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## AVIS

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## MANUFACTURING DATA FOR MITTENS, SHELL, EXTREME COLD WEATHER, MULTICAM®

### 1.1 Scope

This specification covers the material, design and construction requirements for the Mittens, Shell, Extreme Cold Weather (ECW), MULTICAM®, to be worn with Mittens, Insert, Extreme Cold Weather, Brown.

### 1.2 Classification

Gloves covered by this Manufacturing Data are classified as follows: Mittens, Shell, Extreme Cold Weather (ECW), MULTICAM®.

## 2.0 GENERAL

### 2.1 Intellectual Property

The information, data, know-how, formulas, algorithms, software, processes, systems, methods, designs, text, works, figures, tables, sketches, photographs, plans, drawings, specifications, samples, reports, names, inventions and/or ideas contained herein (hereinafter "Intellectual Property") is the exclusive property of Her Majesty The Queen in Right of Canada as represented by the Minister of National Defence (hereinafter referred as "DND"). No one has the right to reproduce, disclose, disseminate, or utilize, in any manner or in any form, this Intellectual Property, or any part thereof, without the prior written consent of DND. For further information on the restrictions applicable to this Intellectual Property, or to request consent from DND, please contact the Contracting Authority.

### 2.2 Applicable Documents

The following documents form part of this Manufacturing Data to the extent specified, and are supportive of this Manufacturing Data when referenced; all other document references are to be considered supplemental information only. In the event of a conflict between the documents referenced and the contents of this Manufacturing Data, then the contents of this Manufacturing Data must take precedence:

#### DND Drawings (provided upon request)

- Pattern 389365 – Small
- Pattern 389366 – Medium
- Pattern 389367 – Large
- Pattern 389368 – X-Large
- Pattern 389369 – Small and Medium
- Pattern 389370 – Large and X-Large

- 389364 Mitts, Shells, Winter, C1, A1
- 389371 Face Warmer Assembly
- CS-101 Buckle, Slide - 2 Bar

CAN/CGSB Standards (email: [ncr.cgsb-ongc@pwgsc.gc.ca](mailto:ncr.cgsb-ongc@pwgsc.gc.ca))

- CAN/CGSB 4.2-M Textile Test Methods
- CAN/CGSB-54.1-M Stitches and Seams, Parts I and II
- CAN/CGSB-86.1-2003 Care Labelling of Textiles
- 4-GP-85M Nylon Thread

FED Standards (Download Documents: <http://assist.daps.dla.mil/quicksearch/>)

- FED-STD-595C - Colors Used in Government Procurement

2.2.1 Order of Precedence

The order of preference is as follows:

- (a) In the event of inconsistency between contract documents, such as contract, Manufacturing Data, drawing and sealed pattern, the order of precedence must be contract, Manufacturing Data, drawing and sealed patterns;
- (b) In the event of a conflict between the text of this manufacturing data and the references cited herein, the text of this manufacturing data must take precedence;
- (c) In the event of inconsistency within this manufacturing data, the Contracting Authority must be contacted for clarification; and
- (d) Nothing in this document supersedes applicable laws and regulations, unless a specific exemption has been obtained.

2.3 Material Standards

The following material standards are supplemental to this standard:

- (a) Specification for Tape, Textile, Bias, Single Fold;
- (b) Specification for Cloth, Cotton, Duck, Unbleached, Plied Yarns;
- (c) Specification for Cloth, Nylon Cotton, MULTICAM®, Oil And Water Repellent Treated;
- (d) Specification for Leather, Goat Skin, Aniline, Chrome Tanned, Gloving;
- (e) Specification for Leather, Cowhide, Split, Chrome Tanned;
- (f) Specification for Cloth, Taffeta, Nylon;
- (g) Specification for Cloth, Wool, Single Face; and
- (h) Specification for Cloth, Melton, Wool.

## 2.4 Definitions

Earth Tone	By definition, earth tone is considered a color scheme that draws from a color palette of browns, tans, grays, greens, oranges, whites and some reds. The colors in an earth tone scheme are muted and flat in an emulation of the natural colors found in soils, moss, trees and rocks. For the purpose of this specification, the earth tone color (where specified) must be based on the predominantly brown, tan and gray color series (lusterless) within FED STD-595C, where those colors do not include any elements of orange, red and white.
MULTICAM®	A proprietary design for a computer generated digital camouflage pattern patented by Crye Precision Ltd.

## 2.5 Picture

A picture of the finished product is given at Appendix 1. Note that the colour of the components are not correct.

## 2.6 Patterns

DND will provide patterns as follows:

- (a) Sealed Sample: DCGEM 379-72-MC-M - Mitten, Shell, Extreme Cold Weather (for glove design only) in size medium; and
- (b) Paper patterns - Paper patterns for all sizes under Style Code ARCMIT33. Size Medium will be used for tendering purposes.

Note: The Sealed Sample has the following deviation: Marking Label is missing.

## 3.0 **REQUIREMENTS**

### 3.1 Design

The design must be in accordance with Sealed Sample DCGEM 379-72-MC-M and must incorporate the following features:

- (a) Brown coloured leather with a MULTICAM® cloth gauntlet;
- (b) Curved palm with sidewall pieces;
- (c) Elasticized wrist;
- (d) Adjustable strap closure on the gauntlet;
- (e) Face warmer on the back of the hand; and
- (f) Snaps to anchor to the Mitten Insert.

### 3.2 Tooling

The pattern for cutting the Mitten Shell must be in strict accordance with the Government pattern supplied to the successful bidder. The Government does not supply tooling; dies and blocking forms must be provided by the Contractor.

3.3 Materials

- (a) Palm, Back, Thumb, Carrying Loop and Sidewalls - The Palm, Back, Thumb, Carrying Loop and Sidewalls must be as follows:
  - i. Leather, Goatskin, Aniline, Chrome Tanned, Gloving;
  - ii. Thickness:  $1.1 \pm 0.1$  mm ( $0.043 \pm 0.004$  in); and
  - iii. Brown in colour. Slight variations in colour will be accepted providing the mittens are a matched pair;
- (b) Palm and Thumb Welting, and the Cuff Stiffening Strips - The Palm and Thumb Welting, and the Cuff Stiffening Strips, must be:
  - i. Leather, Cowhide, Split, Chrome Tanned;
  - ii. Have a thickness as follows:
    - a. Welting:  $1.1 \pm 0.01$  mm ( $0.043 \pm 0.0004$  in); and
    - b. Cuff Stiffening Strips: 1.4 to  $1.6 \pm 0.2$  mm ( $0.055$  to  $0.063 \pm 0.007$  in);
- (c) Face Warmer - The Face Warmer must be Cloth, Wool, Single Face ( $630 \text{ g/m}^2$ ). This material will be Government supplied NSN 8305-21-874-1016;
- (d) Bias Binding - The Bias Binding must be Tape, Textile, Bias, Single Fold (Type II) with a finished width of  $12.7 \pm 0.8$  mm, in a non-florescent earth-tone colour that matches the Face Warmer cloth;
- (e) Elastic Tape - The elastic tape must:
  - i. Be braided construction;
  - ii. Meet the requirements specified in Table 1; and
  - iii. Be undyed or white in colour

Table 1: Technical Requirements for Elastic Tape

Property	Requirement	Tolerance
Width	19 mm	N/A
Cover Yarn	2 ply 20 ECC Natural Cotton	N/A
Core	16 ends of #40 rubber	N/A
Stretch	170%	+/- 5%

- (f) Cuff - The Cuff must be made from Cloth, Nylon Cotton, MULTICAM®, Oil And Water Repellent Treated;
- (g) Cuff Interlining - The Cuff Interlining must be made from Cloth, Cotton Duck, Unbleached, Plied Yarns, have a minimum weight of  $400 \text{ g/m}^2$ , in a non-florescent earth-tone colour;
- (h) Webbing - The webbing for the Cuff Straps, Loops and Tabs must:
  - i. Be 100% Nylon;
  - ii. Meet the requirements specified in Table 2; and
  - iii. Be black in colour;

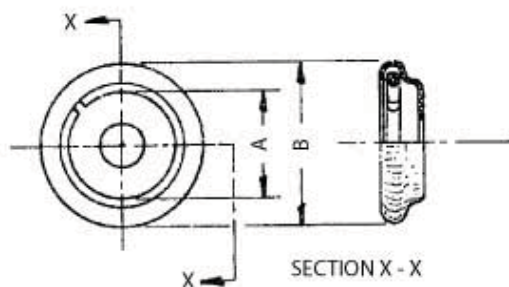
Table 2: Technical Requirements of Suppression Strap Webbing

Property	Requirement
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Type of Weave	Plain, double weave
Ground Ends	65 x 810 denier Nylon
Binder Ends	14 x 810 denier Nylon
Weft Ends	410 denier Nylon
Picks	7.5 picks/cm, 2 picks/shed
Width	16.0 mm (tolerance +/- 1.00 mm)
Thickness	1.0 mm (tolerance +/- 0.25 mm)

- (i) **Thread** - The following applies:
- i. The top thread must:
    - a. Be bonded nylon in accordance with CAN/CGSB 4-GP-85, Type 2, Class A, Tex 70;
    - b. Meet the physical requirements specified in Table 2 of CAN/CGSB 4-GP-85 for Tex Ticket No. R 70 Tex;
    - c. Size: E (T-10); and
    - d. Be a colour that matches the leather and/or textile being sewn;
  - ii. The bottom thread must:
    - a. Be bonded nylon in accordance with CAN/CGSB 4-GP-85, Type 2, Class A, Tex 45;
    - b. Meet the physical requirements specified in Table 2 of CAN/CGSB 4-GP-85 for Tex Ticket No. R 45 Tex;
    - c. Size: C (T-45); and
    - d. Be a colour that matches the leather and/or textile being sewn;
- (j) **Buckle** - The cuff closure buckle must be similar in design to the 2-bar slide (Drawing CS-101) as follows:
- i. Commercially available black Acetyl;
  - ii. 15.9 mm (0.625 in) ladder lock style; and
  - iii. Texfast Group Ltd. Part No. P004 - PLA-1645 is known to meet this requirement; however, equivalent products will be considered as long as they are Acetyl and have approximately the same overall dimensions;
- (k) **Snap Fasteners** - Snap fasteners must be regular spring clamp type in brass with nickel plating, a black finish and a phosphor bronze spring as detailed in the following drawings:

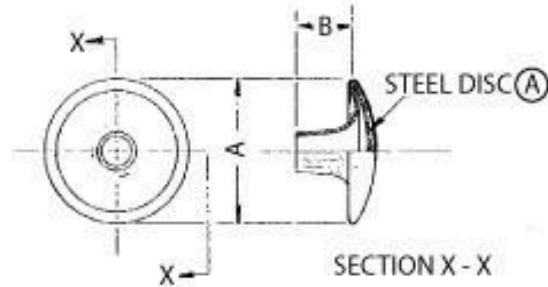
Drawing 1: CS-149 - Socket Fastener



Inside diameter "A"	9.34 mm (0.368 in)
Outside diameter "B"	14.4 mm 0.5625 in)

Texfast Group Ltd. Part No. PRY-2000 has been known to meet this requirement

Drawing 2: CS-153 - Button Fastener



Diameter "A"	Ligne	24
	Diameter	15.39 mm (0.606 in)
Diameter "B"	Barrel Length	3.0 mm (0.118 in)

Texfast Group Ltd. Part No. PRY-1000 has been known to meet this requirement.

### 3.4 Sizing

The Mitten Shell must be available in the following sizes:

Table 3: Size Roll for Mitten Shell

Size	Pattern	NSN
A/A	N/A	8415-20-012-9164
Small	389365	8415-20-012-2415
Medium	389366	8415-20-012-2416
Large	389367	8415-20-012-2417
Extra-Large	389368	8415-20-012-2418

### 3.5 Cutting

The component parts of the shell must:

- (a) Be cut with the use of dies and/or patterns specified;
- (b) Be cut parallel to the backbone of the goat skin in order to obtain maximum flexibility and fit in the finished mitten; and
- (c) The palm, back, thumb and sidewalls are to:
  - i. Be cut from only the best portion of the butt;
  - ii. Be free from any flakiness or soft spots; and
  - iii. Meet the specified thickness requirements.

### 3.6 Welting

The welting for the thumb and palm must;

- (a) Be  $4.8 \pm 0.8$  mm ( $0.189 \pm 0.03$  in) in width;
- (b) Have all joints beveled and cemented tightly together;
- (c) Be continuous with not more than one (1) joint in either palm or thumb; and
- (d) Where ends are joined, the joining is to result in a smooth and serviceable joint.

### 3.7 Sewing

All stitching must:

- (a) Be lock stitch Type 301 in accordance with CAN/CGSB 54.1-M with nine (9) to eleven (11) stitches per 2.5 cm (1 in);
- (b) Have the beginning and ending of all seams securely back tacked for at least 19 mm (0.75 in); and
- (c) Not utilize the trimmer on trimmer equipped machines.

### 3.8 Marking Label

The Mitten Shells must have the following information legibly and indelibly inscribed in numerals and letters 6.4 to 9.5 mm (0.25 to 0.375 in) in height on the back of the cuff:

- (a) Nomenclature in English and French as follows:

MITTENS, SHELL, ECW, MULTICAM  
COQUILLES POUR MITAINES, TGF, MULTICAM

- (b) Size/taille;
- (c) Year of manufacture/année de fabrication;
- (d) Contract number/numéro du contrat;
- (e) NATO Stock number/numéro de nomenclature de l'OTAN; and
- (f) Care Instructions: Surface wash, do not dryclean/Nettoyer surface, ne pas nettoyer à sec.

### 3.9 Construction

The Mitten Shells are to be manufactured in accordance with the following requirements:

- (a) **Sidewall, Palm and Back** - The sidewall, palm and back must be joined as follows:
  - i. The two (2) sidewalls inseam stitched (seam type 1.01.01) together at the fingertip part of the mitt with seam allowance of  $3.2 \pm 0.8$  mm ( $0.126 \pm 0.03$  in);
  - ii. The back of the mitt is to overlap the two (2) sidewalls (seam type 2.01.01) by 4 to 6 mm ( $0.157$  to  $0.24$  in) and be top stitched to the side walls with one (1) row of continuous stitching placed  $1.5 \pm 0.8$  mm ( $0.06 \pm 0.03$  in) from the edge of the back;
  - iii. The palm and the back of the thumb are then sewn to the sidewalls with the use of the welting (seam type 1.11.01);
  - iv. The edges of the palm, back of the thumb, welt and the sidewall are to be flush and stitched together with one (1) row of stitching with a seam allowance of  $2.3 \pm 0.8$  mm ( $0.09 \pm 0.03$  in); and
  - v. The welting is to end 25 mm (1 in) above the bottom of the leather palm;
- (b) **Thumb** - The thumb must be assembled as follows:
  - i. Thumb to be fully welted and sewn (seam type 1.11.01) to the palm with one (1) row of stitching, with a seam allowance  $1.5 \pm 0.8$  mm ( $0.06 \pm 0.03$  in); and
  - ii. The edges of the palm, thumb and the welting are to be flush;
- (c) **Face Warmer** - The face warmer must be assembled as follows:
  - i. Cut according to the paper pattern then the edges bound with the bias binding; and

- ii. The face warmer is then centred on the back of the hand portion of the mitt and sewn all around with one (1) row of lock stitch placed approximately 3.0 mm (0.12 in) from the edge;
- (d) **Elastic** - The elastic must be assembled as follows:
- i. Centered approximately 3.8 cm (1.5 in) below the top edge of the palm and sewn to the palm and back of the thumb in the stretched state with one (1) row of lock stitch (seam type 5.04.03); and
  - ii. Ends of the elastic are to be caught in the shell closing stitching;
- (e) **Cuff and Interlining** - The cuff and interlining must be assembled as follows:
- i. Include stiffening strips as follows:
    - a. Six (6) leather stiffening strips, each being  $12.7 \pm 1.5$  mm ( $0.5 \pm 0.06$  in) wide by  $13.3 \pm 3.2$  mm ( $5.25 \pm 0.125$  in) long;
    - b. The strips are placed in a vertical position on the underside of the interlining, three (3) strips spaced evenly on the back portion of the cuff and three (3) strips spaced evenly on the front portion of the cuff; and
    - c. Strips are then sewn to the interlining around all four (4) edges with one (1) row of stitching placed 2.3 mm (0.09 in) from the edge of the strip;
  - ii. After the stiffening strips have been sewn to the interlining, the ends of the interlining are sewn to the cuff, with one (1) row of stitching placed approximately 3.2 mm (0.125 in) from the edge;
  - iii. The two (2) vertical sides of the cuff are seamed together with one (1) row of stitching 4.8 mm (0.19 in) from the edge;
  - iv. The depth of the cuff is then folded in half to form two (2) plies and the inside bottom raw edge folded over the outer surface for a distance of 8 mm (0.315 in) and sewn with a row of stitching 4 mm (0.157 in) from the edge;
  - v. The bottom edge of the interlining is then stitched to the doubled cuff with one (1) row of stitching placed a 4.8 to 6.3 mm (0.19 to 0.25 in) from the folded top edge of the cuff; and
  - vi. The cuff is then attached to the shell, with the leather overlapping 11.2 to 12.7 mm (0.44 to 0.5 in) with two (2) rows of stitching as follows:
    - a. The first row of stitching is placed  $1.5 \pm 0.8$  mm ( $0.06 \pm 0.03$  in) from the edge of the leather; and
    - b. The second row of stitching at 3.2 mm (0.125 in) gauge;
- (f) **Straps, Loops, Tabs and Buckles** - The Mitten Shells must have a cuff closure strap and buckle assembly as follows (see Drawing 389364):
- i. The loops, tabs and strap assemblies are to be cut and sewn in accordance with Drawing 389364 and the sealed sample; and
  - ii. The assemblies including the buckle are to be positioned on the back of the mitten cuff and securely stitched to the cuff at the locations indicated on Drawing 389364;
- (g) **Snap Fasteners** - Four (4) snap female portions of a snap fastener must be included on the mitten cuff as follows:
- i. Evenly spaced around the perimeter of the cuff such that they align with the male portions of a snap fastener on the Mitten Insert; and
  - ii. Firmly attached through all layers of the cuff assembly with the female portion of the snap fastener facing inward;
- (h) **Carrying Loop** - The Mitten Shells must have a carrying loop as follows"



- i. Constructed from a strip of Leather, Goatskin, Aniline, Chrome Tanned, Gloving that is  $19 \pm 0.8$  mm ( $0.75 \pm 0.03$  in) wide by  $12.7 \text{ cm} \pm 3.2$  mm ( $5 \pm 0.125$  in) long;
  - ii. Doubled flesh-to-flesh to form a loop and positioned on the cuff as shown on Drawing 389364;
  - iii. Securely sewn to the cuff as follows:
    - a. One (1) row of stitching forming a rectangle approximately 15.8 mm by 19 mm ( $0.62$  in by  $0.75$  in); and
    - b. Stitching to continue corner to corner in the rectangle to form an "X";
- (i) **Finishing** - After closing, the Mitten Shells must be blocked and shaped on a suitably shaped and heated form.

**APPENDIX 1 FINISHED PRODUCT**

