Director General CRPF
Block No. 1 CGO Complex, New Delhi-110003
(Govt. of India/Ministry of Home Affairs)
(Phone / Fax- 011-24360155)
(E-Mail- digprov@crpf.gov.in)

No.U.II-98(Spec)/2022-23-Prov-(L/W Sleeping Bag)-14 Dated, the 08 August' 2022

To

The DsG: AR, BSF, CISF, ITBP, NSG, SSB and BPR&D

Subject: Revised QRs/Specification of "Light Weight Sleeping Bag (Improved)" for CAPFs.

I am directed to refer on the subject mentioned above and to say that the revised QRs/Specification in respect of "**Light Weight Sleeping Bag (Improved)**" as per **Appendix-A** which has been recommended by CAPFs Sub-Group has been approved by the competent authority.

2. Henceforth, all the CAPFs may procure the above item required by them, strictly as per the laid down revised QRs/Specification. The earlier revised QRs/Specification of Light Weight Sleeping Bag (Improved) **approved vide CRPF letter No. U.II-98(Spec)/2020-21-Prov-(L/W Sleeping Bag)-14 dated 28/01/2021 is rescinded**.

3. This has the approval of DG, CRPF on 04/08/2022 (empowered vide MHA letter F. No. 11012/02/2009-Fin-I-17 dated 02/01/2018).

Encl: As above.

08/08/22

(D.N. Lal)
DIG(Prov)

No.U.II-98(Spec)/2022-23-Prov-(L/W Sleeping Bag)-14 Dated, the 08August' 2022

Copy forwarded to:-

1. SO (IT), North Block-with request to upload the approved revised QRs/Specification of "Light Weight Sleeping Bag (Improved)" for CAPFs on MHA Website (e-mail ID : soit@nic.in).
2. **Sh. Paritosh Singhal, ACEO(GeM),** Government of India, Ministry of Commerce & Industry, Government e-Marketplace, Jeevan Tara Building, 5-Parliament Street, New Delhi-110001.
3. DIG (IT), Dte Genl., CRPF-with request to upload this approved revised QRs/Specification of "Light Weight Sleeping Bag (Improved)" for CAPFs on CRPF Portal and Selo Module.
4. All Zones/Sectors/GC's/Units HQr for information and necessary action.

08/08/22

(D.N. Lal)
DIG(Prov)

Appendix-"A"

BOARD PROCEEDINGS

Proceedings of	:	Sub-Group of CAPFs
Constituted vide	:	GOI/MHA F.No. 11012/02/2009-Fin-I/Prov-17 dated 02/01/2018.
Assembled at	:	Directorate CRPF, Block No. 01, CGO, Complex Lodhi Road, New Delhi
Assembled on	:	29/07/2022 (at 1500 hrs)
Purpose	:	Framing of revised QRs/Specification of **"Light Weight Sleeping Bag (Improved)"** approved by CRPF letter No. U-II-98(Spec)/2000-21-(L/W Sleeping Bag)-14 dated 28/01/2021.

Composition of Board

1. Sh. Ajay Kumar, IPS, IG(Prov), CRPF
2. Sh. D. N. Lal, DIG (Prov) , CRPF
3. Sh. Sanjeev Kumar, 2-I/C(Prov), CRPF
4. Sh. Mahender Singh, Dy. Comdt., BSF.
5. Sh. Arun Kumar, Dy. Comdt., NSG.
6. Sh. Raj Ranjan, Dy. Comdt., SSB.
7. Sh. R.S. Bisht, Asstt. Comdt., CISF.
8. Sh. Kamlesh Kumar Sharma, Asstt. Comdt., ITBP.
9. Nb./Sub. D.P. Mishra, Assam Rifles

Composition of Co-Opt members

1. Col. Ashwani Kumar PSO(U/A) , BPR&D
2. DR. Sanjeev Shukla, AD, NITRA

2. In pursuance of GOI/MHA OM F.No. 11012/02/2009-Fin-I/Prov-17 dated 02/01/2018, the sub group of CAPFs under the Chairmanship of IG (Prov), CRPF assembled at Directorate General, CRPF to revise the QRs/Specification of **Light Weight Sleeping Bag (Improved)** which was approved vide CRPF letter No. U-II-98(Spec)/2000-21-(L/W Sleeping Bag)-14 dated 28/01/2021 were discussed. The crux of the discussion is as under:-

   i. Considering use of Nylon 6.6 / Nylon 6 material in the Sleeping Bag. As Nylon 6.6 is not manufactured in India and imported from abroad.
   ii. Further it was discussed that, does the tensile strength mentioned in the existing QRs are really required for manufacturing of Light Weight Sleeping Bag or it can be considered to achievable level with Nylon 6.

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3. To have a judicious decision, another all CAPF Sub Group meeting with expert agencies namely NITRA, BIS, BPR&D and representatives of firms namely - M/s Sunil Industries, M/s Kusumgar Corporates, M/s Rednik Auto Exports, M/s Arvind Mills was held on 05/01/2022. In said meeting, BIS, NITRA and Sunil Industries representatives were of the opinion that tearing and breaking strength are quite on higher side and needs to be reviewed to make the QRs generic.
4. As discussed during the meeting dated 05/01/2022, NITRA examined the matter and mailed a draft revised QRs/Specification of LWSB (Improved) to CRPF Directorate on 15/3/2022. The draft QR so received was hosted on MHA and CRPF website for 15 days EoI w.e.f 30/03/2022 to 14/04/2022.
5. The comments/suggestion received from the firms on EoI hosted at CRPF as well as MHA website were discussed in a meeting held on 06/05/2022 with representatives of CAPFs Sub-Group member, expert members form NITRA, BIS and representatives of firms from M/s 6X, M/s Arvind Mills, M/s Kusumgar corporate, M/s Sunil Industries. During the meeting, M/s Sunil Industries submitted that tearing and breaking strength on the draft QRs/Specification is still on the higher side. Besides tearing and breaking strength, few other aspects like – Non woven inner lining, slide fastener, slider puller cord, packing bag, cord piping etc. were also discussed and observations were resolved amicably with minute deliberations with firms and expert agencies.
6. Based on the minutes of the meeting held on 06/5/2022, Prov. Dte, CRPF vide letter No.U.II-98(Spec)/2019-20-Prov(L/W Sleeping Bag)14 dated 20/05/2022 approached various firms/vendors to offer their views /comments on the tearing and breaking strength of draft QRs/Spec.
7. The comments and views of the firms received on tearing and breaking strength, NITRA was requested to examine the matter and offer their valuable views/comments vide CRPF Directorate letter No. U.II-98(Spec)/2019-20-Prov(L/W Sleeping Bag)14 dated 16/06/2022. In turn, NITRA vide email dated 17/6/2022 conveyed that tearing strength of 80 N for warp and 65 N for weft is achievable by atleast four firms in the market.
8. Based on the comments of NITRA regarding tearing and breaking strength, another meeting on 24/06/2022 was held with CAPFs subgroup members, expert members of BPR&S, BIS and NITRA as well as representatives of firms namely M/s 6X, M/s Arvind Mills, M/s Kusumgar corporate, M/s Sunil Industries, M/s Ganpati Interglobe, M/s Kailadevi Traders, M/s Mayur Sales, M/s Oriental Mills. In this meeting all the QRs including tearing and breaking strength were unanimously agreed upon by expert agencies and firms. Regarding colour of the sleeping bag, Olive Green was decided and NITRA was requested to define the parameters of OG shade.
9. As discussed during the meeting on 24/6/2022, NITRA forwarded revised draft QRs/Specification of LWSB according to the discussion/deliberation in the meeting on 06/07/2022.
10. Final Draft revised QRs/Spec forwarded by NITRA was examined and hosted on MHA and CRPF website for 15 days w.e.f. 08/07/2022 to 25/07/2022.

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11. On EoI, following firms submitted their views/consent on the draft revised QRs/Spec. Details of firms are as under:-

i. **M/s DGM, Corporate Affairs, New Delhi**. "Interested to dealing the above product and we provide the sample of the product as per QRs/Specification".

ii. **M/s JCT Ltd.**- "Give confirmation on the fabric specs as per draft QR".

iii. **M/s Kusumgar Corporates Pvt. Ltd.**- "Fabric specification mentioned in the EoI are achievable".

iv. **M/s Sunil Industries Ltd.** – "Proposed revised specification for LWSB(Improved) is acceptable".

13. Having gone through carefully, the draft QRs/Specifications of "Light Weight Sleeping Bag (Improved)" and after due deliberation by the CAPFs Sub-Group came to the conclusion that th e draft QRs/ Specification of the item prepared by NITRA are acceptable and generic in nature and will promote fair and wider participation.

14. Accordingly, the CAPFs Sub Group and expert members recommends for submitting the QRs/ Specifications of "Light Weight Sleeping Bag (Improved)" to DG, CRPF for approval.

Member:..... Nb. Sub. D P Mishra, Assam Rifles	Member:..... Kamlesh Kumar Sharma, Asst. Comdt, ITBP
Member:..... R.S. Bhist, Asst. Comdt, CISF	Member:..... Mahender Singh, DC, BSF
Member:..... Raj Ranjan, DC, SSB	Member: ..... Arun Kumar, DC, NSG
Member:..... Sanjeev Shukla, AD, NITRA	Member:..... Sanjeev Kumar Singh, 2I/C(Prov), CRPF
Member: ..... Col. Ashwani Kumar, PSO(U/A), BPR&D	Member :..... D. N. Lal, DIG, (Prov), CRPF
Chairman :..... Ajay Kumar, IPS, IG(Prov) HQr, CRPF	

QRs/Specification of "Light Weight Sleeping Bag (Improved)

0.0 FORWARD

0.1. This specification has been prepared by Office of the Directorate General of Police, CRPF on the authority of The Director General of Police, CRPF.

0.2. This specification is for use by the CRPF.

0.3. This specification would be used for manufacture, quality assurance and procurement of the item.

0.4. Quality assurance authority for the item covered in this specification is Office of the Directorate General of Police, CRPF, New Delhi. All enquiries regarding this specification, including those relating to any contractual conditions contained therein shall be addressed to the Quality Assurance authority at the following address:

Office of the Directorte General of Police,
CRPF, Ministry of Home Block No-1, CGO Complex, Lodhi Road,
New Delhi-03

0.5. Copies of the specification can be obtained from:

Office of the Directorte General of Police,
CRPF, Ministry of Home Block No-1, CGO Complex, Lodhi Road,
New Delhi-03

0.6. This specification holds good only for the supply order for which it is issued.

0.7. The Quality Assurance Authority reserves the right to amend or modify this specification as and when required.

0.8. The Quality Assurance Authority is the competent authority to grant concessions, if any, in respect of any clause contained in this specification.

0.9. For the purpose of deciding whether a particular requirement of this specification is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS:2-1960 (Reaffirmed 2006). The number of significant places retained in the rounded off value should be the same as that of the specified value in this specification.

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1. 0 SCOPE

1.1 The specification prescribes the requirement of "Sleeping Bag"including packing bag.

1.2 This specification does not specify the general appearance, luster, feel, type of finish of "Sleeping Bag".

.2.0 MATERIAL AND MANUFACTURE

2.1 The design and shape of the "Sleeping Bag" shall be as per Fig. 1 to 7. Wherever tolerance in dimensions are not given following tolerances shall be applicable:

i) Dimensions upto 50 cm : ±1.00 cm

ii) Dimensions from 51 cm and above :±1.50 cm

2.2 Following are the components used in the manufacture of "Sleeping Bag":

Component No.	Name of the component	Description
1& 2	Outer shell fabric and Inner shell fabric	1. Nylon multifilament yarn shall be used. 2.For guidance i) warp count: 70 Denier, ii) weft count: 70 Denier 3. Weave: Plain with Rib Stop(One side rib after 16±2 threads and other side rib after 11±2 threads , rib may be of 3 yarns consisting each of 3 yarns) 4. The fabric shall be 'Heat set' and fully shrunk. 5. Olive green shade and finished with water repellent finish. 6. Table-4 for component-1 and component-2
3	Nonwoven inner lining fabric(**Scrim**)	1. Polypropylene/ Polyester non woven fabric on both side of the Polyester Fibre Batting (FibreFiiling component -4). 2. Bursting strength(kg/cm^2). Min.: 1.2 3. Mass=20±2 g/m^2 4. WhiteColour
4	Fibre filling (Polyester batting)	1. Polyester fibre suitably mixed with hollow fibre shall be used. 2. For guidance 4 Denier hollow fibre batting of app.70 ±5 g/m^2 may be used subject to limitation imposed by weight and Clo Value . 3.Compression recovery: 90% Min when tested as per IND/ TC /4578 (C) 4. White colour

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5	Slide fastener 145±1 cm length	Following tests shall be carried out as per IS 14181:2002.Amended 2016 1. Designation: Heavy or better 2. Type: Two-way open-end type "D" slide fastener. 3.Double puller 4.Colour: Visual Matching with Component-1 & 2 5.Security of interlocking of textile chain lateral or crosswise strength: 950 N (Min.) 6.Security of attachment of puller to slider: 350 N (Min.)
6	Non-woven backing material	1. Polyester batting shall be used. 2. Mass (Min.)=50 g/m^2 3. White Colour
7	Slider puller cord with end lock	1. For guidance Nylon filament yarn of 700 Denier (3 ply) may be used 2. Length of the cord =10 cm ± 2 cm and diameter= 3.0 mm (Min), Linear weight : 9.0 g/meter (Min) 3. Black colour 4. End lock: Black in colour and made out of nylon (Fig 6B)
8	Nylon Tape 25±1 mm wide	1. Nylon multifilament yarn shall be used. 2.Linear weight : 5.5 g/meter (min) 3.For guidance i) Warp count: 600 Denier ii) Weft count:320 Denier iii) Total ends(full width): 50±2 .Picks per inch: 28 minimum IV). Weave: 1 up 1 down plain manufactured on Needle loom shall be used .. 5. Black colour
9	Cord Piping on the edge of slide faster	1.Polyester satin Piping: 2.Linear weight : 2.2 g/m (min) 3.For Guidance : Ends per dm: 850 Min :.Picks per dm: 320 Min 4.Weave: Satin 5. Width: 25±2 mm 6. Black in colour **7.Cotton Cord:** I)Linear weight 2.5 g/ meter (Min) .Diameter : 2.0 mm (Min) II)For Guidance : Count of cord:0.25 Ne {4fold 17 ply i.e 4/17/17s)
10	Hook and Loop Fastener	Following tests shall be carried out as per IS 8156: 2014 1. Identification of Material **Hook**: Nylon 66 : **Loop**: Nylon 66 or Nylon 6 2. Width :25 mm ±2mm 3. Peel strength: 200 gm/cm (Min) 4. Shear strength - Normal: 900 gm/cm^2 (Min) -After endurance: 675gm/cm^2 (Min) 5. Colour: Black
11	Elastic Draw Cord	1. For guidance : Elastic cord made out of rubber threads/ strips in core covered with polyester filament yarn in sheath may be used. 2. Length of the cord =140 cm (Min) and Diameter = 3.0 mm (Min.) 3. Linear weight : 14.0 g/m (min) 3. Blackcolour
12	Draw Cord lock	1. Made out of Nylon, 2. For dimension refer Fig. 6A. 3. Black Colour

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13	Nylon Cord (packing bag closer)	1.For guidance Nylon filament yarn of 700 Denier (3 ply) may be used 2.Length of the cord =100 cm (Min) and diameter= 3.0 mm (Min) , Linear weight = 9 g/m (min) 3. Blackcolour
14	Nnylon Tape 25±1 mm wide (With packing bag)	1. Nylon multifilament yarn shall be used. 2.For guidance i) Warp count: 600 Denier ii) Weft count 600 Denier iii)Total ends(full width): 96. Picks per inch: 32 3. Weave for guidance: Refer Fig. 7. Needle loom shall be used to manufacture 4. Linear weight : 18 g / m (Min.) , Width : 25±1 mm 5. Black Colour
15	Size indicator label 10±1 mm wide	1. Made out of Polyester fabric 2. Folded length 15±1 mm 3. Colour white 4. Designated "R" (right side)
16	Ladder lock	1. Made out of Nylon. 2. For dimension refer Fig. 6C. 3. Black Colour
17	Sewing Thread	1. Polyester/ nylon sewing thread of 3/60s Ne (For guidance) 2. Green Colour

NOTE: Guidance parameters are for manufacturer's guidance only. Non Compliance of the guiding parameters may not be reason for rejection .

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2.3 Sleeping bag shall be made of a thick layer of filling batting (Component-4) of polyester hollow and normal fibre (for insulation purposes) sandwiched between non-woven inner lining (Component-3) and outer shell fabric (Component-1). Manufacturers may sandwich filling material (batting) between two nonwoven fabric layers and then stitched with outer layer fabric. However,the total weight of the sleeping bag shall be maintained as per Table 3. All the three layers are stitched together (No. of stitches per centimetre: 3) width-wise at a distance (20± 3) cm from one seam to another to have a quilting effect. Further, the same stitching pattern shall be followed for all sides of the sleeping bag. Finally, an inner shell fabric (component 2) is stitched along with side of the above combination to give a finished look to the inside of the sleeping bag. Figure- 1 (a) and 1(b) represent the assembly of the "Sleeping bag". Figure-2 refers to the dimensions of the sleeping bag.

The opening and closing of the Sleeping bag are carried out using a Slide fastener (Component-5). Slide fastener is attached to the opening of the sleeping bag using a lock-stitch. Further, non-woven backing material (Component-6, Refer Fig. 3) shall be provided below the tape of Component-5 to give extra strength to the stitching. A polypropyleneor nylon or polyester tape (Component-8, Refer Fig. 3) shall be provided to one side of the Component-5 so that fabric shall not come in between the slide fastener teeth. Further on the same side of the nylon tape an insulating rectangular tube running alongside and beneath the Component-5 shall be provided to prevent heat loss through the teeth of Component-5. This tube shall be made by stuffing Component-4 between two layers of Component-2. A black colour cord piping (Component-9) is provided on the face side of Component-5, so that fabric shall not come in between the teeth of the slide fastener chain (Refer Fig. 3) when the slide fastener is either opened or closed.

A covering flap with a hook fastener (Component-10) is attached to the right side of Component-5 to prevent heat loss. This flap shall be attached to the loop fastener (left side) stitch to the outer shell fabric (Component-1). For more clarification, Fig. 3 shall be referred to. Also, triangular insulation (Fig-2) made of a thick layer of filling

(Component-4) sandwiched in between outer shell fabric (Component-1) is provided below the slide fastener ending to prevent heat loss at this area.

The way all the components are attached is shown in Fig. 3.

2.4 Hood: It shall be made out of Components-1,2, 3 and 4. The hood of the "Sleeping Bag" is shown in Figure 1 (a). The dimensions of the Hood of "Sleeping Bag" are given inFig. 2. Hood shall be provided with an elastic draw card (Component-11) placed in a drawcord tunnel {Refer Fig. 1(a)}. The objective of Component-11 shall be to open and close the hood effectively with the help of a cord lock(Component-12). The drawcord tunnel shall be made out of Component-1 and Component-4.

2.5 Pockets: "Sleeping Bag" shall have one pocket attached to the inner side of the sleeping bag (left side) made out of Component-2. Opening and closing of the pocket shall be with the help of Component-10 (25mm x 38 mm). The pocket shall be 6.0 cm wide and 7.5 cm deep.

2.6 Hanging tab: The sleeping bag shall be provided with three hanging tabs for storage and drying purposes. The positioning and the way they are attached are shown in the Fig. 2.

2.7 Packing bag (Stuff sack): A stuff sack shall be provided to stuff the sleeping bag. It shall be made out of Components-1, 13, 14 and 16. Fig. 4 shows its assembly. Its dimensions are shown in Fig. 5. A side indicator label (Component-15, Refer Fig 4) shall be attachedto the packing bag. The folded label shall be printed with an alphabet "R" on both sides, whose dimensions are 4X4 mm.'R' indicates the right side. The packing bag shall be provided with 4 ladder locks (Component-16) and an equal number of nylon tapes (Component-14). A pulling handle made out of single fold nylon tape (Component-14) (stitched by lockstitch and bartack at the end for seam security against wear and tear) shall be provided at the other end. For the exact location of the pulling handle,Fig.5 may be referred. The dimensions for the packing

bag are for guidance only. The sleeping bag shall be perfectly accommodated in this packing bag. The packing bag will be stitched by using

3.0 STITCHING:

3.1 Lock stitch shall be employed to assemble components of "Sleeping Bag". In the case of Lock stitch, three stitches per cm shall be employed. The stitching shall be done with even tension and all loose ends shall be securely fastened off.

3.2 The packing bag of the sleeping bag shall be sewn with lapped seam using lockstitch.

3.3 Polyester / nylon sewing threads of 3/60s Ne count (Component-17 of clause 2.2), matching with Component-1may be used.

4. FREEDOM FROM DEFECTS:

The "Sleeping Bag" shall be visually examined. It shall be evenly stitched, free from missed stitches, holes, cuts, puckering and other defects. The colour of the sewing thread used for stitching shall not bleed or stains. The "Sleeping Bag" shall be free from dyeing defects.

The "Sleeping Bag"shall be free from any other defects which may significantly mark the appearance or serviceability.

5.0 REQUIREMENTS

5.1 For general requirements sleeping bag shall meet the requirement as given in the Table-3

5.2 Component-1 and Component-2 used in the "Sleeping Bag" shall conform to the requirements as given in Table 4. Specification for colour used in Component-1 &2 shall be as given in Table 5. Also, refer to clause 2.2.Seller/vendor shall provide 2 meters of each component's fabric along with the sleeping bag.

5.3 The Component-3 used in the "Sleeping Bag" shall meet the requirements as given in Table 6.Also, refer to clause 2.2. Seller/vendor shall provide 1 meter of component-3 fabric along with the sleeping bag.

5.4 The Component-4 used in the "Sleeping Bag" shall meet the requirements as given in Table 7.Also, refer to clause 2.2.

5.5 The component-5 used in the "Sleeping Bag" shall meet other requirements as per clause 2.2. Seller/vendor shall provide 10 numbers of extra Slide fastener (Component-5) for conforming IS 14181.

5.7 The component-6 used in the "Sleeping Bag" shall meet the requirement as given in clause 2.2.

5.8 The Component-7 used in the "Sleeping Bag" shall meet the requirements as given in clause 2.2.

5.9 The component-8 used in the "Sleeping Bag" shall meet the requirement as given in clause 2.2.

5.10 The component-9 used in the "Sleeping Bag" shall meet the requirement as given in clause 2.2.

5.11 The component-10 used in the "Sleeping Bag" shall meet the requirement as given in clause 2.2. Seller/vendor shall provide 10 meters of extra Hook and Loop fastener (Component-10) for conforming IS 8156.

5.12 The component-11 used in the "Sleeping Bag" shall meet the requirement as given in clause 2.2.

5.13 The components-12 and 16 used in the packing bag of "Sleeping Bag" shall meet the requirement as given in the Table-8 (Also see clause 2.2).

5.14The component-13 used in the packing bag of "Sleeping Bag" shall meet the requirement as given in clause 2.2.

5.14 The component-14 used in the packing bag of "Sleeping Bag" shall meet the requirement as given in clause 2.2.

5.15 The component-15 used in the packing bag of "Sleeping Bag" used in the "Sleeping Bag" shall meet the requirement as given in clause 2.2.

6.0 SEALED SAMPLE:

In order to illustrate or specify the indeterminable characteristics such as general appearance, workmanship , luster and feel of the "Sleeping Bag", a sample has been agreed upon and sealed; the supply shall be conformity with the sample in such

respects.The custody of the sealed sample shall be a matter of prior agreement between the buyer and seller.

7.0 MARKING

The "Sleeping Bag" shall be legibly and indelibly marked with the following information:

i) Manufacturer's name, initials or trade-mark;
ii) Instructions for storage and care;
iii) Date of manufacture; and
iv) Any other information required by the law in force and/or by the buyers.

8. PACKING

The "Sleeping Bag"shall be delivered in a clean and dry condition. One such bag shall be packed in a polyethylene bag. Four such "Sleeping Bag"shall be made into one unit pack by suitably placing in the cardboard box (Cases).

Unless otherwise agreed upon by the buyer and seller the "Sleeping Bag" shal be packed in cases in conformity with the procedure laid down in IS 1347: 1972 or IS: 1980.

Before dispatch each box, it shall be legibly marked by stencil showing the following information:

i) Nomenclature and Category number of the store
ii) Quantity packed in the box
iii) Serial number of the box
iv) Month & Year of packing
v) Name/Trademark of the Manufacture
vi) Gross weight of the box in Kg.
vii) Name & Address of the consignee
viii) Inspection note number and date

8.0 SAMPLING AND CRITERIA FOR CONFORMITY

8.1 The sampling procedure detailed in 8.2 to 8.3 shall give desired protection to the buyer and the seller, provided that the lot submitted for inspection is homogeneous. To achieve this, the manufacturer shall maintain a system of process control at all stages

of manufacturing ensuring the "Sleeping Bag" tendering by him for inspection to comply with the requirements of this standard in all respects.

8.2 The manufacturer should offer the stores serially numbered and arranged in such a way that the entire lot is accessible to the inspecting officer. The conforming of a lot to the requirement of this specification shall be determined on the basis of the tests carried out on the samples selected from it. The number of samples shall be selected at random in accordance with Table 1.

8.3 The number of test samples and the criterion for conformity for various characteristics shall be as given in Table 2:

8.4 **Lot:** For the purpose of conformance inspection and test sampling, a lot is defined as all the completed "Sleeping Bag"of the same size and type, with same assemblies, produced in one facility, using the same production processes and materials, and being offered for delivery at one time to buyer against a dispatch note.

Table 1: "Sleeping Bag"to be selected from a lot and permissible number of non-conforming "Sleeping Bag"

Lot size	Non – Destructive Testing		Destructive Testing	
(1)	No. of "Sleeping Bag"to be selected (2)	Permissible number of non-conforming "Sleeping Bag" (3)	No. of "Sleeping Bag"to be selected (4)	Permissible number of non-conforming "Sleeping Bag" (5)
0 – 300	10	1	2	0
301 - 500	20	2	3	0
501 – 1000	30	3	5	0
1001 – 3000	50	5	8	0
3001 and above	80	5	13	1

Table 2: Criterion for conformity

Characteristics	Number of test samples	Criteria for conformity
Dimensions, Nos. of ends & picks, visual colour inspection and freedom from defects	All the "Sleeping Bag"selected according to the column 2 of table-1	Non-conforming "Sleeping Bag"not to exceed the corresponding number given in column 3 of table-1
Dimensional change, pH value, total mass, breaking strength, tear strength, abrasion resistance, water repellency, colour fastness to various agencies, Thermal insulation.	All the "Sleeping Bag"selected according to the column 4 of table-1	Non-conforming "Sleeping Bag" not to exceed the corresponding number given in column 5 of table-1

Note: Test methods may be taken as guidance wherever specimen size is not sufficient as per standard.

Table 3: General requirements of sleeping bag

Sl. No.	Characteristics	Requirements	Test Method
1	Total Mass including packing bag, g, Maximum	1150	Using Calibrated weighing machine
2	Thermal Insulation (Single layer of sleeping bag), clo, Minimum	2.0	ISO 11092 (R_{ct}) (Only for material under testing)
3	Length of the sleeping bag, cm	207 to 215	Measuring tape
4	Width (W) of the sleeping bag	As mentioned in the Fig. 2 (W1 to W8)	Measuring tape (Tolerance as given in clause 2.1)

Table 4 : Requirements of "Sleeping Bag"–Component-1 & 2

Sl. No.	Characteristics	Requirements	Test Method
1	Nature of fibre/filament	Nylon	IS : 2005
2	Weave	Rip stop	Visual
3	End/dm, Minimum	450	IS 1963
4	Picks/dm, Minimum	320	IS 1963
5	Mass, g/m^2	70±5	IS 1964
6	Breaking strength, Newton (Minimum) -Warp-wise -Weft-wise	 630 385	IS: 1969 (5 X 20 cm specimen size)
7	Tearing Strength, Newton (Minimum) - Warp-wise - Weft-wise	 80 65	IS 7016 Part-3, Method A-1 with amdt No. 1
8	Abrasion Resistance (Martindale) -After 20,000 cycles	No thread breakage	IS: 12673
9	Colour fastness to washing - Change in colour - Staining on adjacent fabric	 4 or better 4 or better	IS/ISO 105 C10 C(3)
10	Colour fastness to perspiration - Change in colour - Staining on adjacent fabric	 4 or better 4 or better	IS/ISO 105 E04
11	Colour fastness to rubbing - Dry - Wet	 4 or better 4 or better	IS/ISO 105 X12
12	Colour fastness to light	5 or better	IS/ISO 105 B02
13	Dimensional Change due to relaxation, both directions, percentage, maximum	2.0	IS 2977
14	Water repellency (Face side) Initial	Spray rating Min. 80	IS 390(If water is penetrated through the fabric and surface is not wet, sample will be considered as failed.)
	After 20 washes (Washing as per IS 15370:2005 Type A machine, Procedure 5A)	Spray rating Min. 70	
15	pH value of aqueous extract	6.0-8.0	IS1390 (Cold method)

Note: Latest version of test methods shall be taken

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Table-5: Specification of colour of "Sleeping Bag (Component-1&2; Outer & Inner shall Fabric)

(Guideline of AATCC Test method 173 : 2009 & AATCC Evaluation Procedure 7 : 2015)

Colour	:	**Olive Green**
System	:	**CIE LCH**
Illuminant Observer	:	**D 65**
Standard Observer	:	**10 Degree**

Tristimulus Values :

X	Y	Z
6.345	6.893	5.333

L C H :

L	C	H
31.562	8.699	103.221

CMC (l:c)	:	**2:1**
Colour difference, ΔE_{cmc}	:	**$\leq$ 2.5**

Interpretation of Results :

i) If ΔE_{cmc} is less than or equal to $\leq$ **2.5**, then the sample is acceptable.

ii) If ΔE_{cmc} is greater than $\leq$ **2.5**, then the sample is unacceptable.

Note-1: Absorbance/reflectance/ transmittance are affected by surface characteristic features of the substrate. Therefore, the comparison should be made between samples of the same type i.e., identical fabric construction parameters and filament/ fibre composition.

Note-2: Test should be carried out after proper conditioning as per AATCC 173 using a Diffuse (sphere) geometry spectrophotometer.

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Table 6: Requirements of "Sleeping Bag"–Component-3

Sl. No.	Characteristics	Requirements	Test Method
1	Nature of fibre/filament	Polypropylene/Polyester	AATCC 20
2	Mass, g/m^2	20±2	IS 15891 (Pt-1)
3	Breaking strength, Newton -Warp-wise -Weft-wise	 8 Minimum 15 Minimum	IS: 15891 (Part -3)

Note: Latest version of test methods shall be taken

Table 7: Requirements of "Fibre fill (Polyester Batting) –Component-4

Sl. No.	Characteristics	Requirements	Test Method
1	Nature of fibre	Polyester	IS 667
2.	Fibre hollowness % by volume (for hollow fibre), Minimum	14	Microscopic examination
3	Compression recovery , %	90% Min	IND/ TC /4578 (C)
4	Colour	White	Visual

Note: Latest version of test methods shall be taken

Table 8: Requirements of "Sleeping Bag"– *Component-12 and 16*

Sl. No.	Characteristics	Requirements	Test Method
1	Nature of material	Nylon	-Nylon is Soluble in formic acid -Melting point of Nylon is 215°C to 220°C
2	Resistance to accelerated ageing	No apparent change of aged samples in comparison to the original sample in respect of softening, brittleness, colour, tackiness etc.	Keep the sample in a hot air circulating oven at 70±1°C for 24 hrs.
3	Resistance to low temperature	No apparent change of test samples in comparison to the original sample in respect of brittleness &crackness when bent at 180° and back.	Keep sample in deep freezer at (-)10°C for 24 hrs.
4	Colour fastness to light	4 or better	IS /ISO 105 B02

Note: Latest version of test methods shall be taken

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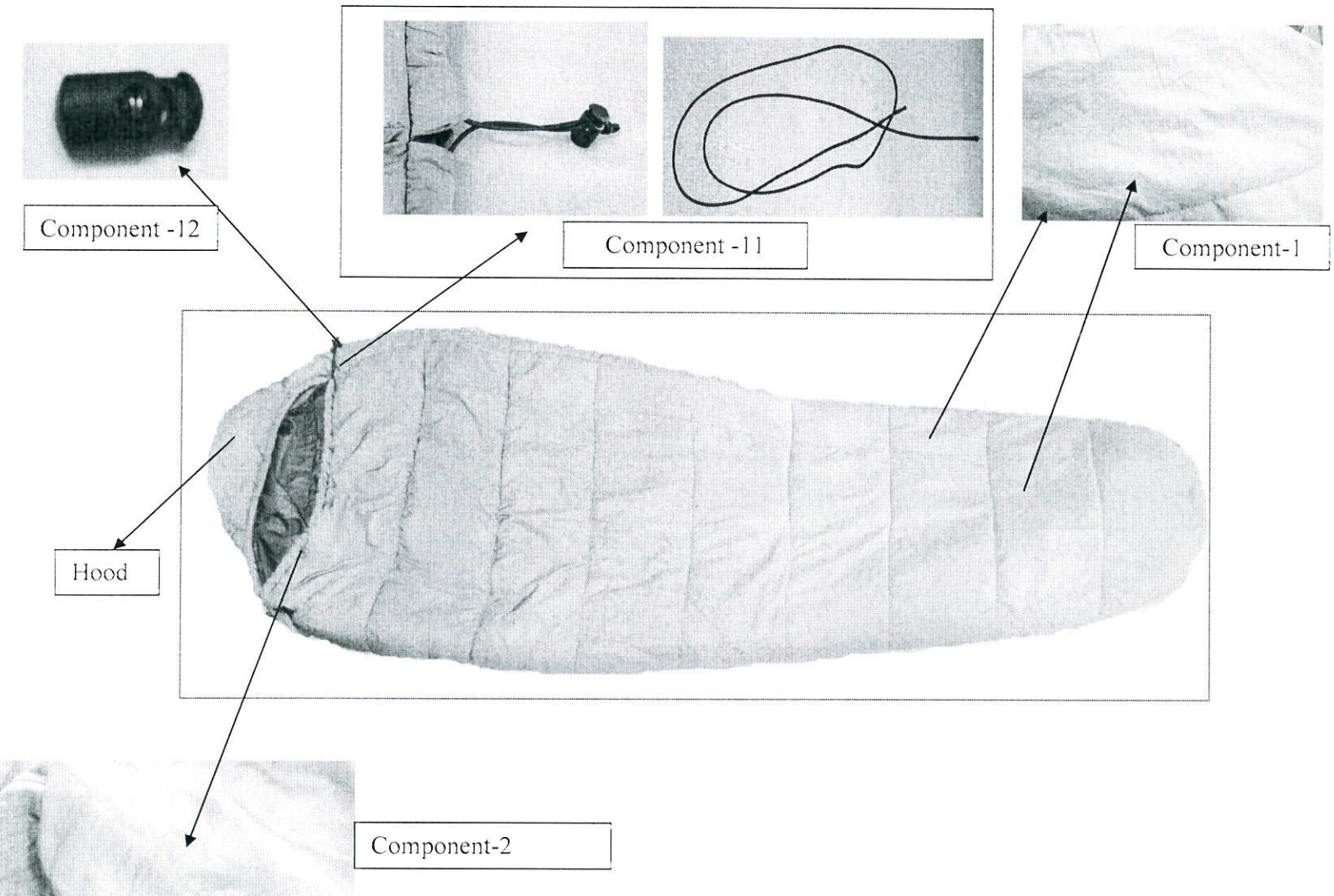
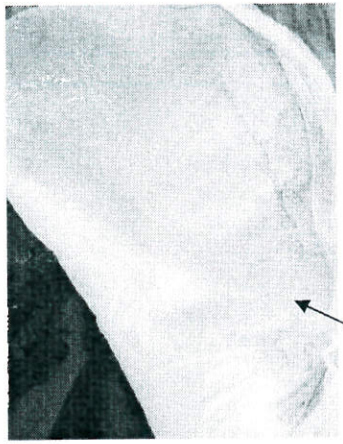
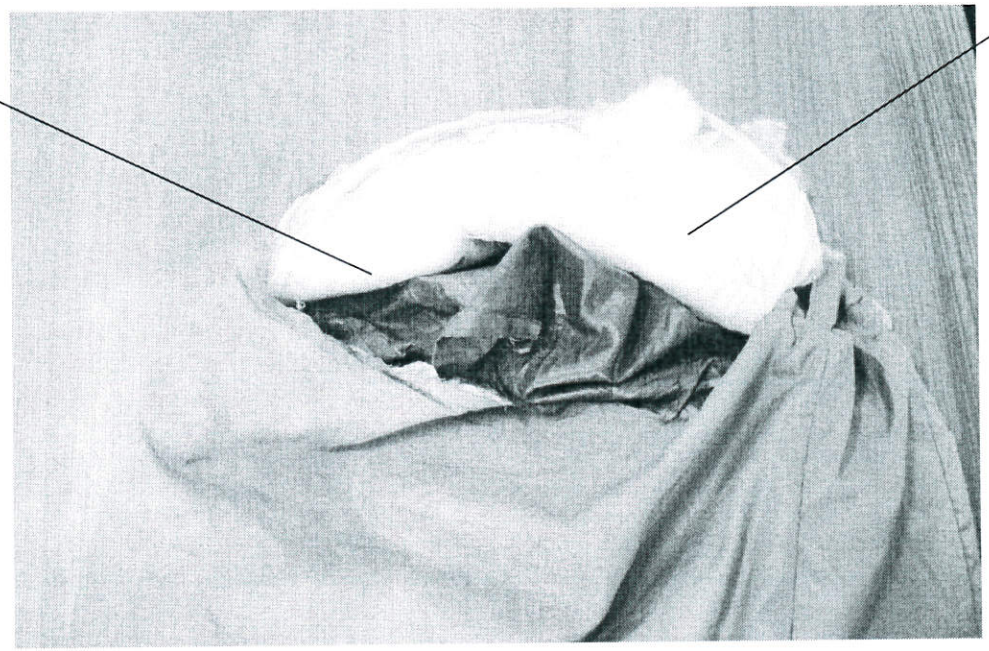
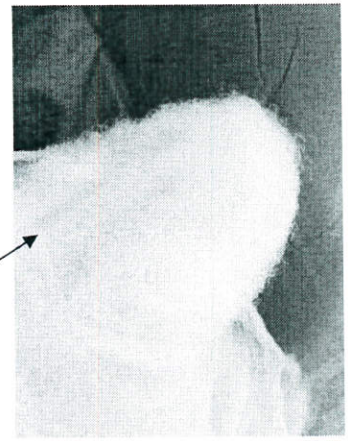


Fig.1 (a)-Assembly of a sleeping bag



Component -3





Component -4

Fig.1 (b)-Assembly of a sleeping bag

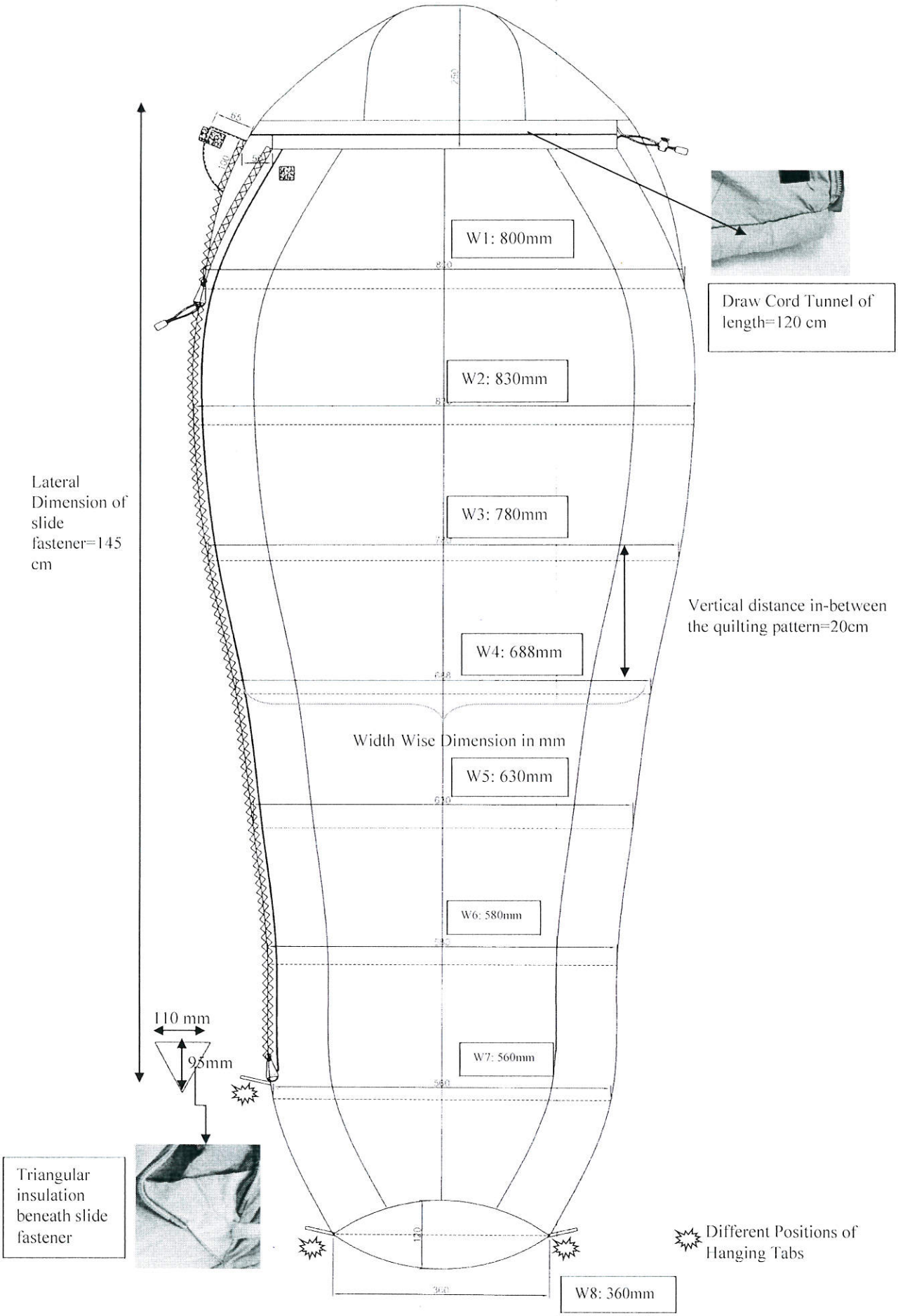


Fig.2-Dimension of a sleeping Bag (Dimensions are in mm and cm)

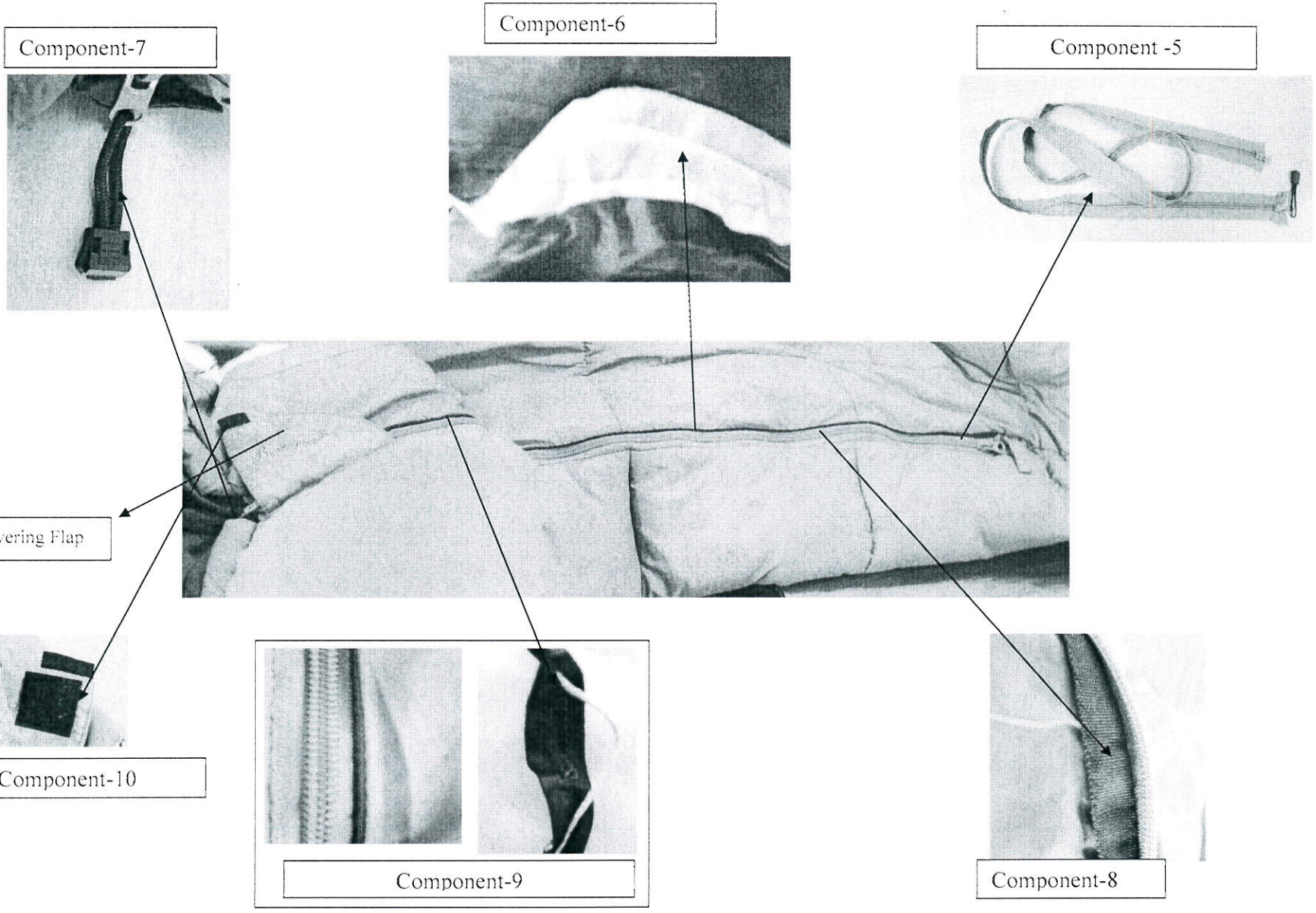


Fig.3-Assembly of a slide fastener in a sleeping bag

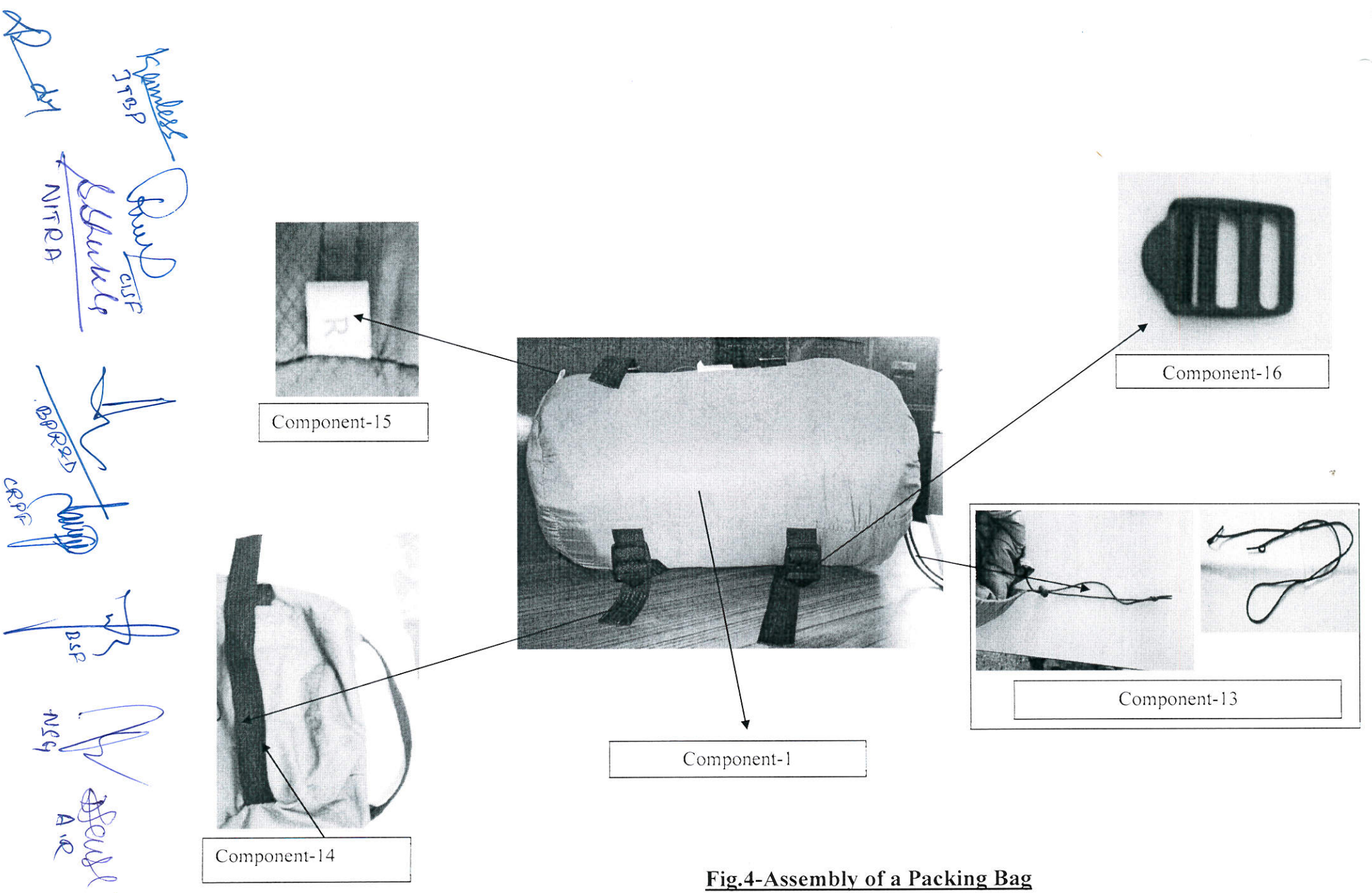


Fig.4-Assembly of a Packing Bag

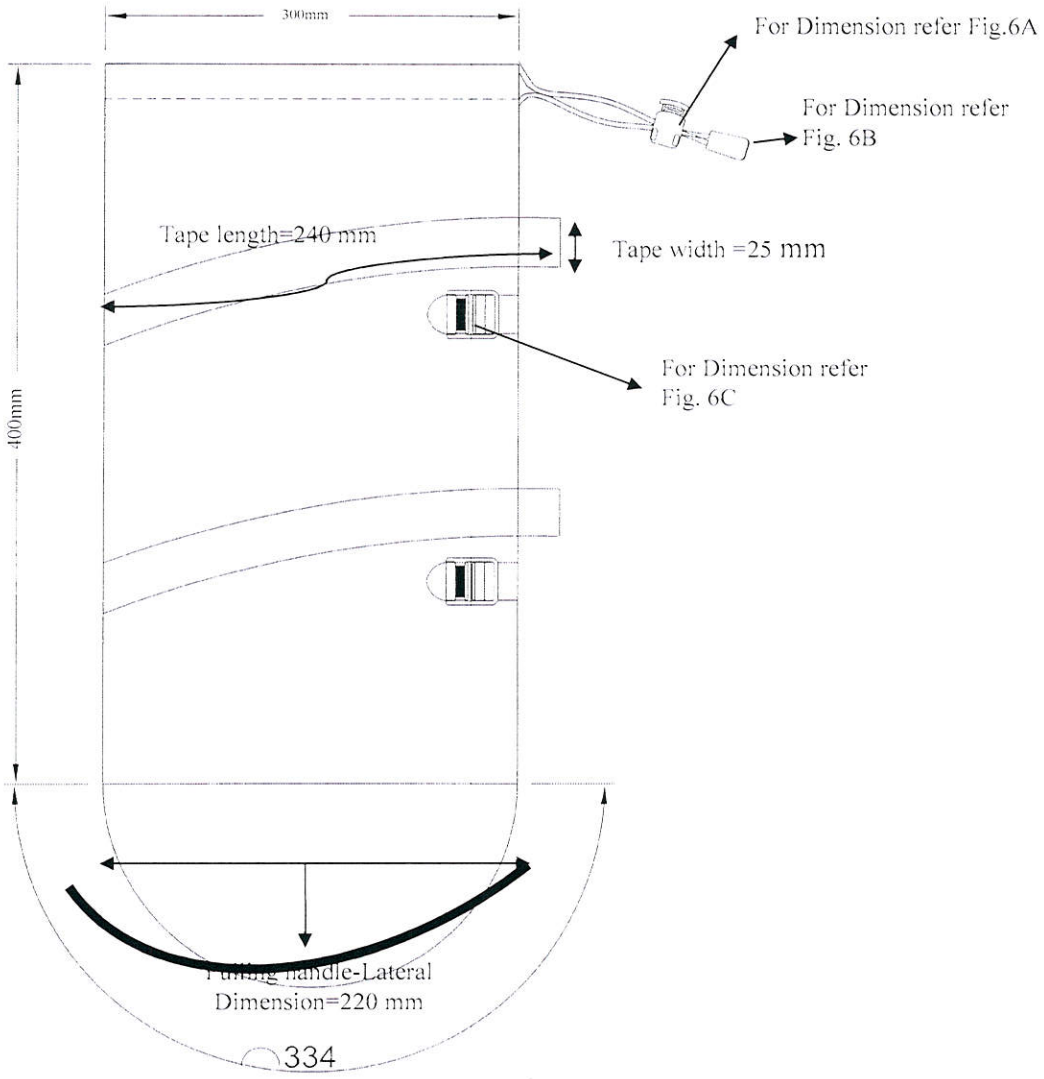


Fig.5-Dimension of a Packing Bag for guidance (All dimensions are in mm)

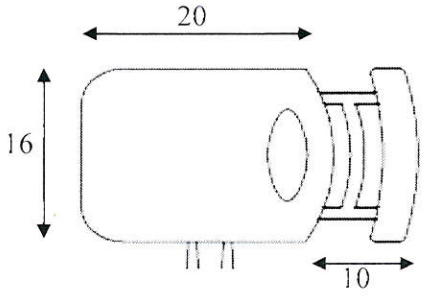


Fig.6A-Draw Cord Lock
(Dimensions in mm)

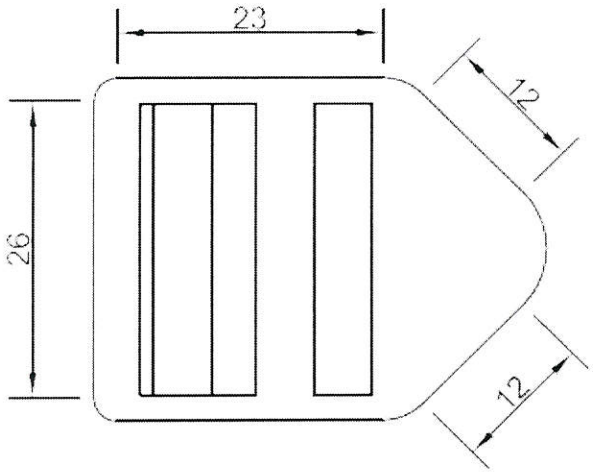


Fig.6C- Ladder
Lock(Dimensions in
mm)

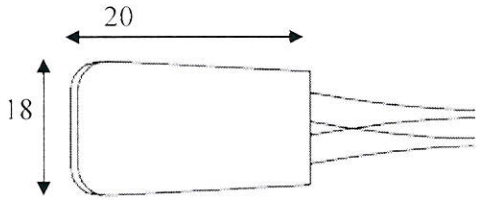


Fig.6B-Nylon Cord End
Lock(Dimensions in mm)

Fig.6-Components used in a Sleeping/Packing Bag

B	X		X	X	X		X	X	X		X	X		X		X	X	X		X	X	X		X	X		8
F			X				X				X		X			X				X				X		X	7
B	X	X	X		X	X	X		X	X	X			X	X	X		X	X	X		X	X	X			6
F	X				X				X				X	X				X				X				X	5
B	X		X	X	X		X	X	X		X	X		X		X	X	X		X	X	X		X	X		4
F			X				X				X		X			X				X				X		X	3
B	X	X	X		X	X	X		X	X	X			X	X	X		X	X	X		X	X	X			2
F	X				X				X				X	X				X				X				X	1
	1	2	3	4	5	6	7	8	9	10	11	12	13	1	2	3	4	5	6	7	8	9	10	11	12	13	

Fig.-7 Nylon tape 25 mm wide –Weave repeat
(F-Face, B-Back)

Note:

1. Warp No. 1-12 are body ends
2. Warp No. 13 is stitching end
3. One pick in weave represents two threads

9.0 REFERENCES

Sl. No.	Method/Spec. number	Title
1	IS:397(Part I) : 2003	Method for statistical quality control during production : Part I Control charts for variable
2	IS 2005	Fibre Analysis: qualitative & quantitative
3	IS:6359: 1971	Method for conditioning of Textiles
4	IS:10789:2000	Classification and terminology of stitch types used in seams
5	IS:11161:2000	Textiles-seam types-classification and terminology
6	IS:1963:1981	Method for determination of thread per unit length in woven fabric
7	IS:1964:1970	Methods for determination of weight per square meter and weight per linear meter of fabric
8	IS: 1954:1990	Determination of length and width of woven fabric
9	IS: 1969: 1985	Method for determination of breaking strength and elongation of woven fabrics
10	IS: 6489: 1993	Textile-woven fabrics-determination of tear resistance by falling pendulum method.
11	IS: 12673: 1989	Textile fabrics-Abrasion resistance
12	IS /ISO 105 C10	Method for determination of colour fastness of textile material to washing (IS /ISO 105 C10 C(3)
13	IS /ISO 105 E04	Method for determination of colour fastness of textile material to perspiration
14	IS/ISO 105 X 12	Method for determination of colour fastness of textile material to rubbing
15	IS /ISO 105 B02	Method for determination of colour fastness of textile material to artificial light (Xenon lamp) pressing
16	IS 1390 : 1983	Method for determination of pH value of aqueous extract of textile materials
17	AATCC Test method 173 : 2005	CMC: Calculation of small colour differences for acceptability
18	AATCC Evaluation Procedure 7 : 2003	Instrumental assessment of the change in colour of a test specimen

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