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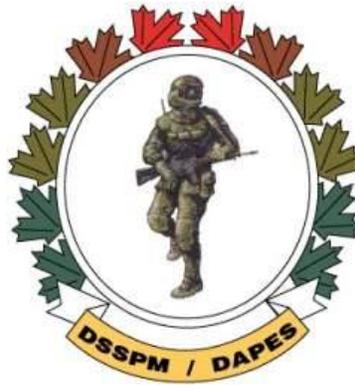
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ANNEX B

DRAFT

DIRECTORATE OF SOLDIER SYSTEMS  
PROGRAM MANAGEMENT



MANUFACTURING DATA  
FOR RUCKSACK ASSEMBLY, CADPAT™, TEMPERATE WOODLAND (TW)  
NSN 8465-20-001-2864



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## 1 SCOPE

### 1.1 SUBJECT

- 1.1.1 This Manufacturing Data defines the requirements for a Canadian Armed Forces Rucksack Assembly, including design, construction materials and manufacturing assembly.

### 1.2 TERMINOLOGY

1.2.1	CADPAT™ TW	Canadian Disruptive Pattern, Temperate Woodland
1.2.2	CAG	Canadian Average Green
1.2.3	CFTPO	Canadian Forces Transportation Packaging Order
1.2.4	DSSPM	Director Soldier Systems Program Management
1.2.5	NATO	North Atlantic Treaty Organization
1.2.6	NSN	NATO Stock Number
1.2.7	P/N	Part Number

## 2 APPLICABLE DOCUMENTS

- 2.1 In the event of a conflict between the text of this document and any references or samples cited herein, the text of this document will take precedence.
- 2.2 In the event of inconsistency within this Manufacturing Data, including inconsistency between languages, the Design Authority, DSSPM 3-5-6, must be contacted for clarification.

### 2.3 NATIONAL DEFENCE PUBLICATIONS

- 2.3.1 The following publications form part of this document to the extent specified herein. Unless specified otherwise, the effective date of the publications will be those in effect on the date of the Contract. Copies of this document and the publications below may be ordered by contacting the Contracting Authority.

#### 2.3.2 Specifications and Standards

2.3.2.1	D-LM-008-002/SF-001	Specification for Marking for Storage and Shipment.
2.3.2.2	D-LM-008-036/SF-000	Department of National Defence Minimum Requirements for Manufacturer's Standard Pack.
2.3.2.3	D-01-400-001/SG-000	Engineering Drawing Practices
2.3.2.4	D-01-400-002/SF-000	Specification for Levels of Engineering Drawings and Associated Lists
2.3.2.5	D-80-001-028/SF-001	Specification for Cord Plaited, Spun Synthetic Fibre.
2.3.2.6	D-80-001-055/SF-001	Specification for Label, Clothing and Equipment
2.3.2.7	D-80-001-091/SF-001	Specification for Cloth, Plain Weave, Nylon, 195 g/m <sup>2</sup> and 230 g/m <sup>2</sup>
2.3.2.8	D-83-001-005/SF-001	Specification for Fasteners, Slide Interlocking
2.3.2.9	CFTPO-Rucksack	Rucksack, Internal Frame



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### 2.3.3 DSSPM Documents

- 2.3.3.1 Rucksack CADPAT™ Specification
- 2.3.3.2 DSSPM 2-2-80-008 Cloth, Coated, Nylon/Neoprene, 220 g/m<sup>2</sup>
- 2.3.3.3 DSSPM 2-2-80-211 Specification for Cloth, Coated, Nylon/Polyurethane, 425 g/m<sup>2</sup>
- 2.3.3.4 Load Carriage Manual
- 2.3.3.5 Rucksack Sizing Jig Kit Instructions
- 2.3.3.6 Pattern Piece List 160719 For Rucksack Assembly 8465-20-001-2864 (Appendix B1 to Annex B)
- 2.3.3.7 Specification 160715 for Moulded EVA Foam Parts for the CTS Rucksack (Appendix B2 to Annex B)
- 2.3.3.8 Specification 160719 for CTS (Clothe the Soldier) Rucksack Labels (Appendix B3 to Annex B)

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| 2.3.4.5  | Drawing CS 152  | Stud, (Eyelet Type), Fastener                         |
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#### 2.3.4.38 OTHER DRAWINGS

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## 2.4 NATIONAL DEFENCE SEALED SAMPLES

2.4.1 Sealed Samples are duplicates of the Master Sealed Sample. The Master Sealed Sample is the Department of National Defence prototype that embodies the characteristics required in production. The following Sealed Samples will be available for examination by Bidders at Public Works and Government Services Canada regional offices:

2.4.1.1	DSSPM 451-03	Rucksack
2.4.1.2	DSSPM 452-03	Accessory Pouch
2.4.1.3	DSSPM 453-03	Shoulder Harness
2.4.1.4	DSSPM 454-03	Hip Belt
2.4.1.5	DSSPM 404-04	Boot, Load Transfer Rod (Attached to DSSPM 451-03)
2.4.1.6	DSSPM 270-02	Warp Knit, CADPAT™ (TW)
2.4.1.7	DSSPM 281-00	Cloth, Nylon, Polyurethane Coated, 425 g/m <sup>2</sup>
2.4.1.8	DSSPM 268-01	Webbing, Nylon, Woven CADPAT™ (TW)
2.4.1.9	DSSPM 259-01	CADPAT™ TW (Disruptive Pattern Temperate Woodland) for pattern, motif, size, colour distribution and colour guidance
2.4.1.10	DSSPM 281-01	Canadian Average Green (CAG)
2.4.1.11	DSSPM 420-06	Rucksack Sizing Jig Kit
2.4.1.12	DSSPM 253-99	Webbing, Nylon, Canadian Average Green, 25 mm



## 2.5 MOULDS, PAPER PATTERNS AND SIZING

### 2.5.1 Moulds

2.5.1.1 The production of the Rucksack Back Pad, Hip Belt and Lumbar Pad will require the use of moulds to shape and cut the laminated foams into the various shapes to meet the technical requirements. Drawings for the moulds will be made available after contract award.

### 2.5.2 Paper Patterns

2.5.2.1 Paper patterns are available from DSSPM 2-5. The size Medium will be provided for bid purposes under style code RUCSCK14. See Appendix B1 of this Manufacturing Data for a list of pattern pieces with their associated thumbnails. Paper Patterns for all sizes of Rucksack, Hip Belt and Shoulder Harness will be made available after contract award.

#### 2.5.2.2 PAPER PATTERN SIZES

2.5.2.3 The following Table identifies Paper Pattern sizes and the NATO Stock Numbers for the component sizes. For a complete list of components and their NATO Stock Numbers see para. 3.1.2.

	Component	Size	NATO Stock Number
2.5.2.3.1	Rucksack	Small	8465-20-001-3171
2.5.2.3.2	Rucksack	Medium	8465-20-001-3172
2.5.2.3.3	Rucksack	Large	8465-20-001-3174
2.5.2.3.4	Rucksack	Extra-Large	8465-20-001-3176
2.5.2.3.5	Hip Belt	Extra-Small	8465-20-003-8679
2.5.2.3.6	Hip Belt	Small	8465-20-001-3182
2.5.2.3.7	Hip Belt	Medium	8465-20-001-3183
2.5.2.3.8	Hip Belt	Large	8465-20-001-3184
2.5.2.3.9	Hip Belt	Extra-Large	8465-20-001-3185
2.5.2.3.10	Hip Belt	Extra Extra-Large	8465-20-003-8678
2.5.2.3.11	Shoulder Harness	Extra-Small	8465-20-001-8675
2.5.2.3.12	Shoulder Harness	Small	8465-20-0013186
2.5.2.3.13	Shoulder Harness	Medium	8465-20-001-3187
2.5.2.3.14	Shoulder Harness	Large	8465-20-001-3189
2.5.2.3.15	Shoulder Harness	Extra-Large	8465-20-001-8676

## 2.6 OTHER PUBLICATIONS

2.6.1 The following publications form part of this document to the extent specified herein. Unless otherwise specified, the effective date of the publications will be those in effect on the date of the Solicitation. The following publications are not supplied by the Department of National Defence.



## 2.6.2 American Association of Textile Chemists and Colorists (AATCC)

2.6.2.1 1 Davis Drive  
PO Box 12215  
Research Triangle Park, North Carolina  
USA 27709-2215  
tel: 919-549-8141  
email: [jonesb@aatcc.org](mailto:jonesb@aatcc.org)  
url: <http://www.aatcc.org>

## 2.6.3 ASTM International

2.6.3.1 100 Bar Harbor Drive  
PO Box C700  
West Conshohocken, Pennsylvania  
USA 19428-2959  
tel: 610-832-9500  
email: [service@astm.org](mailto:service@astm.org)  
url: <http://www.astm.org>

## 2.6.4 Canadian General Standards Board (CGSB)

2.6.4.1 11 Laurier Street  
Place Du Portage, Phase III  
Hull, Québec  
Canada K1A 1G6  
tel: 819-956-0425  
email: [ncr.cgsb-ongc@tpsgc-pwgsc.gc.ca](mailto:ncr.cgsb-ongc@tpsgc-pwgsc.gc.ca)  
url: <http://www.tpsgc-pwgsc.gc.ca/ongc-cgsb/index-eng.html>

2.6.4.2 CAN/CGSB-4.2 Textile Test Methods  
2.6.4.3 CAN/CGSB-54.1 Stitches and Seams – Part 1 and Part 2  
2.6.4.4 CAN/CGSB-86.1 Care Labelling of Textiles  
2.6.4.5 4-GP-85-Ma Nylon Thread (Continuous Multifilament)

## 2.6.5 United States Department of Defense

2.6.5.1 DLA Document Services  
Building 4/D  
700 Robbins Avenue  
Philadelphia, PA  
19111-5094 USA  
tel: 215-697-6396  
url: <http://quicksearch.dla.mil/>

2.6.5.2 A-A-55126B Fastener Tapes, Hook and Loop, Synthetic  
2.6.5.3 FED-STD-191A Textile Test Methods  
2.6.5.4 MIL-F-495 Finish, Chemical, Black, for Copper Alloys  
2.6.5.5 MIL-L-3851 Loops, Slide (for Equipage)

## 2.6.6 Parachute Industry Association (PIA)

2.6.6.1 Parachute Industry Association



Parachute Certification Standards Committee  
 3833 West Oakton Street  
 Skokie, IL 60076  
 Tel: 847-674-9742  
 Fax: 847-674-9743  
 url: <http://www.pia.com>

2.6.6.2 PIA-W-5625 Webbing, Textile, Nylon Tubular

## 2.6.7 ISO (International Organization for Standardization)

2.6.7.1 ISO Central Secretariat  
 1, ch. De la Voie-Creuse  
 CP 56 – CH-1211 Geneva 20  
 Switzerland  
 tel: +41 22 749 01 11  
 email: [central@iso.org](mailto:central@iso.org)  
 url: <http://www.iso.org>

## 3 REQUIREMENTS

### 3.1 SYSTEM

3.1.1 This Manufacturing Data defines the technical requirements for the Rucksack System. The Rucksack System consists of the Rucksack Assembly, CADPAT™, Temperate Woodland; the Load Carriage Manual; and the Rucksack Sizing Jig Kit.

3.1.2 The Rucksack Assembly, CADPAT™ Temperate Woodland consists of the following components and sub-assemblies:

- 3.1.2.1 NSN 8465-20-001-3130 Rucksack, Internal Frame CADPAT (TW) (Main Bag/Internal Frame System), Generic
- 3.1.2.2 NSN 8465-20-001-3171 Rucksack, Internal Frame, CADPAT (TW) Size Small
- 3.1.2.3 NSN 8465-20-001-3172 Rucksack, Internal Frame, CADPAT (TW) Size Medium
- 3.1.2.4 NSN 8465-20-001-3174 Rucksack, Internal Frame, CADPAT (TW) Size Large
- 3.1.2.5 NSN 8465-20-001-3176 Rucksack, Internal Frame, CADPAT (TW) Size Extra-Large
- 3.1.2.6 NSN 8465-20-001-3134 Hip Belt, Generic
- 3.1.2.7 NSN 8465-20-003-8679 Hip Belt, Size Extra-Small
- 3.1.2.8 NSN 8465-20-001-3182 Hip Belt, Size Small
- 3.1.2.9 NSN 8465-20-001-3183 Hip Belt, Size Medium
- 3.1.2.10 NSN 8465-20-001-3184 Hip Belt, Size Large
- 3.1.2.11 NSN 8465-20-001-3185 Hip Belt, Size Extra-Large
- 3.1.2.12 NSN 8465-20-001-8678 Hip Belt, Size Extra Extra-Large
- 3.1.2.13 NSN 8465-20-001-3135 Harness, Shoulder, Contoured, Generic
- 3.1.2.14 NSN 8465-20-001-8675 Harness, Shoulder, Contoured, Size Extra-Small

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- 3.1.2.15 NSN 8465-20-001-3186 Harness, Shoulder, Contoured, Size Small
- 3.1.2.16 NSN 8465-20-001-3187 Harness, Shoulder, Contoured, Size Medium
- 3.1.2.17 NSN 8465-20-001-3189 Harness, Shoulder, Contoured, Size Large
- 3.1.2.18 NSN 8465-20-001-8676 Harness, Shoulder, Contoured, Size Extra-Large
- 3.1.2.19 NSN 8465-20-001-3132 Rod, Load Transfer, Generic
- 3.1.2.20 NSN 8465-20-001-3177 Rod, Load Transfer, Small, Green
- 3.1.2.21 NSN 8465-20-001-3178 Rod, Load Transfer, Medium, White
- 3.1.2.22 NSN 8465-20-001-3179 Rod, Load Transfer, Large, Blue
- 3.1.2.23 NSN 8465-20-001-3180 Rod, Load Transfer, Extra-Large, Red
- 3.1.2.24 NSN 8456-20-001-3136 Stay, Aluminum, Vertical, Generic
- 3.1.2.25 NSN 8465-20-001-3192 Stay, Aluminum, Vertical, Small
- 3.1.2.26 NSN 8465-20-001-3194 Stay, Aluminum, Vertical, Medium
- 3.1.2.27 NSN 8465-20-001-3195 Stay, Aluminum, Vertical, Large
- 3.1.2.28 NSN 8465-20-001-3197 Stay, Aluminum, Vertical, Extra-Large
- 3.1.2.29 NSN 8465-20-001-3140 Strap Assembly, Quick Release, Generic
- 3.1.2.30 NSN 8465-20-001-3199 Strap, Assembly, Quick Release, Small
- 3.1.2.31 NSN 8465-20-001-9640 Strap, Assembly, Quick Release, Medium
- 3.1.2.32 NSN 8465-20-001-3200 Strap, Assembly, Quick Release, Large
- 3.1.2.33 NSN 8465-20-001-3157 Boot, Load Transfer Rod, Left
- 3.1.2.34 NSN 8465-20-001-3158 Boot, Load Transfer Rod, Right
- 3.1.2.35 NSN 8465-20-001-3207 Pouch, Accessory
- 3.1.2.36 NSN 8465-20-001-3155 Strap, Assembly, Sternum
- 3.1.2.37 NSN 8465-20-000-6876 Strap, Assembly, Shoulder Stabilizer
- 3.1.2.38 NSN 8465-20-000-6869 Strap, Assembly, Sleeping System
- 3.1.2.39 NSN 8465-20-001-3142 Stay, Aluminum, Horizontal
- 3.1.2.40 NSN 8470-01-479-3326 Tension Lock, Black
- 3.1.2.41 NSN 8315-01-508-8034 Buckle, Replaceable, Female, 25 mm, Black
- 3.1.2.42 NSN 8315-01-525-0000 Buckle, Side Release, Male, 25 mm, Black
- 3.1.2.43 NSN 8315-01-524-9999 Buckle, Side Release, Female, 25 mm, Black
- 3.1.2.44 NSN 8315-01-502-9669 Buckles, Assembly, Side Release, 50 mm Male and Female
- 3.1.2.45 NSN 8305-21-921-0950 Webbing, Textile, Woven Nylon 50 mm, CADPAT™ (TW)
- 3.1.2.46 NSN 8305-21-921-2272 Webbing, Textile, Woven Nylon, 25 mm, CAG
- 3.1.3 The Load Carriage Manual is a document that describes the Canadian Army Personal Load Carriage suite of equipment. The Rucksack is described in Chapter 4 of the manual and is attached at Annex J.
- 3.1.4 The Rucksack Sizing Jig Kit (NSN 8465-20-003-9027) is a fitting tool that has been designed to assist in the identification of Rucksack size for individual users. The kit consists of a Sizing Jig, a



Curvature Jig, Sizing Jig Kit Instructions and a Sizing Jig Kit Carrying Bag. The Sizing Jig Kit Instruction document is attached at Annex K.

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## 3.2 DESIGN

- 3.2.1 The design of the Rucksack Assembly must be in accordance with the Sealed Samples DSSPM 451-03, 452-03, 453-03 and 454-03 as identified at section 2.4. The Rucksack Assembly has the following design features:
- 3.2.1.1 internal frame system;
  - 3.2.1.2 adjustable suspension system;
  - 3.2.1.3 lower compartment for sleeping system access;
  - 3.2.1.4 access through lower front or the top;
  - 3.2.1.5 lid with two zippered openings providing direct access to radio pocket;
  - 3.2.1.6 48 size combinations;
  - 3.2.1.7 100 litre capacity;
  - 3.2.1.8 detachable hip belt;
  - 3.2.1.9 detachable shoulder straps with Quick Release and Sternum Strap assemblies;
  - 3.2.1.10 moulded foam back pad and lumbar pad support;
  - 3.2.1.11 two vertical and one horizontal aluminum stays for rigidity;
  - 3.2.1.12 two fibreglass load transfer rods;
  - 3.2.1.13 fully accessible and adjustable pocket for Canadian field radios;
  - 3.2.1.14 accessory pouches (2);
  - 3.2.1.15 quick release strap;
  - 3.2.1.16 top and bottom carry handles;
  - 3.2.1.17 2 webbing straps for Sleeping System Assemblies.

## 3.3 MATERIALS

- 3.3.1 All materials that are required to be CADPAT™ Temperate Woodland (TW), must meet the technical performance requirements as identified in Specification for CADPAT™ (Canadian Disruptive Pattern), at Annex C of this Solicitation.
- 3.3.2 All materials that are required to be Canadian Average Green (CAG), must meet the technical performance requirements as identified in Specification for CADPAT™ (Canadian Disruptive Pattern) for Canadian Average Green at Annex C of this Solicitation.
- 3.3.3 **Cloth, Coated, Nylon/Polyurethane, 425 g/m<sup>2</sup>**
- 3.3.3.1 The material used in the construction of the main portions of the Rucksack and the Accessory Pouches must be Cloth, Coated, Nylon/Polyurethane, 425 g/m<sup>2</sup>, Type I, CADPAT™ TW, in accordance with DSSPM 2-2-80-211.
- 3.3.4 **Cloth, Coated, Nylon/Neoprene, 220 g/m<sup>2</sup>**
- 3.3.4.1 The material used in the construction of the Rucksack upper snow cuff, bottom access storm collar, radio access flap and the Accessory Pouch snow cuff, must be Cloth, Coated, Nylon/Neoprene, 220 g/m<sup>2</sup> in accordance with DSSPM 2-2-80-008, CADPAT™ TW.

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- 3.3.4.2 The Cloth, Coated, Nylon/Neoprene must also be treated on the face side with a Durable, Water Repellent (DWR) finish, in accordance with the requirements of the table below.

	Property	Test Method	Requirement	Minimum	Maximum
3.3.4.2.1	Water Resistance Spray Test (face side only)	CAN/CGSB-4.2 No. 26.2			
	After 3 laundering cycles	CAN/CGSB-4.2 58.III.E	100	80	
3.3.4.2.2	Coating Adhesion	ASTM D 751		50 N/25mm	

### 3.3.5 Cloth, Nylon Plain Weave, 195 g/m<sup>2</sup> and 230 g/m<sup>2</sup>

- 3.3.5.1 The material used in the construction of the Rucksack lower compartment snow cuff, radio pocket and the interior divider must be Cloth, Nylon, Plain Weave, Type II, 230 g/m<sup>2</sup> in accordance with D-80-001-091/SF-001, Canadian Average Green.

### 3.3.6 Cloth, Nylon Plain Weave, 117 g/m<sup>2</sup>

- 3.3.6.1 The material used for the lumber pad liner, hip belt centre piece, back pad liner and front panel liner, must be made of nylon cloth in accordance with the requirements of the table below. The material must be Canadian Average Green. The cloth must be polyurethane coated.

	Property	Test Method	Requirement	Minimum	Maximum
3.3.6.1.1	Fibre Content		100% Nylon 6,6		
3.3.6.1.2	Weave		Plain		
3.3.6.1.3	Width (cm)	4.1*	150	148	152
3.3.6.1.4	Mass g/m <sup>2</sup>	5.1*	117	112	122
3.3.6.1.5	Yarn Linear Density (denier)	5.2*	Warp: 200 Weft: 200	Warp: 195 Weft: 195	Warp: 205 Weft: 205
3.3.6.1.6	Woven Fabric Count (yarns/cm)	6*	Warp: 24 Weft: 22	Warp: 22 Weft: 20	Warp: 26 Weft: 24
3.3.6.1.7	Breaking Strength (N/2.54 cm)	9.1*		Warp: 500 Weft: 300	
3.3.6.1.8	Tearing Strength (N)	12.1*		Warp: 50 Weft: 40	
3.3.6.1.9	Water Repellency	26.2*			
	As Received			90	

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	Property	Test Method	Requirement	Minimum	Maximum
	After 3 Laundering Cycles	58* III E		80	
3.3.6.1.10	Dimensional Stability After 3 Laundering Cycles	58* III E 50 degrees C Normal agitation Tumble dry			Warp: -3% Weft: -3%
3.3.6.1.11	Colourfastness To Crocking	22*		Staining Wet – GS 4 Dry – GS 4	
3.3.6.1.12	Colourfastness To Light	18.3*		L 4	

\*CAN/CGSB-4.2 Canadian General Standards Board Textile Test Methods

### 3.3.7 Cloth, Polyester Warp Knit, 240 g/m<sup>2</sup>

3.3.7.1 The material used in the assembly of the back pad, hip belt and lumbar pad must be in accordance with the following table. The knit forms the exterior barrier between the soldier and the Rucksack moulded components. The knit is bonded to the specified foam by flame lamination, prior to the moulding process. The material must conform to the technical performance requirements for CADPAT™ identified at para 3.3.1 of this manufacturing data.

	Property	Test Method	Requirement	Minimum	Maximum
3.3.7.1.1	Fibre Content	14*	100% Polyester		
3.3.7.1.2	Knit Type		Warp Knit		
3.3.7.1.3	Mass g/m <sup>2</sup>	5.1*	240	225	122
3.3.7.1.4	Thickness (mm)	37* (1 kPa pressure)	0.6	0.45	
3.3.7.1.5	Knitted Fabric Count (yarns per cm)	7*	Wales: 10 Courses: 12	Wales: 9 Courses: 11	
3.3.7.1.6	Bursting Strength (N)	11.2*		800	
3.3.7.1.7	Resistance to Abrasion	D 4966** (4000 cycles)	No change in surface appearance		
3.3.7.1.8	Colourfastness To Light (all 4 colours)	18.3*/ISO*** 105-B02 (Method 1)		Standard L 4	

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	Property	Test Method	Requirement	Minimum	Maximum
3.3.7.1.9	Colourfastness To Crocking (all 4 colours)	116****	Dry Staining: GS 5 Wet Staining: GS 5		Dry Staining: GS 4 Wet Staining: GS 3
3.3.7.1.10	Colourfastness To Perspiration (all 4 colours)	23*	Colour Change: GS 5 Staining: GS 5		Colour Change: GS 4 Staining: GS 3
3.3.7.1.11	Colourfastness To Laundering (all 4 colours)	19.1* Test No. 2	Colour Change: GS 5 Staining: GS 5		Colour Change: GS 4 Staining: GS 3
3.3.7.1.12	Dimensional Stability in Laundering (After 3 Cycles)	58* Procedure III E			Wales: ± 4 % Weft: ± 2 %
3.3.7.1.13	Resistance To Micro-organisms (% coverage of growth)	28.2*			10%

\*CAN/CGSB-4.2 (Canadian General Standards Board Textile Test Methods)

\*\*ASTM

\*\*\*ISO

\*\*\*\*AATCC (American Association of Textile Chemists and Colorists)

### 3.3.8 Mesh, Leno

3.3.8.1 The material used in the construction of the Rucksack lid pocket must be a Nylon, Leno Weave, with a resin-coating and anti-microbial finish. The colour must be black. The material must be in accordance with the following table.

3.3.8.2 Resistance to Micro-organisms Test - Modified AATCC 30 Agar Immersion Assay. The following modification is required for the Resistance to Micro-organisms Test identified at para 3.3.8.2.6 in the Table below. Die cut disc samples of the mesh are to be totally immersed into (1/2 half nutrient) molten Potato Dextrose agar (1/2 recipe strength), which contained *Aspergillus Niger* (AATCC 6275) mold spores (1-5x10<sup>5</sup> CFU/ml). Excess liquid agar shall be allowed to drain from the sample prior to placing it into a sterile Petri dish. Mesh samples are to be incubated for 96 hours and the woven fabric surface is then inspected via stereomicroscopy for mold growth.

	Property	Test Method	Requirement	Minimum	Maximum
3.3.8.2.1	Weave Type		Leno Weave		
3.3.8.2.2	Fabric Count (yarns/inch**)	6*	Warp: 30 Weft: 14	Warp: 28 Weft: 12	Warp: 32 Weft: 16
3.3.8.2.3	Mass g/m <sup>2</sup>	5.1*	250	237.5	262.5

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	Property	Test Method	Requirement	Minimum	Maximum
3.3.8.2.4	Tearing Strength (N)	12.1*		Warp: 100 Weft: 125	
3.3.8.2.5	Breaking Strength (N/50 mm)	9.1* (conditioned test)		Warp: 2000 Weft: 2500	
3.3.8.2.6	Resistance To Micro-organisms	28.2***			Maximum Growth and Staining 20%

\*CAN/CGSB-4.2 (Canadian General Standards Board Textile Test Methods)

\*\*Fabric count in the Warp direction is 15 yarns/inch ( $\pm 1$ ) when the two interlaced yarns are counted as one yarn.

\*\*\*Modified AATCC 30 Agar Immersion Assay

### 3.3.9 Cloth, Neoprene Coated

3.3.9.1 The material used in the construction of the Load Transfer Rod Sleeves and Boots must be high tenacity polyester base fabric coated with Hypalon® or equivalent on one side and textured Neoprene on the other side. The colour must be black. The material must be in accordance with the following table.

	Property	Test Method	Requirement	Minimum	Maximum
3.3.9.1.1	Mass g/m <sup>2</sup>	5041*		936	1140
3.3.9.1.2	Thickness	No.37**	0.85mm		
3.3.9.1.3	Tearing Strength	D751/A***		Warp: 8 daN Weft: 8 daN	
3.3.9.1.4	Breaking Strength	D751/B***		Warp: 330 daN/5cm Weft: 300 daN/5cm	
3.3.9.1.5	Adhesion	D751***		Hypalon: 2.0 daN/cm Neoprene: 2.5 daN/cm	

\*FED-STD-191A (Textile Test Methods)

\*\*CAN/CGSB-4.2 (Canadian General Standards Board Textile Test Methods)

\*\*\*ASTM

### 3.3.10 Cloth, Polyurethane Laminated

3.3.10.1 The material used in the construction of the shoulder straps must be polyurethane laminated cloth. The colour must be Canadian Average Green in accordance with para 3.3.2 of this manufacturing data, with the exception of infra-red reflectance, which is not a mandatory requirement. Schoëller Textil AG style number 61460 has been known to meet this requirement. The material must be in accordance with the following table.

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	Property	Test Method	Requirement	Minimum	Maximum
3.3.10.1.1	Fibre Content	14*	10% Spandex 15% Polyurethane 75% Nylon	8% Spandex 10% Polyurethane 70% Nylon	12% Spandex 20% Polyurethane 80% Nylon
3.3.10.1.2	Weave Type		Plain weave		
3.3.10.1.3	Mass g/m <sup>2</sup>	5.1*	275	260	290
3.3.10.1.4	Woven Fabric Count (yarns/cm)	6*	Warp: 16 Weft: 37	Warp: 14 Weft: 35	Warp: 18 Weft: 39
	Breaking Strength (N)	9.2*		Warp: 600 Weft: 600	
3.3.10.1.5	Tearing Strength (N)	12.1*		Warp: 35 Weft: 35	
3.3.10.1.6	% Stretch	D 2594** (10 lbf)		Warp: 15 % Weft: 15 %	
3.3.10.1.7	Resistance to Abrasion	D 4966** (4000 cycles)	No change in surface appearance		
3.3.10.1.8	Water Resistance: Spray Test	26.2*/ISO*** 4920		90	
3.3.10.1.9	Water Resistance	26.5*		140 kPa	
3.3.10.1.10	Colourfastness To Light	18.3*/ISO*** 105-B02 (Method 1)		Standard L4	
3.3.10.1.11	Colourfastness To Crocking	22*	Dry Staining: GS 5 Wet Staining: G S5		Dry Staining: GS 4 Wet Staining: G S3
3.3.10.1.12	Colourfastness To Perspiration	23*	Colour Change: GS 5 Staining: GS 5		Colour Change: GS 4 Staining: GS 3
3.3.10.1.13	Colourfastness To Laundering	19.1* Test No. 2	Colour Change: GS 5 Staining: GS 5		Colour Change: GS 4 Staining: GS 3
3.3.10.1.14	Dimensional Stability in Laundering (After 3 Cycles)	58* Procedure III E			Warp: ± 4 % Weft: ± 2 %



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	Property	Test Method	Requirement	Minimum	Maximum
3.3.10.1.15	Resistance To Micro-organisms (% coverage of growth)		28.2*		10%

\*CAN/CGSB-4.2 Canadian General Standards Board Textile Test Methods

\*\*ASTM

\*\*\*ISO

### 3.3.11 Elastic, 25 mm

3.3.11.1 The elastic used in the assembly of the retaining loops to secure loose cargo strap ends and the securing element on the Load Transfer Rod Boot must be in accordance with MIL-T-17964. The elastic must be Nylon and the colour must be Canadian Average Green. The elastic must be sewn using lockstitch type 301 with 10 to 12 stitches per inch (25.4 mm) and must be securely backstitched. The seam ends must be finished using stitch type 503 or 504.

### 3.3.12 Webbing, Nylon, 25 mm

3.3.12.1 The webbing used in the construction of the Compression Straps, Sleeping System Assembly Straps, Daisy Chain, Sternum Strap, Load Adjusting Straps and other locations on the Rucksack Assembly, must be 25 mm wide, textile, woven nylon, in accordance with MIL-W-17337, Class 1 or 2. The colour must be Canadian Average Green.

### 3.3.13 Webbing, Nylon, 50 mm

3.3.13.1 The webbing used in the construction of the Rucksack Hip Belts and horizontal Aluminum Stay sleeve must be 50mm wide, textile, woven nylon in accordance with MIL-W-17337, Class 1 or 2. The colour must be Canadian Average Green.

### 3.3.14 Webbing, Heavy, Nylon, 50 mm

3.3.14.1 The webbing used in the construction of the shoulder straps attachment assemblies must be webbing, textile, woven nylon, 50 mm wide. The weave must be double plain with binder yards 1 up/1 down and 4 ground ends between binders. The yarn must be high tenacity 100% nylon, continuous filament, 840 denier. The colour must be Canadian Average Green in accordance with para 3.3.2 of this manufacturing data, with the exception of infra-red reflectance, which is not required. The webbing properties must be in accordance with the table below.

	Property	Test Method	Requirement	Minimum	Maximum
3.3.14.1.1	Warp:				
	Total number of ends		135	133	137
	Ground		94	92	96
	Binder		20	19	21
	Stuffer		21	19	23
3.3.14.1.2	Weft per cm		13.6	13.0	14.0
3.3.14.1.3	Width (mm)	4.1*	50.57	50.50	50.58

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	Property	Test Method	Requirement	Minimum	Maximum
3.3.14.1.4	Mass g/linear metre	5.1*	65	64.91	65.30
3.3.14.1.5	Thickness (mm)	37* (1 kPa Pressure)	1.96	1.90	1.988
3.3.14.1.6	Tensile Strength	4108**		5000 lb	
3.3.14.1.7	Stiffness (Bending moment in lbs)	5202**	Warp: Right Side: 0.495 Left Side: 0.325 Weft: 0.22	Warp: Right Side: 0.475 Left Side: 0.265 Weft: 0.2	Warp: Right Side: 0.777 Left Side: 0.503 Weft: 0.32
3.3.14.1.8	Colourfastness to Laundering	19.1*	Grey Scale 3	Grey Scale 3	

\*CAN/CGSB 4.2 Textile Test Methods

\*\*FED-STD-191A Textile Test Methods

**3.3.15 Webbing, Nylon, CADPAT™ (TW), 50 mm, 38 mm**

3.3.15.1 The webbing used in the construction of the daisy chain backing (50 mm), the vertical Aluminum Stay sleeves (50mm), and the top lid hinge (38 mm), must be textile, woven nylon, in accordance with MIL-W-17337, Class 1 or 2. The CADPAT™ (TW) webbing must be ultrasonically cut and sealed or heat cut and sealed when cut from wide weave fabric. The selvedge created during the cutting process must be resistant to buckle abrasion. The selvedge must also remain supple and free of any cracking and fraying within the temperature range of +40 °C to -35 °C. The webbing must be printed CADPAT™ (TW) on one side and Canadian Average Green or best push through on the reverse side.

**3.3.16 Webbing, Nylon, Tubular, 25 mm**

3.3.16.1 The webbing used in the construction of the Rucksack carry handles must be textile, woven nylon, 25 mm wide in accordance with PIA-W-5625. The finished length of the handles must be 30.5 cm. The colour of the tubular nylon webbing must be Canadian Average Green in accordance with para 3.3.2 of this manufacturing data, with the exception of infra-red reflectance, which is not a mandatory requirement.

**3.3.17 Tape, Binding, 25 mm**

3.3.17.1 The binding tape used for sealing and edging the Rucksack seams must be in accordance with MIL-PRF-5038, Textile and Webbing, Nylon, Type III, Class 1, 1A or 2. The width of the binding tape must be 25 mm. The colour must be Canadian Average Green.

**3.3.18 Tape Fastener**

3.3.18.1 The Hook and Loop Fastener Tape used in the construction of the Rucksack must be nylon in accordance with Commercial Item Description – Fastener Tapes, Hook and Loop, Synthetic A-A-55126B. The Hook must be Type II, Class 1. The Loop must be Class 1. The colour must be Canadian Average Green in accordance with para 3.3.2 of this manufacturing data, with the exception of infra-red reflectance, which is not a mandatory requirement.



### 3.3.19 Thread

3.3.19.1 The thread used in the construction of the Rucksack and its components must be 100 % bonded nylon, lubricated, 3-ply, 720 denier or 70 tex in accordance with CAN/CGSB 4-GP-85-Ma. The colour must be a good visual match to Canadian Average Green in accordance with para 3.3.2, with exception to infra-red reflectance, which is not required.

### 3.3.20 Fasteners, Slide

3.3.20.1 The slide fasteners used in the construction of the Rucksack must be in accordance with D-83-001-005/SF-001 Specification for Fasteners, Slide Interlocking. Slider pulls are not required and are to be replaced by drawcord and zipper pull assemblies as identified in this manufacturing data. The length of the slide fasteners should be 45.7 cm. The slide fastener tape must be medium width, polyester twill weave. The tape colour must be a good visual match to Canadian Average Green in accordance with para 3.3.2 of this manufacturing data, with the exception of infra-red reflectance, which is not required. The chain width should be 7.2 mm.

#### 3.3.20.2 RADIO POUCH ACCESS OPENING

3.3.20.2.1 The radio pouch access opening is located at the back of the Rucksack lid and allows access to the main bag and radio pouch. It must have a Class 4, continuous chain, monofilament interlocking members, with 4 non-locking sliders, arranged in a "throat-throat, mouth-mouth, throat-throat" configuration.

#### 3.3.20.3 LID POCKET OPENINGS

3.3.20.3.1 The 2 lid pocket openings must have 1 slide fastener each, located on the underside and the top side of the Rucksack lid. They must each have a Class 4, Type 11, continuous chain, monofilament interlocking members, non-separating, 2-way centre opening slide fastener with 2 non-locking sliders, arranged in a 'throat-throat' configuration.

### 3.3.21 Drawcord

3.3.21.1 The drawcord used in the construction of the snow cuffs, storm collar, interior divider and slide fastener pulls of the Rucksack, and the snow cuff of the Accessory Pouch, must be plaited cord, spun polyester fibre, Type I, in accordance with Specification D-80-001-028/SF-001 Cord Plaited, Spun Synthetic Fibre Types I and II at Annex F. The colour must be a good visual match to Canadian Average Green in accordance with para 3.3.2 of this manufacturing data, with the exception of infra-red reflectance, which is not required.

### 3.3.22 Polyethylene, High Density

3.3.22.1 High Density Polyethylene (HDPE) Sheet,  $1.397 \pm 0.05$  mm thick must be used in the assembly of the Hip Belt and the Quick Doffing Strap. The stiffener shape and dimensions must be as per the paper patterns and sealed sample. The colour must be black. The polyethylene physical properties must be in accordance with the table below.

	Property	Test Method	Nominal Value
3.3.22.1.1	Tensile Yield Strength	D638*	34 MPa
3.3.22.1.2	Ultimate Elongation	D638*	> 800 %
3.3.22.1.3	Flexural Modulus	D790*	1240 MPa



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	Property	Test Method	Nominal Value
3.3.22.1.4	Hardness	D2240*	69 Shore D
3.3.22.1.5	Brittleness Temperature	D746*	<-76 °C
3.3.22.1.6	Softening Point (Vicat)	D1525*	125 °C
3.3.22.1.7	Density	D1505*	0.952 g/cm <sup>3</sup>

\*ASTM

### 3.3.23 Grommets and Washers - Spur

3.3.23.1 The grommet assemblies used in the Rucksack and Accessory Pouch snow cuffs and in the Rucksack drainage holes must be industrial Spur Type, made of brass, dull black oxide finished, Type and Size CS-110-2-BO in accordance with drawing CS-110 with a dull black chemical finish in accordance with MIL-F-495. All grommet assemblies must be reinforced with a piece of vinyl textile or main body shell fabric (Cloth, Coated, Nylon/Polyurethane, 425 g/m<sup>2</sup>). The reinforcement pieces must be at least 35 mm x 35 mm, sewn inside the drawcord channel and bag, centred on the grommet position.

### 3.3.24 Snap Fastener

3.3.24.1 The snap fastener assembly must be made of brass with a dull black chemical finish in accordance with MIL-F-495. It must include socket, stud, eyelet and button. The size and composition of the snap fastener must be in accordance with Drawings, CS149-1, CS150-1, CS151-1, and CS153-1.

### 3.3.25 Stays, Aluminum

3.3.25.1 The aluminium stays, horizontal and vertical, used in the assembly of the Rucksack must be made of standard aluminium alloy 6061-T6511 conforming to ASTM B221. The stays must be 25 mm wide and 3 mm thick. The rough ends of the aluminum stays must be shielded/covered with stave caps. The following stave cap colour coding must be applied to the corresponding size/type of stay as follows:

#### 3.3.25.2 STAY, VERTICAL

3.3.25.2.1 The vertical stays must be in accordance with Drawing 0375637. The sizes of each vertical stay must be identified by stave cap colour as follows:

3.3.25.2.1.1 **Small:** Green

3.3.25.2.1.2 **Medium:** White

3.3.25.2.1.3 **Large:** Blue

3.3.25.2.1.4 **Extra-Large:** Red

#### 3.3.25.3 STAY, HORIZONTAL

3.3.25.3.1 The horizontal stay must be in accordance with Drawing 0375636, and must be identified by stave cap colour as follows:

3.3.25.3.1.1 **Neck Stay:** Black



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### 3.3.25.4 CAP, STAVE

- 3.3.25.4.1 The ends of the aluminium stays must be shielded with 25 mm Stave Caps to prevent them from damaging the rucksack stay sleeves. The stave caps must have a friction fit, necessary to overcome any drag forces created during the withdrawal of the aluminium stays. The Stave Cap shall be in colour coded black, Red, White, Blue and Green according to sizing specifications and be moulded out of elastomeric material. National Molding LLC (of the United States of America) P/N 5569 is known to have met this specification. See Drawings 0375636 and 0375637 for reference.

### 3.3.26 Buckles, Side-Release

- 3.3.26.1 The buckle design must prevent ingress of dirt, soil, water or other foreign particles when being dragged on the ground in the closed condition. The design must incorporate features for rapid drainage and extrusion/evacuation of foreign matter. The buckles must not rattle or make noise when the Rucksack is worn, carried or transported under all conditions. All the exposed edges of the buckles must have smooth surfaces for the prevention of snagging, hooking or interfering in any way with the operation of the Rucksack. The buckles must be easily operated, engaged and disengaged with one hand operation when wearing gloves equivalent in texture and thickness to the soldier's Temperate Combat Gloves (0.9 mm leather). The form fit and function of the buckles must be the same as per the Rucksack Sealed Sample, ensuring compatibility throughout the Rucksack assembly. The Side Release Buckle must be a two-piece assembly: male and female. The colour must be black. The properties of the buckle resin must be in accordance with DuPont™ Delrin® 500AL NC010 Acetal Resin. Where compatible, but alternate SR buckles are requested for submission, by the bidder, other than the known source, the parts must have equivalent or better properties and test results.

#### 3.3.26.2 BUCKLES, SIDE RELEASE, 50 mm

- 3.3.26.2.1 The male Side Release (SR) buckle, 50 mm must be an adjustable type (centre) with two-side release actuating legs. The actuating legs must be secured to the centre stabilizing and crush-resistant bar by retaining straps to prevent accidental breakage or outward bending. The National Molding Anti-Break Male Stealth® Buckle, P/N 7007 has been known to meet this requirement.
- 3.3.26.2.2 The female SR buckle, 50 mm must be a conventional, adjustable type side-release. The National Molding Stealth® Warrior Buckle, P/N 6406 has been known to meet this requirement.

#### 3.3.26.3 BUCKLES, SIDE RELEASE, 25 mm

- 3.3.26.3.1 The male Side Release (SR) buckle, 25 mm must be an adjustable type (centre) with two-side release actuating legs. The actuating legs must be secured to the centre stabilizing and crush-resistant bar by retaining straps to prevent accidental breakage or outward bending. The National Molding Anti-Break Male Stealth® Buckle, P/N 7005 has been known to meet this requirement.
- 3.3.26.3.2 The female SR buckle, 25 mm must be a conventional type side-release, single bar, non-adjust for sewn-on applications. National Molding P/N 6359 has been known to meet this requirement.

#### 3.3.26.4 FIELD REPLACEABLE SR BUCKLE, FEMALE, 25 mm

- 3.3.26.4.1 The field replaceable female SR 25 mm buckle must be compatible with the Anti-Break Male Stealth® Buckle described at para 3.3.26.3.1. The National Molding Quick Attach Stealth® Buckle, P/N 6411 has been known to meet this requirement.

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**3.3.27 Other Acetal Parts**

- 3.3.27.1 The resin properties of all Acetal parts must be in accordance with DuPont™ Delrin® 500AL NC010 Acetal Resin. The colour must be black. Where alternate parts are requested for submission, by the bidder, other than the known source, the part must have equivalent or better properties and test results.
- 3.3.27.2 **FIELD REPLACEABLE TENSION BUCKLE, 25 mm**
- 3.3.27.2.1 The field replaceable tension buckle must be able to perform as a temporary replacement for all other 25 mm tension buckles on the Rucksack assembly. The National Molding, Quick Attach Tensionlock®, 25 mm, P/N 8664 has been known to meet this requirement.
- 3.3.27.3 **ZIPPER PULL**
- 3.3.27.3.1 Zipper pulls, complete with cording, must be added to the sliders of the slide fasteners. The finished length of the zipper pull assembly, with cording and pull assembled and attached to slider, must be a minimum of 7 cm. The National Molding Groovy Zipper Pull, P/N 6967 has been known to meet this requirement.
- 3.3.27.4 **CORD LOCK**
- 3.3.27.4.1 Cord locks must be used to secure the drawcords of the Rucksack top snow cuff, divider cuff, bottom snow cuff, storm collar and accessory pouch snow cuffs. The cord locks must have a pop-lock with stainless steel spring. The National Molding Pop-Lock Cord Lock, P/N 6523 has been known to meet this requirement.
- 3.3.27.5 **HEAVY DUTY SLIDE BUCKLE, 25 mm**
- 3.3.27.5.1 The heavy duty slide buckle, 25 mm is used in the assembly of the shoulder straps to secure the stabilizer straps to the shoulder straps. The National Molding Heavy Duty Sliplok® Buckle, 25 mm, P/N 4783, or equivalent, is required.
- 3.3.27.6 **COMMON LOOP 25 MM – SQUARE SHAPE**
- 3.3.27.6.1 The common loop is used in the assembly of the Hip Belt. The National Molding Common Loop, 25 mm, P/N 4272, or equivalent, is required.
- 3.3.27.7 **LONG TAB, TENSION BUCKLE**
- 3.3.27.7.1 The long tab tension buckle is used in the assembly of the shoulder stabilizer straps. The National Molding Long Tab Mesh Tek™ Tensionlock®, 25 mm, P/N 8622, or equivalent, is required.
- 3.3.27.8 **CURVED TENSION BUCKLE, 25 mm**
- 3.3.27.8.1 The curved tension buckle, 25 mm is used in the assembly of the adjustable neck strap, the lid adjustment straps and the radio pocket securing straps. The National Molding Curved Duckbill® Tensionlock®, 25mm, P/N 7004, or equivalent, is required.
- 3.3.27.9 **SINGLE BAR TENSION BUCKLE, 25 mm**
- 3.3.27.9.1 The single bar tension buckle, 25 mm is used in the assemblies of the lower shoulder strap attachment panel and the transfer rod boot. The National Molding Single Bar Power Pro® Tensionlock®, 25 mm, P/N 8663, or equivalent, is required.



### 3.3.27.10 D-RING, 25 mm

3.3.27.10.1 The D-Ring is used in the assembly of the shoulder stabilizer straps. The National Molding D-Ring, 25 mm, P/N 4274, or equivalent, is required.

### 3.3.28 Tri-glide, Steel 50 mm

3.3.28.1 The tri-glide buckle is used to secure the shoulder straps to the Rucksack bag. The tri-glide buckles must be steel and finished black, Class 3, Style 2, Size 2, Construction A, in accordance with MIL-L-3851. P/N GVT472-2 from Albest Metal Stamping Corp. Brooklyn, NY, or equivalent, is required.

### 3.3.29 Quick Release Buckle System

3.3.29.1 The quick release buckle system forms part of the quick doffing strap system, assembled on the shoulder straps. The quick doffing system is used on the Rucksack to allow the wearer to quickly doff the Rucksack in case of emergency. The quick doffing system is comprised of 4 buckle components assembled as 2 interlocking mechanisms, and a Quick Release Pull Knob. The colour of the 4 components must be a good visual match to Canadian Average Green. The colour of the Quick Release Pull Knob must be black. All components are listed as follows:

3.3.29.1.1 Buckle, Doffing, Male, 25 mm, Drawing Number 0375639 (P/N RTI-1422)

3.3.29.1.2 Buckle, Doffing, Female, 25 mm, Drawing Number 0375640 (P/N RTI-1423)

3.3.29.1.3 Buckle, Rectangular, 25 mm, Drawing 1431NF Ring, Rectangular, D-D (P/N RTI-1431NF)

3.3.29.1.4 Hasp, Quick Release, 25 mm, Drawing Number 0079016 (P/N RTI-1493)

3.3.29.1.5 Knob, Pull, Quick Release, Drawing Number 0079020. The material for the pull knob must be ultraviolet light (UV) stable Thermoplastic Vulcanizate in accordance with Santoprene™ 101-80, UV Stable, colour black, or equivalent. L.D. Tool and Die, 139 Iber Road, Ottawa, ON has been known to meet this requirement.

### 3.3.30 Rod Assembly, Load Transfer

#### 3.3.30.1 ROD, FIBREGLASS- REINFORCED, POLYOLEFIN-MODIFIED URETHANE, ROUND STOCK

3.3.30.1.1 The Rucksack has two load transfer rods incorporated into its design and construction. The table below pertains to the specifications related to pultruded composite round rods. The rods are made of fibreglass-reinforced polyolefin-modified urethane. The dimensions and the colours of the rods must be in accordance with Drawing 0375638. In the event that the pantone colour specified in the Drawing cannot be achieved, the Technical Authority reserves the right to determine and accept a close visual match. Rod samples must be submitted for evaluation and acceptance. Production and inspection of the rods must be performed by a facility certified to ISO 9001:2000 Quality Assurance processes or equivalent. Inspection of the rods must include mechanical resistance evaluation along with % cure evaluation determined by Differential Scanning Calorimetry (DSC) tests. Rods must be supplied stretch wrapped in 20-rod bundles for ease of handling.

Property	Test Method	Units	Requirement	Tolerance ±
3.3.30.1.1.1 Flexural Strength	D790* (16:1 span)	MPa (10 <sup>3</sup> psi)	980 (142.1) Note: with no catastrophic failure at yield	60 (8.7)

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	Property	Test Method	Units	Requirement	Tolerance ±
3.3.30.1.1.2	Flexural Displacement	D790* (16:1 span)	mm (inch)	11.7 (0.46)	minimum
3.3.30.1.1.3	Short Beam Shear	D4475* (6:1 span)	MPa (10 <sup>3</sup> psi)	40 (5.8) Note: with no catastrophic failure at yield	minimum
3.3.30.1.1.4	Base Matrix Izod Impact Strength	D4812*	J/m (ft-lbs/in)	100 (1.85)	minimum
3.3.30.1.1.5	Barcol Hardness of Rod	D2583*		50	minimum
3.3.30.1.1.6	Degree of Cure of Polymer Matrix	Via DSC E2160*	%	98	minimum
3.3.30.1.1.7	Reinforcement (unidirectional fibre content)	D3171* (matrix digestion) or E1131 (analysis by thermogravimetry)	%	60	5
3.3.30.1.1.8	Weight		g/m	90	2

\*ASTM

## 3.3.30.2 CAP, PLASTIC

3.3.30.2.1 The lower end of the Load Transfer Rod must be covered with an End Cap. The end cap must be a soft flexible vinyl, rounded end, protective cap. It must be a tight fit to the rod so it will remain on when removing the rod from the Load Transfer Boot. The cap colour must be black. The cap properties must be in accordance with the table below. Stockcap P/N 078829 has been known to meet this requirement.

	Property	Test Method	Specification	Tolerance
3.3.30.2.1.1	Hardness	D2240*	75	± 5
3.3.30.2.1.2	Tensile Stress at Break	D412*	2000 psi	± 200
3.3.30.2.1.3	% Elongation	D412*	350 %	± 50 %
3.3.30.2.1.4	Modulus at 100%	D412*	950 psi	± 100 psi

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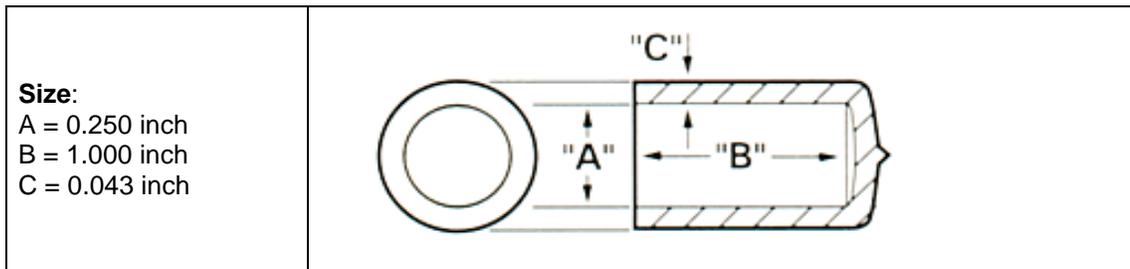
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	Property	Test Method	Specification	Tolerance
3.3.30.2.1.5	Tear Strength	D624*	280 ppi	± 28 ppi
3.3.30.2.1.6	Volume Resistivity at 70 °C	D257*	5.25 x 10 <sup>9</sup> ohm-cm	
3.3.30.2.1.7	Flammability Oxygen Index	D2863-91*	23 %	
3.3.30.2.1.8	Ozone Resistance	D1149*	No Cracking/Crazing	
3.3.30.2.1.9	Low Temperature Impact	D746*	-20 °F	

\*ASTM

- 3.3.30.2.2 On round end caps, the inside length tolerance ± 1.57 mm is measured to the centre of the closed end.
- 3.3.30.2.3 The wall thickness "C" is measured 6.35 mm from the open end, increasing slightly toward the closed end. Wall tolerance is ± 0.25mm.
- 3.3.30.2.4 The materials of the end cap are 75 durometer PVC.
- 3.3.30.2.5 End cap dimensions must be in accordance with the table below.

3.3.30.2.6



**3.3.31 Foam**

**3.3.31.1 FOAM, POLYMERIC, CLOSED CELL, CHEMICALLY EXPANDED (PE/EVA 50 kg/m<sup>3</sup>)**

3.3.31.1.1 The closed cell polymeric foam is used in the construction of the moulded parts of the backpad, lumber pad, and hip belt. The foam thicknesses must be selected to ensure the performance of each component is met. The foam must be Type II in accordance with Specification 160715 for Foam at Appendix B2 of this Manufacturing Data.

**3.3.31.2 FOAM, POLYMERIC, CLOSED CELL, PHYSICALLY EXPANDED (PE/EVA 50 kg/m<sup>3</sup>)**

3.3.31.2.1 The closed cell polymeric foam is used in the construction of the shoulder straps and lumbar pad insert. The polymeric foam thickness must be 9.58mm ± 0.05mm for the shoulder straps, and 12.7 mm ± 0.05 mm for the lumbar pad. The foam must be Type I in accordance with Specification 160715 for Foam at Appendix B2 of this Manufacturing Data.

**3.3.31.3 FOAM, SPONGE CORD, 12.7 mm**

3.3.31.3.1 The foam, sponge cord is used as the inner core of the Rucksack handle. The sponge cord is cut in lengths of 10 ± 0.5 cm. The cut sponge cord is then inserted and centred inside the tubular webbing to form the carry handles. The foam is held in its central position by

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pinching the tubular webbing at the foam ends with stitching. The sponge foam properties must be in accordance with the table below.

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Property	Test Method	Unit of Measure	Requirement	Minimum	Maximum
<b>Sponge Rod – Natural Rubber</b>					
3.3.31.3.2					
3.3.31.3.3	Diameter	3575-91* Para 8	mm	12.7 mm	12.2 13.2
3.3.31.3.4	Density	3575-91* (Suffix: W)	pcf	3.0	2.7 3.3
3.3.31.3.5	Compressive Strength at 25%	3575-91* (Suffix: D)	psi	24	22 26
3.3.31.3.6	Compression Set	3575-91* (Suffix: B)	% set		11
3.3.31.3.7	Tensile Strength	3575-91* (Suffix: T)	psi	37	40
3.3.31.3.8	Elongation	3575-91* (Suffix: T)	%	250	225 275
3.3.31.3.9	Tear Strength	3575-91* (Suffix: G)	lb/in	15	13
3.3.31.3.10	Operating Temperature Range		Degree F	0 +156	

\* ASTM

### 3.3.31.4 FOAM, CROSS-LINKED, CLOSED CELL POLYETHYLENE, NITROGEN EXPANDED

3.3.31.4.1 The cross-linked, closed cell foam is used in the construction of the Rucksack shoulder straps, frame sheet, front access panel and the lower shoulder strap attachment panel to add strength and stiffness. The frame sheet forms part of the Rucksack internal frame system and it provides anchor points for the shoulder straps and hip belt. It is also used in the lower shoulder strap attachment panel. This foam must be in accordance with the table below. Plastazote® HD115 from Zotefoams plc of England has been known to meet this requirement.

Property	Test Method	Unit of Measure	Requirement	Minimum	Maximum
3.3.31.4.2	Density	845*	kg/m <sup>3</sup>	115	95 130
3.3.31.4.3	Compressive Strength at 25 %, & at 50 %	7214*	kPa	475 & 710	1005 & 1095

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	Property	Test Method	Unit of Measure	Requirement	Minimum	Maximum
3.3.31.4.4	Compression Set 22 hrs at 50 % 73 °F 2 hour recovery	3575-91** (Suffix B)	% set			25
	22 hrs at 50 % 73°F 24 hour recovery					18
3.3.31.4.5	Tensile Strength	D412** DieA	kPa		1500	
3.3.31.4.6	Elongation at Break	D412**	%		66	
3.3.31.4.7	Tear Strength	3575-91** (Suffix: G)	lb/in kN/m		68 11.9	
3.3.31.4.8	Operating Temperature Range		Degree F Degree C		-95 -70	250 121

\* ISO

\*\* ASTM

3.3.31.4.9 **Foam Thicknesses, Cross-Linked Closed Cell Foam**

- 3.3.31.4.9.1 Frame Sheet: 5 mm ± 0.5 mm
- 3.3.31.4.9.2 Front Access Panel: 5 mm ± 0.5 mm
- 3.3.31.4.9.3 Shoulder Straps: 3 mm ± 0.3 mm
- 3.3.31.4.9.4 Lower Shoulder Strap Attachment Panel: 3 mm ± 0.3 mm

3.3.31.5 **FOAM, POLYETHER**

- 3.3.31.5.1 One layer of polyether foam is used in the assembly of the shoulder straps and two layers of polyether foam are used in the assembly of the lumbar pad. The polyether foam provides stability, flexibility, cushioning and strength to the shoulder straps and lumbar pad. The foam must be in accordance with the table below.

	Property	Test Method	Unit of Measure	Requirement	Minimum	Maximum
3.3.31.5.2	Thickness mm	3574-03* Para 8	mm	11	Industry Standard	Industry Standard
3.3.31.5.3	Density	3574-03*	pcf		2.25	2.40

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	Property	Test Method	Unit of Measure	Requirement	Minimum	Maximum
3.3.31.5.4	Initial Load Deflection 25 %	3574-03*	lbs	140	130	
3.3.31.5.5	Compression Set	3574-03*	% set			15
3.3.31.5.6	Tensile Strength	3574-03*	psi	12	1500	
3.3.31.5.7	Elongation	3574-03*	%	60		
3.3.31.5.8	Resiliency	3574-95*	%			25

\* ASTM

### 3.4 FOAM COMPONENTS ASSEMBLY

#### 3.4.1 Backpad

3.4.1.1 The backpad is fabricated by first laminating the CADPAT™ (TW) Warp Knit onto the Closed-Cell, Polymeric, Chemically Expanded Foam in accordance with Appendix B2 of this Manufacturing Data. The assembly is then press moulded into shape. The finished backpad must be in accordance with drawings 0375632, 0375633, 0375634 and 0375635. Each backpad is to be produced as a one-piece production item. Seaming of the backpad or sewing of additional lobes to increase the size will not be allowed.

#### 3.4.2 Shoulder Straps Foam Layers

3.4.2.1 The shoulder strap foam padding consists of 3 layers of foam as follows:

3.4.2.1.1 Layer 1: One layer of cross-linked, closed cell, polyethylene, nitrogen expanded foam, 3 mm;

3.4.2.1.2 Layer 2: One layer of polymeric, closed cell, physically expanded foam, 9.58 mm; and

3.4.2.1.3 Layer 3: One layer of polyether foam, 11 mm.

3.4.2.2 Layer 1 is laminated to Layer 2 and Layer 2 is laminated to Layer 3. The 3 foams must be permanently bonded to each other. The 3 layers of foam are cut as one piece. Insert the foam into the shoulder strap shell assembly with the polyether foam placed closest to the user's body.

3.4.2.3 The bonding method and agent must be foam friendly. They must not degrade the physical properties and performance of the foams in any way. The bonding must be continuous and uniform throughout the entire mating surface of the foams being laminated. The cut edges must be smooth, clean and well defined.

#### 3.4.3 Hip Belt Assembly, Components

3.4.3.1 The hip belt insert and materials are handed. The left and right components dimensions must be symmetrical. The hip belt foam components require several assembly steps. Regardless of the assembly method used, the hip belt performance must be met, in particular Deflection %, Interference Fit between the mating surfaces of the materials and inserts, Flexibility and



Durability. The Sealed Sample for the Rucksack Assembly may be used as a guide for the basic hip belt assembly.

3.4.3.1.1 The following parts comprise the hip belt assembly:

3.4.3.1.1.1 pre-moulded, warp knit CADPAT™, laminated foam;

3.4.3.1.1.2 pre-cut fabric pieces: shell, lining;

3.4.3.1.1.3 pre-moulded hip belt foam insert;

3.4.3.1.1.4 webbings;

3.4.3.1.1.5 buckles;

3.4.3.1.1.6 pre-cut high density polyethylene stiffener; and

3.4.3.1.1.7 hook fastener tape.

3.4.3.2 The pre-moulded hip belt foam insert must be positioned to mate properly into the pre-moulded hip belt foam and shell assembly. All surfaces or geometry must provide an Interference Fit to the entire inner surface of the hip belt foam and shell assembly.

3.4.3.3 The finished outer dimensions, thickness and performance of the pre-moulded hip belt foam insert must be in accordance with the related drawings. The hip belt formed foam inserts compression set under constant deflection must be met. The bonding method and/or agent used to secure the pre-moulded hip belt foam insert to its pre-cut polyethylene stiffener piece must be fully compatible with the foam and the HDPE. The bonding must provide a continuous and uniform tear bond throughout the entire mating surface of the pieces being laminated. It must not promote nor contribute to pre-mature failure or performance degradation of either the foam or the HDPE.

#### 3.4.4 Lumbar Pad Assembly

3.4.4.1 The lumbar pad assembly must be in accordance with the paper patterns, Rucksack Assembly sealed sample, Drawing 2004-18 Lumbar Shell Rucksack, and the Foam Insert Assembly Drawing below. The lumbar pad assembly consists of the following components:

3.4.4.1.1 pre-moulded, warp knit CADPAT™, laminated foam;

3.4.4.1.2 polyether foam;

3.4.4.1.3 polymeric, closed cell foam, physically expanded;

3.4.4.1.4 pre-cut lining; and

3.4.4.1.5 hook tape.

3.4.4.2 There are three layers of foam in the lumbar pad insert assembly: 2 layers of polyether and 1 layer of polymeric, closed-cell foam. Each foam layer is pre-cut, stacked and laminated in accordance with the drawing below. The foam insert assembly is then inserted into and secured to the warp knit and lining assembly with the polyether foam layer placed closest to the body.

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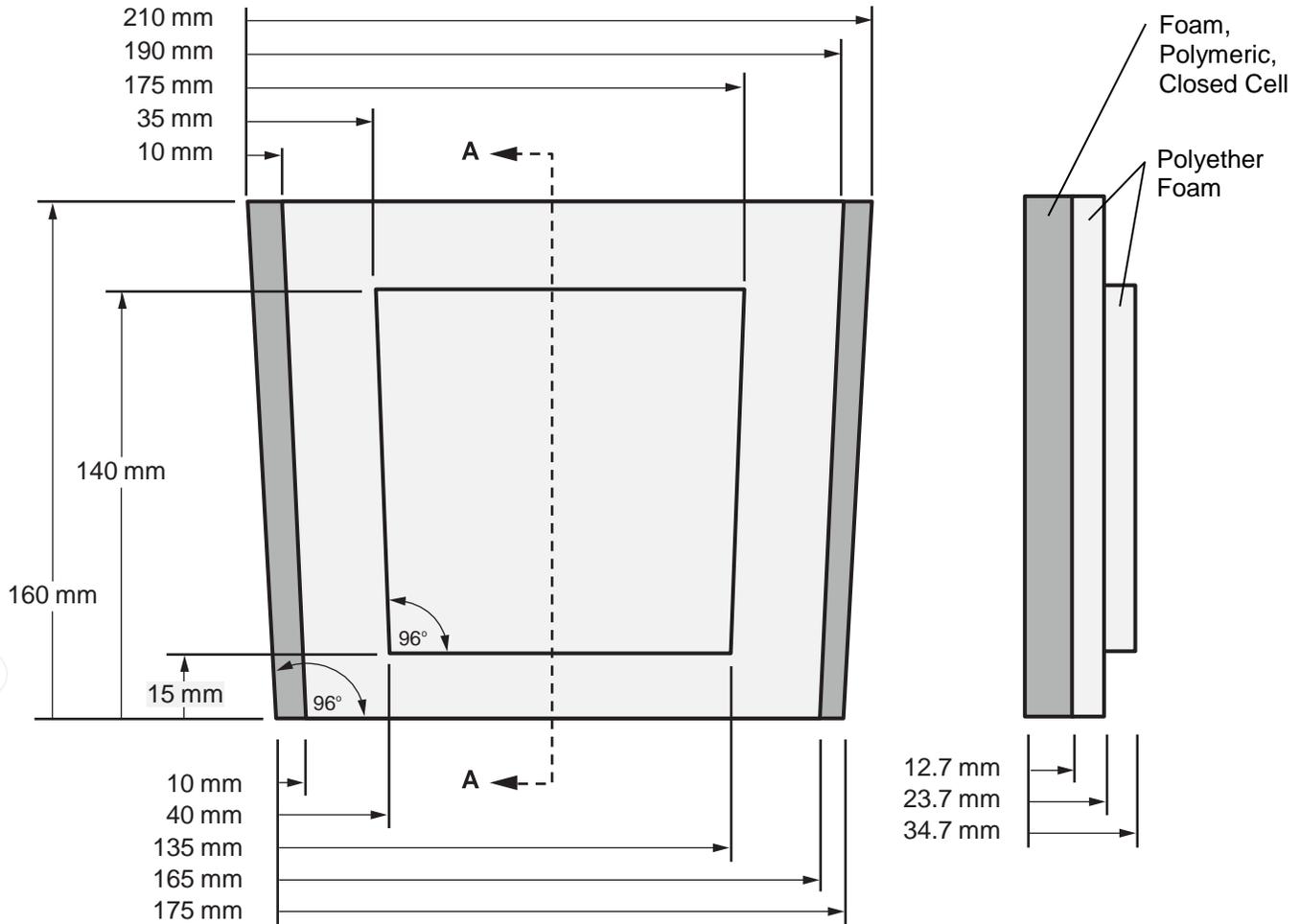


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3.4.4.3 LUMBAR PAD FOAM INSERT ASSEMBLY DRAWING



**Tolerances:**

- ±3 mm on dimensions over 50 mm
- ±1 mm on dimensions under 50 mm



### 3.5 CUTTING

- 3.5.1 Materials must be cut using duplicates of the Government supplied paper patterns. Patterns allow seam allowances but do not include “make-up” allowance. Each contractor must be responsible for any changes, which may be required for “make-up” allowance in order to suit their production method. However, the design, grade, and requirements specified herein must not be changed. Fabric parts must be cut in the direction of the warp as shown on the paper patterns, unless otherwise identified.
- 3.5.2 The methodology utilized to mark the position of components on the fabrics prior to manufacture is left to the discretion of the contractor. No process that damages the fabrics will be permitted. Only when practical and absolutely necessary should drill holes be used on the fabrics. Should it be necessary to use drill holes, they must be as small as possible (1.6 mm or less), and must be completely covered during the assembly and manufacturing process. The drill holes must not promote deterioration of the fabrics used in the construction of the Rucksack or any of its accessory items.
- 3.5.3 All thermoplastic materials such as webbings, tapes, elastics, and cording must be hot-cut or fused to prevent fraying.

### 3.6 SEWING

- 3.6.1 All seams and stitch types must be in accordance with CAN/CGSB 54.1, Stitches and Seams, Parts 1 and 2.
- 3.6.2 Unless otherwise specified, seams allowances must be a minimum of 9.5 mm.
- 3.6.3 All stitching must be Lockstitch Type 301 having not less than 8, nor more 10 stitches per 25 mm.
- 3.6.4 All double topstitching, when specified, must be lock or lock-chain stitch with the needles set 6.4mm apart and not less than .80 mm from the edges.
- 3.6.5 Serging, when specified must be done using stitch Type 504 or 505, three-thread, with not less than 10 cover stitches per 25 mm.
- 3.6.6 The ends of all threads must be securely backstitched to prevent unravelling. Backstitching must have a minimum of 12.7 mm long stitch back. All thread ends must be trimmed.
- 3.6.7 Where seaming, turning and topstitching is specified, the edges must be properly worked out.
- 3.6.8 The tension of the needle and bobbin threads must be adjusted to ensure correctly formed stitches.

#### 3.6.9 Bar Tacks

- 3.6.9.1 Two lengths of bar tacks are used throughout the Rucksack: 25mm and 50mm. The bar tacks must be in accordance with CAN/CGSB 54.1, Part 1, stitch Type 304 and the Sealed Sample. Bar tacks must be in accordance with the following table:

	Length	Stitches Per Inch	Location
3.6.9.1.1	25 mm (1-inch)	25	25 mm (1-inch) webbing
3.6.9.1.2	50 mm (2-inch)	25	50 mm (2-inch) webbing



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### 3.6.10 Daisy Chain Attachment

- 3.6.10.1 Webbing Daisy Chains must be sewn to the sides, front and lid of the Rucksack to add load carrying capability. Daisy chain attachments generally consist of 2 or more strips of 25 mm webbing running in parallel. The daisy chains are secured to the Rucksack 50 mm webbing with bartacks that are equally spaced to create loops that can be used to anchor or secure equipment.
- 3.6.10.2 The daisy chain configuration must be in accordance with the sealed sample and the paper patterns. The bartack stitching used to secure the webbing to the rucksack must run perpendicular to the webbing. The bartacks must be spaced 7.6 cm apart with a tolerance of  $\pm 3$  mm. The strips of webbing must be placed in parallel, with the bartacking lining up across the rows of webbing.

## 3.7 MARKING AND LABELLING

### 3.7.1 Labels, Textile

- 3.7.1.1 The labels must be in accordance with Specification D-80-001-055/SF-001 Specification for Label, Clothing and Equipment. They must be Type I and be made of polyester or nylon. All label instructions must be in bilingual format. The marking and care information must be legible and in indelible black ink. When indicated, the labels must bear care instructions and labelling symbology in accordance with CAN/CGSB-86.1 Care Labelling of Textiles. Label alphanumeric formats shall be in characters no less than 3.2 mm and not more than 6.4 mm. The font and layout must be such that the labels are clearly legible, comprehensible and logically organized. Sample labels must be provided to the Technical Authority for final approval.
- 3.7.1.2 The colour of all fabric labels must be a close visual match to Canadian Average Green.

#### 3.7.1.3 MARKING

- 3.7.1.3.1 Where applicable, labels must include the following nomenclature:

3.7.1.3.1.1	Contract No.;	Numéro du contrat;
3.7.1.3.1.2	I/D (user identification) Line;	Ligne pour l'identité du soldat;
3.7.1.3.1.3	« Rucksack » Nomenclature;	« Havresack » nomenclature;
3.7.1.3.1.4	NSN;	Numéro de NNO;
3.7.1.3.1.5	Size;	Taille;
3.7.1.3.1.6	Month and Year of Manufacture; and	Date de fabrication, année, et mois; et
3.7.1.3.1.7	Care Instructions.	Instructions d'entretien.

#### 3.7.1.4 CARE LABELLING

- 3.7.1.4.1 Care instructions in English and French are as follows:

	English	French	Care Symbol
3.7.1.4.1.1	Wash gently by hand in water, not exceeding 40 °C	Lavage à la main à l'eau tiède, température maximale de 40°C.	
3.7.1.4.1.2	Do not bleach	Ne pas utiliser d'agents de blanchiment chlorés	



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	English	French	Care Symbol
3.7.1.4.1.3	Hang up the soaking wet article to "drip" dry	Suspendre l'article complètement mouillé pour séchage par égouttage	
3.7.1.4.1.4	Do not iron or press	Ne pas repasser ni presser	
3.7.1.4.1.5	Do not dry-clean	Ne pas nettoyer à sec	

### 3.7.1.5 MARKING LABEL LOCATIONS AND TYPES

3.7.1.5.1 There are 2 types of textile marking labels, marking labels that include marking and care labelling as per para's 3.7.1.3 and 3.7.1.4 of this Manufacturing Data; and size identification labels that include only the size designation in English and French, eg. S/P. The marking labels must be in accordance with Appendix B3 of this Manufacturing Data and the table below.

	Location	Size and Application	Marking	Care Labelling
3.7.1.5.2	<b>Rucksack</b>			
3.7.1.5.2.1	Interior wall of snow cuff, centred, above radio access opening	12 cm high x 7 cm wide Sewn around all edges	As per para 3.7.1.3 of this Mfg. Data And 1, 1 cm diameter circle filled with the colour corresponding to the size (See Appendix B3 of this Mfg. data	Full description and Care Label symbols in accordance with para 3.7.1.4 of this Mfg. Data.
3.7.1.5.3	<b>Accessory Pouches</b>			
3.7.1.5.3.1	Interior of pocket snow cuff, in the vertical joint seam	7.5 cm high x 5 cm wide Sewn around all edges	As per para 3.7.1.3 of this Mfg. Data	Care label symbols required only, in accordance with para 3.7.1.4 of this Mfg. Data.

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	Location	Size and Application	Marking	Care Labelling
3.7.1.5.4	<b>Shoulder Straps</b>			
3.7.1.5.4.1	Upper right and left shoulder strap, starting underneath the shoulder attachment webbing on the Coated, Polyurethane Cloth	6 cm high x 5 cm wide Sewn into shoulder attachment webbing application	Right Hand Side label as per para 3.7.1.3 of this Mfg. Data And 1, 1 cm diameter circle filled with the colour corresponding to the size (See Appendix B3 of this Mfg. data  Left Hand Side Label As per Appendix B3 of this Mfg. Data	Right hand Side Label  Care Label symbols required only, in accordance with para 3.7.1.4 of this Mfg. Data.  N/A
3.7.1.5.4.2	Lower sew line of the upper 50 mm tri-glide webbing application	2.5 cm high x 1.5 cm wide. Sewn into upper tri-glide webbing stitching	Size designation as per Appendix B3 of this Mfg. data Text: Bold Font 5mm high.	N/A
3.7.1.5.5	<b>Hip Belt</b>			
3.7.1.5.5.1	Centred on the back HDPE assembly portion, facing the Rucksack bag	6 cm high x 4 cm wide Sewn around all edges	As per para 3.7.1.3 of this Mfg. Data And 1, 1 cm diameter circle filled with the colour corresponding to the size (See Appendix B3 of this Mfg. data	As per para 3.7.1.4 of this Mfg. Data. Care label symbols required only
3.7.1.5.5.2	At lower centre back	2.5 cm high x 1.5 cm wide. Sewn into lower Hook fastener stitching	Size designation as per Appendix B3 of this Mfg. data Text: Bold Font 5mm high.	N/A
3.7.1.5.6	<b>Backpad</b>			
3.7.1.5.6.1	At lower centre back	2.5 cm high x 1.5 cm wide. Sewn onto bottom edge seam.	Size designation as per Appendix B3 of this Mfg. data Text: Bold Font 5mm high	N/A



	Location	Size and Application	Marking	Care Labelling
3.7.1.5.7	<b>Quick Release Straps</b>			
3.7.1.5.7.1	Right and Left Side - Inner side at the base of the interlocking tab between the two (25mm) pieces of hook and loop	2.5 cm high x 1.5 cm wide. Text: Bold Font 5mm high. Sewn onto webbing.	Size designation as per Appendix B3 of this Mfg. data	N/A

### 3.7.1.6 HANG TAGS, ADHESIVE LABELS AND STENCILS

3.7.1.6.1 Hang Tags, Adhesive Labels and Stencils for other component parts such as packaged Rucksack systems, Load Transfer Rods and Aluminum Stays, refer to Appendix B3 of the Manufacturing Data.

### 3.7.1.7 MANUFACTURER BRANDING/LABELLING

3.7.1.7.1 Manufacturer/Supplier branding or product names must not be used on or attached to the Rucksack components, labelling, product information in any way without prior written authorization of the Technical Authority.

## 3.8 PRODUCT PACKAGING AND PACKAGE MARKINGS

3.8.1 Unless specified otherwise, packaging and package markings must be in accordance with D-LM-008-036/SF-000 Department of National Defence Minimum Requirements for Manufacturer's Standard Pack.

3.8.2 NSNs marked on containers in accordance with s. 17 and 18 of D-LM-008-036/SF-000, must also be applied using GS1-128 Bar Code Symbolology, with Application Identifier (AI) 7001, in accordance with s. 5.4 of GS1 General Specifications, and D-LM-008-002/SF-001 Specification for Marking for Storage and Shipment.

## 3.9 WORKMANSHIP

3.9.1 New and refurbished Rucksack Assembly components must be free of manufacturing defects.

3.9.2 A defect will be interpreted as any irregularity that would diminish product performance or user acceptance beyond the levels established at any point during the bid evaluation or the Contract. Visible irregularities can be considered defects when clearly visible from a distance of 1 metre or more, under North-sky daylight.

3.9.2.1 Irregularities include:

3.9.2.1.1 Discrepancies between the product and the specifications (for performance, design, quality control), sealed samples, product markings, or Product Manual.

3.9.2.1.2 Loss, separation or displacement of materials or components (e.g. abrasion, scratches, chipping, flaking, blistering, cracking, leaking, shedding, delamination, fraying, unravelling, tearing, cuts, breaks, holes).

3.9.2.1.3 Fabric irregularities (e.g. unevenness of colour within fabric panels, presence of soiling or staining, dye transfer, crocking, fuzzing, pilling, matting).

3.9.2.1.4 Chemical changes (e.g. weathering, discolouration, corrosion, burns, decomposition).

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- 3.9.2.1.5 Malformations or deformations (e.g. fillings, protrusions, voids, gaps, depressions, dents, undulations, crookedness, twisting, tangling, curling, kinking, puckering, shrinkage, expansion, stretching, flattening, warping, melting).
- 3.9.2.1.6 Stitch and seam irregularities (e.g. improper stitch balance, skipped stitches, seam failure, puckers, needle cutting on knits, ragged or inconsistent edges, broken stitches, seam grin, seam slippage, roping, pleating, improper or inconsistent stitch length and density for application, improper stitch type for application, malformed hems, unfinished seam ends without secure back-tacking).
- 3.9.2.1.7 Contamination from foreign matter (e.g. dust, dirt, fluid, microorganisms, markings, stains).
- 3.9.2.1.8 Extraneous or untrimmed material.
- 3.9.2.1.9 Remnants or residue from production.
- 3.9.2.1.10 Rough, sharp, or poorly finished areas.
- 3.9.2.1.11 Missing, miscounted, mismatched, misplaced, misaligned, or mis-sized features, materials, components, or markings.
- 3.9.2.1.12 Inconsistent, incorrect, or incomplete features, materials, components, or markings.
- 3.9.2.1.13 Tight, loose, interfering, or improperly engaging, features, materials, or components.
- 3.9.2.1.14 Objectionable sensations (appearance, odour, sound, or texture).
- 3.9.2.1.15 Typographical or grammatical errors.

**3.10 QUALITY ASSURANCE**

- 3.11 Unless specified in the Contract, the Contractor is responsible for ensuring that the performance of all inspections, materials and end-items conforms to the requirements of this Manufacturing Data.
- 3.12 Canada reserves the right to perform any verification or testing deemed necessary to confirm that the materials, end-items and services conform to the prescribed requirements. The Contractor is responsible for ensuring that all materials, end-items and services submitted to Canada for acceptance comply with all requirements of the Contract.