

**INCH-POUND**

MIL-M-834L

23 October 1989

SUPERSEDING

MIL-M-834K

20 September 1984

MILITARY SPECIFICATION

MITTEN SET, EXTREME COLD WEATHER

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

1. SCOPE

1.1 Scope. This specification covers one type of arctic mitten set consisting of outer shells, liners, and a harness.

1.2 Classification. The mitten set shall be of the following sizes as specified (see 6.2).

Schedule of sizes

Small  
Medium  
Large

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Natick Research and Development Center, Natick, MA 01760-5014 by using the self-addressed 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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## 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 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

- KK-L-2004 - Leather, Cattlehide, Deerskin and Horsehide, Chrome Tanned
- DDD-L-20 - Label: For Clothing, Equipage, and Tentage, (General Use)
- PPP-B-636 - Boxes, Shipping, Fiberboard
- PPP-T-45 - Tape, Gummed, Paper, Reinforced and Plain, for Sealing and Securing

## MILITARY

- MIL-B-371 - Braid, Textile, Tubular
- MIL-C-483 - Cloth, Pile; Alpaca and Wool
- MIL-W-530 - Webbing, Textile, Cotton, General Purpose, Natural or in Colors
- MIL-B-543 - Buckles, Tongueless and Web Strap
- MIL-T-3530 - Thread and Twine: Mildew Resistant or Water Repellent Treated
- MIL-F-10884 - Fasteners, Snap
- MIL-L-35078 - Loads, Unit: Preparation of Semi-perishable Subsistence Items; Clothing, Personal Equipment and Equipage; General Specification For
- MIL-B-41826 - Batting, Synthetic Fibers: Polyester, (Unquilted and Quilted)
- MIL-C-43191 - Cloth, Wind Resistant Sateen, Cotton and Nylon
- MIL-T-43548 - Thread, Polyester Core: Cotton-, Rayon-, or Polyester-Covered
- MIL-T-43566 - Tape, Textile, Cotton or Polyester, General Purpose, Natural or in Colors

## STANDARDS

## FEDERAL

- FED-STD-751 - Stitches, Seams, and Stitchings

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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 Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DRAWINGS

U.S. ARMY NATICK RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER

- 2-1-944 - Mitten Set, Extreme Cold Weather (Harness Assembly)

(Copies of drawings are available from the U.S. Army Natick Research, Development, and Engineering Center, ATTN: STRNC-EMSS, Natick, MA 01760-5014).

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.

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

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

3.3.1 Leather. The leather used in the mitten shells shall be full grain, soft, flexible deerskin leather conforming to type VI of KK-L-2004.

3.3.1.1 Thickness. The thickness of the leather for the palm, thumb, and sidewalls shall be not less than 2-1/2 ounces nor more than 4 ounces, and for the welting shall be not less than 2 ounces nor more than 3 ounces. The thickness shall be measured as specified in 4.4.4. Note: One ounce equals 1/64 inch.

3.3.1.2 Color. The color of the leather shall be Saddle Brown 214 and the fastness to crocking shall be equal to or better than the standard sample. When no standard sample is available, the colorfastness to crocking shall conform to the requirements for type VI of KK-L-2004.

3.3.1.3 Welting. The welting for reinforcing the edge of the thumb shall be made from chrome tanned deerskin grain leather 11/64 + 1/32 inch wide. A pieced thumb welt will be permitted providing it is properly skived and cemented securely with a 11/64 inch lap and there is not more than one piecing in each thumb welt. The color of the welt shall approximately match the color of the palm leather.

3.3.2 Textiles

3.3.2.1 Cloth, wind-resistant sateen, cotton and nylon. The cloth for the mitten shell shall be class 2, dyed Olive Green 107 and shall conform to MIL-C-43191.

3.3.2.2 Cloth, wool, pile. The cloth for the back of the mitten shall be a knitted pile fabric with the pile portion 100 percent wool and the backing yarn 100 percent spun polyester conforming to type X of MIL-C-483.

3.3.2.3 Batting, synthetic fibers (quilted). The material for the liner shall be a quilted polyester batting and shall conform to type VIII, cover A, style a, class 9 of MIL-B-41826. The nylon thread used for sewing the dumb-bell pattern shall show good colorfastness to laundering and perspiration.

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3.3.2.4 Tape, cotton. The tape for the wrist strap, gauntlet strap, gauntlet loops and breast piece of harness, shall conform to type I, class 3, 5/8 inch width of MIL-T-43566. The color of the tape shall be Olive Drab 7.

3.3.2.5 Webbing, cotton. The webbing for the gauntlet stay shall conform to type III heavyweight, class 3, 1 inch width of MIL-W-530. The color of the webbing shall be Olive Drab 7.

3.3.2.6 Braid, cotton. The braid for the suspension piece of the harness shall be cotton, tubular, solid, 4/32 inch diameter, Olive Green 107 conforming to type IV, class 1 of MIL-B-371.

3.3.3 Thread. The thread for seaming and stitching the mitten shell, harness, and liner shall be cotton-covered, rayon-covered, or polyester-covered polyester-core thread conforming to MIL-T-43548 as specified below. The thread for seaming and stitching the mitten shall be ticket No. 30, 3 ply, and shall be water repellent treated in accordance with type II, class 3 of MIL-T-3530. There shall be no lubrication of the water repellent thread by any means prior to or during sewing (see 4.4.1.1). The thread for stitching the harness and seaming the liner (except overedging) shall be ticket No. 30, 3 ply (either water repellent treated or non-water repellent treated). The thread for overedge stitching the liner shall be ticket No. 70, 2 ply (either water repellent treated or non-water repellent treated). All thread shall be dyed to match Olive Drab shade S-1, C.A. 66022. All thread except the water repellent treated thread shall show colorfastness to laundering and perspiration equal to or better than the standard sample. When no standard sample is available, the non-water repellent thread shall show good colorfastness to laundering and perspiration when tested as specified in MIL-T-43548.

#### 3.3.4 Metal.

3.3.4.1 Buckles. The buckles shall be 5/8 inch, double bar, tongueless, lip type conforming to type II, style 3, class 1 of MIL-B-543.

3.3.4.2 Fasteners, snap. The snap fasteners shall be brass, style 2, finish 2, male and female complete consisting of stud with eyelet size 1 or 2, and 24-line button size 1 or 2 and socket, conforming to MIL-F-10884.

3.3.5 Cement. The cement for bonding the cotton and nylon sateen to the leather sidewall of the shell shall be a natural rubber base solvent cement or other suitable cement capable of meeting the requirements of 3.3.5.1. The bond between the leather and the cloth shall be sufficient to assure the leather does not stretch or become distorted when the side wall is sewn.

3.3.5.1 Cold flexibility of mitten shell. The mitten shell shall not crack or show a noticeable stiffness when tested as specified in 4.4.5.

3.4 Design. The mitten set shall consist of a pair of shells, a pair of liners, and a harness (see figures 1, 2 and Drawing 2-1-944).

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3.4.1 Shells. The shells shall be inseam sewn, curved palm design, having a full grain deerskin palm, thumb, and sidewall, a back consisting of cotton and nylon sateen with a wool pile fabric outer piece, and an adjustable web strap at the wrist. The gauntlet shall be made of cotton and nylon sateen and shall be equipped with an adjustable web strap and four snap fastener sockets in the hem to hold the liner in position (see figure 1).

3.4.2 Liners (batting, polyester, quilted). The liners shall be outseam sewn, made from quilted polyester batting material. The back of the liners down to beginning of gauntlet and the back of thumb shall have a double layer of quilted batting. The liner gauntlet shall have four snap fastener studs to correspond with the sockets on the shell gauntlet (see figure 2).

3.4.3 Harness. The harness shall consist of a breast piece and a suspension piece. The breast piece shall be made from tape specified in 3.3.2.4 and the suspension piece shall be made from braid specified in 3.3.2.6. The harness shall be fabricated as specified in table II and Drawing 2-1-944.

3.5 Patterns. Standard patterns will be furnished by the Government. The standard patterns shall not be altered in any way and are to be used as a guide for cutting the contractor's working patterns. The working patterns shall be identical to the standard patterns.

3.5.1 List of pattern parts. Each shell and liner shall be cut from the materials as specified and in accordance with the pattern parts in table I.

TABLE I. List of pattern parts for shell and liner

Material	Nomenclature of parts	Cut parts
Leather, deerskin (for shell)	Palm and face of thumb	1
	Back of thumb	1
	Sidewall of hand	2
Cloth, cotton and nylon sateen (for shell)	Front of gauntlet	1
	Back of hand and gauntlet	1
	Sidewall of gauntlet	2
	Tab for gauntlet adjusting strap	2
	Backing for leather sidewall of hand	2
Pile, wool (for shell)	Pile back of shell	1

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TABLE I. List of pattern parts for shell and liner (cont'd)

Material	Nomenclature of parts	Cut parts
Batting, polyester, quilted (for liner)	Palm and face of thumb	1
	Back of thumb	2
	Back of hand and back of gauntlet	1
	Back of hand	1
	Front of gauntlet	1

3.6 Labels.

3.6.1 Identification and size label. Each mitten shell shall have a combination identification and size label conforming to type VI, class 4 of DDD-L-20 and the label shall show fastness to laundering.

3.6.2 Instruction label. Each right-hand mitten liner shall have an instruction label conforming to type VI, class 3 of DDD-L-20 and the label shall show fastness to laundering. The label shall measure approximately 3-1/2 by 4-1/2 inches. Information for the instruction label on mitten liner shall be as follows:

## WEARING INSTRUCTIONS - MITTEN SET, EXTREME COLD WEATHER

(Consisting of Shells, Liners and Harness)

## DO NOT DRY CLEAN THE LINER

Wear over mitten, insert, wool, trigger-finger, in extreme cold. If the hands become cold, exercise the entire body vigorously and open and close the hands to increase blood circulation.

Adjust fit of gauntlet over sleeves by pulling adjustment strap.

Keep mitten set attached to suspension piece of harness to prevent loss.

Remove mitten set at onset of sweating as damp mittens provide less protection.

To dry, separate liner from shell.

Dry slowly away from flame.

Use pile facing for warming cheeks and nose.

When not using mitten set, snap behind back.

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### 3.7 Construction.

3.7.1 Stitches, seams, and stitchings. Stitch, seam and stitching types specified in table II shall conform to FED-STD-751. The minimum and maximum number of stitches per inch shall be as specified in table II. Ends of all seams and stitchings, when not caught in other seams and stitchings shall be backstitched not less than  $3/8$  inch. Thread tension shall be maintained so there will be no loose stitching resulting in a loose bobbin or top thread or no excessively tight stitching resulting in puckering of the materials sewn.

3.7.1.1 Use of automated apparel equipment. Automated apparel equipment may be used to perform any of the operations specified in table II, providing that the seam and stitch type are as specified and the finished component conforms to the required configuration.

3.7.1.2 Repairs of type 301 stitching. Repairs of type 301 stitching shall be made as specified below. The ends of the stitching are not required to be backstitched when making these repairs.

a. When thread breaks 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.

b. Thread breaks or two or more consecutive skipped or run-off stitches noted during inspection of the item (in-process or end 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 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 material, and restitching in the required manner.

3.7.1.3 Repair of types 502, 503, 504 and 505 stitching. All repairs shall be in accordance with 3.7.1.2.a and 3.7.1.2.b except substitute  $3/4$  inch for  $1/2$  inch wherever  $1/2$  inch appears.

3.7.2 Setting of snap fasteners. The fasteners shall be securely clinched without cutting the adjacent materials and no more than two splits shall occur in either the button barrel or eyelet barrel.

3.8 Manufacturing operations requirements. The mitten sets shall be manufactured in accordance with all operation requirements specified in table II. The contractor is not required to follow the exact sequence of operations. Tolerances shall be consistent. A plus tolerance of a measurement in one component and minus tolerance in a corresponding measurement of another component, when used in combination will not result in a proper fit and should be avoided.

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NO.	TABLE II. MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	NOBBIN/ LOOPER	COVER
1.	<p><u>Preparation before cutting.</u></p> <p>Before cutting, the leather shall be dampened and properly worked, with the stretch pulled out in the length direction (butt to head direction).</p>						
2.	<p><u>Replacement of defective or damaged parts.</u></p> <p>During the spreading, cutting, and manufacturing process, components having material defects or damages that are classified as defects in 4.4.3 and 4.4.4 shall be removed from production and replaced with non-defective and properly matched components.</p>						
3.	<p><u>Cutting.</u></p> <p>a. Leather components shall be cut in the length direction (i.e., cuff to finger tip direction shall be cut parallel to butt to head direction of leather). The welting may be pieced as specified in 3.3.1.3.</p> <p>b. All fabric components shall be cut from one piece of material with cuff to finger tip direction in the direction of the warp. The length direction (cuff to finger tip direction) of the pile component shall be cut in the wales direction of the pile cloth.</p> <p>c. All tape components shall be cut from 5/8 inch width material. The gauntlet stay webbing shall be cut from one piece of 1 inch width material. The tape and webbing components shall not be pieced.</p>						

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NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
4.	<p><u>Mitten shell. Back of thumb.</u></p> <p>The back of leather thumb shall be attached to the palm leather section of thumb and leather section of palm by inseam closing, with a 1/16 to 3/16 inch seam allowance with welt inserted equidistant along entire seam.</p> <p><u>Cementing leather sidewalls.</u></p> <p>The flesh side of the leather sidewall and the cotton and nylon sateen shall be bonded together with the cement specified in 3.3.5. The pieces shall then be rolled to obtain good adhesion between the two materials.</p>	301	SSJ-1	8-10	30-3	30-3	
5.	<p><u>Join leather sidewall pieces (finger tip section).</u></p> <p>The finger tip portion of the two leather sidewall pieces shall be joined by inseaming grain to grain with a 1/8 to 1/4 inch gage.</p>	301	SSa-1	8-10	30-3	30-3	
6.	<p><u>Join leather sidewall to leather palm.</u></p> <p>The combined fabric and leather section of the sidewall pieces shall be properly matched with the leather palm sections and then seamed using a 1/16 to 3/16 inch stitch margin.</p>	301	SSa-1	8-10	30-3	30-3	
7.	<p><u>Gauntlet.</u></p> <p>a. Seam sidewall sections of fabric to side edges of palm side of gauntlet section of fabric. Turn and single stitch 1/16 to 3/16 inch from edge.</p>	301	SSe-2	8-10	30-3	30-3	

NATICK Form 903

1 Dec 76

EDITION OF 1 OCT 76 WILL BE USED UNTIL EXHAUSTED.

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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.	<p><u>Gauntlet.</u> (cont'd)</p> <p>b. Position the two pieces of 1 inch webbing on gauntlets as indicated by marks on pattern and on figure 1. Seam to the inside of gauntlet with a row of stitching along each edge 1/16 to 3/16 inch from each edge of webbing. One end of webbing shall be caught in the joining seam of the leather palm to gauntlet and the other end shall be caught in the hem of gauntlet.</p> <p>c. Join wrist edge of gauntlet to edge of leather palm with the leather palm overlapping gauntlet not less than 3/8 inch. Seam with a double row of stitching with not less than 3/16 nor more than 1/4 inch gage with outer row of stitching 1/16 to 3/16 inch from edge.</p>	301	LSa-2	8-10	30-3	30-3
9.	<p><u>Wrist strap.</u></p> <p>Wrist strap shall consist of 5/8 inch cotton tape adjusting strap, buckle strap and release tab. The wrist strap shall be placed as indicated by the pattern notches and as shown on figure 1.</p> <p>a. <u>Adjusting strap.</u> Thread end of adjusting strap tape up through the space between the two bars and around the bar nearest the lip end of the buckle, fold end of tape strap under 2 + 1/16 inches to form the pull and turn under raw edge of strap 1/2 + 1/16 inch and boxstitch down with 3/8 to 1/2 inch box centered between edges of strap, (see figure 1) locking ends of stitching. As an alternate, the end of strap may be stitched down with a 1/2 inch bartack centered between edges of</p>	Box-stitched or bartacked	EFb-1	8-10 or 28 per bartack	30-3	30-3

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NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
9.	<p><u>Wrist strap.</u> (cont'd)</p> <p>strap. The bartack shall be placed perpendicular to the length of strap. The finished strap shall measure <math>7-1/2 + 1/2</math> inches.</p> <p>b. <u>Buckle strap.</u> The finished buckle strap shall consist of a double piece of 5/8 inch cotton tape. Thread a single thickness of tape up through the space between the two bars and around the other bar of buckle and seam ends to back of mitten shell as indicated by the pattern notches and as shown on figure 1.</p> <p>Finished buckle strap shall measure <math>1-5/8 + 1/8</math> inches. Attach snap fastener part in center of buckle strap (stud on left mitten facing socket on right mitten).</p> <p>c. <u>Release tab.</u> Thread tape release tab around the lip end of buckle, turn raw edge under <math>1/4 + 1/16</math> inch and stitch down with a <math>1/2</math> inch bartack centered between edges of strap. The bartack shall be placed perpendicular to the length of strap. The finished tab shall measure <math>1 + 1/8</math> inch.</p>	301	SSa-1	8-10	30-3	30-3	
10.	<p><u>Neck tape loops.</u></p> <p>a. The neck tape loops shall consist of 5/8 inch cotton tape. Fold and position as shown on figure 1 and as stated below. Seam raw ends of neck tab loop No. 1 to fabric back of mitten shell below and adjacent to the buckle strap.</p>	Bartacked  301	SS1-1  SSa-1	28 per bartack  8-10	30-3  30-3	30-3	

NATICK Form 903  
1 Dec 76

EDITION OF 1 OCT 76 WILL BE USED UNTIL EXHAUSTED.

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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>Neck tape loops.</u> (cont'd)</p> <p>b. The raw ends of the doubled neck tape loop No. 2 shall be turned under and caught under the inner hemmed gauntlet edge, then bartacked 1/4 to 1/2 inch from the top edge of gauntlet. The neck tape loop shall be placed equidistant between the stays on the palm side of the gauntlet. The length of bartack shall be <math>1/2 + 1/16</math> inch. The finished loops shall measure <math>7/8 + 1/8</math> inch in length between the end of loop and the top edge of gauntlet.</p>	Bartacked	----	28 per bartack	30-3	30-3
11.	<p><u>Joining pile cloth piece at back of mitten.</u></p> <p>The pile cloth piece shall be positioned face down on the back of the mitten as indicated by the notches on the pattern and seamed across the back 3/16 to 5/16 inch from the straight edge. The pile cloth piece shall then be turned with the pile faced out and seamed around the edges to the sateen cloth mitten back with a 1/16 to 3/16 stitch gage. As an alternate, the pile cloth piece may be attached to the sateen cloth by overedge stitching with a minimum 3/16 inch gage.</p>	301 301	LSa-1 SSa-1	8-10 8-10	30-3 30-3	30-3 30-3
12.	<p><u>Gauntlet strap.</u></p> <p>a. The gauntlet strap shall consist of a 5/8 inch cotton tape release adjusting strap, buckle strap, release tab and a cotton tab. The cloth tab shall be made of two pieces of the cotton and nylon shell fabric. Pieces shall be seamed with the end of the adjusting strap centered and extending <math>1/2 + 1/8</math> inch into the tab, then caught in the seam. The</p>	301	SSE-2	8-10	30-3	30-3

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NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D	
					NEEDLE	NOBBIN/ LOOPER COVER
12	<p><u>Gauntlet strap.</u> (cont'd)</p> <p>raw edges of the cotton and nylon tab cloth shall be stitched, turned and stitched <math>1/8 + 1/16</math> inch from edge. Boxstitch or bartack the end of strap (see figure 1).</p> <p>The open end of the finished cloth tab shall be seamed to the back of the gauntlet shell. The tab shall be so positioned that it will be <math>1-1/4 + 1/8</math> inches from the finished top edge of gauntlet.</p> <p>b. <u>Adjusting strap.</u></p> <p>Thread the adjusting strap tape up through the space between the two bars, around the bar nearest the lip end of buckle, turn end of strap under 2 inches to form the pull, turn raw edge of strap <math>1/4 + 1/16</math> inch and boxstitch end down with a <math>3/8</math> to <math>1/2</math> inch box centered between edges of the strap (see figure 1).</p> <p>As an alternate, the end of strap may be stitched down with a <math>1/2</math> inch bartack centered between the edges of the strap. The bartack shall be placed perpendicular to the length of strap. The finished adjusting strap shall measure <math>9 + 1/2</math> inches long.</p> <p>c. <u>Buckle strap.</u></p> <p>The buckle strap shall consist of a double piece of <math>5/8</math> inch tape. Fold piece in half and thread a single thickness of tape up through space between two bars around other bar of buckle and seam to</p>	Box-stitched or bartacked	EFb-1	8-10 or 28 per bartack	30-3	30-3
		Box-stitched or bartacked	EFb-1	8-10 or 28 per bartack	30-3	30-3
		301	SSa-1	8-10	30-3	30-3

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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.	<p><u>Gauntlet strap.</u> (cont'd)</p> <p>back of mitten shell in straight line to correspond with the adjusting strap as shown on figure 1. Finished buckle strap shall measure <math>1-5/8 \pm 1/8</math> inches.</p> <p>d. <u>Release tab.</u></p> <p>Thread tape release tab around lip end of buckle, turn raw edges under <math>1/4 + 1/16</math> inch and stitch down with a <math>1/2</math> inch bartack centered between the edges of strap. The bartack shall be placed perpendicular to the length of strap. The finished tab shall measure <math>1 \pm 1/8</math> inches.</p>	Bartacked	SS1-1	28 per bartack	30-3	30-3
13.	<p><u>Closing operation.</u></p> <p>a. Join back and palm section, wrong side out and stitch edges of wool pile, tape wrist straps, gauntlet tab and tape strap, and neck loop No. 1, <math>3/16 \pm 1/16</math> inch gage.</p> <p>b. Turn mitten and stitch the side edges of gauntlet fabric <math>1/8 \pm 1/16</math> inch from edge.</p>	301	SSa-1	8-10	30-3	30-3
14.	<p><u>Hemming gauntlet.</u></p> <p>Turn top of gauntlet with raw edges turned in <math>3/16</math> to <math>5/16</math> inch and stitch <math>1/16</math> to <math>3/16</math> inch from inside edge. Finish hem to measure <math>1-1/8 + 1/8</math> inches. Top ends of gauntlet stays shall be inserted inside hem and caught in stitching.</p>	301	SSe-2 EFb-1	8-10	30-3	30-3

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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
15.	<p><u>Attaching fasteners.</u></p> <p>Attach four sockets through the hem of gauntlet, two centered through stays at front edge and two centered at back edge of gauntlet in line with front sockets.</p>	502, 503 504 or 505	---	8-14	70-2	70-2
16.	<p><u>Liner (quilted polyester batting).</u></p> <p>a. All edges of the quilted batting components shall be overstitched 1/8 to 3/16 inch gage. Both sides of the cloth used to cover the batting must be caught in this operation (see 6.6).</p> <p>b. Only the back of thumb and back of hand down to beginning of gauntlet shall have two layers of batting. These two layers shall be outseamed 1/8 to 3/16 inch from edge.</p> <p>c. All components of the liner shall then be joined by outseaming 1/8 to 3/16 inch from edge. During the closing operation, it will be necessary to allow the back of hand and gauntlet to flow through the machine at a greater speed than the palm in order to gather the excess material. Match markers are provided on the pertinent pattern parts to guide the operator in the joining and closing operations.</p> <p>d. The top edge of gauntlet shall be turned over the edge to the outside to form the hem and be stitched 3/16 to 5/16 inch from the top edge.</p>	301  301	---	10-14  10-14	30-3  30-3	30-3  30-3

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NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D	
					NEEDLE	BOBBIN/ LOOPER COVER
16.	Liner (quilted polyester batting). (cont'd)  e. Attach four stud portions of fasteners in the hem of liner to correspond with socket portions of shell.					
17.	<u>Harness.</u>  The harness shall be assembled as shown on Drawing 2-1-944. The ends of the suspension piece shall be impregnated with cellulose acetate butyrate.	Bartack	---	28 per bartack	30-3	30-3
18.	<u>Attach labels.</u>  a. Sew the identification and size labels in mitten shells on inside front of gauntlet by catching in the stitching of the hem seam adjacent to webbing stay.  b. Sew the instruction label in right-hand mitten liner, centered inside back of gauntlet about 1-1/4 inches above edge. Stitch all four sides of the label not less than 1/16 inch nor more than 1/8 inch from the edges of the label.	301	---	8-10	30-3	30-3
19.	<u>Trimming.</u>  All thread ends shall be trimmed to not more than 3/16 inch and the loose threads removed from mittens. Remove all spots and stains.					
20.	<u>Assembling and finishing.</u>  The quilted batting liner shall be fitted inside of the outer shells and snapped in place.					

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NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	ROBBIN/ LOOPER	COVER
21	<p><u>Pairing.</u></p> <p>The assembled outer shell and liner shall be matched and paired right to left. Each pair shall be tied together with the assembled harness. Double knot the ends of the suspension piece to the No. 2 loops of each mitten. Then wrap the piece around the pair of mittens.</p>						

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3.9 Measurements. The finished dimensions, taken at points defined on figures 1 and 2, shall conform to the size measurements shown in tables III and IV.

TABLE III. Measurements of shell

Point of measurement	Dimensions, inches			Tolerance plus or minus
	Small	Medium	Large	
A	8-3/4	9-1/8	9-1/2	1/2
B	6	6-3/8	6-3/4	3/8
C	2-1/2	2-3/4	3	1/4
D	3	3-1/8	3-1/4	1/4
E	4-3/4	5-1/8	5-1/2	1/4
F	6-1/2	6-1/2	6-1/2	1/4
G	9-1/2	10	10-1/2	1/2
H	16	16-3/8	16-3/4	1/2
J	4	4	4	1/4
K	1-1/4	1-1/4	1-1/4	3/16

TABLE IV. Measurements of liner (quilted polyester batting)

Point of measurement	Dimensions, inches			Tolerance plus or minus
	Small	Medium	Large	
L	15-1/2	15-7/8	16-1/4	1/2
M	9	9-1/2	10	1/2
N	2-1/2	2-3/4	3	1/4
O	3	3-1/8	3-1/4	1/4

3.10 Workmanship. The end item shall conform to the quality of product established by this specification.

## 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.

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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).

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 4.4.3 and 4.4.4 and tested for the characteristic specified in 4.4.5.

4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed 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. A certificate of compliance may be acceptable as evidence that the thread conforms to the requirement specified in 3.3.3 prohibiting lubrication of water repellent thread, and that the welt and sidewall leather conforms to the thickness requirements specified in 3.3.1.1.

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4.4.2 In-process inspection. Inspection of subassemblies shall be made to ascertain that construction details which cannot be examined in the finished product are in accordance with specified requirements. The Government reserves the right to exclude from consideration for acceptance, any material or service for which in-process inspection has indicated nonconformance.

4.4.3 End item visual examination. The end items shall be examined for the defects listed in table V. The lot size shall be expressed in units of mitten shells and liners. The sample unit shall be one mitten shell and liner, including harness, and the selection shall be by pairs. Examination for attachment of harness shall be performed with the pairing examination. Any defect in pairing or attachment shall be classified as a single defect. The inspection level shall be II (see 6.5).

TABLE V. End item visual defects

Examine	Defect	Classification	
		Major	Minor
Pairing	Not properly mated, i.e., right and left liner and shell not same size	101	
	Wide variation in color or appearance between the pair		201
Color and finish	Any component, except thread, not specified color or finish	102	
	Thread not specified color		202
	Color not uniform		203
Cleanliness	Any spot or stain		204
Material, general	Any component not fabricated of the specified material	103	
Quality of leather	Not full grain deerskin	104	
	Hard or boardy leather	105	
	Flanky or spongy:		
	- seriously affecting serviceability	106	
	- affecting serviceability but not seriously		205
	Flesh side not smooth or contains loose flesh in excess of one square inch in total area		206
	Cut, brand, or scar:		
- seriously affecting serviceability	107		
- affecting serviceability but not seriously		207	

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

Examine	Defect	Classification	
		Major	Minor
Quality of leather (cont'd)	Any through hole or open scratch	108	
	Fat wrinkles:		
	- seriously affective serviceability	109	
	- affecting serviceability but not seriously		208
	Grain damage:		
- seriously affecting serviceability	110		
- affecting serviceability but not seriously		209	
Finish of leather	Finish applied to grain surface	111	
Fabrics, other than pile, webbing, and braid	Hole, tear, mend, or splice	112	
	Any weakened area due to smashes, multiple floats, or other weave deficiencies that can be expected to develop into a hole	113	
	Any fabric defect affecting serviceability but not seriously, i.e., mispicks or slubs		210
Wool pile	Hole, tear, mend, or splice	114	
	Not properly tigered, i.e., pile not opened up	115	
	Length direction (cuff to finger tip direction) not cut in wale direction of fabric		211
	Pile tufts missing:		
	- seriously affective serviceability	116	
- affecting serviceability but not seriously		212	
Suspension braid	Not impregnated on each end	117	
Webbing	Any hole or cut	118	
	Not tightly woven, edge frayed or scalloped		213

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

Examine	Defect	Classification	
		Major	Minor
Batting, (quilted polyester)	Unrepaired broken or missing stitching 1 inch or more		214
Construction and workmanship, general (applic- able to all components and assemblies un- less otherwise indicated herein)	Any component misplaced or operation omitted or not properly performed: - seriously affecting serviceability	119	
	- affecting serviceability but not seriously		215
	Any component missing or not specified type (unless other- wise classified herein): - seriously affecting service- ability	120	
	- affecting serviceability, but not seriously		216
	Any component not securely affixed	121	
	Any workmanship damage, e.g., scissor or knife cut	122	
Seams and stitching	Any mend or patch (not applic- able to restitched seam repair)	123	
	Open seam: - in single stitched seam	124	
	- in both rows of a double stitched seam	125	
	- in one row of a double stitched seam		217
	- in wrist hem		218
- repaired, but not repaired as specified		219	

NOTE: A seam shall be classified as open when one or more stitches joining a seam are broken or when two or more consecutive skipped or run-off stitches occur.

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

Examine	Defect	Classification	
		Major	Minor
Seams and stitching (cont'd)	Needle chew likely to develop into a hole.	126	
	Not specified seam type	127	
	Not specified stitch type	128	
	Any row of stitching omitted	129	
	Loose stitch tension resulting in a loosely secured seam	130	
	Tight stitch tension resulting in cutting of leather or breaking of stitches when normal pull is applied	131	
	Thread breaks not backstitched as specified		220
	Ends of stitching not backstitched as specified when not caught in another row of stitching		221
	Gage or margin of stitching irregular or not as specified:		
	- affecting serviceability, but not seriously		222
	- seriously affecting serviceability	132	
	Any part caught in unrelated row of stitching	133	
	One or two stitches per inch less than specified		223
	Three or more stitches per inch less than specified	134	
	More than the specified maximum number of stitches per inch resulting in damage to assembly	135	
	More than the specified maximum number of stitches per inch not damaging assembly		224

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

Examine	Defect	Classification	
		Major	Minor
Hardware	Broken, damaged, or malformed	136	
	Any sharp burr or metal sliver		225
	Any part missing, will not function as intended, reversed on assembly, or not properly set to a degree where it may become detached from assembly	137	
	Any part not properly set or attached but will adequately be retained on assembly and will function as intended		226
Assembly detail	Mitten not neatly laid off, i.e., not well-formed		227
	Not outseam or inseam construction where specified	138	
	Welting omitted on thumb	139	
	Welting not caught in the seaming of the thumb	140	
	Poorly assembled:		
	- seriously affecting serviceability, e.g., thumb distorted or twisted affecting comfort of wearer	141	
	- affecting serviceability but not seriously, e.g., buckle strap and adjusting strap not in proper alignment causing malformation when strap is tightened		228
	Not properly trimmed or finished causing discomfort to user, e.g., excess bulk in thumb seam because material was not sufficiently trimmed, etc.	142	
	Not constructed with specified number of pieces of material (not applicable to welting)	143	
	Any socket or stud of snap fastener mispositioned to an extent that the assembly cannot be joined or, if joined, results in serious distortion of assembly	144	

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

Examine	Defect	Classification		
		Major	Minor	
Assembly detail (cont'd)	Any socket or stud of snap fastener mispositioned but not to the extent that the assembly cannot be joined and, when joined, does not result in serious distortion of assembly		229	
	Any snap fastener tightly clinched resulting in cutting of fabric	145		
	Any snap fastener not functioning properly i.e., fails to: snap closed, provide a secure closure, open freely	146		
	Any snap fastener clinched loosely, permitting either component to rotate freely	147		
	Incorrect style snap fastener	148		
	Three or more splits in either eyelet or button barrel		230	
	NOTE: The fasteners shall be snapped and unsnapped twice to determine whether parts of fastener separate freely and also effect a secure closure.			
		Mittens not attached to each other as specified		231
		Thread ends not trimmed through-out item		232
		Harness not assembled		233
	Harness not attached as specified		234	
Labels,	Missing, incomplete, incorrect, not legible, not specified type or size, not in proper location, or not accomplished in the specified manner		235	

4.4.4 End item dimensional examination. The end items shall be examined for conformance to the dimensions specified in tables III and IV. Any dimension not within the specified tolerance shall be classified as a defect. The leather thickness requirements for the palm and thumb shall be checked for

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conformance to the requirements of 3.3.1.1 using a calibrated spring-type gauge graduated to 0.5 ounce. The lot size shall be expressed in units of mitten shells and liners. The sample unit shall be one mitten shell and liner, including harness, and the selection shall be by pairs. The inspection level shall be S-3 (see 6.5).

4.4.5 End item testing. The end items shall be tested for cold flexibility as follows: The sample shells shall be placed in a cold box at  $-57^{\circ} + 3^{\circ}\text{C}$  for 6 hours. The sample shells shall then be hand tested by bending each sample shell at a 90 degree angle and examined, giving particular attention to the sidewall, for flexibility and cracking. Any shell failing to conform to the requirement in 3.3.5.1 shall be considered a test failure. The lot size shall be expressed in units of shells. The sample unit shall be one shell. The inspection level shall be S-1 (see 6.5).

4.4.6 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 (see 6.5).

<u>Examine</u>	<u>Defect</u>
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 component, such as: incomplete closure of container flap, improper taping, loose strapping, or inadequate stapling Bulged or distorted container
Content	Number of mitten sets per shipping container is more or less than required

4.4.7 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 (see 6.5).

<u>Examine</u>	<u>Defect</u>
Finished dimensions	Length, width, or height exceeds specified maximum requirements
Palletization	Pallet pattern not as specified Interlocking of loads not as specified Load not bonded as specified

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<u>Examine</u>	<u>Defect</u>
Weight	Exceeds maximum load limits
Marking	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application

## 5. PACKAGING

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

5.1.1 Level A preservation. Each mitten set shall be unit packed flat in a fiberboard box conforming to style OPF, type CF, variety SW, class domestic, grade 125 of PPP-B-636. Inside dimensions of each box shall be 16-3/4 inches in length, 10-1/2 inches in width, and 2 inches in depth. The box closure shall be secured with 2 inch minimum width gummed paper tape conforming to type III, grade B of PPP-T-45.

5.1.2 Commercial preservation. Mitten sets 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 mitten sets of one size only, preserved as specified in 5.1, shall be packed in a fiberboard shipping container conforming to style RSC, grade V2s of PPP-B-636. Level A unit packs shall be packed on end 12 in length, 2 in width, and 1 in depth. Inside dimensions of each shipping container shall approximate 29 inches in length, 21-3/4 inches in width, and 17 inches in depth. Approximate dimensions are furnished as a guide only. Each shipping container shall be closed in accordance with method III, waterproofed in accordance with method V, and reinforced as specified in the appendix of PPP-B-636, except that inspection shall be in accordance with 4.4.6. 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 mitten sets of one size only, preserved as specified in 5.1, shall be packed in a fiberboard shipping container conforming to style RSC, type CF (variety SW) or SF, class domestic, grade 275 of PPP-B-636. Level A unit packs shall be packed on end 12 in length, 2 in width, and 1 in depth. Inside dimensions of each shipping container shall approximate 29 inches in length, 21-3/4 inches in width, and 17 inches in depth. Approximate dimensions are furnished as a guide only. Each container shall be closed in accordance with method II as specified in the appendix of PPP-B-636, except that inspection shall be in accordance with 4.4.6.

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5.2.2.1 Weather-resistant fiberboard containers. 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 in accordance with method III as specified in the appendix of PPP-B-636, except that the inspection shall be in accordance with 4.4.6.

5.2.3 Commercial packing. Mitten sets, preserved as specified in 5.1, shall be packed in accordance with ASTM D 3951.

5.3 Palletization. When specified (see 6.2), mitten sets packed as specified in 5.2.2 and 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, or 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 and G. Pallet pattern shall be number 1 in accordance with the appendix of MIL-STD-147. Interlocking of loads shall be effected by reversing the pattern of each course.

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.

## 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 mitten set is intended for use with other components of arctic clothing under cold dry conditions by military personnel of the Department of Defense.

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 5.2.2.1).
- h. When palletization is required (see 5.3).
- i. Acceptance criteria required (see 6.5).

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

6.5 Acceptance criteria. The acceptance criteria below are recommended for use. The acceptance criteria as specified in the contract or purchase order shall be binding. Unless otherwise specified, the following acceptance criteria are in accordance with MIL-STD-105.

6.5.1 For end item visual examination. An acceptable quality level (AQL), expressed in terms of defects per hundred units, of 2.5 for major defects and 6.5 for total (major and minor combined) defects is recommended.

6.5.2 For end item dimensional examination. An AQL, expressed in terms of defects per hundred units, of 4.0 is recommended.

6.5.3 For end item testing. An AQL, expressed in terms of defects per hundred units, of 4.0 is recommended.

6.5.4 For packaging examination. An AQL, expressed in terms of defects per hundred units, of 2.5 is recommended.

6.5.5 For palletization examination. An AQL, expressed in terms of defects per hundred units, of 6.5 is recommended.

6.6 Overedge stitching of polyester batting. When overedge stitching the quilted polyester batting component sections, machines with trimmer attachments have been found to provide ease of operation.

6.7 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.

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Custodians:

Army - GL  
Navy - NU

Preparing activity:

Army - GL

(Project 8415-0718)

Review activities:

Army - MD  
DLA - CT

User activities:

Navy - MC, YD

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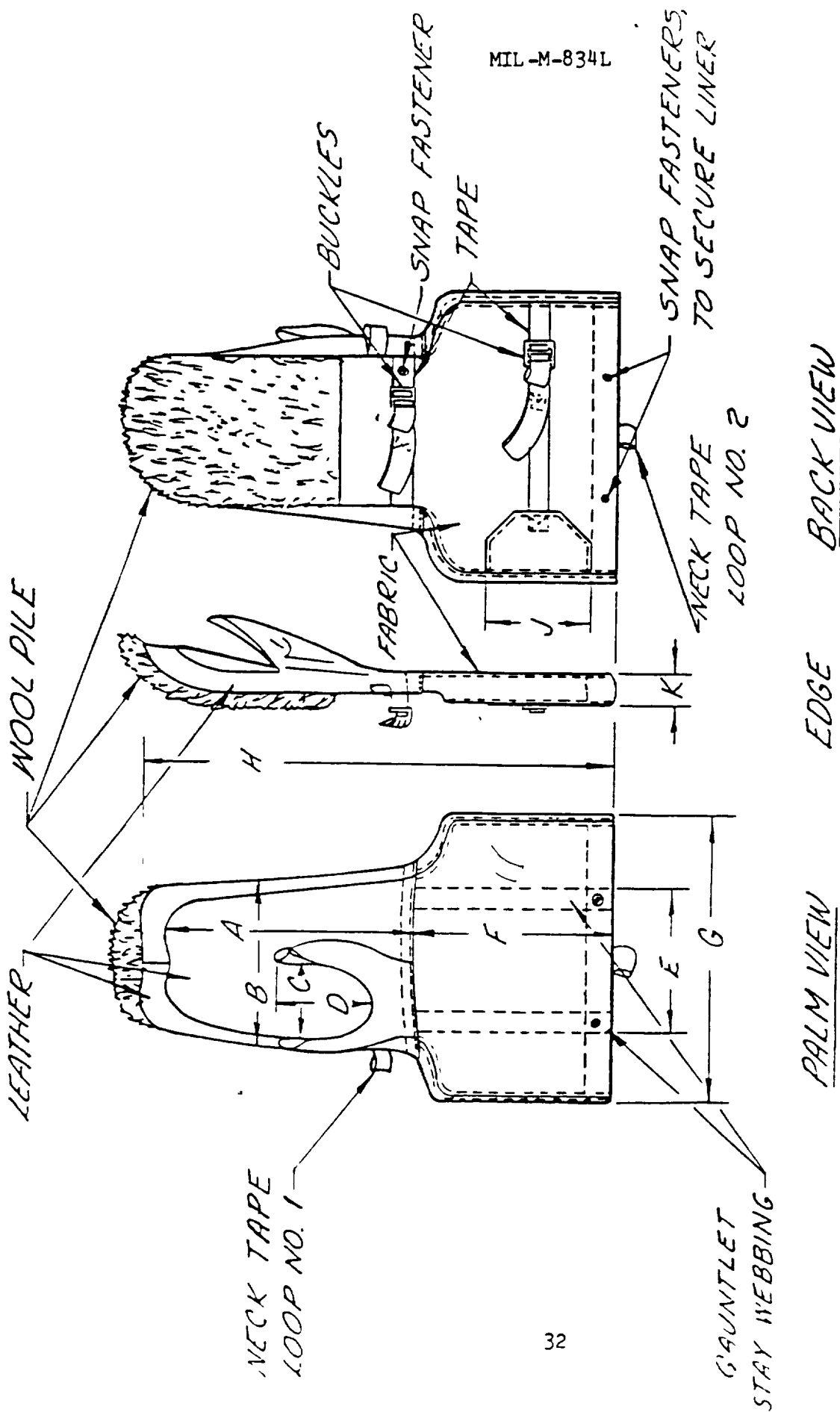


FIGURE-1 MITTEN SET, EXTREME COLD WEATHER;  
(SHELL)

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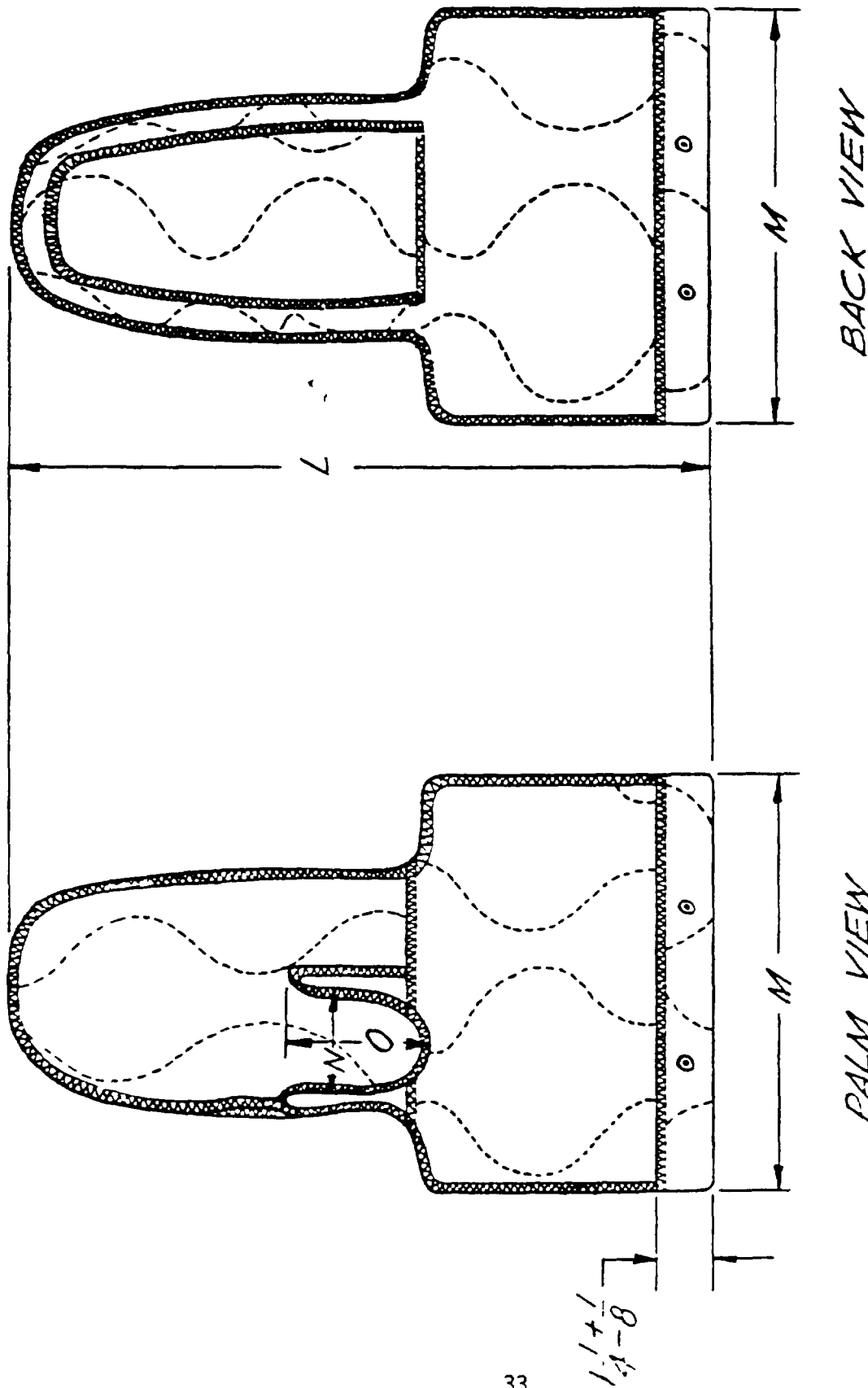


FIGURE - 2 MITTEN SET, EXTREME COLD WEATHER (LINER)



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