

PURCHASE DESCRIPTION

**GLOVE INSERT, LIGHT DUTY
U.S. MARINE CORPS**

The United States Marine Corps has approved this document for use.

1. SCOPE.

1.1 Scope. This document covers the requirements for the Marine Corps Light Duty Glove Insert for stand-alone use or under the Light Duty Work glove for use in all environments.

1.2 Schedule of sizes. The Glove Inserts shall be constructed in the following sizes (see 6.2).

SMALL/MEDIUM

LARGE/X-LARGE

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

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

Beneficial comments (recommendations, additions, and deletions) and any data that may improve this document should be addressed to: Marine Corps Systems Command (MARCORSYSCOM) 2202 Lester Street, Quantico, VA 22134-5000.

AMSC N/A

FSC 8415

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

DEPARTMENT OF DEFENSE SPECIFICATIONS

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

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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

ASTM INTERNATIONAL

| | |
|-------------|---|
| ASTM D 6413 | Standard Test Method for Flame Resistance of Textiles (Vertical Test) |
| ASTM D 2594 | Standard Test Method for Stretch Properties of Knitted Fabrics Having Low Power |
| ASTM E 96 | Standard Test Methods for Moisture Vapor Transmission of Materials |
| ASTM D 3776 | Standard Test Methods for Mass Per Unit Area (Weight) of Fabric |

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

AMERICAN ASSOCIATION OF TEXTILE COLORIST AND CHEMISTS

| | |
|--|--|
| AATCC-61 | Colorfastness to Laundering: Accelerated |
| AATCC-135 | Dimensional Changes of Fabrics after Home Laundering |
| AATCC-22 | Water Repellency: Spray Test |
| AATCC Evaluation Procedure 9 – Visual Assessment of Color Difference of Textiles | |

(Copies of documents are available on line at www.aatcc.org or from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709-2215).

MISCELLANEOUS

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

(Copies are available online at <http://www.asq.org> or from the American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203.)

2.4 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 specified exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified, (see 6.2), a sample shall be subjected to first article inspection (see 6.3), in accordance with 4.2.

3.2 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.3 Design and construction.

3.3.1 Design. The light duty glove insert shall be a four finger and thumb design designed to be worn either alone or under a glove shell. The glove insert shall provide warmth and protection in both cold weather and moderate temperature environments for tasks requiring maximum dexterity and tactility. The glove insert shall be no-melt/no-drip, fast drying, have water repellency, good durability, insulation, good manual dexterity/tactility and grip, and compatible fit with a glove shell. The glove insert shall be seamlessly knit using a 13 gauge machine (i.e., 13 needles per inch of the needle bed) and constructed from a Cotton/Lycra® spandex blend with no-melt/no-drip grip dots on the palm side that shall cover the entire palm, fingers and thumb. The fingers and palm portion of the glove insert shall be knit in plain jersey stitch. The cuff shall be turned under and hemmed using a blind stitching machine inside, and the thread shall be no melt/drip. As an alternate, a standard seamless cuff may be provided. The elastic shall approximate the basic shade of the glove insert, and be knit into the cuff on every other course in mock-ribbing style to provide a snug fit for the wearer. The glove insert construction shall be durable to minimize pre-mature holes at stress points, and shall provide a next to skin fit with the gauntlet providing a comfortable form fit on the wrist and forearm. The glove insert must provide sufficient lengthwise and widthwise stretch to fit the hand comfortably and be able to return to its approximate original relaxed dimensions after wear.

(See 6.1.1).

3.4 Material.

3.4.1 Basic material. The cloth for the glove insert shall be a cotton/lycra spandex blend (between 2% and 4% spandex content) and contain a corespun cotton/spandex yarn. One ply shall be corespun with a single strand of Lycra® spandex or equal. The Lycra® spandex or equal shall be 70 Denier. The glove inserts shall be treated with a durable water repellent treatment, and shall be Camouflage Green 483. The fabric shall conform to the following requirement as specified in Table I.

Table I. – Basic Material Characteristics and Requirements

| CHARACTERISTIC | REQUIREMENT | | TEST METHOD | |
|--|--|--|--|-----------|
| | Material (with no grip dots applied – back of hand portion) | Material (with grip dots applied – palm portion) | | |
| Flame Resistance: Burning behavior | No melt/drip | No melt/drip | ASTM D 6413 | |
| Fabric Stretch % ^{1/} : Wales: Courses: | 25 minimum 40 minimum | 25 minimum 40 minimum | ASTM D 2594 | |
| Fabric Growth % ^{1/} : Wales: Courses: | 8 maximum 8 maximum | 8 maximum 8 maximum | | |
| Moisture Vapor Transmission Rate: grams/square meter/24 hours | 950 minimum | 950 minimum | ASTM E96, Method B | |
| Dimensional Stability: % After 1 Laundering: Wales: Courses: After 3 Launderings: Wales: Courses: After 10 Launderings: Wales: Courses: | 3.5 maximum 2.0 maximum 4.5 maximum 2.5 maximum 6.0 maximum 3.5 maximum | 3.5 maximum 2.0 maximum 4.5 maximum 3.0 maximum 6.5 maximum 4.5 maximum | AATCC 135 Normal 120F, Tumble Normal | |
| Time to Dry (in house procedure): hours | 14 maximum | 8 maximum | | See 4.4.2 |
| Spray Rating (Initial) | 80 minimum | 80 minimum | | AATCC 22 |
| Weight (hand portion): ounces per square yard | 13.5 - 17 | 20 maximum | ASTM D 3776, Method C | |

^{1/} Sample size and benchmark size dependent on the overall size of the specimen being tested.

3.4.2 Color matching.

3.4.2.1. Visual matching. The color and appearance of the knitted cloth shall match the standard sample when viewed using AATCC Evaluation Procedure 9, Option A, under filtered tungsten lamps that approximate artificial daylight D75 illuminant with a color temperature of 7500 ± 200 K with illumination of 100 ± 20 foot candles, and shall be a good match to the standard sample under horizon lamplight at 2300 ± 200 K.

3.4.2.2 Colorfastness. The finished glove insert cloth shall show fastness to: laundering (after 4 cycles). The finished cloth shall show fastness to laundering equal to or better than the standard sample, or equal to or better than a rating of “3” using the AATCC Gray Scale for Color Change and a rating of “3-4” using the AATCC Gray Scale for Staining.

3.4.3 Grip Dots. The grip dots on the palm side of the glove shall extend from the bottom of the palm to the fingertips and tip of the thumb, and consist of a Polyvinyl Chloride Plastisol screen-printing ink. The grip dots shall be no melt/drip. The grip dots shall be no more than 1/16” in width, and shall be spaced approximately 1/16” apart. (See Figure 1).

3.5 Stitches, seams and stitching.

3.5.1 Hem. The hem shall exhibit a uniform appearance. Material edges must not ravel. Raw edges may be turned-in, or turned-under or surged to prevent raveling. No raw edges allowed.

3.6 Labels. Each glove insert shall have a combination size, identification and instruction label. The label color shall be white. The inscription shall have a minimum font size of 10 points. The inscription legibility, label, and label attachment method shall last the expected life of the glove insert. The labels shall show fastness to laundering. The labels must boldly specify size, identify the item, and provide use and care instructions. In addition to labeling each glove, easy recognition of sizes shall be provided such as stamped size easily visible on the glove.

3.6.1 Combination size-identification-instruction label. The label shall be located on the inside wrist of both glove inserts, centered, and positioned at least 1/2” below the cuff hem. The label shall conform to MIL-DTL-32075, Type III, Class 14, and contain the following information as applicable:

Size & Identification Information

GLOVE INSERT, LIGHT DUTY
CONTRACT NO.:
CONTRACTOR’S NAME:
NSN:
SIZE:
FIBER CONTENT:
LOT NO:

Glove Insert Instruction Label Contents

1. Do not store in direct sunlight.
2. Machine wash low temp.
3. Use liquid laundry detergent.
4. No chlorine bleach or soap.
5. Tumble dry low temp.
6. Remove promptly from dryer.

3.7 Bar Code Label/Tag. Each pair of gloves shall be packaged in a reverse tuck or sealable type clear plastic bag. Each item shall be individually Bar Coded. The bar code element shall be a 13 digit national stock number (NSN). The bar code for NSN shall be a medium to high density, clearly legible and readable by scanner, and shall be located so that they are completely visible on the item when

packaged as specified. Attachment of the label shall cause no damage to the item. The bar code shall conform to Type VII, Class 17 of MIL-DTL-32075.

3.8 Configuration. The following specifics are needed to ensure uniform appearance, comfort and durability in garrison use, combat, and field operations. End item construction and appearance shall conform to the requirements of this document and the finished dimensions as specified in Table IV, and to maintain item configuration and compliance to end item and component performance tests. (See 4.4).

3.9 Figures. Figure 1 is furnished for information purposes only. If there are any inconsistencies between the specification and the figures, the specification shall govern.

4. VERIFICATION

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

1. First article inspection (see 4.2).
2. Conformance inspection (see 4.3).

4.2 First article inspection. A first article inspection when required (see 3.1) shall be inspected for the defects listed in Table III, glove dimensions in Table IV and tested for characteristics in Table II.

4.3 Conformance inspection. Sampling for inspection shall be performed in accordance with ANZI/ASQC Z1.4.

4.4 Component and end item inspections. In accordance with 4.1, components and end items shall be tested in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this document or applicable procurement documents. The government reserves the right to inspect all components and end items to determine conformance to requirements.

4.4.1 In-process inspection. Inspection shall be made at any point or during any phase of manufacturing to determine whether the components are as specified or operations and/or assemblies are accomplished as specified. The Government reserves the right to exclude from consideration for acceptance any material or service for which in-process inspection has indicated non-conformance.

4.4.2 End item visual and dimensional examination. The finished gloves shall be examined for the defects listed in Table III and for the dimensional measurements listed in Table IV. The lot size shall be expressed in units of gloves. The sample unit shall be one pair of gloves and selection shall be by pairs. Defects for pairing shall be classified as a single defect.

4.4.3 Component and material testing. The cloth shall be tested for the characteristics listed in Table I. The testing shall be performed using the test methods as specified in Table II. All test reports shall contain the individual values utilized in expressing the final results. For material and in-process testing on glove insert cloth produced by tubular knitting, the equivalent of five square yards each of cloth material, with no grip dots applied, and with grip dots applied, in pieces of lay-flat tubular form (approximately 3.5 inches wide each) shall be supplied for all physical and chemical tests. The lot size shall be expressed in units of one yard each. The sample size shall be as shown below and the lot shall be considered unacceptable if one or more sample units fail to meet any requirements specified. All test reports shall contain the individual value utilized in expressing the final result.

| <u>Lot Size (yards)</u> | <u>Sample size</u> |
|--------------------------------|--------------------|
| 800 or less | 2 |
| 801 up to and including 22,000 | 3 |
| 22,001 and over | 5 |

Table II. Test Methods

| Characteristic | Requirement Paragraph | Test Method |
|---|------------------------------|--|
| Flame Resistance | 3.4.1 | ASTM D 6413 |
| Fabric Stretch Recovery: Fabric growth after 1 minute Fabric growth after 60 minutes Stretch under 4 lb force load | 3.4.1 | ASTM D 2594 |
| Moisture Vapor Transmission Rate | 3.4.1 | ASTM E96, Method B |
| Dimensional Changes of Fabrics after Home Laundering | 3.4.1 | AATCC 135 Normal 120F, Tumble Normal |
| Spray Rating (Initial) | 3.4.1 | AATCC 22 |
| Weight, (oz. per square yard), Method C | 3.4.1 | ASTM D 3776 |
| Colorfastness Laundering, Home and Commercial; Accelerated | 3.4.2.2 | AATCC 61 <u>1</u> / |
| Visual Assessment of Color Difference of Textiles | 3.4.2.1 | AATCC Evaluation Proc.9 |
| Drying Time | 3.4.1 | See 4.4.4 |

1/ Use procedure 2A which is 120F

4.4.4 Drying Time Test Method.

Test Specimens:

1. Fabric samples and blotting paper should be conditioned at 65±2% RH and 21±1°C (70±2°F) for a minimum of four hours before testing.
2. Test three specimens from each sample. Each specimen consists of a 2" x 2" piece cut wearing gloves. The long dimension should be cut parallel to warp direction. Mark each specimen for identification as a part of the sample set.

Procedure:

1. Weigh the conditioned sample using a laboratory balance, accurate to the 0.1g.

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2. Place 100mls of distilled or reverse osmosis water into a 250ml beaker.
3. Submerge one specimen in the beaker for 30 minutes. Make certain that the specimen is completely submerged under the water to insure complete wetting.
4. Remove from the specimen and sandwich it between two pieces of unused blotter paper and pass it through the wringer. Leave the piece sandwiched in the wet blotters. Repeat this process for the remaining two specimens of the same sample.
5. Weigh the blotted specimens one at a time.
6. Record the weight as wet weight.
7. Hang each sample separately to dry in a location that is in conditions of $65\pm 2\%$ RH and $21\pm 1^{\circ}\text{C}$ ($70\pm 2^{\circ}\text{F}$).
8. Weight the sample to the nearest 0.1g every 5 minutes recording each weight, until completely dry.
9. This is repeated until all the specimens return to their original dry weight. At this time the overall drying time is calculated by averaging the dry time of all three specimens of all three if they do not dry at the same time.

Notes: The wringer, household laundry type, should be equipped with soft rubber squeeze rolls 5.1-6.4 cm in diameter and 28.0-30.5cm in length, with a hardness of 70-80 when measured using the A Scale of a Shore Durometer. The wringer should be so constructed that the pressure on the top of the piece of fabric is maintained by a dead weight or lever system such that the total pressure (resulting from the total of the dead weight or lever system and the weight of the roller) is 27.2 ± 0.5 kg. It should be power-driven at a constant rate so that the piece of fabric passes through the rolls at a rate of 2.5 cm/s. Also suitable is the Atlas Motorized Laboratory Wringer available from SDL Atlas L.L.C., 1813A Associate Lane, Charlotte, NC 28217; Tel No.: 704/329-0911; fax: 704/329-0914; e-mail: info@sdatlas.com.

The diameters of the squeeze rolls should be determined with a pair of calipers or directly with a suitable micrometer. Measurements should be made at five different places along the length of each roll, and the average of these measurements taken as the diameter of the roll.

The load applied by the dead weight or lever system should be measured using a spring scale or balance, and suspending the top roll of the wringer from the scale by means of two tapes of equal length. The tapes should be placed between the rolls near their ends and should be provided with a means of holding them sufficiently far apart so that there is no contact between the tapes and the top structural member of the wringer and loading system. The spring scale or balance should be suspended from a suitable rigid support and provided with a turnbuckle or other device for adjusting the height of the scale. The usual precautions concerning the zero correction of spring scales should be observed. The turnbuckle or other device should then be adjusted to place the weight of the top roll and its weighting system on the spring scale or balance, and the system should be considered to be in equilibrium when the top roll of the wringer had been lifted just sufficiently from the bottom roll to permit vision between the bottoms of the tapes and the top of the bottom roll. At this point, the dead weight on the loading system should be adjusted until the spring scale or balance indicates a load of 27.7 ± 0.5 kg. The calibration of the spring scale or balance should be certified by the use of known certified dead weights of 24.95, 27.22 and 29.48 kg ± 0.23 kg total weight. The spring scale should be accurate to within ± 0.2268 kg at each of the three verification loads.

The linear speed of the rolls should be measured by feeding a thin steel tape through the rolls. The steel tapes should be at least 150cm long and should be accurate to within 3mm per 150cm. The time required for exactly 150 cm of this tape to pass through the nip of the rolls should be measured in seconds to the nearest second with a stopwatch calibrated in intervals of not more than 0.5 sec. The

speed of the rolls should be adjusted until the time required for 150 cm of tape to pass through the nip of the roll is 60±2 sec.

Blotters suitable for this test can be obtained from AATCC, P.O. Box 12215, Research Triangle Park, NC 27709; tel: 919/549-8141; fax: 919/549-8933; e-mail: orders@aatcc.org

Should it be necessary to run only one specimen, a specimen of similar material with respect to weight should be run as ballast with the specimen under going test.

4.4.5 End item visual examination. The glove insert shall be examined for the defects listed below.

Table III. Defects

| EXAMINATION | DEFECT |
|--------------------------|--|
| Material and workmanship | Component part omitted, distorted, full, tight, or twisted; any part caught in any unrelated stitching. Any hole, cut, tear, smash, burn, drill hole, run, thin place, dye streak, color not as specified, mis-knit, knot or slub affecting appearance or serviceability. Grip dots not as specified, misplaced, not properly attached, or wearing off. |
| Material and workmanship | Knit: not as specified, puckered, distorted, pleated, wavy, twisted, irregular or open, loose or tight stitch tension, broken or missing thread or stitch, needle chew, visible mend, visible raw edge - affecting appearance or serviceability. Seam: hem not as specified |
| | Any component part omitted, not functioning properly, or defective. |
| | Unwanted permanent fold, pleat, or crease in fabric or garments, affecting appearance or serviceability |
| Shade | Any color not as specified. |
| Cleanness | Spot, stain, excessive thread ends not trimmed or removed, shade stamp marking on outside; odor, affecting appearance or serviceability |
| Labels | Omitted, incorrect, illegible, not attached where specified; bar-codes omitted, not readable by scanner; human-readable interpretation (HRI) omitted or illegible; bar code not visible on folded, packaged item; bar code attachment causes damage to the item. |
| Packaging | Not packaged in accordance with the contract or purchase order |

4.4.6 Finished dimensions. The glove insert shall conform to the dimensions listed in Table IV below:

Table IV. Glove Insert Finished Dimensions (in inches)

| | SMALL/MEDIUM | LARGE/X-LARGE | TOLERANCE |
|---------------------------------|---------------------|----------------------|------------------|
| Overall Length <u>1/</u> | 9-1/2 | 11-1/4 | 3/4 |
| Palm Width <u>2/</u> | 3-3/4 | 4 | 1/4 |
| Palm Length <u>3/</u> | 3-1/2 | 4-1/8 | 3/8 |
| Cuff Width <u>4/</u> | 2-7/8 | 2-7/8 | 1/4 |
| Cuff Length <u>5/</u> | 3-1/2 | 4-1/4 | 3/8 |

1/ Overall Length: Measure the entire length of the glove insert from the middle fingertip to the cuff edge, lying flat, relaxed.

2/ Palm Width: Measure the width of the palm of the glove insert from the edge of the palm one half inch above the thumb crotch to the opposite edge of the palm beginning and ending along the same course of stitches, lying flat, relaxed.

3/ Palm Length: Measure the length of the palm of the glove insert from the crotch of the index finger to the beginning of the mock-ribbing of the cuff, lying flat and relaxed.

4/ Cuff Width: Measure the width of the cuff of the glove insert from edge to edge across the cuff one and one half inches down from the center where the palm joins the mock-ribbing, lying flat, relaxed.

5/ Cuff Length: Measure the length of the ribbed cuff along the side of the cuff from the cuff edge, to where the palm begins, lying flat, relaxed.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be in accordance with best commercial practice and ASTM D- 3951 unless specified differently in the contract or purchase order (see 6.2). Each item shall be packaged separately with no mixed cartons. Partial cartons will be clearly marked. When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The light duty glove insert is for stand-alone use, or to be worn under the Light Duty Work Glove by military personnel of the United States Marine Corps for use in all environments during light duty work.

6.1.1. The Government's intent is to have 2 sizes of glove inserts with the stretch providing a proper fit for a range of hand measurements eliminating the need for additional sizes. However, if the winning offeror's 2 sizes do not satisfactorily fit Marines in the smallest size range, the government reserves the right to add in a third size, X-Small. The government will work with the contractor to develop the additional size that is a derivation from the original two sizes awarded.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number and date of this document.
- b. Types, classes and sizes required (see 1.2).
- c. Issue of DODISS to be cited in the solicitation and, if required, the specific issue of individual documents referenced (see 2.2).
- d. When first article sample is required (see 3.1, 4.2 and 6.3).
- e. Packaging requirements (see 5.1)

6.3 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209-4. 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 include specific instructions in all acquisitions documents regarding arrangements for selection, inspection, and approval of the first article.

6.4 Sources of Supply. Danalco Inc.'s Seamless Cotton and Lycra Liner glove, Product Numbers 2101 and 2105, has been found to meet the requirements listed in this purchase description.

Danalco, Inc.
1020 Hamilton Road
Duarte, California 91010

6.5 Subject term (key word) listing.

Insert
Glove
Handwear
Water repellent

6.6 Figures.

USMC LIGHT DUTY GLOVE INSERT

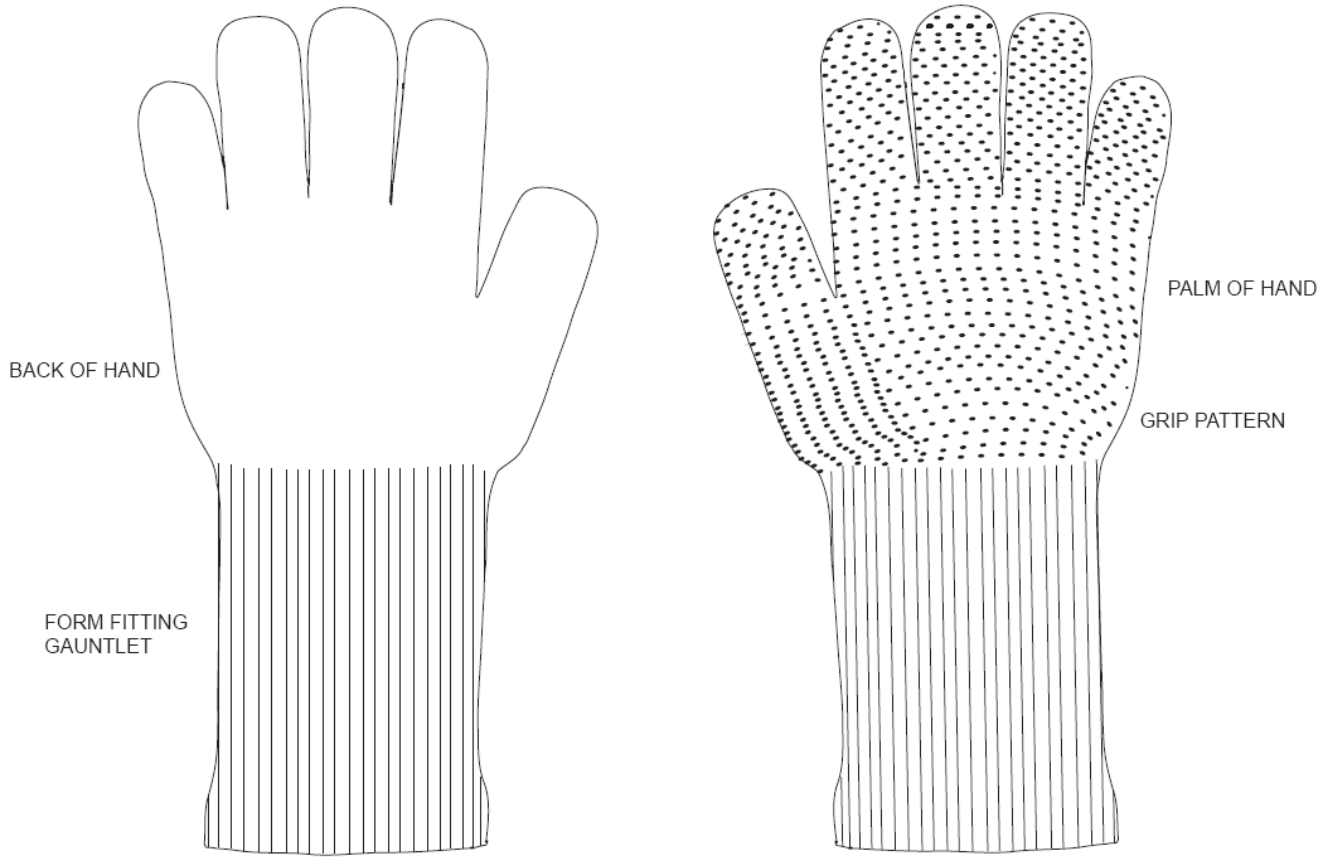


Figure 1. Glove Insert, Back of Hand and Palm View

Concluding material:

Custodians:
Marine Corps

Preparing activity:
MARCORSYSCOM