

No. U-II-25/2011-12-Prov-(CoBRA)  
 Government of India/भारत सरकार  
 Ministry of Home Affairs/गृह मंत्रालय  
 Police Modernization Division/पुलिस आधुनिकीकरण प्रभाग  
 Prov.I Desk/संभरण-I डेस्क

26, Mansingh Road, Jaisalmer House,  
 New Delhi, the 11<sup>th</sup> February, 2013

DsG : AR/BSF/CISF/CRPF/ITBP/NSG/SSB & BPR&D

**Subject : QRs/Specification of 14 various Clothing items.**

The QRs/Specification of following 14 items as per annexures have been approved by the Competent authority in MHA:

- i. Socks woollen heavy (Annex. B).
- ii. Hand Gloves Knitted (Annex. C)
- iii. Cotton Terry Towel (Sky Blue Color)/Hand Towel (Annex. D)
- iv. Scoured and bleached rib knitted round neck sleeveless and short sleeve vests/Vest Cotton (Annex. E)
- v. Water Bottle(Annex. F)
- vi. Trouser BD Serge Cloth/Cloth Trouser BD (Annex. G)
- vii. Shirt Angola Cloth./Shirt Angola (Annex. H)
- viii. Cap Comforter Woollen(Annex. I)
- ix. Under Pant Thermal/ Under Pant Woollen (Annex. J)
- x. Vest Thermal/Vest Woollen (Annex. K)
- xi. Coat Parka (Annex. L)
- xii. Beret Cap (Annex. M)
- xiii. Rain Cape( Annex. O)
- xiv. Blanket Air Force Blue (Annex. S)

2. Henceforth, all CAPFs should procure the above items required by them, strictly as per the laid down QRs/Specifications.

*widm 5/12*  
 13/2/2013

Yours faithfully,

*Tilak Raj*  
 (Tilak Raj)

Under Secretary to the Govt. of India

*O/C*

Encl : As above.

Copy to :

1. SO, IT Cell, MHA - with the request to host the above QRs/Specification on the official website of MHA (under the page of Organizational set up, Police Modernization Division) and confirm to this Division. Softcopy is being sent separately.
2. Director(Procurement), MHA

Copy for information to PS to JS(PM).

# CENTRAL RESERVE POLICE FORCE STANDARD

## SPECIFICATION FOR BERET CAP

*Submitted to :*

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

*Prepared by :*

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# SPECIFICATION FOR "BERET CAP"

## RECORD OF AMENDMENTS

<b>Amendment No. and Date</b>	<b>Amendment pertains to SI.No./Para No./Column No.</b>	<b>Authority</b>	<b>Amended by Name and Appointment (in block letter)</b>	<b>Signature and Date</b>

## PREAMBLE

The Inspector General of Police, CRPF, has asked NITRA to prepare technical specifications for specification for "Beret Cap". The specification describes the performance requirements and material properties – ends/dm, pick/dm, weave, weight, yarn count, fibre composition, dimensions, color fastness to light, washing, and perspiration; pH, dimensional change due to washing, etc. Bureau of Indian Standards (BIS) and American Association of Textile Chemists and Colorists (AATCC) test methods are considered to draw this specification.

This report contains 16 pages which describe the technical specifications of "Beret Cap" for CRPF.

Whenever a reference to any other standard occurs in this specification, it shall be taken as reference to the latest version of that standard existing at the time of finalization of a contract.

This technical specification will enable the CRPF to prepare tender documents (technical details) at the time of placing orders for "Beret" and final inspection as well.

# SPECIFICATION FOR "BERET"

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**0.0 FORWARD**

- 0.0 This specification has been prepared by Office of the Directorate General of Police, CRPF on the authority of The Director General of Police, CRPF.
- 0.1 This specification is for use by the CRPF.
- 0.2 This specification would be used for manufacture, quality assurance and procurement of the item.
- 0.3 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 Directorate General of Police,  
CRPF, Ministry of Home Affairs  
Block No-1, CGO Complex, Lodhi Road,  
New Delhi-03
- 0.4 Copies of the specification can be obtained from:  

Office of the Directorate General of Police,  
CRPF, Ministry of Home Affairs  
Block No-1, CGO Complex, Lodhi Road,  
New Delhi-03
- 0.5 This specification holds good only for the supply order for which it is issued.
- 0.6 The Quality Assurance Authority reserves the right to amend or modify this specification as and when required.
- 0.7 The Quality Assurance Authority is the competent authority to grant concessions, if any, in respect of any clause contained in this specification.
- 0.8 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.

## 1.0 SCOPE

- 1.1 The specification prescribes the requirement of "Beret Cap" (Navy Blue colour) herein referred as "Beret".
- 1.2 This specification does not specify the general appearance, lusture, feel of "Beret".

## 2.0 MATERIALS AND MANUFACTURE

2.1 The shape, dimensions and design of the "Beret" shall be as shown in Fig 1 and 2. The "Beret" shall be manufactured as described in the following sub classes.

2.1.1 Base fabric: A plain knitted fabric made out of 100% wool yarn ( wool grade not less than 64s conforming IS 5910: 1977) of approximate count 74 tex (Nm 13s) shall be used to manufacture the "Beret". The single thread breaking strength shall not be less than 175 g, when tested on a constant rate traverse type machine having a traverse of  $300 \pm 15$  mm per minute and test length of 500 mm (Guideline of IS 1670 : 1991).

2.1.2 The plain knitted fabric shall be manufactured using two strands of yarn on a suitable circular knitting machine depending upon the size of the "Beret". The fabric shall undergo milling and finishing like raising (both side) before making "Beret".

2.1.3 The "Beret" shall be lined with black colour polyester cloth and shall have an interlining of polyethylene film of minimum 40 microns thickness (see IS 2508) covering completely the crown and the bevel portions. The crown of the "Beret" shall have four layers of fibres bed (Each layer of around 3.0 mm thickness when tested in accordance to IS 7702 at 1 Kpa pressure and waste fibres of wool, polyester etc may be used for fibre bed) along with jute fabric (For guidance End/dm: 78, Picks/dm: 28 and

mass: 550 g/m<sup>2</sup>) sandwiched between polyethylene film and polyester cloth to give cushioning effect. These layers shall be stitched together (No. of stitch per centimeter: 3) along with jute fabric with the polyester cloth. These layers shall not be stitched with base fabric of the crown. For clarification of location of stitches "Beret" sample held in the custody of CRPF may be referred. The mass of the crown assembly including base fabric, lining fabric, four fibres layers, Jute fabric and polyethylene film shall be around 2000 g/m<sup>2</sup>. The approximate thickness of crown assembly shall be 12 mm when tested in accordance to IS 7702 at 5 Kpa pressure. The lining of crown shall be of one piece while of bevel in two pieces. The crown of the "Beret shall be circular in shape.

2.1.4 The polypropylene tape ( for guidance around 600 Denier polypropylene filament yarn in warp and weft and total ends in full width 58 and Picks/dm 228 may be used for the manufacture of tape) of ( 25±2) mm shall be attached to the bottom edge of the bevel by one row of stitches, turned over and joined to the body by an additional row of stitches. The channel so formed shall be around 13 mm and provided with a braided polyester draw tape (For guidance 300 denier polyester filament yarn may be used for manufacture, width of the tape: approximately 10 mm and number of threads: approximately 24) approximately 18 cm longer than the circumference of the head band. The two ends of the draw tape shall be tied to form a bow. The two ends of polypropylene tape shall overlap at the back to form a triangular slit which shall be secured by two rows of stitches. The polypropylene tape and draw tape shall be of black colour. For further clarification "Beret" sample held in the custody of CRPF may be referred.

2.1.5 Two metal eyelets of 6 mm size shall be fitted at the back approximately 25 mm apart and 20 mm above the bottom edge of the "Beret". The eyelets shall be black in colour. The exact placement of eyelets may be seen in the sample held in the custody of CRPF.



### 3.0 STITCHING:

- 3.1 Lock stitch having 3 to 4 stitches per cm shall be employed wherever stitching has to be carried out. The stitching shall be done with even tension and all loose ends shall be securely fastened off.
- 3.2 Polyester sewing threads of 2/40s Ne count may be used. The colour of the sewing thread shall visually match with the navy blue colour of *base fabric*.

### 4.0 WORKMANSHIP AND FINISH

The *base fabric* used shall be free from defects such as yarn, fabric and dyeing defects.

The workmanship to stitch the "Beret" should be free from defects due to stitching and handling.

### 5.0 SEALED SAMPLE

For appearance, shape, general workmanship, finish and for other aspects, not defined in this specification, "Beret" shall conform to the sealed sample held in the custody of the CRPF. The custody of sealed sample shall be a matter of prior agreement between the buyer and the seller.

### 6.0 DIMENSIONS

- 6.1 The "Beret" shall conform to the dimensions given in the Table 2. To measure dimensions of the "Beret", take the "Beret" to be tested and lay it flat on a horizontal surface. Remove all creases and wrinkles without distorting it.

## 7.0 SAMPLING AND CRITERIA FOR CONFORMITY

Manufacturers must satisfy themselves that the stores are in accordance with the requirements of the buyer and fully conform to the required specification by carrying out a thorough pre-inspection of each lot before actually tendering the same for inspection to the inspecting officer nominated by the CRPF. A declaration by the manufacturer that necessary pre-inspection has been carried out on the store tendered, will be submitted along with the *CHALLAN*. The declaration will also indicate the method followed in carrying out pre-inspection showing the feature checked/tested and will have the test certificate attached to the *challan/declaration*.

7.1 The sampling procedure given below shall give desired protection to the buyer and the seller provided the lot submitted for inspection is homogeneous. To achieve this, manufacturer shall maintain a system of process control at all stages of manufacture and shall ensure that the "Beret" tendered by him for inspection comply with the requirements of this standard in all respects.

7.2 In any consignment, all the "Beret" of same size and colour delivered to a buyer against a dispatch note shall constitute a lot.

7.2.1 The conformity of the lot to the requirements of this specification shall be determined on the basis of the tests carried out on the samples selected from it.

7.3 Unless otherwise agreed to between the buyer and the seller, the number of "Beret", depending upon the size of the lot, shall be selected at random in accordance with the col 2 of Table 1 for non-destructive testing and col 4 of Table 1 for destructive testing.

**Table-1: Number of "Beret" to be selected from a lot and permissible number of non-conforming "Beret"**

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

7.4 The sample size and the criteria for conformity for various characteristics shall be as follows:

Characteristics	Number of test samples	Criteria for conformity
Dimensions and freedom from defects	All the "Beret" selected according to the column 2 of Table 1	Non-conforming "Beret" not to exceed the corresponding number given in column 3 of Table 1
Dimensional change, pH value, weight, colour fastness to various agencies except light	All the "Beret" selected according to the column 4 of Table 1	Non-conforming "Beret" not to exceed the corresponding number given in column 5 of Table 1
Colour fastness to light	One up to 500 "Beret" and two above 500 "Beret"	Each observed value satisfies the specified requirement.

## 8.0 MARKING

A suitable cloth label marked with the following information shall be securely attached adjacent to the chin strap of each "Beret".

- a) Size;
- b) Manufacturer's name or trade-mark, if any; and
- c) Year of manufacture, if required.

## 9.0 PACKAGING & PACKING

- 9.1 The "Beret" shall be packed in clean and dry condition.
- 9.2 Each "Beret" shall be wrapped in a polythene bag of suitable size.
- 9.3 Ten "Beret" of same size packed as mentioned in 9.2 and shall be arranged suitably and tied together with twine jute 3 ply (IS 1912:1984 RA 2007) to form a bundle.
- 9.4 The bundles shall be wrapped with layer of polyethylene film of minimum 40 microns thickness (See IS : 2508:1984, RA 2003). A suitable number of such bundles shall be packed in wooden cases lined with water proof packing paper (See IS 1398:1982, RA 2004) or polyethylene film of 40 microns.

## 10.0 REQUIREMENTS

- 10.1 The dimensions of the various sizes of "Beret" shall conform to Table 2.
- 10.2 The "Beret" shall conform to the requirement given in Tables 3 and 4.

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Table- 2 : Dimensions of the "Beret"

Size	Head Band		Diameter of circular crown in cm  B	Depth of Bevel to seam on polypropylene tape all around in cm  C
	Diameter in cm A	Circumference in cm -		
Small	17.75	56.5	26.0	5
Medium	19.00	60.5	27.5	5
Large	20.25	64.5	28.5	5
Tolerance	±0.5	±1.0	±0.5	±0.3

NOTE: For dimension test, lay Beret flat on a horizontal surface. Remove all creases and wrinkle without distorting it. Measure correct to the nearest millimeter as per the dimensions given in the above table.

Table-3: Requirements of "Beret"

S. No.	Parameters	Requirements	Method of Testing
<b>Base Fabric</b>			
1	Composition	Wool	AATCC 20: 2010
2	Dimensional Change (due to relaxation), percentage, Maximum	3.0	As per guidance of IS 2977:1989 (See Annexure 1)
3	Weight in g/m <sup>2</sup>	510 ± 35	IS 1964 : 1970
4	Colour Fastness to a). Light (on blue wool Standards) b). Washing - Change in shade - Staining on cotton c). Perspiration (Acid & Alkaline) - Change in shade - Staining on cotton d) Dry cleaning e) Hot Pressing	5 or better  4 or better 4 or better  4 or better 4 or better  4 or better 4 or better	IS 2454:1985  IS/ISO 105 C10 A(1): 2006  IS 971:1983  IS 4802:1988  IS : 689: 1988 at 150 ± 2 ° C
5	pH Value of aqueous extract	6.0 – 8.0	IS 1390:1983 (Cold method)
6	Colour specification	≤ 2.0	See Table 4
<b>Polyester cloth</b>			
7	Composition	Polyester	AATCC 20: 2010
8	Weave	1 up 1 down plain	Visual
9	Ends/dm, Minimum	380	IS 1963:1981
10	Picks/dm, Minimum	240	IS 1963:1981
11	Weight, g/m <sup>2</sup>	50 ± 5	IS 1964 : 1970
12	Colour	Visual	Black

<b>Polypropylene tape</b>			
13	Composition	100% Polypropylene	AATCC 20: 2010
14	Weave	Pointed twill refer Fig 3	Visual
15	Width, mm	25 ± 2	IS 1954: 1990
16	Linear weight, g/100 meter (Minimum)	800	IS 1964: 2001
17	Colour	Visual	Black
<b>Braided draw tape</b>			
18	Composition	Polyester	AATCC 20: 2010
21	Linear Weight, g /100 meter (Minimum)	100	IS 1964: 2001
22	Colour	Black	Visual

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**Table-4 : Specification of colour of base fabric "Beret"**

(AATCC Test method 173 : 2009 & AATCC Evaluation Procedure 7 : 2003)

Colour	:	Navy Blue		
System	:	CIE LCH		
Illuminant Observer	:	D 65		
Standard Observer	:	10 Degree		
Tristimulus Values	:	X	Y	Z
		1.608	1.614	2.604
L C H	:	L	C	H
		13.315	7.648	286.107
CMC (l:c)	:	2:1		
Colour difference, $\Delta E_{cmc}$	:	$\leq 2.0$		

**Interpretation of Results :**

- i) If  $\Delta E_{cmc}$  is less than or equal to 2, then sample is acceptable.
- ii) If  $\Delta E_{cmc}$  is greater than 2, then sample is unacceptable.

**Note-1 :** Absorbance/reflectance/ transmittance are affected by surface characteristic features of the substrate. Therefore comparison should be made between samples of 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 Diffuse (sphere) geometry spectrophotometer.



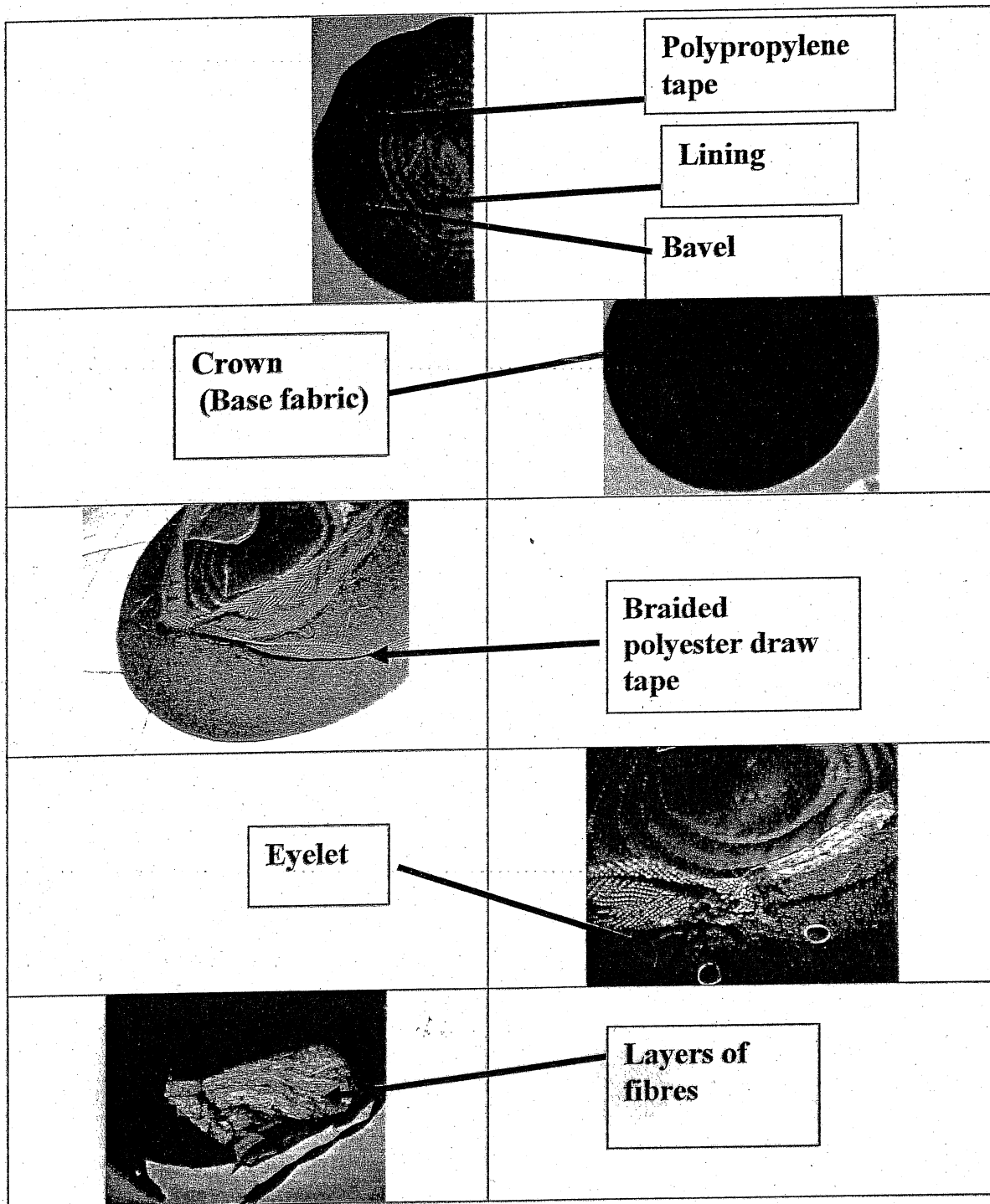


Fig. 1 Parts of "Beret"

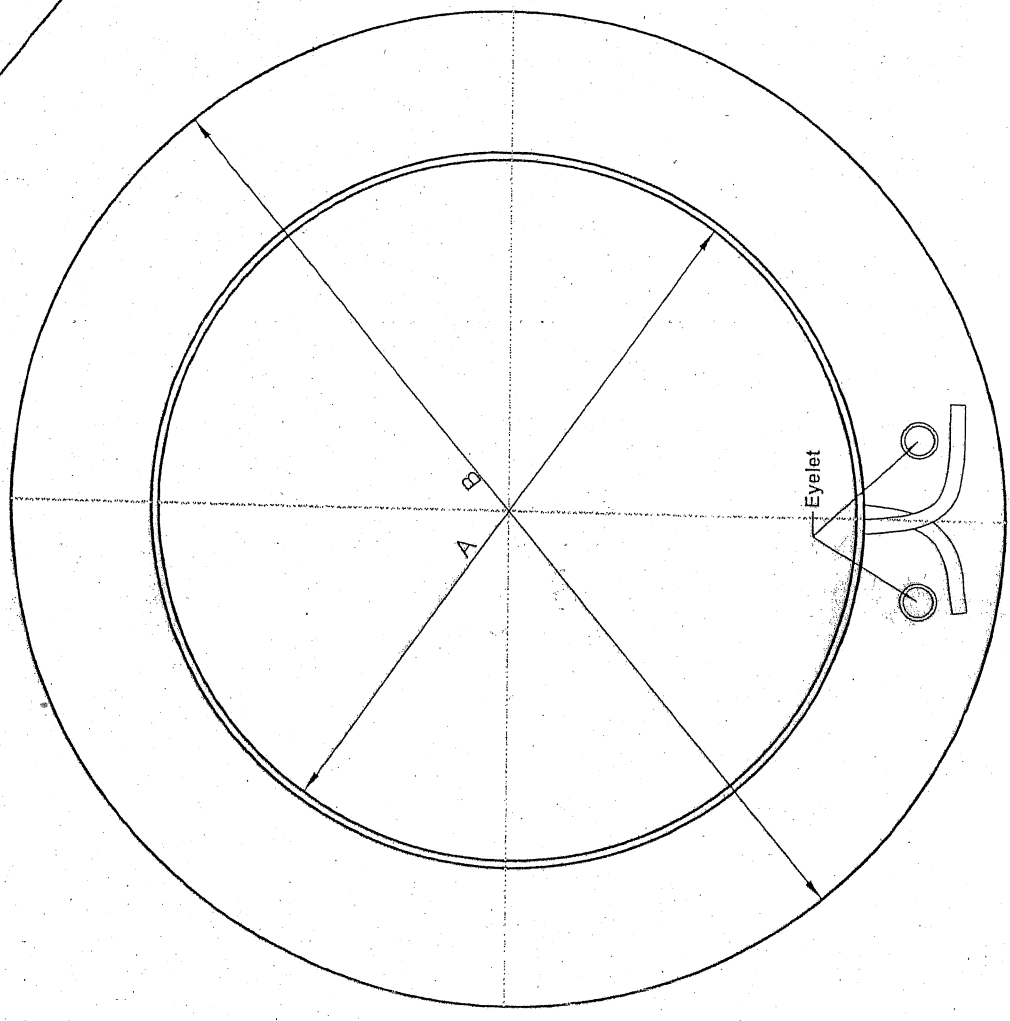
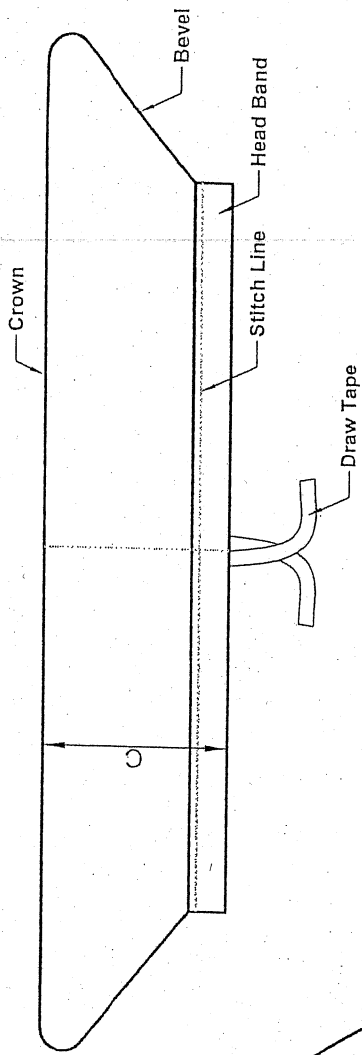
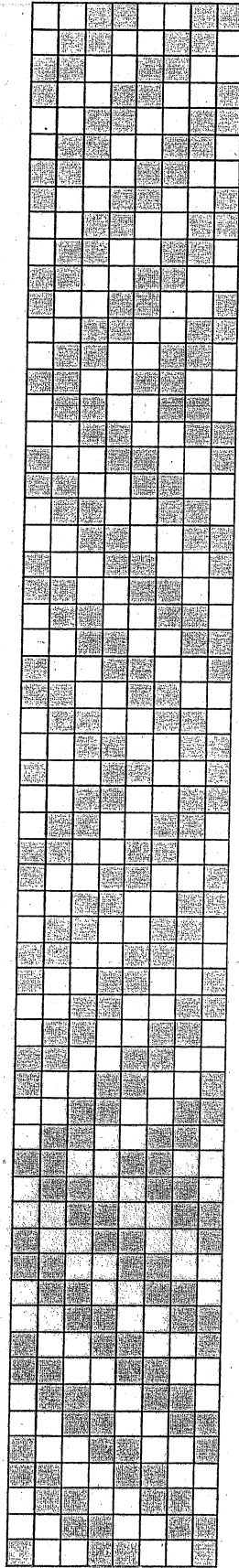


Fig.-2 Beret

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**Fig. 3 25 mm wide Polypropylene Tape  
(2/2 Pointed Twill -Two repeats, Loom: Needle loom)**

## 11. REFERENCES

Sl. No.	SPEC. /TEST METHOD No.	DESCRIPTION
(a)	AATCC 20 : 2010	Fibre analysis: Qualitative
(b)	IS 971: 1983, RA 2004	Method for determination of colour fastness of textile material to perspiration
(c)	IS 1390: 1983, RA 2004	Methods of testing of pH value of aqueous extract
(d)	IS 2454: 1985, RA 2006	Methods for determining of colour fastness of textile materials to artificial light (xenon lamp)
(e)	IS 2500 (Part 2): 1965, RA 2006	Sampling inspection tables
(f)	IS/ISO 105 C10 A(1): 2006	Method for determination of colour fastness of textile material to washing
(g)	IS 4905: 1968, RA 2006	Method of random Sampling
(h)	IS : 2977:1989, RA 2005	Method for determination of dimensional changes on soaking in water
(i)	IS 6359:1971, RA 2004	Method for Conditioning of Textiles
(j)	AATCC Test method 173 : 2009	CMC: Calculation of small colour differences for acceptability
(k)	AATCC Evaluation Procedure 7 : 2009	Instrumental assessment of the change in colour of a test specimen

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### **DIMENSIONAL CHANGE AFTER WASHING**

Dimensional change shall be tested as per the guidance of IS 2977 with the following change in procedure:

For determination of change in dimensions of "Beret", first, take a "Beret" (fully conditioned), to be tested. Lay it flat on a horizontal surface. Remove all creases and wrinkles without distorting it. Measure to the nearest millimeter (dimension are given in the Table 2). Treat the "Beret" as per IS 2977:1989, dry and condition. After conditioning, again measure all the dimensions as above and compare with the untreated Beret's dimensions.