PROVISIONAL SPECIFICATION NO. IND/TC/4587 (d)
Supersedes Prov. Specn: IND/TC/4587(c)
Drawing Sheet - Four

भारत सरकार
रक्षा मंत्रालय
गुणता आश्वासन महानिदेशालय

GOVERNMENT OF INDIA
MINISTRY OF DEFENCE
DIRECTORATE GENERAL QUALITY ASSURANCE

विशिष्टि/SPECIFICATION

के लिए/FOR

कोट एक्सट्रीम कोल्ड क्लाइमेट
COAT EXTREME COLD CLIMATE

डिफ़ेन्स स्टोर्स कैटलाग नंबर:
DEFENCE STORES CATALOGUE NO:

NIV

द्वारा जारी किया / **Issued by**
नियंत्रक
गुणता आश्वासन नियंत्रणालय (कपड़ा एवं वस्त्र)
अशोक पथ, कानपुर – 208004

CONTROLLER
CONTROLLERATE OF QUALITY ASSURANCE
TEXTILES AND CLOTHING
ASHOK PATH,
KANPUR 208 004

वर्ष/Year: मई 2016 मूल्य/Price:

23/5/16

RECORD OF AMENDMENTS

AMENDMENT Sl. No.	DATE	DETAILS OF AMENDMENTS	AMENDMENT CARRIED OUT BY & DATE

INDEX

0.0 FOREWORD

0.1 This specification has been prepared by Controller, Controllerate of Quality Assurance (Textiles and Clothing), Ashok Path, Kanpur on behalf of the Director General of Quality Assurance, Ministry of Defence, New Delhi.

0.2 This specification has been revised on the basis of MGO/EM (GS&C) letter No. B/82222/2A/Coat ECC/MGO/EM (GS&C) dated 31 Aug 2015 under cover of HQ DQA (S) letter No. 39115/2/Coat ECC/DGQA/S-7 dated 03 Sep 2015 and two prototype samples received vide OCF Shahjahanpur letter No. OCFS/1807/Coat ECC dated 10.10.2015.

0.3 This specification supersedes the Prov. Specn. No. IND/TC/4587 (c) and any other important relevant information on the store.

04. This specification shall be used for tender enquiry, procurement, manufacture and Quality Assurance of the item covered by this Specification.

0.5 The Quality Assurance Authority for the store covered by this specification is the Controller, Controllerate of Quality Assurance (Textile & Clothing), DGQA Complex, Ashok Path, Kanpur-208004. Enquiries regarding this specification related to technical particulars shall be referred to the QA Authority mentioned in the tender or contract.

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

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

0.8 Copies of any other reference document such as specification/Drawing can be obtained from AHSP or from respective agencies.

0.9 The store must conform in all respects with this specification and other particulars issued with it.

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1.0 SCOPE

1.1 This specification covers the requirements of Coat ECC in three sizes viz small, medium and large and intended for use at high altitude areas. It consists of three independent components:-

(a) Wind Cheater (Water proof)
(b) Insulating layer
(c) Waist coat (Sleeve less)

1.2 The coat system gives the opportunity to the user to use the component of his choice of different layers of thermal insulation depending upon the intensity of cold weather and as per individual's metabolic response to the environmental conditions.

2.0 RELATED SPECIFICATIONS & REFERENCES

2.1 Reference is made in this specification to:-

S.NO.	SPECIFICATION NO.	PARTICULARS
1.	IS: 14181 (Part 1 to 3):2002 Amd No. 2, Reaffirmed 2013	Synthetic (Plastic) Slide Fasteners
2.	IS: 8156-1994 Reaffirmed-2009	Fastener Synthetic Hook & Loop Tape
3.	IS: 9543-1980 Reaffirmed 2010	Spun Polyester Sewing Thread
4.	IS : 11652-2000 Reaffirmed-2010	High Density Polyethylene (HDPE)
5.	IND/TC/0161	Fabric Nylon, Knitted, Aluminized
6.	DMSRDE/LE2/2000/Eyelet	Eyelet Steel
7.	CQA(GS)/US/460	Boxes fibre board rigid corrugated
8.	IND/TC/1208	Double Layer Bonded Polyester Fleece (Various Shades) 150 cm width
9.	IS:4227-1998 RA - 2008 (Variety No. 10A)	Textiles- Braided Nylon cords for aerospace purposes
10.	JSS: 8040- 08: 2014 (Revision No.3) with Amendment List No.1	Tape Adhesive, Transparent Water proof

S.NO.	SPECIFICATION NO.	PARTICULARS
11.	JSS: 8135-10 : 2004 (Revision No.1) Reaffirmed 2011 with Amd No.1	Polypropylene Strapping 12 mm Dia
12.	Prov. Specn. No. ADRDE/SPECN/1980/5(a)	Fabric Nylon 75 GSM White 100 cm wide
13.	CQA (T&C) Packing & Marking Schedule No. IND/TC/PMS/2008 with Amendment No.3	Packing & Marking

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

2.2 Copies of IS specifications can be obtained on payment from Bureau of Indian Standards, 9 Bahadur Shah Zafar Marg, New Delhi or their regional offices. E-mail http://www.bis.org.in.

2.3 Copies of CQA (T&C) specifications i.e. IND/TC series can be obtained on payment from Controllerate of Quality Assurance (T&C), DGQA Complex, Ashok Path, Kanpur-208004. E-mail cqatc-dgqa@nic.in.

2.4 CQA (GS)/US series of specifications may be obtained against payment from the Controller, Controllerate of Quality Assurance (General Stores), Post Box No. 127, Kanpur.

2.5 Copies of JSS specifications may be obtained from The Director, Directorate of Standardisation, Ministry Of Defence, Standardisation Documentation Center, Room No. 13, J Block, DHQ PO, New Delhi on payment. E-mail medssc@defstand.gov.in.

2.6 Copies of DMSRDE specification can be obtained on payment from the office of The Director, Defence material stores research & development Estt. G.T.Road, Kanpur.

3.0 TERMINOLOGY DEFINITIONS & SYMBOLS

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

4.0 STANDARD PATTERN

4.1 The standard pattern of Coat ECC held in the custody of the Controller CQA (T&C), Kanpur shall constitute the standard as regards any particulars/properties not noted/defined in this specification.

5.0 MATERIALS AND COMPONENTS

5.1 The basic material for the fabrication of Coat ECC shall be procured from composite mills/ reputed suppliers. The basic materials and garniture items shall be pre-inspected for quantity and quality as per contract by the Quality Assurance Officer of area concerned for issuance of Inspection Certificate (IC). In this regards CQA(T&C) Kanpur Schedule No. CQA(T&C)/TC-15/8(d) shall be applicable.

5.2 The various components of Coat ECC shall be manufactured from the materials as per details given below: -

COMPONENTS	MATERIALS	PARTICULARS
(a) Body and other components (Wind Cheater)	Three Layer Waterproof Breathable fabric Dual shade OG/white.	Appendix 'A'
(b) Body and other components (Insulating Layer)	(i) Batting Polyester 100 GSM, 150 cm wide	Appendix 'B'
	(ii) Fabric Nylon Knitted aluminized.	IND/TC/0161
	(iii) Fabric Nylon75 GSM white 100 cm wide	Prov. Specn. No. ADRDE/ SPECN/1980/5(a) except Air Permeability Test, thickness test & mass per Square metre to be 75 gm ± 5 %. Linear Density and turns per metre of yarn as guiding parameters.
(c) Body and other components (Waist Coat)	Double Layer Bonded Polyester Fleece (Various Shades)	IND/TC/1208
(d)Plastic Slide Fasteners for Hood of Wind Cheater	Medium Duty Open End Plastic Slide Fasteners of 28 cm length OG & White	IS: 14181 (Part 1 to 3): 2002 Amd No. 2, Reaffirmed 2013
(e) Plastic Slide Fasteners for Hood of Insulating Layer	Plastic Slide Fasteners of Medium Special Duty Open End White	IS: 14181 (Part 1 to 3):2002 Amd No. 2, Reaffirmed 2013

COMPONENTS	MATERIALS	PARTICULARS
(f)Fasteners Synthetic Hook & Loop Tape for Storm Flap, Cuff and Pockets	Synthetic Hook & Loop Fasteners Tape 25 mm wide OG/White	IS : 8156-1994
(g) All sewings	Sewing thread spun polyester OG 125 dtex/3 (V. No 4) Sewing thread spun polyester white 125 dtex/3 (V. No. 4)	IS : 9543 -1980
(h)Front Closing of all three parts	(i) Plastic Slide Fasteners open end heavy duty OG for Windcheater (ii) Plastic Slide Fastener open end Medium Special duty white for Waist Coat & Insulating Layer	IS: 14181 (Part 1 to 3):2002 Amd No. 2, Reaffirmed 2013
(j) Nylon Cordage for hood, waist and bottom tunnels	Textiles- Braided Nylon cords for aerospace purposes	IS:4227-1998 RA-2008 (Variety No. 10A)
(k) Tunnel outlet	Eyelet Steel	DMSRDE/LE2/2000/Eyelet
(l) Rib Cuff for Insulating Layer	Fabric Tubular Nylon OG (Running Length)	Best Trade Quality

6.0 PROCESSING / MANUFACURE

6.1 The Coat ECC shall be manufactured to the shape and design as illustrated in the drawings attached to this specification. The Coat ECC shall consist of the following three components:-

(a) Wind Cheater, It shall be made from Breathable Fabric (Three layer) dual shade i.e. one side OG and other side white keeping OG side of the fabric out side. It shall be cut in single breast design with hood.

(b) Insulating Layer, Intermediate insulating layer made from 75 GSM white Nylon Fabric filled with Batting Polyester 100 GSM lined with a thin layer of heat reflector Aluminized Nylon Fabric.

(c) Sleeveless Waist Coat, It is manufactured from Double Layer Bonded Polyester Fleece White with raw edges enveloped in 75 GSM Nylon fabric.

6.2 Wind Cheater

6.2.1 Forepart, The forepart shall be in two pieces, each piece or forepart shall have facing of single layer of body material caught in between the gorge seam and the bottom hem. The loose edge of the facing shall have one row of machine stitching.

6.2.2 Plastic Slide fastener shall be stitched by two rows of machine stitching at the fore edges from front closure. The stitching of top of Plastic Slide Fasteners (stopper) shall be started from neck point. A storm flap 10.0 cm wide at top and 5 cm wide at bottom from edges seam in double layer of the body material shall be stitched on the left fore part. The top of the storm flap shall be stitched with gorge seam as per the sealed sample. Six pieces of 2.5 cm wide fastener loop tape measuring 4.5 cm shall be stitched into the right forepart at the edge from outside. The distance of the first fastener piece shall be as per sealed sample of wind cheater. Six pieces of 2.5 cm wide fastener hook tape measuring 4.5 cm shall be stitched (only on the inner layer of the storm-flap) at the corresponding places, for marrying with the loop tape pieces stitched onto the right forepart. One cord Nylon should be provided at the bottom tunnel of 2.5 cm width of Wind Cheater.

6.2.3 Back:. The back of wind cheater shall be cut in one piece. The provision of collar of 7.5 cm width made of same material shall be extended upto foreparts. Two medium duty open end plastic slide fasteners of 28 cm length OG and White on respective sides shall be stitched placing those on the base at the middle of the collar. Two flaps OG & White each of 33 cm length and 4.5 cm width are placed on the respective sides as per the sealed sample. Each flap is made of the same material of wind cheater by making a fold of it. Three fastener hook tape in OG shape each of 25 mm length and 25 mm width are placed evenly along the length of OG Flap at its inner side. Fastener loop tape in OG shade are placed at OG side of the collar. Similarly, three fastener hook & loop tape in white shade with aforesaid dimensions are placed on the white flap and white side of collar respectively as per the sealed sample.

6.2.4 Sleeves: The sleeves shall be cut in two pieces joined together by two lapped seams i.e. underarm seam and hind arm seam. The bottom of the sleeve shall be turned-in to form 3.0 cm wide hem. Above the hem one adjustable strap of 2 layers of the fabric is to be provided as per the drawing. Fasteners Hook tape of 4 cm length under the strap and correspondingly 15 cm long fasteners loop tape on sleeve shall be stitched as per sealed sample. Sleeves shall be attached to the body with lapped seam. The shoulder seam on both left and right sides shall be lapped seam. The free end of the shoulder straps shall be provided with fastener hook tape measuring 4 cm (only on inner layer of the fabric) to be closed on

the shoulder provided with fastener loop tape measuring 4 cm as shown in the sealed sample.

6.2.5 Pockets: Each forepart shall be provided with slant patch pocket at the Bottom with flap, stitched by machine stitching. The top edge of the pocket shall be turned in to form 2.5 cm wide hem. Both ends of top edge of the pocket shall be so designed that 02 cm top of edge shall be free to align and stitched to the flap edge from inside as shown in the drawing. The pocket flap shall be stitched by machine to the body of the garment at 2.0 cm above the tacking point of the pocket edge. A 4.5 cm long piece of fastener loop tape shall be stitched on the pocket hem placed centrally to marry with 4.5 cm long fastener hook tape stitched on to the pocket flap from inside on the inner layer of fabric, for pocket closure, as per drawing sheet attached.

6.2.6 Assembly: The forepart and the back shall be joined together by lapped seam, while the sleeves shall be joined to the body by double plain seams showing two rows of machine stitching from inside only.

6.2.7 Hood: The design of hood shall be as per drawing sheet attached. It shall be in three pieces and in one layer of body material. The three pieces shall be joined separately by lapped seam. The outer and the inner shall then be joined together at the face periphery and bagged out from the bottom of the hood. Two medium duty open ended plastic slide fasteners of 28 cm length OG and White on respective side of hood marrying to the plastic slide fasteners of the collar are placed at the bottom of the hood.

6.2.8 The face periphery shall be finished by two rows of machine stitching 2.0 cm apart and two eyelets shall be fixed using two layers strengthening piece of basic fabric as washer, at a distance of 7 cm from each end of periphery to form a tunnel for inserting cordage nylon. The ends of cordage nylon shall be heat sealed. Each end of the cordage shall bear a knot. As a closing arrangement for ear flap, 8.0 cm long piece of fastener hook tape 2.5 cm wide OG shall be stitched by machine at the end of the right ear flap from outside to marry with 8.0 cm long piece of fastener loop tape white 2.5 cm wide, stitched at the end of the left ear flap from inside, as per drawing sheet attached. The hood shall be made detachable by using medium duty open end plastic slide fasteners of 28 cm length OG & White on back as per clause No. 6.2.3.

6.3 INSULATING LAYER

6.3.1 Forepart: This shall be made from Polyester Batting, one layer of heat reflective Knitted Nylon Fabric (aluminized surface towards the body) and Fabric Nylon 75 gm white encasing polyester batting & heat reflective knitted nylon fabric. The outer most layer of fabric nylon and one layer of batting next to outer most layer

shall be tucked 5.0 cm long by machine at two places at each forepart, as per drawing and sealed sample to hold the batting in position with the outer material. The inner most layer of fabric nylon 75 g and next to inner most layer viz. heat reflective knitted nylon fabric and remaining layer of batting, shall be tucked 5.0 cm long by machine, similarly at three places in each forepart to hold the batting with the inner most fabric in position. The tucked stitches of the two layers shall be uniformly staggered and at no place the tucked stitched of outer assembly shall coincide with the inner assembly.

6.3.2 Back: The back shall be fabricated in one piece of four layers of materials similar to those used in the foreparts. 5.0 cm long tucking by machine at four places and two darts at shoulder seam shall be done similarly as in the front and as per the drawing and sealed sample. The provision of collar of 8.5 cm width made of body material shall be extended upto foreparts. Plastic Slide Fasteners shall be evenly placed on the base of the collar for attaching the hood.

6.3.3 Sleeves: The sleeves shall be in one piece of batting polyester & two pieces of the three plies of materials similar in nature and arrangement to those used in forepart of the insulating liner. 5.0 cm long tucking by machine placed at centre position in longitudinal direction in bottom and top part of the sleeves shall be made. The bottom of the sleeves shall be provided with cuff made of double layer of nylon tubular rib fabric as per the drawing sheet attached.

6.3.4 Front Opening: Liner shall be provided with a plastic slide fastener open end medium special duty white at the front for its closure. One part of the Plastic Slides Fastener shall be stitched on each fore-edge of the two foreparts from the neck point by two rows of machine stitching. A tunnel of 3 cm width is to be provided at waist to house nylon cord white for tightening as per drawing and sealed sample. Eyelet steel is fixed on mouth of tunnel by using one layer stay piece made from body material of wind cheater.

6.3.5 Hood: The design of hood should be similar to hood of wind cheater and material & its arrangement shall be similar to fore part of Insulating Layer. The hood should be made detachable from body by using Plastic Slide Fasteners of medium Special Duty Open End White.

6.4 WAIST COAT

6.4.1 Waist coat shall be made from Double Layer Bonded Polyester Fleece White. It is in single breasted design with round neck. Stitching at side & shoulders should be as shown in the drawing. Plastic slide fastener medium special duty open end shall be stitched from neck point upto bottom using two rows of machine

stitching at the fore edges for front closing. The back shall be in one piece to the shape and design, as per the drawing sheet attached.

6.4.1.1 Assembly: - Each forepart shall be joined with the back at sides and at the shoulders by one row of machine stitching. The edges shall then be pressed open and finished with one row of machine stitching.

6.4.1.2 Beading: The free edges of the waist coat at front, bottom, neck and arm holes shall then be finished with a 0.8 cm wide beading of Fabric Nylon 75 gm white.

6.5. General Stitching: The coat shall be assembled throughout with lock stitches regulated at 35 to 40 stitches per decimeter with even tension. The ends of the threads shall be securely fastened off and loose threads shall be trimmed off. At all the places where two rows of machine stitching have been carried out for finishing i.e. assembling, front opening, pockets, flaps, collar and hood of the wind cheater etc., the distance between the two rows shall be approx. 0.7 cm evenly maintained as far as possible. The fabricated store shall be cleaned with the help of Air Suction cleaning machine to remove all loose threads and other foreign material adhere during fabrication.

7.0 DIMENSIONS AND TOLERANCES

7.1 The dimensions of Coat ECC shall conform to the dimensions laid down in tables attached as Appendix 'C', 'D', 'E' & 'F' to this Specification.

8.0 WORKMANSHIP & FINISH

8.1 The general workmanship and finish of Coat ECC shall be of a high standard and similar to approved sample. In order to attained high standard in aesthetic appearance (shade, fitments and texture), general workmanship (alignments, stitching and consistency), finish (softness, comfort and neatness), the Coat ECC shall be free from yarn, weaving, wet processing, garmenting defects and any other spots which affects the serviceability of the Coat ECC. All components of the Coat ECC shall also be compatible in fitment, workmanship and finish.

9.0 ADVANCE SAMPLE

9.1. Advance sample clause is applicable only if it is mentioned in the contract. In case of its applicability, the manufacturer needs to submit 06 Sets of Coat ECC representing size(s) involved in the contract along with three meters each of basic materials as Advance samples for inspection/ trial, testing and approval by AHSP/concerned SQAE(GS) of that area for bulk production clearance (BPC) or as laid down in the contract.

10.0 PRE-INSPECTION BY MANUFACTURER

10.1 Manufacturers/Contractors must satisfy themselves first that the stores manufactured are in accordance with the contract and fully conform to the specification, by carrying out thorough pre-inspection of each store of the lot/batch before actually tendering the same for inspection to the Quality Assurance Officer nominated under the terms of the contract.

10.2 A declaration by the contractor that necessary pre-inspection/tests have been carried out on the stores tendered and the same are fit for inspection and test report shall be rendered along with the challan. The declaration shall include the method followed in pre-inspection showing features checked/tested and the test reports be submitted along with challan.

10.3 If the Quality Assurance officer finds that pre-inspection of the consignment as required above has not been properly carried out, the consignment is liable for rejection.

11.0 QUALITY ASSURANCE

11.1 On examination of random samples taken from any portion of the consignment or during surveillance inspection shall conform to the requirement when tested in accordance with the method mentioned against each in the specification.

11.2 The store should be of the latest manufacture, conforming to the current production standard and having 100% defined life at the time of delivery.

12.0 SAMPLING

12.1 The lot size is restricted to 5,000 sets.

12.2 The supplier shall offer the store in box (four unit packs in a box), serially numbered and arranged in such a manner that the entire lot is easily accessible to the sampling officer.

12.3 Based on the lot size offered for quality assurance, sample units for visual examination and dimensions check at the time of sampling be drawn as per column-2 and for bulk inspection as per column-4 of the table using technique of random sampling as per IS : 4905-1968.

12.4 On having satisfied with the preliminary examination, sample if required for laboratory test/examination shall be drawn as per column 5 & 7 of the table.

TABLE FOR SCALE OF SAMPLING AND PERMISSIBLE NUMBER BASED ON 4% AQL IS: 2500-2000

Lots Size in Sets.	Sampling Plan for						
	Visual examination/ dimensional check at the time of sampling(L-1)		Sample size for detail check at Bulk QA stage (L-II)	Physical Parameters (for laboratory tests) (S-4)		Chemical Parameters (for laboratory tests) (S-2)	
	Sample Size	Acceptance No.		Sample Size	Acceptance No	Sample Size	Acceptance No
1	2	3	4	5	6	7	8
Upto 280	13	1	32	13	1	5	0
281 - 500	20	2	50	13	1	5	0
501 - 1200	32	3	80	20	2	5	0
1201-3200	50	5	125	32	3	8	1
3201- 10000	80	7	200	32	3	8	1

Note:- (i) The Sampling shall be done randomly as per IS: 4905.1968-Amd -1

(ii) Samples for lab testing will be drawn from the samples drawn and mentioned in Col No. 2 only.

(iii) Samples for chemical test (Col. No.7) shall be drawn out of Physical test samples (Col. No.5).

(iv) Total Acceptance No. mentioned in Col. No. 6 for physical Parameter is inclusive of Acceptance No. mentioned at Col. No.8 for Chemical Parameter

13.0 CRITERIA FOR CONFORMITY

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

14.0 TEST METHOD

14.1 The basic cloth and garniture used shall conform to the specification requirements when tested as per method laid down in the relevant specification as shown in Appendix 'A' and 'B'.

15.0 MARKING OF STORE

15.1 Each Wind Cheater, Insulating Layer & Waist Coat shall be stitched with marking label made of cloth taffeta synthetic white 7.0 cm x 2.5 cm in double layer on inside below the collar seam of back side in Insulating Layer, on white side of Wind Cheater at left portion from the inside of storm flap at top and on back of the neck

opening of waist coat. The label shall be printed details mentioned below in HINDI & ENGLISH on face & back of the size label.

(i) Brief Nomenclature of store & Size.
(ii) Cat/Part No
(iii) Manufacturers name initials or recognized trade mark.
(iv) Year of manufacturing.

15.2 **MARKING OF WASHING INSTRUCTIONS**

15.2.1 Each Coat shall have washing instructions label made of cloth taffeta synthetic white 7 cm x 2.5 cm attached adjacent to the size label of each component of Coat ECC. The label shall be printed details mentioned below in HINDI on face of the size label.

15.2.2 At top of the label "धुलाई निर्देश" shall be written underlined in bold letters.

धुलाई निर्देश
सादे गुनगुने पानी में बढ़िया डिटरजेंट (सर्फ, एरीयल आदि) से हाथ या मशीन से धोयें। पटके नहीं। पलटकर छांव में सुखायें। हल्की गर्म प्रेश करें।

15.2.3. Label shall be got approved by the Quality Assurance Officer/Quality Assurance Authority, before use.

16.0 **PACKAGING AND MARKING**

16.1 Packaging & Marking shall be as per CQA(T&C) Packing Marking Schedule No. IND/TC/PMS/2008 with Amendment No.3

17.0 **TECHNICAL LITERATURE AND DOCUMENTS**

17.1 Refer clause 2.0 of this specification.

18.0 **WARRANTY**

18.1 "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. 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 not withstanding 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 three 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 apply 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 break of the Warranty herein contained".

19.0 **DEFENCE STORE CATALOGUE NO.**

STORE	**CAT/ PART No.**
COAT EXTREME COLD CLIMATE	NIV

20.0 **DRAWINGS/SKETCHES**

20.1 Four drawing sheets attached to this specification.

21.0 **SUGGESTION FOR IMPROVEMENT**

21.1 Any suggestions for improvement of this document may be forwarded to:-

THE CONTROLLER
CONTROLLERATE OF QUALITY ASSURANCE
TEXTILES AND CLOTHING
ASHOK PATH
KANPUR 208 004
E-mail-cqatc-dgqa@ nic.in

Date : ((May 2016

Controller
CQA(T&C)
Kanpur

(31)

PROVISIONAL SPECIFICATION NO. IND/TC/4587 (d)

APPENDIX 'A'

THREE LAYER WATER PROOF BREATHABLE FABRIC

S.NO.	PARTICULARS	SPECIFICATION	METHOD OF TEST
1.	Fabric (Three Layer) Nature of material	Membrane sandwiched between two layers of Polyester fabric OG & white	For Polyester- IS : 667:1981, RA 2013
2.	Colour/Shade	One side white & other side O.G	Visual
3.	Width cm	118 minimum	IS:7016 (Part I):1982 RA 2008
4.	Mass/m^2 (g)	280 +15 g - 20 g (Plus 15 g and minus 20 g)	IS:7016 (Part I):1982 RA 2008
5.	Breaking Load (N) (5 x 20 cm between grip) Warp Weft	1200 N (Min) 1000 N (Min)	IS: 7016 (Part-2):1981 RA 2008 Method A-1
6.	Tear Strength (N) Through Warp Through Weft	90 min 40 min	IS: 7016 (Part -3):1981 RA 2008 Method A-I Annexure-'II'
7.	Thread/cm i) Warp ii) Weft (Guidance Parameter)	40 ± 3 30 ± 3	IS:1963 : 2004, RA 2008
8.	Water Proof ness Water col. Of 100 cms of one hour	No leakage of water through the fabric or wetting of the outer surface.	IS: 7016 (Part-7):2009
9.	Colour Fastness to (i) Light (ii) Washing	Rating 5 or better Rating 5 or better	IS: 2454:1985, RA 2013 Test Number C(3) of IS/ISO 105-C10:2006
10.	Air permeability ($cm^3/cm^2/sec$)	No air permeability	By low pressure method as per IS:11056:1984 RA 2010
11.	Moisture Vapour Transmission mg/cm2/hrs (Upright cup method)	1mg/cm^2/hrs min equivalent to 240 gms/m^2/24 hrs.	ASTM 96/E 96 M:2005 Test condition for measurement of MVT (i) Temp 32°C±2°C (ii) RH in Chamber - 50 ± 2 % (iii) RH in Cup-100% (iv) Air Velocity 0.02 to 0.3 m/Sec
12.	Resistance to damage by flexing	100000 (1 lac) cycles Min. No Cracking No Delaminate	IS: 7016 (Part 4): 2003 RA 2009
13.	Peel strength N/5 cm	10 N Min both ways	IS : 7016 (Part 5): 2003 RA 2010
14.	Water repellency (Each side)	80 min	IS: 390:1975 RA 2013
15.	pH of Aqueous extract	6.0 to 8.5	IS :1390:1983, RA 2009 (Cold method)

NOTE:- Repeatability & reproducibility of test results must be ensured when tested for correlation testing.

APPENDIX 'B'

BATTING POLYESTER

1. **Material** :

1.1 In the manufacture of batting polyester the fibre used shall be crimp, staple, virgin hollow polyester fibre of denier 3 to 6. The batting polyester hollow cylindrical siliconised & non siliconised fibre shall be mixed in equal proportion.

2. **Processing/ Manufacture :**

2.1 During manufacture batting polyester for the bonding of polyester fibre a low melting point polyester fibre shall be used. This low melting point polyester fibre shall be mixed homogeneously with virgin polyester fibre of 3 to 6 denier. The content of low melting point polyester fibre shall not exceed 20% and shall not be less than 5% in the total weight of batting. The low melting point polyester fibre shall be melt at around 120°C and after melting this low melting polyester fibre act as thermal bonding agent. The low melting point polyester and normal polyester shall be blended in such a way that the thermally bonded batting shall meet the performance of the store.

3. **REQUIREMENTS AND TOLERANCES:**

3.1 The batting polyester shall conform to following particulars and shall withstand the test as described.

S.NO.	PARTICULARS	REQUIREMENTS	METHOD OF TEST
1.	Mass g/m^2	100 + 15 -10	IS : 15891(Part I)-2011
2.	Width in cm	150 ± 1 or as agreed	IS:1964:2001, RA 2010
3.	Nature of Material	100% Polyester	IS:667:1981, RA 2013
4.	Count of Fibre (In denier)	3-6	IS:10014 (Part -2) : 1981, RA 2008
5.	Thickness, mm under pressure of 0.5 g/cm^2	5 mm (Min)	ISO :9073-2-1995 (E)
6.	Compressional recovery '%' (Min)	90 %	As per Appendix 'G'
7.	Resistance to blocking	The batting shall not stick and the surface shall open out clearly	As per Appendix 'H'

DIMENSIONS OF WIND CHEATER

All dimensions are in cms.

SIZE	LENGTH AT		HALF BACK	ROUND MEASURE AT			SLEEVE			Shoulder Strap Length x Width at Top x Width at Base	Length of PSF	Length of Cord at bottom of Wind Cheater	Length of Cord at hood of Wind Cheater
	Front from Neck Point	Back from Teak Point		Chest (when closed)	Waist (when closed)	Seat (when closed)	Length from shoulder point to Cuff joining seam	Elbow Round	Bottom Round (at cuff Joining seam)				
	A	B	C	D	E	F	G	H	I	J	K	L	M
Small	85	84	28	164	164	164	63	56	35	19x3.5x7.0	72	220	100
Medium	90	89	29	169	169	169	66	58	36	20x3.5x7.0	76	220	100
Large	95	94	30	174	174	174	69	60	37	21x3.5x7.0	80	220	100
Tolerance	±1	±1		±1	±1	±1	±1	±1	±1				

APPENDIX 'D'

DIMENSION OF INSULATING LAYER

All dimensions are in cms.

SIZE	LENGTH AT		HALF BACK	ROUND MEASURE AT			SLEEVE			CORD LENGTH FOR WAIST	LENGTH OF PSF	CORD LENGTH AT HOOD
	Front from Neck Point	Back from Teak Point		Chest (when closed)	Waist (when closed)	Seat (when closed)	Length from shoulder point to cuff joining seam	Elbow Round	Bottom Round (at cuff joining seam)			
	A	B	C	D	E	F	G	H	I	J	K	L
Small	75	74	27	151	145	153	60	50	22	220	66	100
Medium	80	79	28	156	150	158	63	52	24	220	72	100
Large	85	84	29	161	155	163	66	54	26	220	76	100
Tolerance	± 1	± 1	± 0.5	± 1	± 1	± 1	± 1	± 1	± 0.5			

DIMENSION FOR WAIST COAT

All dimensions are in cms.

SIZE	LENGTH AT		HALF BACK	ROUND MEASURE AT			ROUND NECK	LENGTH OF PSF
	Front from Neck Point	Back from Teak Point		Chest (when closed)	Waist (when closed)	Seat (when closed)		
	A	B	C	D	E	F	G	H
Small	65	64	22.5	111	107	109	50	54
Medium	70	69	23.0	116	112	114	50	58
Large	75	74	23.5	121	117	119	52	62
Tolerance	±1	±1	± 0.5	± 1	±1	± 1	± 0.5	-

APPENDIX 'F'

DIMENSIONS OF HOOD

All dimensions in cms.

S.No	Dimension for Hood	Wind cheater	Insulating layer	Tolerance
(i)	Height at centre	40	39	± 1
(ii)	Width at centre	55	52	± 1
(iii)	Round face periphery (when closed)	66	62	± 1
(iv)	Bottom when closed	61	59	± 1
(v)	Storm flap	9.0	12	± 1
(vi)	Overall crown length	52	51	± 1
(vii)	Length of PSF for Attachment of Hood to Main Body	28	28	-

APPENDIX 'G'

DETERMINATION OF COMPRESSIONAL RECOVERY

Initially the thickness of the thermally bonded batting polyester is determined under 0.5 gm/cm^2 pressure on a 9 cm x 9 cm specimen. The specimen is then subjected to a compressional force of 700 gms/cm^2 pressure for 60 seconds after which it is allowed to relax for 300 seconds. The thickness of the test specimen is again measured under 0.5 gms/cm2 of pressure. The percentage recovery is calculated as under:-

$$\text{Percentage Compressional Recovery} = \frac{\text{Thickness of the specimen after compression}}{\text{Thickness of the specimen Before compression}} \times 100$$

APPENDIX 'H'

DETERMINATION OF RESISTANCE TO BLOCKING

The specimen 20 cm x 20 cm in size folded double face, then back to back making 10 cm x 10 cm square is placed in between two glass plates (Approx 11 cm x 11 cm) and a two Kg weight is placed on the top. The specimen then exposed for 30 minutes at a temperature of 82 $\pm$ 2°C. At the end of exposed period the test assembly is removed from between the glass plates and allowed to cool for five minutes. The sample is then slowly unfolded and carefully examined for evidence of adherence or peeling. The batting shall not stick and surface shall open out clearly.

WIND & WEATHER

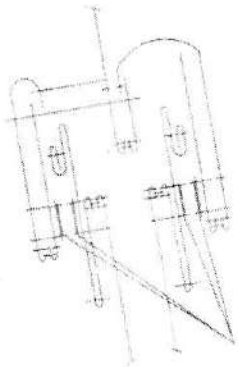
FRONT VIEW

BACK VIEW

SECTION-BB

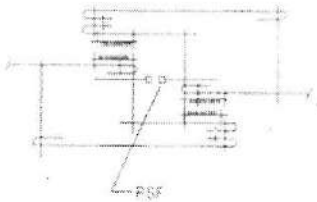
SECTION-AA

SECTION-CC



FASTENER HOOK & LOOP TAPE

SECTION-DD



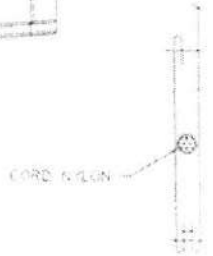
PSF

SECTION-EE

SECTION-FF

SECTION-GG

SECTION-HH



CORD NYLON

SECTION-KK

BREATHABLE FABRIC W. P.
DUAL SHADE OG/WHITE

M.K.KUMAR (TC-15)		DATE	NAME
	DSN		
	DRN		AJAY KUMAR
	CHD		R.K. JOSHI
	TRD		
	QDSP		
PASSED BY :- 60/TC-15	SCALE :-		
APPROVED BY :- 10/10-15			

CAT PART NO. NIV

COAT EXTREME COLD CLIMATE

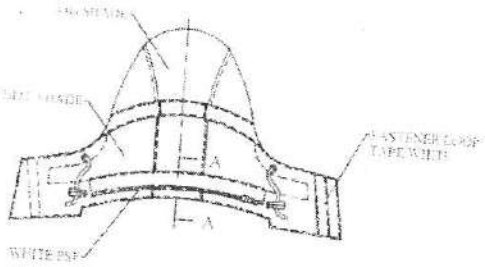
CONTROLLERATE OF QUALITY ASSURANCE (TEXTILE & CLOTHING) MINISTRY OF DEFENCE (DGQA) KANPUR

ALL DIMENSIONS ARE IN MILLIMETRES

PROD. SPECN. No. IND/TC-15/87

WIND CHEATER

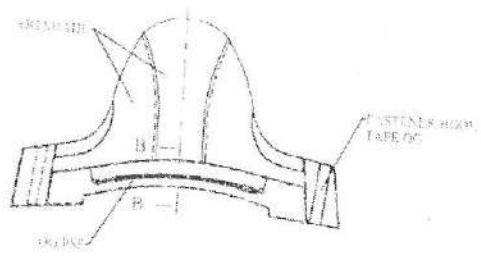
FRONT VIEW



HOOD

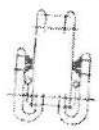
SECTION-AA

BACK VIEW

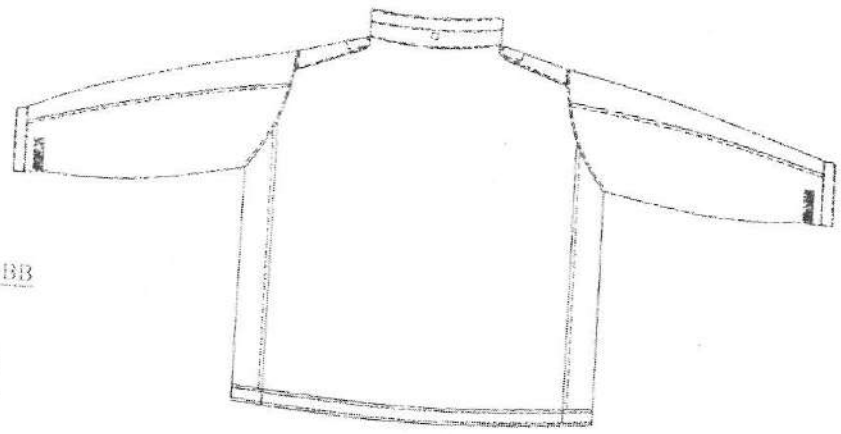


FRONT VIEW

SECTION-BB



BACK VIEW



AJAY KUMAR JTO(D)	DSN	DATE	NAME
PASSED BY:- GO/TC-15	DRN		AJAY KUMAR
APPROVED BY:- DC/TC-15	FHD		AJAY KUMAR
	TRD		
	COMP		
	SCALE		
CAT PART NO. NIV			
COAT EXTREME COLD CLIMATE			

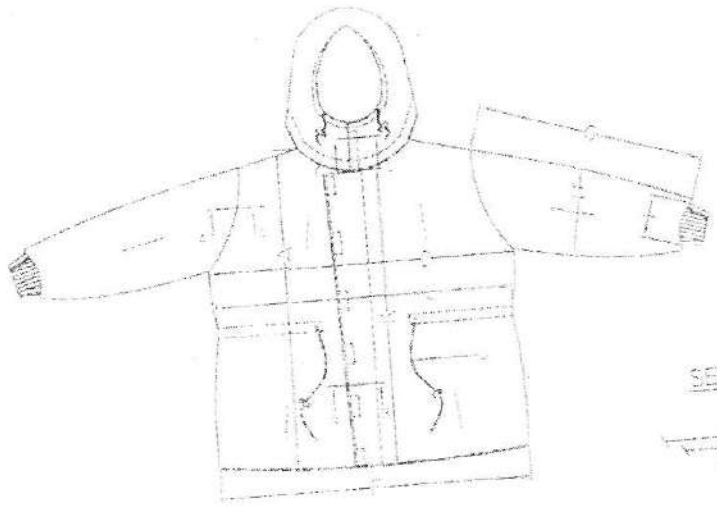
CONTROLLERATE OF QUALITY ASSURANCE (TEXTILE & CLOTHING) MINISTRY OF DEFENCE (DGQA) KANPUR

ALL DIMENSIONS ASE IN MILLIMETER

PROV SPECN. No. IND/TC/4587 (d)

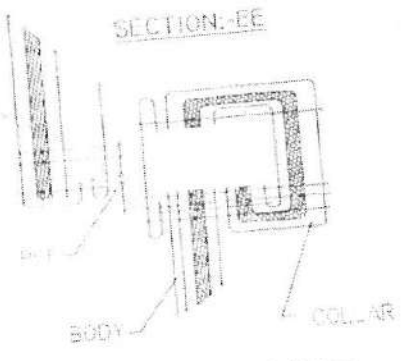
INSULATING LAYER

FRONT VIEW



BACK VIEW

SECTION:-EE



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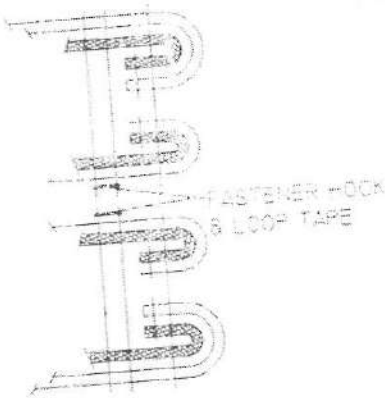

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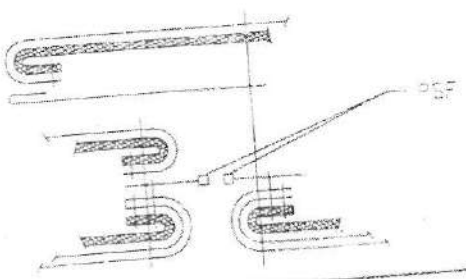

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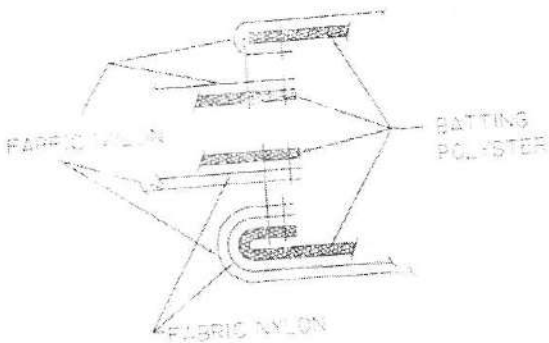


	DATE	NAME
DES.		
CH.		
APP.		
MFG.		
STAND.		

CAT PART No. NH

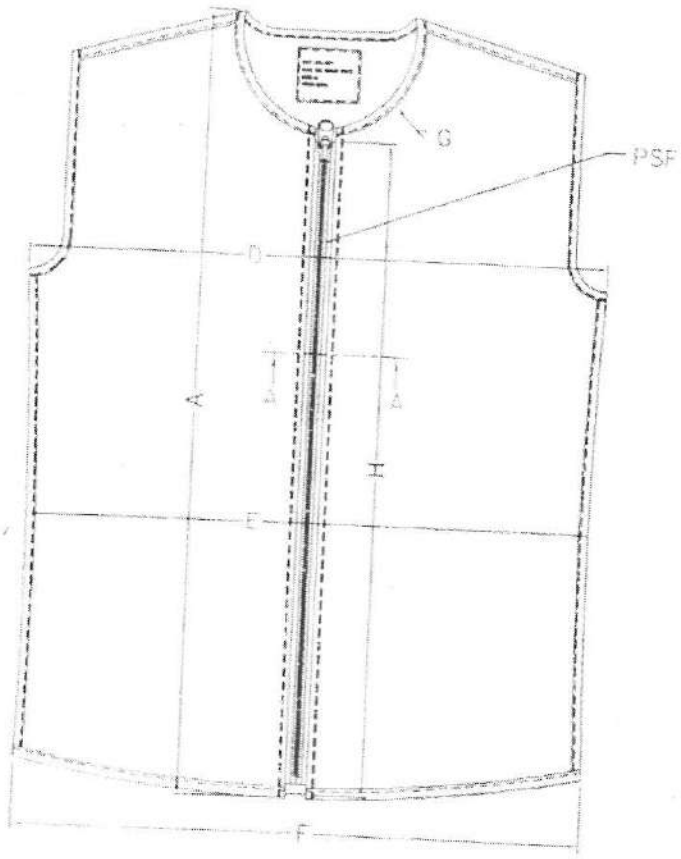
COAT EXTREME COLD CLIMATE

PROV. SPECN. No. IND TC 458

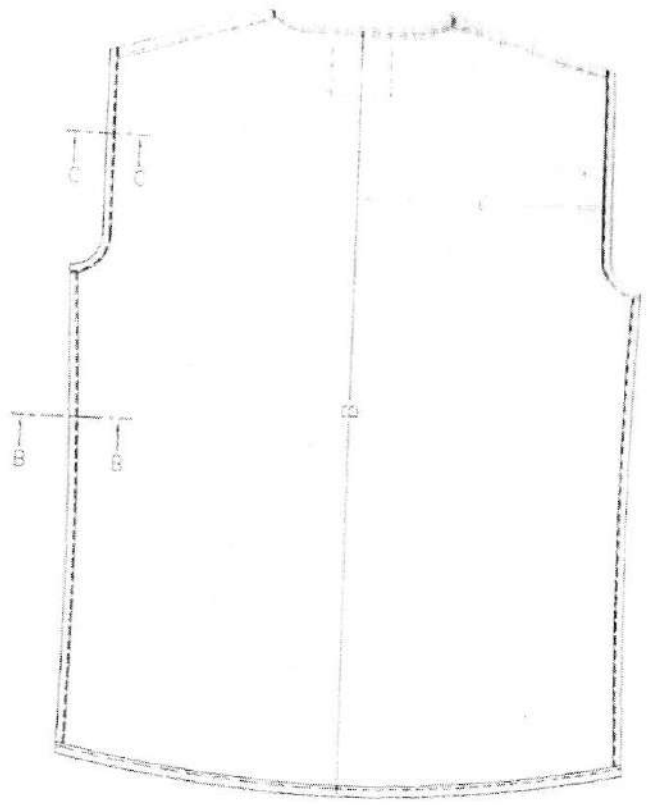
23

WAISTCOAT

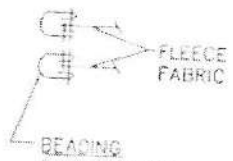
FRONT VIEW



BACK VIEW



SECTION:-CC
(ENLARGED VIEW)



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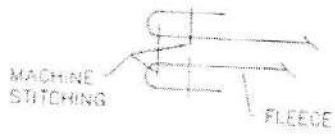

SECTION :-AA
(ENLARGE VIEW)

DRAWN BY	DES.	NAME	CAT HART No. INV
TRACED BY	DRN.	AJAY KUMAR	
PASSED BY	CHD.	R.K. VERMA	
APPROVED BY	TRD.		
	CHKD.		
	SCALE :-		COAT EXTREME COLD CLIMATE

CONTROLLERATE OF QUALITY ASSURANCE (TEXTILE & CLOTHING) MINISTRY OF DEFENCE (DGQA) KANPUR

ALL DIMENSIONS ARE IN MILLIMETER

PROV. SPECN No. INDIA 1987(a)

Local BC

(31)

PROVISIONAL SPECIFICATION NO. IND/TC/4587 (d)

APPENDIX 'A'

THREE LAYER WATER PROOF BREATHABLE FABRIC

S.NO.	PARTICULARS	SPECIFICATION	METHOD OF TEST
1.	Fabric (Three Layer) Nature of material	Membrane sandwiched between two layers of Polyester fabric OG & white	For Polyester- IS : 667:1981, RA 2013
2.	Colour/Shade	One side white & other side O.G	Visual
3.	Width cm	118 minimum	IS:7016 (Part I):1982 RA 2008
4.	Mass/m² (g)	280 +15 g - 20 g (Plus 15 g and minus 20 g)	IS:7016 (Part I):1982 RA 2008
5.	Breaking Load (N) (5 x 20 cm between grip) Warp Weft	1200 N (Min) 1000 N (Min)	IS: 7016 (Part-2):1981 RA 2008 Method A-1
6.	Tear Strength (N) Through Warp Through Weft	90 min 40 min	IS: 7016 (Part -3):1981 RA 2008 Method A-1 Annexure 'E'
7.	Thread/cm i) Warp ii) Weft (Guidance Parameter)	40 ± 3 30 ± 3	IS:1963 : 2004, RA 2008
8.	Water Proof ness Water col. Of 100 cms of one hour	No leakage of water through the fabric or wetting of the outer surface.	IS: 7016 (Part-7) 2000
9.	Colour Fastness to (i) Light (ii) Washing	Rating 5 or better Rating 5 or better	IS: 2454:1985, RA 2013 Test Number C03 of IS/ISO 105-C10:2006
10.	Air permeability (cm³/cm²/sec)	No air permeability	By low pressure method as per IS:11056:1984 RA 2010
11.	Moisture Vapour Transmission mg/cm2/hrs (Upright cup method)	1mg/cm²/hrs min equivalent to 240 gms/m²/24 hrs.	ASTM 96/E 96 M:2005 Test condition for measurement of MVT (i) Temp 32°C±2°C (ii) RH in Chamber - 50 ± 2 % (iii) RH in Cup-100% (iv) Air Velocity 0.02 to 0.3 m/Sec
12.	Resistance to damage by flexing	100000 (1 lac) cycles Min. No Cracking No Delaminate	IS: 7016 (Part 4): 2003 RA 2009
13.	Peel strength N/5 cm	10 N Min both ways	IS : 7016 (Part 5): 2003 RA 2010
14.	Water repellency (Each side)	80 min	IS: 390:1975 RA 2013
15.	pH of Aqueous extract	6.0 to 8.5	IS :1390:1983, RA 2009 (Cold method)

NOTE - Repeatability & reproducibility of test results must be ensured when tested for correlation testing.

BATTING POLYESTER

1. **Material** :

1.1 In the manufacture of batting polyester the fibre used shall be crimp, staple, virgin hollow polyester fibre of denier 3 to 6. The batting polyester hollow cylindrical siliconised & non siliconised fibre shall be mixed in equal proportion.

2. **Processing/ Manufacture :**

2.1 During manufacture batting polyester for the bonding of polyester fibre a low melting point polyester fibre shall be used. This low melting point polyester fibre shall be mixed homogeneously with virgin polyester fibre of 3 to 6 denier. The content of low melting point polyester fibre shall not exceed 20% and shall not be less than 5% in the total weight of batting. The low melting point polyester fibre shall be melt at around 120°C and after melting this low melting polyester fibre act as thermal bonding agent. The low melting point polyester and normal polyester shall be blended in such a way that the thermally bonded batting shall meet the performance of the store.

3. **REQUIREMENTS AND TOLERANCES:**

3.1 The batting polyester shall conform to following particulars and shall withstand the test as described.

S.NO.	PARTICULARS	REQUIREMENTS	METHOD OF TEST
1.	Mass g/m^2	100 + 15 -10	IS : 15891(Part I)-2011
2.	Width in cm	150 ± 1 or as agreed	IS:1964:2001, RA 2010
3.	Nature of Material	100% Polyester	IS:667:1981, RA 2013
4.	Count of Fibre (In denier)	3-6	IS:10014 (Part -2) : 1981, RA 2008
5.	Thickness, mm under pressure of 0.5 g/cm^2	5 mm (Min)	ISO :9073-2-1995 (E)
6.	Compressional recovery '%' (Min)	90 %	As per Appendix 'G'
7.	Resistance to blocking	The batting shall not stick and the surface shall open out clearly	As per Appendix 'H'

Coat of CC

(19)

PROVISIONAL SPECIFICATION No. IND/TC/4587(b)

APPENDIX 'A'

THREE LAYER WATER PROOF BREATHABLE FABRIC

S.NO.	PARTICULARS	SPECIFICATION	METHOD OF TEST
1.	Fabric (Three Layer) Nature of material	Membrane sandwiched between two layers of Polyester fabric OG & white	For Polyester- IS : 667
2.	Colour/Shade	One side white & other side O.G	Visual
3.	Width cm	118 minimum	IS:7016(Part I)
4.	Mass/m^2 (g)	280 +15 g - 20 g	IS: 7016 Pt-I
5.	Breaking Load (N) (5 x 20 cm between grip) Warp Weft	 1200 N (Min) 1000 N (Min)	 IS: 7016 Pt-II Method A-1
6.	Tear Strength (N) Through Warp Through Weft	90 min 40 min	IS: 7016 Pt-III Method A-1 Annexure 'II'
7.	Thread/cm i) Warp ii) Weft (Suggestive Parameter)	40 ± 3 30 ± 3	IS:1963
8.	Water Proof ness Water col. Of 100 cms of one hour	No leakage of water through the fabric or wetting of the outer surface.	IS: 7016 Pt-VII
9.	Colour Fastness to (i) Light (ii) Washing	Rating 5 or better Rating 5 or better	IS: 2454 Test Number C(3) of IS/ISO 105-C10:2006
10.	Air permeability (cc/cm2/sec)	No air permeability	By low pressure method as per IS:11056:1984
11.	Moisture Vapour Transmission mg/cm2/hrs (Upright cup method)	1mg/cm2/hrs min equivalent to 240 gms/m2/24 hrs.	ASTM 96/E 96 M:2005 Test condition for measurement of MVT (i) Temp 32°C±2°C (ii) RH in Chamber 50±2°C (iii) RH in Cup-100% (iv) Air Velocity-0.02 to 0.3 m/Sec
12.	Resistance to damage by flexing	100000 cycles Min No Cracking No Delaminate	IS: 7016(Pt IV)
13.	Peel strength N/5 cm	10 Min both ways	IS : 7016 (Part V)
14.	Water repellency (Each side)	80 min	IS: 390
15.	pH of Aqueous extract	6.0 to 8.5	IS :1390-1983 (Cold method)

NOTE:-Repeatability & reproducibility of test results must be ensured when tested for correlation testing.