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RESTRICTED

Specification No. IND/TC/4969

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DGQA ORGANISATION  
GOVERNMENT OF INDIA  
MINISTRY OF DEFENCE

SPECIFICATION

FOR

MEN'S SHIRT COLD WEATHER THERMAL UNDER GARMENT FOR  
GLACIER REGION (POLYPROPYLENE)

DS CAT NO.-N I V

ISSUED BY

CONTROLLER  
CONTROLLERATE OF QUALITY ASSURANCE  
(TEXTILE & CLOTHING)  
ASHOK PATH,  
KANPUR-208004

Price: Rs...

Year 2022

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(ii)

RECORD OF AMENDMENTS

AMENDMENT S.NO.	DATE	DETAILS OF AMENDMENTS	AMENDMENTS CARRIED OUT BY & DATE

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0.0 **FOREWORD**

0.1 This specification containing number. of pages including Appendix has been prepared by Controller, Controllerate of Quality Assurance (Textiles & Clothing) Ashok Path, Kanpur – 208 004 on behalf of the Director General of Quality Assurance, Ministry of Defence, New Delhi.

0.2 This specification supersedes DMSRDE Provisional Specification No. DMSRDE/T&GS/2002/457(a).

0.3 This specification shall be used for procurement, manufacture, and QA of the item covered by this specification.

0.4 The Quality Assurance Authority for the store covered by this specification is the Controllerate of Quality Assurance (Textile & Clothing), Ashok Path, Kanpur - 208004. Enquiries regarding this specification relating to technical particulars shall be referred to QA authority mentioned above/quoted in the tender or contract.

0.5 Any deviation from this specification will not be resorted to without the explicit written sanction of the QA Authority viz. The Controllerate of Quality Assurance (Textile & Clothing), Ashok Path, Kanpur - 208004 or his authorized representative.

0.6 This specification is liable to amendment at anytime and therefore is applicable only to specific enquiry made at any time. For any subsequent enquiry, a fresh copy of specification is to be obtained.

0.7 This specification is a live and dynamic document and is therefore, likely to undergo changes. Any major change in design should have the approval of General staff, Users, financial authorities, concurrence in the form of DGQA approval as for Army. Thus it may involve some price difference. Therefore, a specification issued hold goods only for the supply order for which it was issued for.

0.8 This is a restricted document and therefore, should not be communicated to any one who is not authorized to receive information pertaining to this document. Copies of any other reference / document such as specification /drawing/instructions/guides can be obtained on payment from Controller, Controllerate of Quality Assurance (Textiles & Clothing), Ashok Path, Kanpur, 208004.

**1.0 SCOPE**

1.1 This specification covers the requirements of Men's Shirt Cold Weather Thermal Undergarment for Glacier Region (Polypropylene). This item is available in four sizes viz. Small(S), Medium (M), Large (L) and Extra Large (XL).

**2.0 RELATED SPECIFICATION AND REFERENCE**

2.1 Reference is made in this specification to :-

SI No.	SPECIFICATION	PARTICULARS TO BE TESTED
(a)	IS:3442 -1980 (I <sup>st</sup> Rev) Amdt-1	Method for determination of Count of Yarn removed from fabrics.
(b)	IS:5524-1980 (I <sup>st</sup> Rev) ( Method- A4)	Method for determination of thread density
(c)	IS/ISO:5084-1996	Method for determination of thickness of basic fabric
(d)	IS:1964-2001(2 <sup>nd</sup> Rev)	Method for determination of mass per unit length and mass per unit area of fabrics.
(e)	IS:5524 -1980 (I <sup>st</sup> Rev) ( Method- A5)	Method for determination of mass
(f)	IS/ ISO:13938-2:2019	Method for determination of bursting strength
(g)	IS:5524-1980(I <sup>st</sup> Rev)	Method for determination of relaxation area shrinkage
(h)	IS/ISO:105-C10-2006 IS/ ISO:105-E 04-2013	Method for determination of colour fastness to Washing Method for determination of colour fastness Perspiration
(j)	IS:667-1981(I <sup>st</sup> Rev)	Method for Identification of nature of material
(k)	IS:9543-2015 (I <sup>st</sup> Rev)	Method for determination of sewing threads
(l)	IS:4905-2015 ((I <sup>st</sup> Rev)/ISO 24153-2009)	Method for random sampling and randomization procedure.

**Note:** All specifications/drawing referred to in this specification for any tender or contract shall mean the edition current on the date of such tender or contract.

### 3.0 TERMINOLOGY/DEFINITIONS/SYMBOLS

3.1 For the purpose of this specification definitions and terminology given in the relevant Indian Standards should apply.

### 4.0 STANDARD PATTERN

4.1 The standard pattern/ sealed sample of Men's Shirt Cold Weather Thermal Undergarment for Glacier Region (Polypropylene) held in the custody of the Controller, Controllerate of Quality Assurance (Textiles & Clothing), Ashok Path, Kanpur 208004, shall constitute the standard with regard to general workmanship, feel, finish and in other aspects not noted/ defined in this specification.

### 5.0 MATERIAL

5.1 YARN : A continuous multi filament yarn made of polypropylene fibre and dope dyed in Khaki shade (as per sealed sample).

5.2 Basic Fabric : Polypropylene

5.3 Fabric for Cuff Portion :- Polypropylene , Lycra/Spandex (70 denier).

5.4 Slide Fastness (ZIP) :- Light duty coil type synthetic slide fastener (Closer Type) of length  $29 \pm 1$  cm as per IS:14181:2002 should be used. The colour of the slide fastener should match to that of the sealed sample.

### 6.0 PROCESSING / MANUFACTURE

6.1 The yarn used in the knitting of Men's Shirt Cold Weather Thermal Undergarment for Glacier Region (Polypropylene) shall be a continuous multi filament yarn made of fibre grade polypropylene, dope dyed in Khaki shade (as per sealed sample). The yarn shall be even in terms of quality with minimum twist and should not contain any admixture of fibres.

6.2 The basic fabric shall be evenly knitted in terrypile (uncut) construction on a flat or circular knitting fine gauge machine. After knitting, the fabric shall be thoroughly cleaned and heat set (setting temperature should be between  $90^{\circ}\text{C}$ ).

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6.3 The fabric of cuff portion shall be knitted in 1x1 or 2x2 compact Rib knit construction with the same polypropylene thread along with polyurethane threads like Lycra/spandex (70 denier). If the above portions are knitted separately, the same may be stitched or linked with seams inside the shirt. The shade of the cuff should match to that of the basic fabric.

6.4 The light duty coil type synthetic slide fastner (Closer Type) of length 29±1 cm as per IS:14181:2002 should be used. The colour of the slide fastener should match to that of the sealed sample.

7.0 **REQUIREMENTS AND TOLERANCE**

7.1 The finished fabric shall conform to the following requirements (Table-1(a), 1(b) & 1(c):-

**Table 1 (a)**

**Physical and Chemical Parameters of Basic Fabric:**

S.No	Characteristics	Requirement	Method
(a)	Count of Yarn (single ) 'Denier" (For guidance only)	130-135	IS:3442
(b)	Thread density (i)Wales per decimeter (ii)Course per decimeter	90±5% 150±5%	A-4 of IS:5524
(c)	Thickness of basic fabric at 7.0 g/cm <sup>2</sup> pressure (mm)	2.0±0.2	IS:7702
(d)	Mass of the basic fabric , g/cm <sup>2</sup>	225±5%	IS:1964
(e)	Mass per 10 Shirts	Refer clause- 7.2	A-5 of IS:5524

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(f)	Weave	Terry pile (uncut)	Visual
(g)	Bursting strength, N/cm <sup>2</sup>	80(min)	IS:1966
(h)	Relaxation area shrinkage, %	2(max)	A-5 of IS:5524
(j)	Colour fastness to, (i) Washing (ii) Perspiration	Rating 4(min) 4(min)	IS/ISO:105-C10 (test-3) IS/ISO:105-E04
(k)	Nature of material	Polypropylene	IS:667

**Table 1(b)**  
**Physical and Chemical Parameters of Fabric for Cuff Region :**

S.No	Characteristics	Requirement	Method
(a)	Count of Yarn (single ) 'Denier (For guidance only) (i) Polypropylene (ii) Lycra/Spandex	130-135 70	IS:3442
(b)	Thread density (i)Wales per decimeter (ii)Course per decimeter	60±5% 180±5%	A-4 of IS:5524
(c)	Thickness of fabric at 7.0 g/cm <sup>2</sup> pressure (mm)	1.0±0.2	IS:7702
(d)	Mass of the fabric 'g/cm <sup>2</sup>	190±5%	IS:1964
(e)	Weave	Rib Knit	Visual
(f)	Colour fastness to, (i) Washing (ii) Perspiration	Rating: 4(min) 4(min)	IS/ISO:105-C10(Test-3) :2006 IS/ISO:105-E04:
(g)	Nature of Material	Polypropylene Lycra/Spandex	IS:667 As per Appendix-A



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**Table 1(c)**  
**Particulars of sewing thread for seam and stitches are given below**

S. No.	Portion to be stitches	Type of stitch	Denier of thread	Requirement
(a)	All joining	3 thread over lock	3/60 <sup>s</sup> Polyester (through needle) 3/40 <sup>s</sup> Polyester (through looper)	IS:9543, V. No. 2 & 5
(b)	All Hemming	2 thread over lock	3/60 <sup>s</sup> Polyester (through needle) 3/40 <sup>s</sup> Polyester (through looper)	IS:9543, V. No. 2 & 5

Note: - The stitches shall be of even tension throughout and all the loose end shall be securely fastened. The number of stitches shall not be less than 5 per centimeter. The seam shall withstand stretching in all directions to the full extent of the knitted fabric.

**7.2 Dimensions & tolerances:** The dimensions and mass of Shirt cold weather thermal undergarment for various sizes are appended below:-

(All dimensions are in cm)

Size	Width across chest 'A'	Sleeve			Neck opening Width 'E'	Length overall 'F'	Mass/10 garments (g)
		Length including cuff 'B'	Cuff Length 'C'	Cuff Width 'D'			
Small	50	48	9.0	10	20	58	2400
Medium	54	52	10.0	11	21	62	2800
Large	58	56	10.0	11	21	66	3200
X-Large	62	60	11.0	12	22	70	3600
Tolerance	±2	±2	±0.5	±0.5	±1	±2	±100

**8.0 WORKMANSHIP AND FINISH**

8.1 The shirt shall be free from manufacturing defects such as large mends, ladders, dropped stitches, missed stitches at the stitched portion, holes cuts, tear, noticeable broken threads, chemical damage etc. The Shirt shall be free grease, soap or any other extraneous material. It shall also be free from stain, chemical damages and other defects etc. The stitches shall be of even tension throughout and all the loose ends shall be securely fastened. The number of stitches shall not be less than 5 per cm. The seams shall withstand stretching in all direction to the full extent of the knitted fabric.

8.2 In appearance, feel, shade, workmanship, finish and in all other respect not covered in this specification, the shirt shall conform to the standard pattern held in custody of Controller, Controllerate of Quality Assurance (Textiles & Clothing), Ashok Path, Kanpur-208004.

**9.0 PRE-INSPECTION OF SUPPLIES BY PRODUCER**

9.1 **PRE-INSPECTION:** Manufacturer/ Contractors must satisfy themselves first that the store manufactured are in accordance with the contract and fully conform to the required specification by carrying out through pre-inspection of each lot/batch before actually tendering the same for inspection to the Quality Assurance Officer nominated under the terms of the contract. A declaration by the Contractor that necessary pre-inspection has been carried out on the stores tendered will be submitted along with the challan. The declaration will also include the method followed in carrying out pre-inspection showing features checked/tested and will have the test certificate attached to the challan/declaration. If the Quality Assurance Officer finds that pre-inspection of the consignment as required above has not been carried out, the consignment is liable for rejection.

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10.0 **ADVANCE SAMPLE:-**

10.1 Advance sample will be applicable only for Non-established/ Non-developed supplier of the product.

10.2 05 Nos as advance sample should be submitted to the Controller, CQA (T&C), DGQA Complex, Ashok Path, Kanpur-208004 for test and approval prior to commencement of Bulk manufacture. The Advance sample must be submitted to AHSP within 30 days from issuing date of contract. QA authorities will verdict the advance sample within 30\* days.

10.3 The testing of samples will be carried out by designated AHSP labs. Where test facilities are not available, facilities of Govt. Labs /NABL accredited labs will be utilized & testing charges for the same shall be borne by the vendor/firm. However, additional time may be required if the testing has to be carried out outsourced labs.

10.4 The AHSP shall carry out testing and evaluation of Advance sample and forward the recommendation of Bulk Production Clearance (BPC) to the Purchase Officer.

11.0 **QUALITY ASSURANCE**

11.1 The store shall conform to the requirements when tested in accordance with the methods mentioned against each in the specification.

11.2 Sample cutting of bulk supply samples along with sentence report shall be forwarded to AHSP concerned to check/monitor the quality of the store.

12.0 **PRODUCT SPECIFICATION**

12.1 The finished store shall satisfy the constructional physical particulars and shall satisfy requirement as given under clause 7.0.

12.2 Precision of the results of all tests must have reproducibility and repeatability.

**13.0 SAMPLING PROCEDURE**

13.1 **FORMATION OF LOT**: The delivery shall be visually inspected by Quality Assurance Officer on the spot in the first instance to ascertain its homogeneity in respect of shade, feel, finish & general appearance. The supplier shall arrange the units of homogeneous lot in such a way that all the product units are easily accessible to the sampling officer from all side to enable him to draw sample at random from any portion of the lot.

13.2 The sampling of the stores shall be carried out by adopting appropriate sampling method as per IS : 4905:2015/ISO:24153:2009.

13.3 The Scale of sampling as given in Appendix 'B' shall be followed in respect of physical and chemical parameters.

13.4 Lot Size: 10,000 Nos. (Max.)

**14.0 CRITERIA OF CONFORMITY**

14.1 The lot shall be considered to be in conformity with the required standard if the samples drawn for lab test as above are found satisfactory and the lot is also found otherwise satisfactory in regards to visual parameters.

15.0 **TEST METHOD** : The specification required for test method as mentioned in clause 7.0 against each parameters be followed for test method .

16.0 **PACKING, MARKING & PRESERVATION** :As per CQA(T&C) Packing Marking Schedule No. IND/TC/PMS/2008 Amdt. No. 3.

17.0 **ACCEPTANCE MARK** : Each accepted shirt shall be legibly and indelibly stamped with acceptance mark of QA staff of suitable size.

**18.0 TECHNICAL LITERATURES / DOCUMENTS**

18.1 Refer clause 2.0 of the specification.

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19.0 **WARRANTY:**

19.1 "Except as otherwise provided in the invitation to the tender, the Contractor/seller hereby declare that the goods, stores, articles sold/supplied to the purchaser under this Contract shall be of the best quality and workmanship and new in all respects and shall be strictly in accordance with the specifications and particulars contained/mentioned in the Contract.

19.2 The contractor/seller hereby guarantees that the said goods/stores/articles would continue to conform to the description and quality aforesaid for a period of 12 months from the date of delivery of the said goods/stores/articles to the purchaser or 15 months from the date of shipment/dispatch from the contractor's work, whichever is earlier and that notwithstanding the fact that the purchaser (Inspector) may have inspected and/or approved the said goods/stores, articles, if during the aforesaid period of 12/15 months the said goods/stores/articles, be discovered not to be conform to the description and quality aforesaid or not having satisfactory performance or have deteriorated and the decision of the purchaser in that behalf shall be final and binding on the contractor/seller to rectify replace by acceptable goods/stores/articles or such portion or portions thereof as is found to be defective by the purchaser within a reasonable period not exceeding 3 months or as may be allowed by the purchaser in his discretions on the application made thereof by the contractor/seller and in such an event the above mentioned warranty period shall supply to goods/stores/articles rectified/replaced from the date of rectification/replacement thereof, otherwise the contractor/seller shall pay to the purchaser such compensation as determined by the purchaser as may arise by reason of the breach of the warranty herein contained".

20.0 **DEFENCE STORE CATLOGUE NO. :**

DS CAT No: NIV - MEN'S SHIRT COLD WEATHER THERMAL  
UNDER GARMENT FOR GLACIER REGION (POLYPROPYLENE)

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21.0 **DRAWING/SKETCHES** : As per Appendix 'C'


22.0 **SUGGESTION FOR IMPROVEMENT**

22.1. Any suggestion for improvement of this document may be forwarded to:

**CONTROLLER  
CONTROLLERATE OF QUALITY ASSURANCE  
(TEXTILES & CLOTHING)  
MINISTRY OF DEFENCE  
ASHOK PATH,  
KANPUR-208 004  
Email: cqate-dgqa@nic.in**

**Place:** Kanpur (UP)

**Dated:** 10 Jan '2023



**CONTROLLER  
CONTROLLERATE OF QUALITY ASSURANCE  
(TEXTILES & CLOTHING),  
ASHOK PATH, KANPUR -208004**

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**Appendix-A**

**Identification of Polyurethane Thread**

Approx 5g of the material is dissolved in 5 ml Glacial Acetic Acid by warming the solution for several minutes 0.1 g of p-dimethylamine benzaldehyde is added and the solution is further warmed for 2-3 minutes. The solution turns to yellow indicating the presence of polyurethane.

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Appendix – “B”

BASED ON 4% AQL

AUTHORITY ISO 2859-1-1999

IS: 2500-(Pt-1) - 2000

Lots Size in Nos.	Sampling Plan For							
	Visual examination / dimensional Check at the time of sampling		Physical Parameters for laboratory tests)		Chemical Parameters and other physical parameters requiring long testing time (for laboratory tests)		Sample size for visual check at bulk QA stage	
	Gen Insp. Level-II		Spl Insp. Level S-4		Spl Insp. Level S-2		Gen Inspection Level – III	
	Sample Size	Acceptance No.	Sample Size	Acceptance No	Sample Size	Acceptance No	Sample Size	Acceptance No
1	2	3	4	8	9	7	8	9
Below 150	20	2	8	1	2	0	32	3
151-280	32	3	13	1	3	0	50	5
281-500	50	5	13	1	5	0	80	7
501-1200	80	7	20	2	7	0	125	10
1201-3200	125	10	32	3	10	1	200	14
3201-10000	200	14	32	3	8	1	315	21

Note:

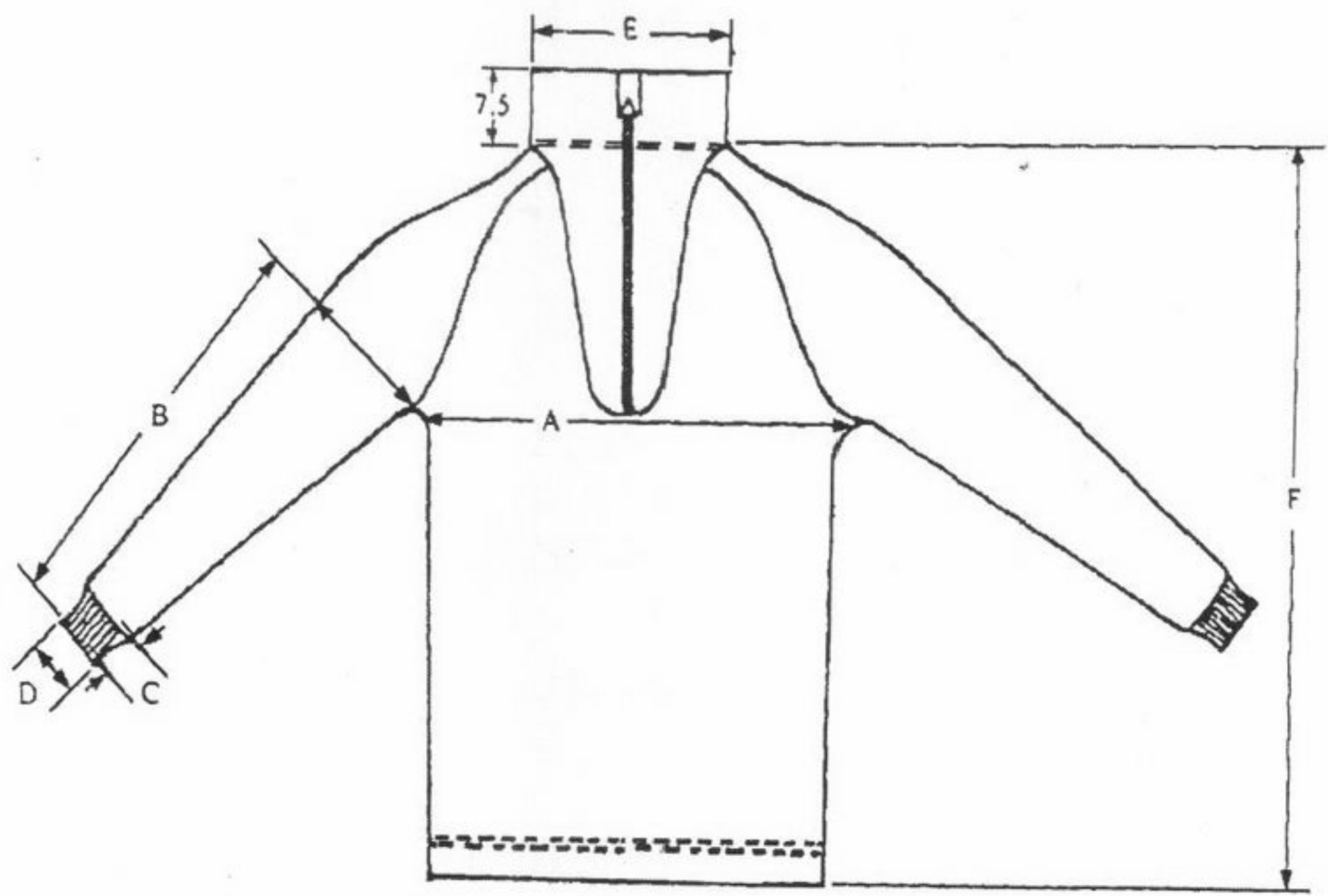
- (i) Samples drawn as per column (2) to be first examined visually.
- (ii) If above is found satisfactory, the samples for lab testing as per column (4) be drawn out from the samples originally drawn as per column (2) by the sampling officer and marked accordingly.
- (iii) For chemical parameters samples to be drawn at random as per IS: 4905-2015 / ISO: 24153-2009 from those samples iii drawn as per column (4)
- (iv) Maximum Lot Size: 10,000 Nos.



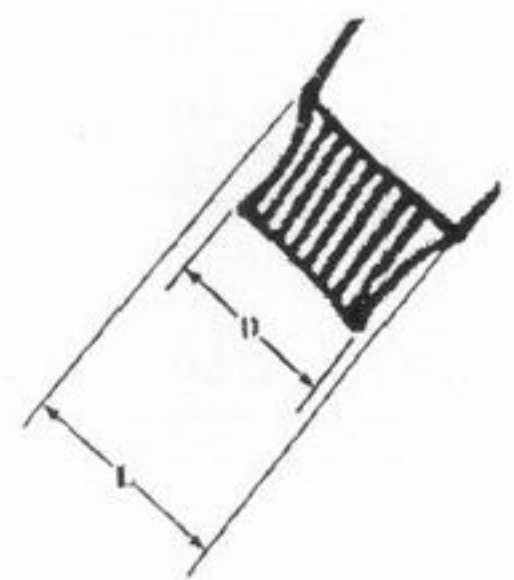
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APPENDIX 'C'

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ENLARGE VIEW



<p><i>Ajay Kumar</i> AJAY KUMAR JTO (D)</p>	DATE	NAME	<p>CONTROLLERATE OF QUALITY ASSURANCE (TEXTILE &amp; CLOTHING) MINISTRY OF DEFENCE (DGQA) ASHOK PATHI, KANPUR</p>
	DGN.		
	DRN.	Ajay Kumar	
	CHD.	Ajay Kumar	
	TRD.		
PASSED BY:-	COMP.		
GO/TC-1(b)	SCALE: —	<p>MEN'S SHIRT COLD WEATHER THERMAL UNDERGARMENT FOR GLACIER REGION (PP)</p>	
APPROVED BY:-			
DC/TC-1(b)			<p>ALL DIMENSIONS ARE IN CENTIMETER</p> <p>SPECIFICATION No. IND/TC/4969</p>