

## NOTICE

This documentation has been reviewed by the technical authority and does not contain controlled goods. Disclosure notices and handling instructions originally received with the document must continue to apply.



## AVIS

Cette documentation a été révisée par l'autorité technique et ne contient pas de marchandises contrôlées. Les avis de divulgation et les instructions de manutention reçues originalement doivent continuer de s'appliquer.

## MANUFACTURING DATA FOR SHIRT, HOT WEATHER, HYBRID, MULTICAM®

### 1.0 SCOPE

#### 1.1 Scope

This Manufacturing Data covers the materials, design and construction requirements for the Shirt, Hot Weather, Hybrid, MULTICAM® with a knit material body and fire resistant (FR) fabric arms for use by the Canadian Special Operations Forces Command (CANSOFCOM).

#### 1.2 Classification

The Hybrid Shirts covered by this Manufacturing Data are classified as follows: Shirt, Hot Weather, Hybrid, 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 to 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 Specifications and Standards (provided upon request)*

- D-80-001-028/SF-001 Specification for Cord, Plaited, Spun, Synthetic Fibre
- D-80-001-055/SF-001 Specification for Label, Clothing and Equipment
- D-83-001-005/SF-001 Fastener, Slide, Interlocking
- D-LM-008-002/SF-001 Specification for Marking for Storage and Shipment

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

- CAN/CGSB-4.2-M Textile Text Methods
- CAN/CGSB-4.131-M Cotton-Covered or Polyester-Covered, Polyester Thread
- CAN/CGSB-54.1-M Stitches and Seams, Parts I and II
- CAN/CGSB-86.1-2003 Care Labelling of Textiles

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

- FED-STD-595C - Colors Used in Government Procurement
- A-A-55126B Commercial Item Description - Fastener Tapes, Hook and Loop, Synthetic
- A-A-55217 Commercial Item Description – Thread, Aramid, Spun Staple

Federal Aviation Administration: ([www.faa.gov](http://www.faa.gov))

- Federal Aviation Regulations (FAR) Part 25 - Airworthiness Standards Transport Category Airplanes: Subpart D - Design and Construction (Fire Protection: 25.853 Compartment Interiors)

U.S. Department of Transportation ([www.transportation.gov](http://www.transportation.gov))

- Code of Federal Regulation (CFR) Part 517 (Federal Motor Vehicle Safety Standards) 571.302 - Flammability of Interior Materials

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 Cloth, Ripstop, Aramid/Fire Resistant (FR) Rayon, MULTICAM®; and
- (b) Specification for Cloth, Knit, Jersey, 60/40 Cotton/Nylon.

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.
Hook and Loop Fastener	A fastening consisting of two strips of nylon fabric, one having hooked threads and the other a coarse surface, that form a strong bond when pressed together, trademarked under the name VELCRO®.
MULTICAM®	A proprietary design for a computer generated digital camouflage pattern patented by Crye Precision Ltd.
Slide Fastener	A fastener for locking together two toothed edges by means of a sliding tab, commonly referred to as a zipper.

### 2.5 Layout Sketches

Schematic layout sketches for the Hybrid Shirts are included as part of this Annex. The sketches are designed to provide a general layout of the Hybrid Shirts only. They are not to scale and are not representative of the style, fit, colour scheme or form of the final garment. The following sketches are included in Appendix 1:

- (a) Figure 1 - Front and Back Views;
- (b) Figure 2 - Construction Details - Sleeve Pockets and Cuffs; and
- (c) Figure 3 - Care and Marking Label.

### 2.6 Patterns

DND will provide patterns as follows:

- (a) Sealed pattern: CANSOFCOM - Shirt, Hot Weather, Hybrid, MULTICAM® (Sealed for construction and design only); and
- (b) Paper patterns - DSSPM paper patterns for all sizes under Style Code SHHYB14 - Shirt, Hot Weather, Hybrid. Size medium must be issued for tendering purposes.

Note: The paper patterns for the Shirt, Hot Weather, Hybrid are to be used for the construction of the Shirt, Hot Weather, Hybrid, MULTICAM®. The paper patterns have the following deviations:

- The sleeves have been changed from three-piece to two-piece raglan style;
- The sleeve pockets have been changed from slanted top-opening to vertical side-opening with an internal pencil pocket;
- The cuff bellows have been deleted;
- The back of the shirt has been lengthened by 5 cm (2 in);

## 3.0 **REQUIREMENTS**

### 3.1 Design

The design must be in accordance with Sealed Patterns and must incorporate the following features:

- (a) Lined, high flat (mandarin) collar;

- (b) Vertical slide fastener closure at neck;
- (c) Flame retardant cloth sleeves, shoulders, and outer collar;
- (d) No melt, no drip t-shirt jersey cloth body and inner collar;
- (e) Raglan style sleeves;
- (f) Semi-bellows pockets on upper sleeve with pencil pocket and slide fastener closure;
- (g) Lower sleeve elbow reinforcement;
- (h) Adjustable cuff with hook and loop tape; and
- (i) Hang loop on the back of the collar;

Note: Unless otherwise specified, these garments must be governed by the Scale of Measurements at Appendix 2.

### 3.2 Materials

The following applies:

- (a) Shell Material - The shell material for the sleeves, sleeve pockets, shoulders, hang loop, and outer collar must be Cloth, Ripstop, Aramid/Fire Resistant (FR) Rayon, MULTICAM®;
- (b) Knit Material - The knit material for the body, underarms and inside collar must be Cloth, Knit, Jersey, 60/40 Cotton/Nylon;
- (c) Slide Fastener - The slide fasteners must be as follows:
  - i. Front neck opening as follows:
    - a. Class 3, Type 1 with an automatic locking slider and a pull tab with large hole in accordance with D-83-001-005/SF-001;
    - b. Flame retardant treated, monofilament (coil) as follows:
      - 1. Compliant with the FAR Part 25, Subpart D, Section 25.853 Flammability Test requirements; and
      - 2. Compliant with the FMVSS 302 for burn rate;
  - ii. Sleeve pockets as follows:
    - a. Class 3, Type 1 with a non-locking slider and a pull tab with large hole in accordance with D-83-001-005/SF-001;
    - b. Flame retardant treated, monofilament (coil) as follows:
      - 1. Compliant with the FAR Part 25, Subpart D, Section 25.853 Flammability Test requirements; and
      - 2. Compliant with the FMVSS 302 for burn rate;
  - iii. Be a non-fluorescent earthtone colour that is a good visual match to the knit material used for the body;
- (d) Hook and Loop Fastener Tape - The hook and loop fastener tape must:
  - i. Be Type II, Class 1 regular nylon in accordance with A-A-55126B; and
  - ii. Be a non-fluorescent earth tone colour to match the MULTICAM® camouflage pattern;

- (e) Thread - The following applies:
- i. The thread for flame retardant fabric components must:
    - a. Be aramid spun staple thread (R27 Tex) conforming to Type II of A-A-55217;
    - b. Be used for all sewing operations (seaming and serging) on the garments' sleeves, as well as all seams where a flame retardant fabric component is joined to a non-flame retardant fabric component (e.g., seaming of knit material to flame retardant material used on underarm and upper sleeve, stitching of the collar materials and the slide fastener placket, etc.); and
    - c. Be a non-florescent earthtone colour that is a good visual match to the components being sewn;
  - ii. The thread for non-flame retardant fabric components must:
    - a. Be polyester covered, polyester thread (R27 Tex) conforming to Class B, Type 1 of CAN/CGSB-4.131;
    - b. Be used for the flatlock seaming of the knit material body; and
    - c. Be a non-florescent earthtone colour that is a good visual match to the components being sewn;
  - iii. The thread for sewing hook and loop fastener tape must:
    - a. Be aramid spun staple thread (R27 Tex) conforming to Type II of A-A-55217; and
    - b. Be a non-florescent earthtone colour that is a good visual match to the fastener tape being sewn;
- (f) Draw Cord - The draw cord for the slide fastener pulls must:
- i. Be Cord, Plaited, Spun Synthetic Fibre, Type I in accordance with D-80-001-028/SF-001; and
  - ii. Be a non-florescent earthtone colour that is a good visual match to the knit material used for the body;
- (g) All material must be sourced and supplied by the Contractor.

### 3.3 Sizing

The Hybrid Shirts must be available in the following sizes in accordance with the Scale of Measurements at Appendix 2:

Size	Chest (in)	NSN
Extra-Small	29-32	8415-20-011-8172
Small	33-36	8415-20-011-8173
Medium	37-40	8415-20-011-8174
Large	41-44	8415-20-011-8175
Extra-Large	45-48	8415-20-011-8176
Extra-Extra-Large	49-52	8415-20-011-8177

The Shirts must also be available in special/extended sizes where the above sizes are not suitable.

### 3.4 Cutting

The following applies:

- (a) The Hybrid Shirts must be cut using duplicates of Government supplied paper patterns as follows:
- i. Paper patterns include seam allowance but do not include 'make-up' allowance; and

- ii. The Contractor is responsible for adding 'make-up' allowance to suit their production methods without changing the design, grade or requirements for the Hybrid Shirts;

Note: Paper patterns will not be supplied to the Contractor for special/extended sizes.

- (b) The inherent properties of FR material render it prone to excessive fraying. Additional allowance has been incorporated into the patterns to accommodate fraying. Care must be taken to ensure that all seam allowances are adhered to without compromise to the shape and finished dimensions outlined in the scale of measurements; and
- (c) The shell parts of the Hybrid Shirts must:
  - i. Be cut and used in accordance with best commercial standards;
  - ii. Be cut in the direction of the warp as shown on the paper patterns; and
  - iii. Be cut from the same piece of shell material;
- (d) The knit components of the Hybrid Shirts must be cut from the same dye lot so there is no shade variation between components.

### 3.5 Sewing

The following applies:

- (a) Seams must be as follows:
  - i. Conform to CAN/CGSB-54.1-M; and
  - ii. Be a minimum of 9.5 mm (0.375 in) wide unless otherwise specified;
- (b) Stitching must be as follows:
  - i. Be lock stitched Type 300 (unless otherwise specified) conforming to CAN/CGSB-54.1-M, having not less than eight (8) nor more than ten (10) stitches per 2.5 cm (1 in);
  - ii. Ends of all lock stitched seams and stitching, also breaks in thread, securely backstitched; and
  - iii. The tension of the needle and bobbin thread is to be adjusted to ensure correctly formed stitches;
- (c) Serging must be as follows:
  - i. All exposed raw edges serged with a three-thread serger, numerical designation 504 or 505, with a minimum gauge of 10 stitches per 2.5 cm (1 in);
  - ii. Simple overlock operations such as pocket edges may be two-thread serging, numerical designation 502 or 503, having not less than 10 stitches or more than 12 stitches per 2.5 cm (1 in); and
  - iii. Width bite to be 9.5 mm (0.375 in);
- (d) Cover-stitching of the hem must be done using stitch type 406 with needle spacing of 8.3 mm (0.327 in) and a minimum gauge of 15 stitches per 2.5 cm (1 in);
- (e) Lapped, flatlock seams used for the body (knit portion) must be seam type 2.01.01 and stitch type 607 with a minimum width gauge of 5.0 mm (0.1875 in);
- (f) Where seaming, turning and stitching is specified, the edges must be properly worked out before stitching;
- (g) Hook and loop fastener tape must:

- i. Be stitched around all edges 3.2 mm (0.125 in) gauge, taking care to ensure stitching is formed into the hook and loop portion of the tape;
  - ii. For tapes wider than 2.5 cm (1 in) stitched around all edges and through the centre or have a 'X' enclosed in the box; and
  - iii. For best results, a ball point needle, size 110 (#18) should be used;
- (h) Bartacks, unless specified otherwise, must be 9.5 mm (0.375 in) long and have not less than fifteen (15) cover stitches.

### 3.6 Marking and Care Label

The Hybrid Shirts must include a Marking and Care Label (see Figure 3), in French and English, as follows:

- (a) A label printed via heat transfer that does not show through to the face of the garment, positioned on the inside centre back bottom near the hem on the Hybrid Shirt;
- (b) Black printing in characters not less than 3.2 mm (0.125 in) nor more than 6.4 mm (0.25 in) in height, with the exception of the size identification which must be twice the height;
- (c) Care symbols in accordance with CAN/CGSB-86.1-2003 including the following:
  - i. Washing – Normal 50°C;
  - ii. Drying – Tumble Dry on Medium Heat;
  - iii. Bleaching – Do Not Bleach;
  - iv. Ironing/Pressing – Iron at Low Temperature; and
  - v. Professional Textile Care – Do No Dry Clean;
- (d) Marking label in accordance with D-80-001-055/SF-001 including the following:
  - i. Nomenclature in English and French:  
  
SHIRT, HOT WEATHER, HYBRID, MULTICAM®  
CHEMISE, HYBRIDE, POUR TEMPS CHAUD, MULTICAM®
  - ii. NSN/NNO: as required for each size;
  - iii. SIZE/TAILLE: XS (29-32), S (33-36), M (37-40), L (41-44), XL (45-48) or 2XL (49-52);
  - iv. Fiber content:
    - a. SLEEVES/MANCES: ARAMID/ARAMIDE/PFR VISCOSE; et
    - b. BODY/CORPS: COTTON/COTON/NYLON;
  - v. Care Symbols;
  - vi. Care instructions in English and French as follows:
    - a. Wash new garments before wearing/Laver le vêtement neuf avant de le porter; and
    - b. Launder garments separately in hot water. A second clean water rinse is recommended. Do not use chlorine bleach/Laver les vêtements séparément des autres avec de l'eau chaude. Deux rinçages sont recommandés. Ne pas utiliser d'agents de blanchiment;
  - vii. User Identification;
- (e) Include a bar code in accordance with D-LM-008-002/SF-001, Appendix 3 that identifies the NATO stock number.

### 3.7 Construction

The Hybrid Shirts are to be manufactured in accordance with the following requirements:

- (a) **General** - The Hybrid Shirts must consist of a full-length shirt with full-length arms constructed of the shell material and a torso constructed of the knit cotton/nylon material;
- (b) **Collar** - The Hybrid Shirts must have a high flat (mandarin) collar that rises above the shoulders as follows (see Figure 1):
  - i. Consists of two (2) layers, an outer layer constructed from one (1) ply of shell material and an inner layer constructed from two (2) plies of knit material;
  - ii. The top edge of the inner and outer layers are seamed together, then the outer layer is seamed and serged to the neckline of the shirt;
  - iii. Include a 25.4 cm (10 in) long slide fastener front closure as follows:
    - a. Include a facing constructed from one (1) layer of shell material sandwiched between two (2) layers of knit material positioned on the right, inside opening;
    - b. The raw edges of the facing material is serged together, then stitched to the right tape of the slide fastener;
    - c. The slide fastener and placket are then stitched to the raw edge of the center front opening and collar with the top of the zipper facing folded over to the outside and included in the seam;
  - iv. The raw edge of the under collar is then turned under 16.4 mm (0.25 in) and topstitched at the neckline through all layers with a double row of stitching, and the front closure and collar are topstitched at 6.4 mm (0.25 in) gauge;
  - v. Include a hang loop as follows:
    - a. Constructed from one (1) ply of shell material with a finished width of 6.4 mm (0.25 in);
    - b. Located on the back center of the collar; and
    - c. Raw edges of the loop to be included in the stitching of the collar seam then bartacked in place;
- (c) **Sleeves** - The Hybrid Shirts must have set-in sleeves as follows:
  - i. Consists of three (3) sections as follows:
    - a. Upper section constructed from one (1) ply of shell material; and
    - b. Two-piece lower section (front/back) each constructed from one (1) ply of shell material;
  - ii. The front and back pieces of the lower section seamed together;
  - iii. The lower part of the cuff turned under and seamed to form a 5 cm (2 in) wide cuff, then stitched 1.6 mm (0.0125 in) gauge from the bottom edge;
  - iv. The raw edges of the upper and lower sleeve pieces seamed together, serged, and topstitched at 6.4 mm (0.25 in) gauge, then seamed and serged together at the underarm;
  - v. The raw edge of the shoulder piece seamed, serged and topstitched 6.4 mm (0.25 in) to the upper sleeve piece;
  - vi. Include an adjustable cuff with hook and loop fastener closure as follows (see Figure 2):
    - a. Closure tab with a pointed tip and a hook fastener tape on the inside that is 3.8 cm (1.5 in) wide by 4.4 cm (1.75 in) long; and
    - b. Loop fastener tape on the cuff that is 3.8 cm (1.5 in) wide by 17.8 cm (7 in) long;
- (d) **Semi-Bellows Pocket** - The Hybrid Shirts must have a semi-bellows pocket located on the upper exterior portion of each sleeve as follows:
  - a. Constructed from two (2) plies of shell material as follows:
    - 1. Sides and bottom edge of the pocket serged;



2. Bellows cut seamed to form a box corner;
  3. Front edge of the pocket turned under 2.5 cm (1 in) and stitched at 1.6 mm (0.0625 in) gauge;
  4. Front bottom bellow stitched securely through all layers; and
  5. Remaining sides must be folded in line with the corners and stitched 1.6 mm (0.0625 in) gauge;
- b. Removable pocket patch as follows:
1. Constructed of shell material; and
  2. Include a web pull tab as follows:
    - a. Centered on the bottom edge; and
    - b. Sandwiched between the shell fabric and the hook tapes and reinforced by a bar tack;
  3. Include hook tapes as follows:
    - a. Two (2) pieces of hook fastener tape as follows:
      - i. 10 cm (2 in) width; and
      - ii. 11.4 cm (4.5 in) length;
    - b. Double needle stitched around all edges; and
    - c. Finished with an 'X' enclosed in the box formed by the tapes;
- c. Loop tape attachment for Removable Pocket Patch as follows:
1. Two (2) pieces of loop fastener tape as follows:
    - a. 10 cm (2 in) width; and
    - b. 16.5 cm (6.5 in) length;
  2. Sewn to the pocket front (see Figure 2);
  3. Double needle stitched around all edges; and
  4. Finished with an 'X' enclosed in the box formed by the tapes;
- d. Slide fastener on the front edge as follows:
1. 15 cm (6 in) in length;
  2. Close upward; and
  3. Sides folded in line with the corners and secured as follows:
    - a. Outer covered by the folded edge of the pocket and secured by a double row of stitching;
    - b. Inner attached by a double row of stitching to the sleeve shell;
    - c. Top and bottom of the slide fastener tape included in the above operation; and
    - d. Top and bottom of the slide fastener opening reinforced by backstitching, with a finished opening of 12.7 cm (5 in);
- e. Include a pencil pocket sewn to the inside of the pocket as follows:
1. Constructed from one (1) ply of shell material;
  2. Positioned on the inside of the pocket angled towards the top opening to permit easier insertion and removal of a pencil;;
  3. Top edge turned under and stitched 12.7 cm (0.5 in) gauge; and
  4. Remaining edges are serged and stitched to the sleeve at 1.6 mm (0.0625 in) gauge;
- (e) **Assembly** - As follows:
- i. The front, back, two sides and underarm pieces sewn together using flat lock stitching;
  - ii. The raw edges of the body and underarm knit piece seamed and serged to the upper sleeve and shoulder piece, turned and topstitched 6.4 mm (0.25 in) gauge; and
  - iii. The bottom hem is turned up 2.5 cm (1 in) and cover stitched;
- (f) **Slide Fastener Thongs** - Each slide fastener pull must have a thong as follows:

- i. A length of drawcord threaded through each slide fastener pull, tied with a single knot at the pull tab;
- ii. Ends of the drawcords heat sealed to prevent fraying; and
- iii. Finished functional length: 5.7 cm (2.25 in).

**APPENDIX 1 LAYOUT SKETCHES**

Figure 1: Front and Back Views

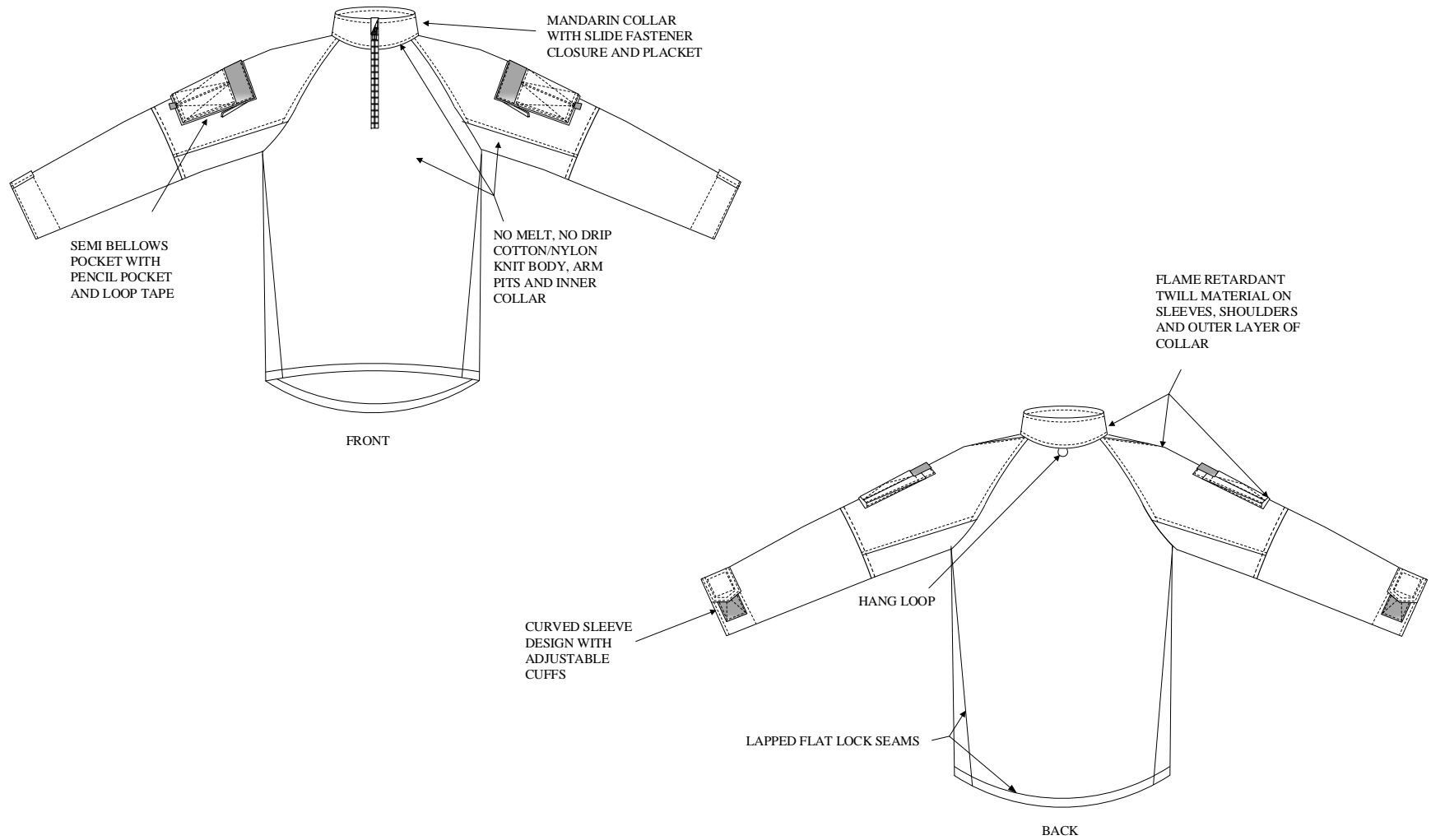


Figure 2: Construction Details - Sleeve Pockets and Cuffs

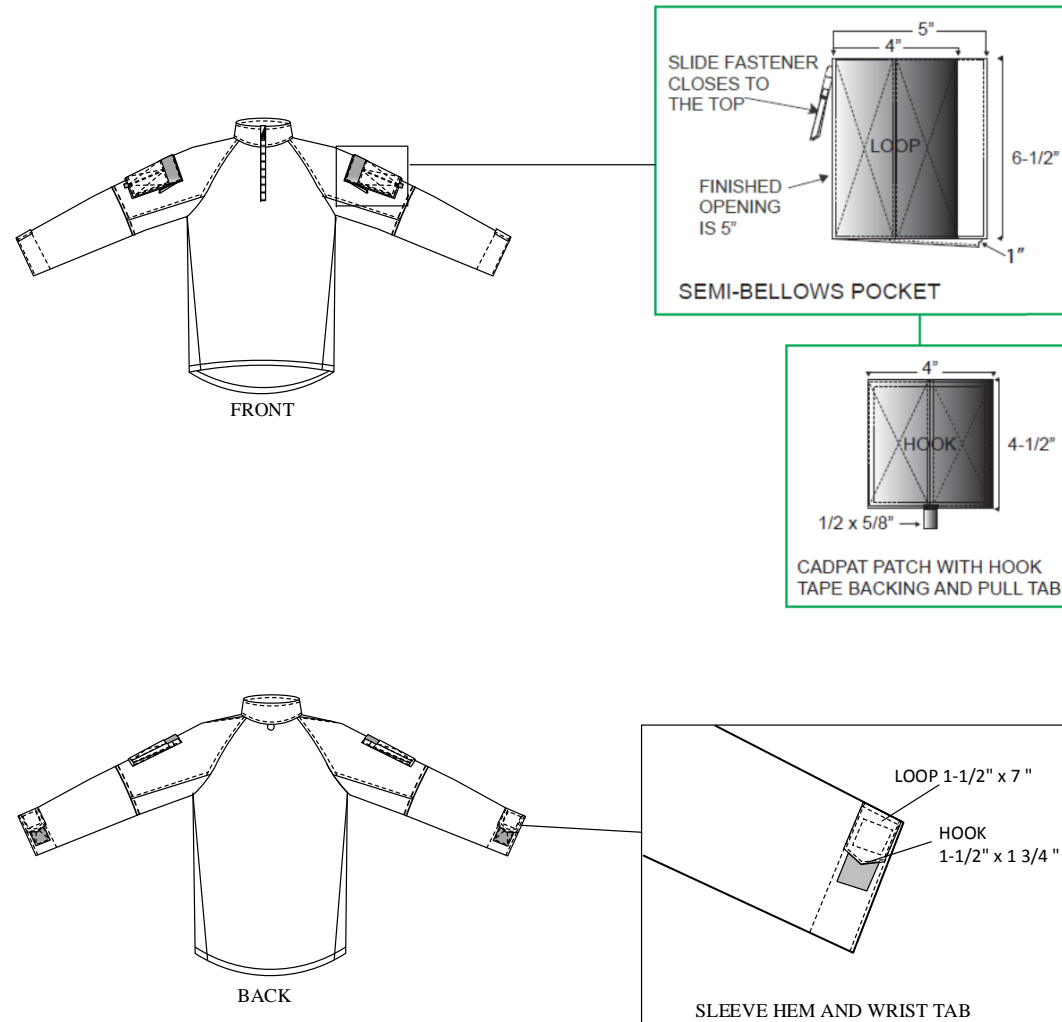
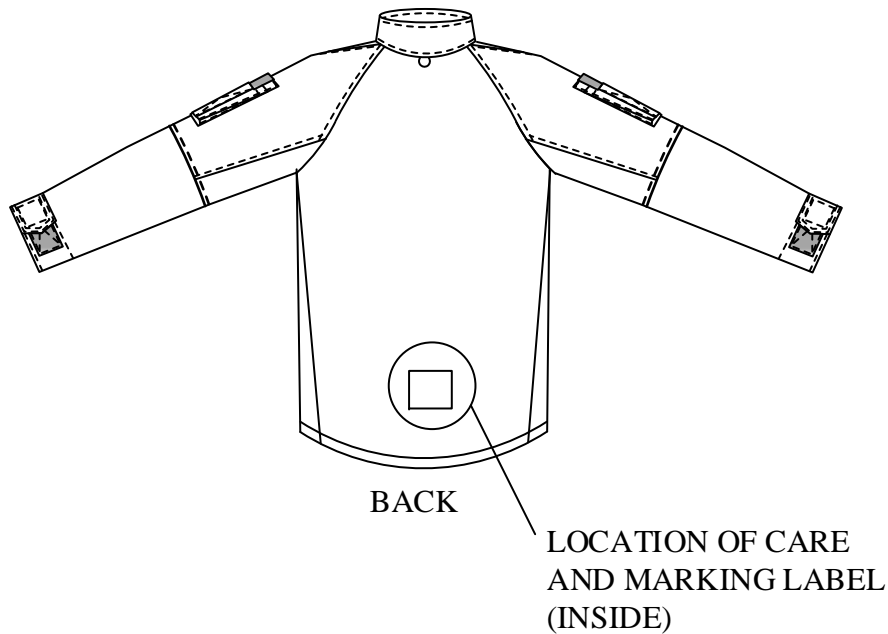


Figure 3: Care and Marking Label



SHIRT, HOT WEATHER, HYBRID, MULTICAM®  
CHEMISE, HYBRIDE, POUR TEMP CHAUD, MULTICAM®  
NSN / NNO: 8415-20-004-XXXX

**SIZE/TAILLE M/M (37-40)**

SLEEVES/MANCHES: ARAMID/ARAMIDE/PFR VISCOSE  
BODY/CORPS: COTTON/COTON/NYLON



50°C



Tumble dry  
on medium. /  
Séchage par  
culbutage  
T/moyenne.



Iron at low  
temperature.  
/ Repasser à  
basse  
temperature.



Do not  
bleach. / Ne  
pas javelaiser.



Do not dry-clean /  
Ne pas nettoyer  
à sec

---

1. WASH NEW GARMENTS BEFORE WEARING.  
2. LAUNDRY GARMENTS SEPARATELY IN HOT WATER. A SECOND  
CLEAR WATER RINSE IS RECOMMENDED. DO NOT USE  
CHLORINE BLEACH.

---

1. LAVER LE VÊTEMENT NEUF AVANT DE LE PORTER.  
2. LAVER LES VÊTEMENTS SEPARÉMENT DES AUTRES AVEC  
DE L'EAU CHAUDE. DEUX RINÇAGES SONT RECOMMANDÉS.  
NE PAS UTILISER D'AGENTS DE BLANCHIMENT.

---

ID. \_\_\_\_\_

**APPENDIX 2 SCALE OF MEASUREMENTS**

BODY MEASUREMENTS		MEASUREMENTS OF FINISHED GARMENT								
SIZE	CHEST	CHEST CIRCUMFERENCE RELAXED	BOTTOM CIRCUMFERENCE RELAXED	FRONT LENGTH FROM TOP OF COLLAR	BACK WIDTH 5" FROM NECK SEAM	BACK LENGTH FROM NECK SEAM	NECK SEAM CIRCUMFERENCE, CLOSED	SLEEVE INSEAM INCLUDING CUFF	SLEEVE CIRCUMFERENCE AT SEAM ABOVE ELBOW	BOTTOM SLEEVE CIRCUMFERENCE
X-SMALL	29-32	35	36	25 1/2	13 1/2	29	17	19 1/2	13 3/4	14
SMALL	33-36	39	40	26 1/2	15	30	17 3/4	20 1/2	14 3/4	14 1/2
MEDIUM	37-40	43	44	27 1/2	16 1/2	31	18 1/2	21 1/2	15 3/4	15
LARGE	41-44	47	48	28 1/2	18	32	19 1/4	22 1/2	16 3/4	15 1/2
X-LARGE	45-48	51	52	29 1/2	19 1/2	33	20	23 1/2	17 3/4	16
XX-LARGE	49-52	55	56	30 1/2	21	34	20 3/4	24 1/2	18 3/4	16 1/2
TOLERANCE PLUS OR MINUS		1	1	1/2	1/2	3/4	3/8	1/2	1/2	1/4