LOOPER COVER																	
1.	<p><u>Cutting and marking.</u></p> <p>a. Cut the trousers in strict accordance with patterns furnished which show size, shape, directional lines, and notches for proper assembly of parts. The directional lines indicate the warp, unless otherwise specified. The directional lines may vary from the warp direction by not more than 2-1/2 inches on both fronts and backs. 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 parts of the trousers from one piece of material.</p> <p>b. Shear cut fastener tapes and hot wire cut suspender loops and drawcords in lengths in inches as follows:</p> <table><tr><td><u>X-Small</u></td><td><u>Small</u></td><td><u>Medium</u></td><td><u>Large</u></td><td><u>X-Large</u></td><td><u>Tol.</u></td></tr><tr><td>38</td><td>42</td><td>46</td><td>50</td><td>54</td><td>± 1</td></tr></table> <p><u>Drawcord</u></p> <p>NOTE: As an alternate to hot wiring, drawcord ends may be dipped or impregnated with cellulose acetate or cellulose butyrate.</p> <p><u>Fastener tapes (hook)</u></p> <table><tr><td>1-1/2</td><td>1-1/2</td><td>1-1/2</td><td>1-1/2</td><td>1-1/2</td><td>± 1/4</td></tr></table>	<u>X-Small</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>X-Large</u>	<u>Tol.</u>	38	42	46	50	54	± 1	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	± 1/4				
<u>X-Small</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>X-Large</u>	<u>Tol.</u>																		
38	42	46	50	54	± 1																		
1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	± 1/4																		

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1 Dec 76

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NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/ LOOPER COVER
1.	<p><u>Cutting and marking.</u> (cont'd)</p> <p><u>Fastener tapes (loop)</u></p> <p>6-3/4 6-3/4 6-3/4 6-3/4 6-3/4 ± 1/4</p> <p><u>Suspender loops</u></p> <p>6-1/2 6-1/2 6-1/2 6-1/2 6-1/2 ± 1/4</p> <p>c. Leg slide fasteners shall be in lengths as indicated on patterns.</p> <p>d. Fly slide fasteners shall be in the following lengths per size stated:</p> <p>X-Small Small Medium Large X-Large</p> <p>X-Short</p> <p>6-1/2 7 7-1/2 8 8-1/2</p> <p>Short</p> <p>7 7-1/2 8 8-1/2 9</p> <p>Regular</p> <p>7-1/2 8 8-1/2 9 9-1/2</p> <p>Long</p> <p>8 8-1/2 9 9-1/2 10</p>					

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NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD		
					NEEDLE	BOBBIN/ LOOPER	COVER
2.	<u>Replacement of damaged parts.</u> 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.						
3.	<u>Marking.</u> Mark, ticket or bundle all component parts to insure a correct shade and size throughout the trousers. Markings shall not be visible on the outer shell of the trousers. Drill holes shall not be used.						
4.	<u>Assemble ankle tabs.</u> a. Position $1-1/2 \pm 1/4$ inch piece of 1-1/2 inch hook fastener tape to the right side of tab per marks on patterns and stitch on all four sides 1/8 to 3/16 inch from edge. b. Fold in half, (right side out) folding raw edges in 3/8 inch and stitch 1/16 to 1/8 inch from folded edge, tacking ends.	301	LSbj-1	10-13	B	B	
5.	<u>Assemble leg insert.</u> a. Align leg insert pieces right side to back and stitch together 1/4 inch from edges along top, side and bottom. b. Turn leg insert, force out corners and top stitch 1/16 to 1/8 inch from edges.	301	EFn-2	10-13	B	B	
		301	SSe-2(a)	10-13	B	B	
		301	SSe-2(b)	10-13	B	B	

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NO.	MANUFACTURING OPERATIONS REQUIREMENTS	SPITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/ LOOPER COVER
6.	<p><u>Make pocket flaps.</u></p> <p>a. Set snap on pocket flap (centered with cap toward wrong side).</p> <p>b. With right sides of flap together, stitch along sides and pointed edges. Turn, work out edges and points and stitch 1/16 to 1/8 inch from edges.</p>	301	SSe-2 (a-b)	10-13	B	B
7.	<p><u>Attach knee patches.</u></p> <p>a. Clip corner at the top of slide fastener cut out, fold under 1/4 inch and edge stitch 1/16 inch from folded edge, back stitching in corner only.</p> <p>b. Position knee patch to insert opening, wrong side to right side per marks on pattern. Fold bottom of patch under 1/2 inch and stitch to trousers 1/16 to 1/8 inch from folded edge.</p> <p>c. With raw edges aligned, stitch knee patch along insert opening 1/8 inch from raw edge.</p> <p>d. With bottom of knee patch folded under 1/2 inch, position per marks on patterns and top stitch in place 1/16 to 1/8 inch from folded edge.</p> <p>e. Fold top and short side of knee patch under 1/2 inch, position per marks on patterns and top stitch in place 1/16 to 1/8 inch from folded edge.</p>	301	EFa-1	10-13	B	B
		301	LSd-1	10-13	B	B
		301	SSa-1	10-13	B	B
		301	LSb-1	10-13	B	B
		301	LSd-1	10-13	B	B

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NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/ LOOPER COVER
8.	<u>Attach insert/slide fastener.</u> a. Tongue notch top of leg opening. With right sides together, raw edges of leg opening and slide fastener tapes even, stitch slide fastener to leg opening along each edge of slide fastener and across notch 1/4 inch from edge. Insert ankle tab between slide fastener tape and leg opening catching tab in the front leg stitching. b. On front portion of leg opening, position raw edges of leg insert even with back edge of slide fastener tape. The right side of the slide fastener. Stitch 1/8 inch from edges. c. Top stitch slide fastener 1/16 to 1/8 inch from folded edges on both sides and across notch, tacking ends.	301	LSq-2(a)	10-13	B	B
		301	LSq-2(b)	10-13	B	B
		301	LSq-2(b)	10-13	B	B
9.	<u>Attach seat patch.</u> a. Position wrong side of trousers to right side of seat patch with raw edges at side entry aligned and stitch 1/4 inch from raw edge of side entry from top to cut out. b. Notch and turn patch to outside of trousers and baste along raw edges of top and center back seam. c. Turn bottom and side of patches under 1/2 inch and top stitch 1/16 to 1/8 inch from folded edge.	301	SSa-1	10-13	B	B
		301	SSa-1	10-13	B	B
		301	SSb-1	10-13	B	B

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NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/ LOOPER COVER
10.	<p><u>Set pocket flaps and facings for side openings.</u></p> <p>a. Position pocket flap and facing on trousers right side to right side. Slash trouser front and pocket facing as indicated by marks on pattern and tongue notch ends. Align raw edges of flap and facing along slash line, and stitch around opening 1/4 inch from raw edges.</p> <p>b. Turn facing to inside of trousers and pocket flap to its finished position. Raise stitch front folded edge and ends of opening 1/16 inch from edge continuing along flap 1/8 inch from folded edge.</p>	301	SSa-1	10-13	B	B
11.	<p><u>Heat seal seam (knee patches, leg inserts, seat patches.</u></p> <p>a. Lay all seam sealing tape to wrong side of trousers, completely covering seam or stitching and heat seal.</p> <p>b. Heat seal knee patch stitching across top and bottom.</p> <p>c. Heat seal insert seams the length of insert on one side and to the top of knee patch on the other.</p> <p>d. Spot seal corner of knee patch.</p> <p>e. Spot seal heat seaming tape across top of insert.</p> <p>f. Heat seal seat patch stitching along bottom to corner, cut tape, reposition and seal to bottom opening of side entry extending to the intersection of the</p>	901	SSq-2	10-13	B	B

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NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD		
					NEEDLE	BOBBIN/ LOOPER	COVER
11.	Heat seal seam (knee patches, leg inserts, seat patches. (cont'd) welt and trousers, making sure the pocket opening is not reduced. g. Spot seal corner and end by side entry.						
12.	<u>Assemble front fly.</u> a. Overedge stitch around edge of fly, from top of trousers around bottom of fly curve. b. With slide fastener closed and face up, position to right side of right front of trousers and stitch 1/16 to 1/8 inch from edge of slide fastener tape, from top to bottom of slide fastener stop tacking ends. c. Position left slide fastener tape to left front of trousers with right sides together and stitch 1/8 inch from tape edge tacking ends. d. Position left and right trouser fronts with right sides together and crotch seam edge aligned. Stitch 1/4 inch from raw edge from inseam edge to 1/2 inch past curved edge, tacking both ends. e. Fold the left front fly to the inside per marks on pattern and stitch through trousers and slide fastener with fly, from top to J curve under slide fastener stop, tacking end.	504 or 516 301 301 301 301	EFd-1 SSa-1 SSa-1 SSa-1 SSb-1	10-13 10-13 10-13 10-13 10-13	B B B B B	B B B B B	

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NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD		
					NEEDLE	BOBBIN/ LOOPER	COVER
12.	<u>Assemble front fly. (cont'd)</u> f. Stitch the bottom of the fly extension together with edges aligned for 1-1/2 inch minimum at curve.	301	SSa-1	10-13	B	B	
13.	<u>Close trousers and heat seal seams.</u> a. With right sides together and edges aligned join center back seam stitching 1/4 inch from raw edge, tacking ends. b. With right sides together and edges aligned close inseam by stitching 1/4 inch from raw edge, tacking ends. The crotch and seat seams shall not be staggered more than 1/4 inch (measurement taken from center of seams). c. Lay all seam sealing tape to wrong side of trousers, completely covering seam or stitching and heat seal. d. Crotch and back center seam shall lie on either side of the trousers as long as both seams lie on the same side. e. Inseam shall lie towards either side of the trousers. f. Starting at top edge of back, heat seal seat and crotch seam to bottom of front fly. g. Starting at bottom of leg, heat seal to crotch. Repeat other leg.	301	SSa-1	10-13	B	B	

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NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/ LOOPER COVER
13.	<u>Close trousers and heat seal seams.</u> (cont'd)					
	h. Spot seal crotch.					
14.	<u>Hem trousers (and attach fastener tape).</u> a. Position a 6-3/4 inch strip of 1-1/2 inch loop fastener tape to bottom of back leg per marks on pattern and stitch on all four sides 1/8 to 3/16 inch from edge. NOTE: Start loop fastener tape at mark closest to gusset. b. Turn bottom edge of leg to inside 1/2 inch, fold in again 1/2 inch, and stitch 1/16 to 3/32 inch from fold around leg. Repeat for other leg.	301	LSbj-1	10-13	B	B
15.	<u>Hem waist.</u> a. Position eyelet reinforcement on inside of right side on mark for eyelet, and attach eyelet through reinforcement piece and trousers. The eyelet shall be centered on the reinforcement piece. b. Overedge top raw edge of trousers. c. Turn top of trousers over drawcord at notches provided on pattern and stitch with one row of stitching 1/2 ± 1/8 inch from top edge. The ends of drawcord shall exit through the eyelet on the right front and at the front of the waistband on the left. The drawcord shall not be caught in the stitching of the waist hem.	301 515 or 516 301	EFb-1 SSa-2 Eft-1	10-13 10-13 10-13	B B B	B B B

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NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD		
				NEEDLE	BOBBIN/ LOOPER	COVER
15.	<u>Hem waist.</u> (cont'd) d. Position suspender loop tapes to fronts per marks on patterns. Fold raw edges of tapes under 3/8 inch with edges of tapes extending toward top of waist and bartack in place with a 3/8 horizontal bartack. The suspender loops shall finish $5-1/4 \pm 1/8$ inches (from outer edges of bartacks) in length.	3/8 inch bartack stitch	21-28	B	B	
16.	<u>Set snaps.</u> a. Set cap to outside of left front on waistband aligned with center of fly. b. Set three studs, one to outside of right waistband to match with cap on left and one to each side entry back to match with cap on entry flaps.					

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3.9 Finished measurements. The measurements of the trousers shall conform to the requirements specified in table III.

TABLE III. Finished measurements (inches)

	1/2 Waist <u>1/</u>	Inseam <u>2/</u>	Outseam <u>3/</u>
<u>X-Short</u>			
X-Small	15	26-1/8	35
Small	17	26-1/4	35-1/2
Medium	19	26-3/8	36
<u>Short</u>			
X-Small	15	28	37-1/2
Small	17	28-1/8	38
Medium	19	28-1/4	38-1/2
Large	21	28-3/8	39
X-Large			
<u>Regular</u>			
X-Small	15	30	40
Small	17	30-1/8	40-1/2
Medium	19	30-1/4	41
Large	21	30-3/8	41-1/2
X-Large	23	30-1/2	42
<u>Long</u>			
X-Small	15	32	42-1/2
Small	17	32-1/8	43
Medium	19	32-1/4	43-1/2
Large	21	32-3/8	44
X-Large	23	32-1/2	44-1/2
<u>Tolerance</u>			
Plus	1/2	3/4	1/2
Minus	1/2	3/4	1/2

1/ With trousers fastened measure along center of waistband from folded edge to folded edge.

2/ Measure inseam of trousers from crotch seam to bottom edge of trouser leg hem.

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- 3/ Fasten slide fastener and ankle tab at leg insert. Snap pocket welt. With trousers flat, measure from top of waistband above front edge of welt to trouser leg hem below the ankle tab seam attachment at gusset front.

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

4. QUALITY ASSURANCE PROVISIONS

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

4.1.1 Responsibility for compliance. All items shall 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 ensuring 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 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 Certificates of compliance. When certificates of compliance are submitted, the Government reserves the right to inspect such items to determine the validity of the certification.

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

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

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4.3 First article inspection. When a first article is required (see 3.1 and 6.2), it shall be examined for the defects specified in 4.4.2 and 4.4.3 and tested as specified in 4.4.4.

4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be in accordance with MIL-STD-105.

4.4.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.4.1.1 Component and material certification. Unless otherwise specified, a certificate of compliance will be acceptable as evidence that the heat sealing tape conforms to the requirements specified in 3.3.2.

4.4.2 End item visual examination. The end items shall be examined for the defects listed in table IV. The lot size shall be expressed in units of trousers. The sample unit shall be one of the trousers. The inspection level shall be II and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 2.5 for major defects and 15.0 for total (major and minor combined) defects.

TABLE IV. End item visual defects

Examine	Defect	Classification	
		Major	Minor
Materials 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 <u>1/</u>	103	201
Cleanliness	Any spot, streak, or stain of a permanent nature on any portion of trousers which would be visible when trousers are worn		202
	Removable spot, streak, or stain on outside of trousers		203
	Thread ends not trimmed throughout trousers		204
	Any holding or basting threads visible on the outside of the finished trousers when applicable		205

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

Examine	Defect	Classification	
		Major	Minor
Component and assembly	Any defective component <u>1</u> /	104	206
	Any component part omitted	105	
	Any required operation omitted or improperly performed <u>1</u> /	106	207
Drawcord	Any drawcord caught in waistband stitching restricting use of drawcord	107	
	Any end not heat sealed		208
	Any drawcord omitted	108	
	Any end not knotted or not having a toggle		209
	Any drawcord insufficient in length	109	
	Any drawcord not caught in center back bartack		210
Slide fastener	Any part of slide fastener bent, broken, or otherwise defective	110	
	Not closing and locking properly	111	
	Length not as specified	112	
	Color not as specified		211
	Thong not as specified		212
Labels	Missing, illegible or incorrect	113	
	Incorrectly placed or attached		213
Accuracy of seaming	Seam twisted, pleated, or puckered <u>1</u> /	114	214
	Part of trouser caught in any unrelated operation or stitching <u>1</u> /	115	215
	Thread break secured by stitching back of the break less than 1/2 inch		216
	Ends of all seams and stitchings when not caught in other seams or stitching, backtacked less than 1/2 inch		217
	Color of thread not as specified		218
	Gage of stitching not as specified		219
	Edge of seam tape less than 1/8 inch from seam allowance	116	

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

Examine	Defect	Classification	
		Major	Minor
Heat sealed seams	Any sealing tape with wrinkle, turn under, or pleat <u>1</u> /	117	220
	Any seam tape not located as specified (see 3.7)		221
	Any required stitching not covered by seam tape	118	
	Any area where heat sealing tape has been removed <u>1</u> /	119	222
	More than two layers of heat sealing tape in any one area <u>1</u> /	120	223
Repairs	Any heat sealing repairs extending beyond 15 inches in length <u>1</u> /	121	224
	More than three repairs on any one item <u>1</u> /	122	225
Seam tape adhesion	Seam tape lifting off fabric within 3/4 inch of seam <u>1</u> /	123	226
	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. The length requirement shall not apply to the leg insert seams <u>1</u> /	124	227
Open seams	More than 1/8 inch up to 1/4 inch		228
	More than 1/4 inch	125	
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	126	
	Missing, broken, or skipped stitches <u>1</u> /	127	229

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

Examine	Defect	Classification	
		Major	Minor
Stitch tension	Loose tension in any area:		
	- more than 1 inch but not more than 2 inches		230
	- more than 2 inches	128	
	Tight tension (stitches break when normal strain is applied to the seam or stitching)	129	
Stitches per inch (to be scored only when the condition exists on major portion of the seam)	Less than minimum specified:		
	- one stitch		231
	- two or more stitches	130	
	More than maximum specified		232
Shaded parts	Variation in shade within an outside part <u>1</u> /	131	233
	Any part required to be cut from one piece of material, shaded <u>1</u> /	132	234
	NOTE: Parts suspected as being shaded shall be examined at a distance of three feet against the background of the other parts and colors of the garment. When shade difference is readily discernible under these examining conditions, it shall be scored as a shaded part.		
Bottom hems	Width not as specified		235
	Hems uneven at leg insert by more than 1/4 inch		236
Bartacks	Bartack omitted	133	
	Any bartack not in specified location, insecure, or not serving intended purpose:		
	- more than two		237
	- two or less	134	
	Any loose stitching, incomplete or broken		238
	Length or width not as specified		239

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

Examine	Defect	Classification	
		Major	Minor
Inseams	Inseam staggered at crotch more than specified (center to center)		240
	Crotch and seat seam staggered at inseam more than specified (center to center)		241
Ankle tab	Missing	135	
	Improperly located or not width specified <u>1/</u>	136	242
Snap fasteners	Any part of assembly missing, mismatched, broken, cracked, bent, not securely clinched, affecting function:		
	- two or more snap fasteners	137	
	- one snap fastener		243
	One or more clinched too tightly cutting surrounding fabric	138	
	Loose, i.e., socket or stud spins freely or wobbles in connection portions		244
	One or more having rough or sharp edges	139	

1/ This defect shall be scored as major when seriously affecting serviceability and as 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 trousers. The sample unit shall be one of the trousers. The inspection level shall be S-3 and the AQL, expressed in terms of defects per hundred units, shall be 4.0.

4.4.4 End item testing. The end items shall be tested as specified in 4.5.1 for conformance to the leakage requirement in 3.7. The lot size shall be expressed in units of trousers. The sample unit shall be one of the trousers. 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.

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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 2.5.

<u>Examine</u>	<u>Defect</u>
Marking (exterior and unit packs)	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, inadequate stapling, or improper taping. Bulged or distorted container.
Content	Number per container is more or less than required. 1/ Size shown on one or more trousers not as specified on shipping container. 1/

1/ For this defect, one container in the sample shall be examined.

4.4.6 Palletization examination. The fully packaged and palletized end items shall be examined for the defects listed below. The lot size shall be expressed in units of palletized unit loads. The sample unit shall be one palletized unit load, fully packaged. The inspection level shall be S-1 and the AQL, expressed in terms of defects per hundred units, shall be 6.5.

<u>Examine</u>	<u>Defect</u>
Finished dimension	Length, width, or height exceeds specified maximum requirement.
Palletization	Pallet pattern not as specified. Load not bonded as specified.
Weight	Exceeds maximum load limits.
Marking	Omitted; incorrect; illegible; of improper size location, sequence, or method of application.

4.5 Methods of testing.

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4.5.1 Hydrostatic resistance test. The hydrostatic resistance of sealed seam areas of the trousers shall be tested in accordance with Method 5516 of FED-STD-191. The test may be performed on any device which tests the same specimen area at the equivalent pressure. The hydrostatic head shall be 50 cm pressure for 3 minutes. The trouser shall be tested at three different locations as follows: one on top seam of knee patch, one leg seam, and one seat seam. Evidence of leakage in one or more seam locations shall be considered a test failure.

5. PACKAGING

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

5.1.1 Level A. Each of the trousers shall be folded to less than the maximum dimensions of 23 by 15 inches. The trousers shall then be placed in a close-fitting clear polyethylene bag conforming to A-A-50083 or type I or II, style 1 or 2 of PPP-B-26. Style 1 bag shall have a 1/4 inch hole located near a bottom corner to allow air to escape.

5.1.2 Commercial. Trousers shall be preserved in accordance with ASTM D 3951.

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

5.2.1 Level A packing. Twenty-four trousers of one size only, preserved as specified in 5.1, shall be packed within a snug-fitting fiberboard shipping container conforming to style RSC-L, class weather-resistant, grade V2s of PPP-B-636. The shipping container shall be fitted with a box liner conforming to class weather-resistant, variety DW, grade V15c of PPP-B-636. Level A unit packs shall be packed flat, 1 in length, 1 in width, and 24 in depth. Approximate dimensions of the container are 23 inches in length, 15 inches in width, and 15 inches in depth. Approximate dimensions are furnished as a guide only. Each shipping container shall be closed in accordance with method III, water-proofed in accordance with method V, and reinforced as specified in the appendix of PPP-B-636, except that the inspection shall be in accordance with 4.4.5. Shipping containers shall be arranged in unit loads in accordance with MIL-L-35078 for the type and class of load specified (see 6.2). Strapping shall be limited to nonmetallic strapping, except for type II, class F loads.

5.2.2 Level B packing. Twenty-four trousers of one size only, preserved as specified in 5.1, shall be packed within a snug-fitting fiberboard shipping container conforming to style RSC-L, class domestic, grade 275, variety SW of PPP-B-636. The shipping container shall be fitted with a box liner conforming to class domestic, variety DW, grade 275 of PPP-B-636. Level A unit packs shall be packed flat, 1 in length, 1 in width, and 24 in

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depth. Approximate dimensions of the container are 23 inches in length, 15 inches in width, and 15 inches in depth. Approximate dimensions are furnished as a guide only. Each shipping container shall be closed in accordance with method II as specified in the appendix of PPP-B-636, except that the inspection shall be in accordance with 4.4.5.

5.2.2.1 Weather-resistant fiberboard container. When specified (see 6.2), the shipping container shall be a grade V3c, V3s, or V4s fiberboard box fabricated in accordance with PPP-B-636 and closed as specified in PPP-B-636, except that the inspection shall be in accordance with 4.4.5.

5.2.3 Commercial packing. Trousers of one size only, preserved as specified in 5.1, shall be packed in accordance with ASTM D 3951.

5.3 Palletization. When specified (see 6.2), trousers packed as specified in 5.2.2 or 5.2.3, shall be palletized on a 4-way entry pallet in accordance with load type Ia of MIL-STD-147. Pallet type shall be type I (4-way entry), type IV or type V in accordance with MIL-STD-147. Pallets shall be fabricated from wood groups I, II, III, and IV of MIL-STD-731. Each prepared load shall be bonded with primary and secondary straps in accordance with bonding means C and D or film bonding means F or G. Pallet pattern shall be number 3 in accordance with the appendix of MIL-STD-147.

5.4 Marking. In addition to any special marking required by the contract or purchase order, unit packs, shipping containers and palletized unit loads shall be marked in accordance with MIL-STD-129 or ASTM D 3951, as applicable.

5.4.1 Polyethylene bagged unit packs. Polyethylene bagged unit packs shall have the required information legibly printed or stamped in black directly on the bag across the center face or on a white paper label inserted within the bag so as to permit ready identification. The bag or label shall indicate the following information:

Stock number
Nomenclature
Size
Quantity

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 trousers are intended for use by personnel of the Department of Defense as a component of the Extended Cold Weather Clothing System.

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6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number and date of this specification.
- b. 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 a first article is required (see 3.1, 4.3, and 6.3).
- e. Levels of preservation and packing (see 5.1 and 5.2).
- f. Type and class of unit load required (see 5.2.1).
- g. When weather-resistant grade fiberboard shipping containers are required for level B packing (see 5.2.2).
- h. When palletization is required (see 5.3).

6.3 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should 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.

6.5 Source for eyelets and washers. Eyelets and washers may be purchased from Stimpson Co., Inc., Bayport, NY 11704, telephone (516) 472-2000 or Stimpson Co., Inc., Pompano Beach, FL 33060, telephone (305) 946-3500.

6.6 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

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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 patterns 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.

6.7 Subject term (key word) listing.

ECWCS
Extended cold weather clothing system
Laminated cloth
Moisture vapor permeable
Waterproof

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

Custodians:

Army - GL
Navy - NU

Preparing activity:

Army - GL
(Project 8415-0775)

Review activities:

Army - MD
Navy - MC
DLA - CT

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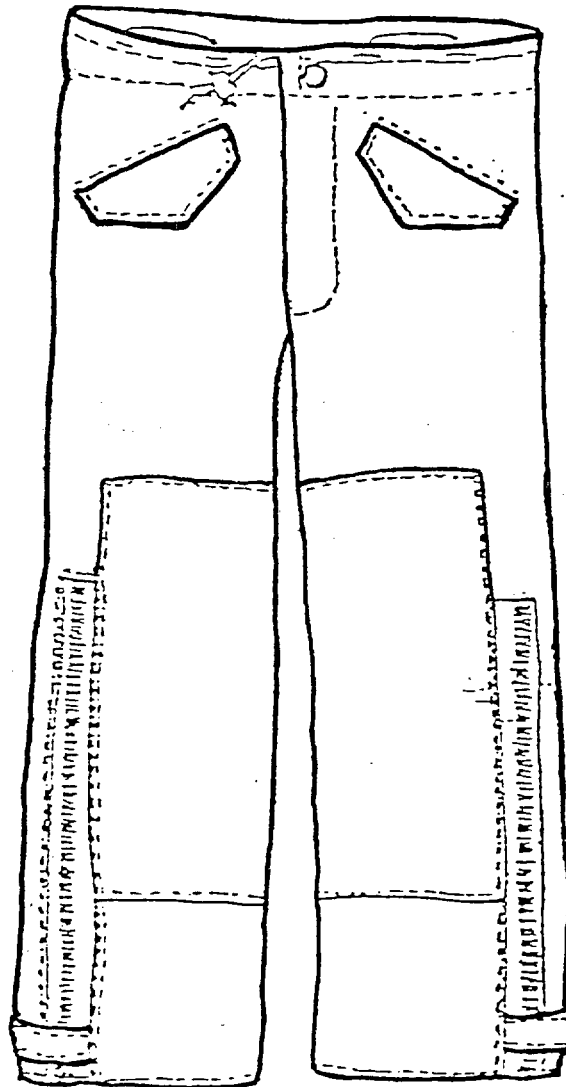


FIGURE 1: Trousers, Cold Weather, Camouflage