No. IV-21011/3/2010-Prov-I
Government of India
Ministry of Home Affairs

26, Man Singh Road, Jaisalmer House,
New Delhi, 20.9.2011

To
The DG: CRPF

Subject:- QRs/Technical Specifications for the Special Equipments for CoBRA Bns.

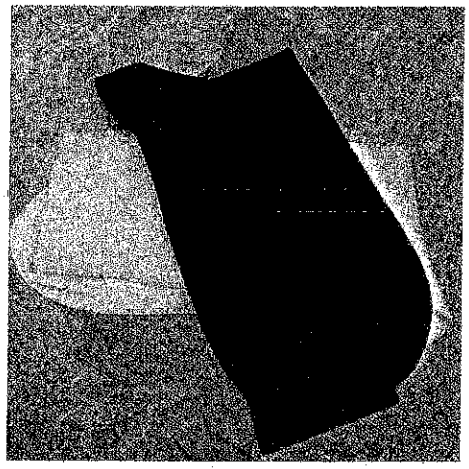
Sir,

The QRs/ Technical Specifications of **Organic Socks** for CoBRA Bns, have been approved by the Competent Authority in the MHA and the same are enclosed for information and Record.

Yours faithfully,

(S.B.Nanda)
Under Secretary to the Govt. of India

CENTRAL RESERVE POLICE FORCE (CoBRA) STANDARD



SPECIFICATION FOR "'ORGANIC SOCKS"

Submitted to :

Office of the Inspector General of Police, CoBRA Sector
CRPF, Sector –IV, PUSHP VIHAR,
New Delhi-110017

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SPECIFICATION FOR "ORGANIC SOCKS"

RECORD OF AMENDMENTS

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

PREAMBLE

The Inspector General of Police (CoBRA Sector), CRPF, has asked NITRA to prepare technical specifications for specification for "Organic Socks" in white, black and green colour. The specification describes the performance requirements and material properties – course/dm, mass, yarn Count, composition, dimensions, color fastness to light, color fastness to washing, color fastness to perspiration, colour fastness to rubbing, pH, dimensional change due to relaxation, stretch measurement 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 14 pages which describe the technical specifications of "Organic Socks" for CRPF (CoBRA).

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 (CoBRA) to prepare tender documents (technical details) at the time of placing orders for "Organic Socks" and final inspection as well.

SPECIFICATION FOR "ORGANIC SOCKS"

C O N T E N T S

ITEM	SUBJECT	PAGE NO.
0	FORWARD	1
1	SCOPE	3
2	MATERIAL	3
3	MANUFACTURE	3
4	WORKMANSHIP AND FINISH	4
5	SEALED SAMPLES	4
6	PAIRING	5
7	DRAWING AND DIMENSIONS	5
8	REQUIREMENTS	7
9	SAMPLING	11
10	MARKING AND LABELLING	12
11	PACKAGING	13
12	MARKING OF THE BOX	13
13	REFERENCES	14

0.0 FORWARD

0.0 This specification has been prepared by Office of the Inspector General of Police, CoBRA sector, CRPF on the authority of The Inspector General of Police, CoBRA sector.

0.1 This specification is for use by the CRPF - CoBRA.

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 Inspector General of Police, CoBRA Sector, 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 Inspector General of Police, CoBRA Sector
Sector –HQ. (Old sect.), Near I.S.B.T, Civil Line Thana,
Delhi

0.4 Copies of the specification can be obtained from:

Office of the Inspector General of Police, CoBRA Sector
Sector –HQ. (Old sect.), Near I.S.B.T, Civil Line Thana,
Delhi

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 This specification covers the requirement for **"Organic Socks"** in three colours- white, black and green herein referred as "Socks" against CRPF-CoBRA requirements.

1.2 This specification does not specify general appearance, feel etc of the socks.

2.0 MATERIAL

Socks shall be manufactured using a combination of cotton, nylon, elastane, and polyester double covered rubber yarns. For manufacturers guidance following yarns may be used:

- 24s Ne combed cotton yarn with minimum 2250 CSP and 17 ± 5% TPI
- 70 denier Nylon filament yarn
- 20 denier Elastane yarn
- 110 Gauge rubber thread, double covered with 80 denier polyester filament yarn for Welt Elastic (top). The stretch ability of the covered yarn shall be 1:3 (Minimum) from its original length i.e it shall be stretchable 3 times of its unit length
- 70 denier nylon filament yarn as a linking yarn

In the case of white socks, bleached combed cotton yarn shall be used, while in the case of coloured socks, black and green dyed combed cotton yarns shall be used.

3.0 MANUFACTURE

3.1 The shape, dimensions and design of the socks are shown in Fig. 1.

3.2 The socks shall be knitted on circular socks knitting machine using plain knit structure in leg & foot portions and pique knit structure in the welt, ensuring that socks are perfectly plaited. The socks shall be plaited throughout the foot and the leg portion. The plaiting shall be even, free from creases, folds and similar in construction to the fabric of the socks. The socks shall be linked with the 70 denier thread over the toe. The linking shall be elastic, smooth and free from lumps and knots. The free end of the linking yarn shall be securely fastened off. The socks shall be free from manufacturing defects such as broken threads in the body, large mends, ladders, dropped stitches, holes, cut, tears. and any other defect, which may significantly affect the appearance or serviceability of socks.

3.3 For guidance circular socks knitting machine of cylinder diameter 3 ¾ inch with 180 needles (36 gauge) may be used for manufacturing 24x24 cm sizes socks.

4.0 WORKMANSHIP AND FINISH

The linking of the toe portion to the foot shall be elastic, smooth, and free from lumps and knots. The socks shall be free from workmanship defects i.e. texture, knitting flaws etc. The finished product (socks) should not have large mends, dropped stitches, ladders etc. The socks shall be properly pressed and folded after manufacturing. The socks when worn shall reach half way of the shine bone.

5.0 SEALED SAMPLE

Socks shall conform in every respect with the requirements specified in this specification. Sealed sample held in the custody of Indian navy headquarters. Sealed sample shall constitute the standard pattern with

regard to appearance, shade, feel, finish and any other characteristics, properties and parameters not noted and defined in this specification.

6.0 PAIRING

Socks shall be matched and paired according to their type, size and shade. A tolerance of ±1.0 cm in the leg and foot length portions of socks shall, however, be permissible while pairing.

7.0 DRAWING AND DIMENSIONS

7.1 The drawing of socks is shown in the Fig. 1.

7.2 The Dimensions of foot, leg and welt portions of the socks and mass of 10 pairs are given in Table-1.

Table-1 : Dimensions requirement of socks

Size	Foot Length (cm) (A)	Leg Length (cm) (B)	Width of leg (cm) (C)	Width of foot (cm) (D)	Welt Depth (cm) (E)	Welt Width (cm) (F)	Mass per 10 pairs (gm)	Type of Knit
Medium(24X24)	24	24	9.0	9.0	5.0	8.0	390	Pique at welt and Plain in leg & foot portions
Tolerance limit	± 1	± 1	± 0.5	± 0.5	± 0.5	± 0.5	± 10%	

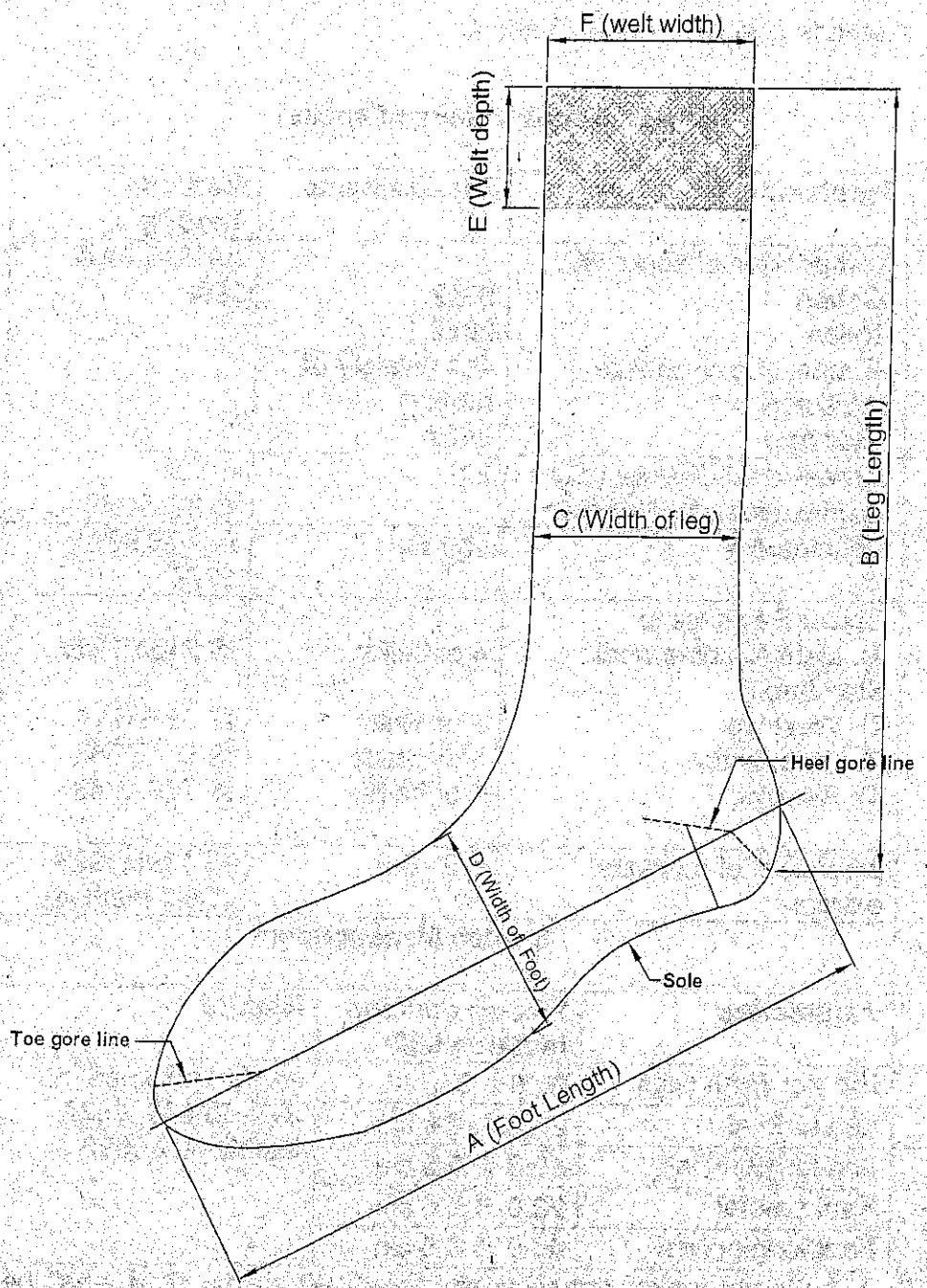

F (welt width)
E (Welt depth)
B (Leg Length)
C (Width of leg)
Heel gore line
D (Width of Foot)
Sole
Toe gore line
A (Foot Length)

Fig-1 Socks

8.0 REQUIREMENTS

8.1 The socks shall conform to the parameters tested as per the methods given in Table-2, 3 and 4.

Table-2: Requirements of socks

Sl. No.	Parameters	Requirements	Method of Testing
1.	Composition of socks, % -Cotton -Nylon -Rubber (Covered with polyester) -Elastane	 68±2 26±2 4±1 (Weight of rubber) 2±0.5	AATCC:20 & 20A
2.	Dimensional Change (due to relaxation), %, Maximum	2.5	A-6 of IS:3329:1973
3	Courses/dm	130 ± 4	A-5, IS:833, 1977
4.	Colour Fastness to 1). Light (on blue wool Standards) 2). Washing 3). Perspiration 4). Rubbing	 4 or better 4 or better 4 or better 4 or better	 IS 2454:1985 IS 687:1979 IS 971:1983 IS 766:1988
5.	pH Value of aqueous extract	6.0 - 8.5	IS 1390:1983 (Cold method)
6.	**Stretch Measurement**		

	Parameters	**Stretch position requirements**	**Method**
a.	Rib top width (welt)	20.0 ± 0.5 cm	As per guidance of A-7, IS 833: 1977, Reaffirmed 1999
b.	Leg Lateral	20.0 ± 0.5 cm	
c.	Leg longitudinal	40.0 ± 0.5 cm	
d.	Foot Lateral	20.0 0 ± .5 cm	
e.	Foot longitudinal	40.0 ± 0.5 cm	

NOTE: 110 Gauge rubber thread used in the welt elastic (Top) shall be double covered with 80 denier polyester filament yarn. Qualitative test shall be performed to check the presence of polyester.

Table-3: Colour specification of White socks

Colour	:	**White**
Method	:	**AATCCC-110** **(Whiteness of textiles)**
Illuminant Observer	:	**D 65**
Standard Observer	:	**10 Degree**
Whiteness Index (WI CIE) **(With Fluorescent whitening agent)**	:	**140 ±10**

Interpretation of Results :

i) If the sample meets the WI CIE, then sample is acceptable.

ii) If the sample does not meet the WI CIE, then sample is unacceptable.

Note-1 : Absorbance/reflectance/ transmittance are affected by surface characteristics feature 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 : If there is a discrepancy, a committee of experts can be constituted to take final decision on the requirement of whiteness property by visual assessment.

Note-3 : Test should be carried out after proper conditioning as per AATCC 173.

Table-4: Colour specification of black colour socks (AATCC Test method 173 : 2005 & AATCC Evaluation Procedure 7 : 2003)

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

Tristimulus Values :

X	Y	Z
1.517	1.597	1.873

L C H :

L	C	H
13.212	1.508	273.533

CMC (l:c)	:	**2:1**
Colour difference, ΔE_{cmc}	:	**≤ 1.5**

Interpretation of Results :

i) If ΔE_{cmc} is less than or equal to 1.5, then sample is acceptable.

ii) If ΔE_{cmc} is greater than 1.5, then sample is unacceptable.

Note-1 : Absorbance/reflectance/ transmittance are affected by surface characteristics feature 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.

Table-5: Colour specification of green colour socks (AATCC Test method 173 : 2005 & AATCC Evaluation Procedure 7 : 2003)

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

Tristimulus Values :

X	Y	Z
5.234	5.964	4.813

L C H :

L	C	H
29.321	8.650	124.923

CMC (l:c)	:	**2:1**
Colour difference, ΔE_{cmc}	:	**≤ 1.5**

Interpretation of Results :

i) If ΔE_{cmc} is less than or equal to 1.5, then sample is acceptable.

ii) If ΔE_{cmc} is greater than 1.5, then sample is unacceptable.

Note-1 : Absorbance/reflectance/ transmittance are affected by surface characteristics feature 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.

9. SAMPLING

9.1 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-6 given below as per IS 4905 : 1968.

Table-6: Pairs of Socks to be selected from a lot and permissible number of non-conforming pairs

No. of Pairs in the lot	Non – Destructive Testing		Destructive Testing (Chemical Testing)	
	No. of pairs to be selected	Permissible number of non-conforming pairs	No. of pairs to be selected	Permissible number of non-conforming pairs
(1)	(2)	(3)	(4)	(5)
Upto 50	10	1	2	0
51 – 100	20	2	2	0
101-200	30	3	2	0
201 – 300	40	3	3	0
301 - 500	50	4	5	0
501 – 800	70	6	7	1
801 – 1300	110	8	10	1
1301 – 3200	150	10	15	2
3201 and above	220	14	30	3

9.2 The number of test samples and the criterion for conformity for various characteristics shall be as follows:

Characteristics	Number of test samples	Criteria for conformity
Dimensions, Nos. of courses and freedom from defects	All the pairs selected according to the column 2 of table-6	Non-conforming pairs not to exceed the corresponding number given in column 3 of above table-6
Weight	All the pairs selected according to the column 2 of above table-6	Each observed value satisfies the relevant requirement
Dimensional change, pH value, colour fastness to various agencies except light	All the pairs selected according to the column 2 of above table-6	Non-conforming pairs not to exceed the corresponding number given in column 5 of above table-6
Colour fastness to light	One up to 500 pairs and two above that	Each observed value satisfies the specified requirement.

10. MARKING AND LABELLING

Each pair of socks should have a printed label that contains the following:

a) Nomenclature of the store i.e. Socks (white with blue band)
b) Material Composition
c) Size
d) Name / Trademark of the manufacturer
e) Washing Details
f) Month & Year of manufacturing

11. PACKAGING

11.1 Each pair shall be ironed wrinkle free, clipped at the heel, toe and welt portions. The clipped pair shall be properly folded and placed in 30 micron (minimum) BOPP bags. The socks shall be packed in clean and dry conditions.

11.2 Ten pairs of socks shall be packed in polybag to form a unit pack. The quantity of the items packed and weight of the unit pack shall be stenciled with indelible ink on the unit pack.

11.3 Ten such unit packs shall be placed in 5 ply corrugated board box. Unit packs shall be tightly packed in the carton to avoid the movement of unit packs. The carton shall be closed with waterproof cellophane tape. The carton shall be strip bound with polypropylene tape of at least 20 mm width. The gap between the strips and the edges shall not exceed 45 cm. The box shall be lead sealed with the CRPF-CoBRA impression seal.

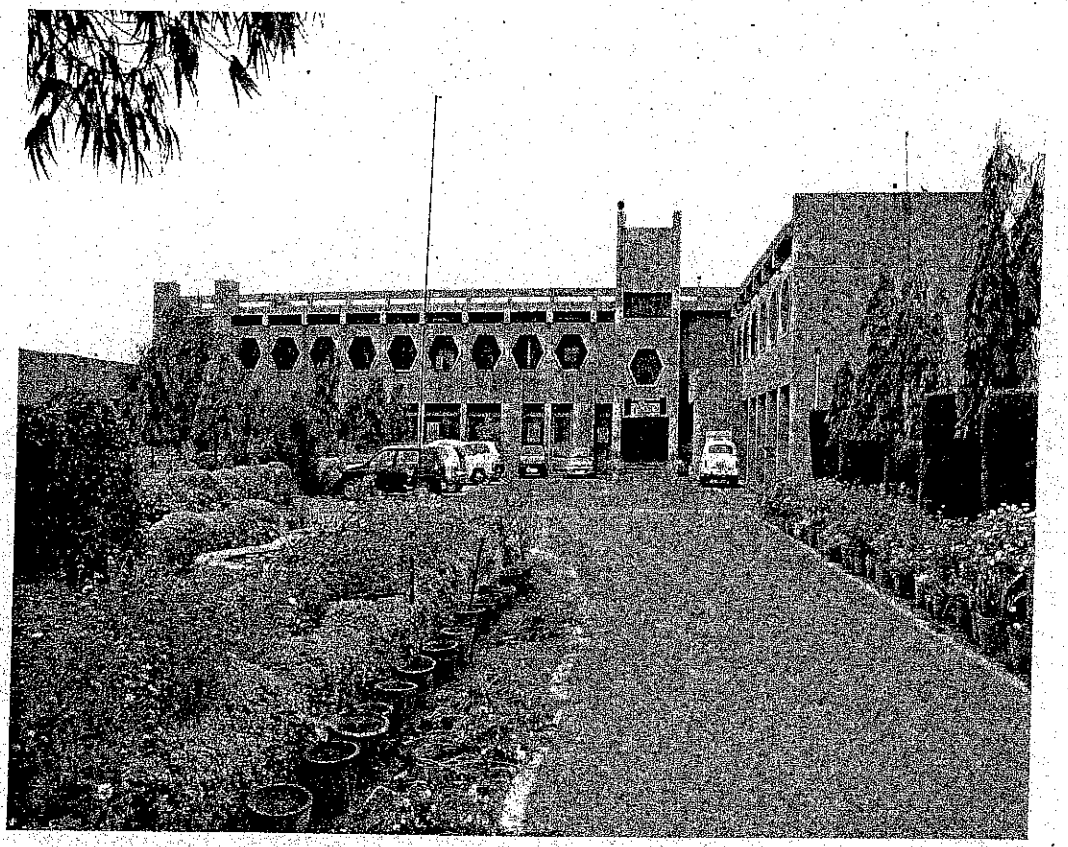
12. MARKING OF THE BOX

Each box shall be legibly marked by 40-50 mm letter stenciled with indelible marking ink / paint with following details on the box :

a) Nomenclature of the store
b) Qty. packed in the box
c) Supply order number with date
d) Inspection note number and date
e) Serial number of the box
f) Month & year of packing
g) Gross wt. of the box
h) Address of consignee
i) Complete address of the Manufacturer

13. REFERENCES:

Sl. No.	METHOD/ SPEC. No.	TITLE
(a)	IS 667: 1981, RA 2008	Methods for identification of textile fibres
(b)	IS 833: 1977, RA 2004	Gent's rib-knitted stockings (courses and wales /dm), dimensions, mass and No. of needles
(c)	IS 971: 1983, RA 2004	Method for determination of colour fastness of textile material to perspiration
(d)	IS 1390: 1983, RA 2004	Methods of testing of pH value of aqueous extract
(e)	IS 2454: 1985, RA 2006	Methods for determining of colour fastness of textile materials to artificial light (xenon lamp)
(f)	IS 2500 (Part 2): 1965, RA 2006	Sampling inspection tables
(g)	IS 3361: 1979, RA 2004	Method for determination of colour fastness of textile material to washing (test 2)
(h)	IS 4905: 1968, RA 2006	Method of random Sampling
(i)	IS 681:1964, RA 2006	Count of yarn of cotton and rubber thread
(j)	IS 766: 1988 RA 2004	Method for determination of colour fastness of textile material to Rubbing (dry & wet)
(k)	IS : 833:1977, RA 2004	Method of testing of relaxation shrinkage
(l)	AATCC 20:2007 & 20A: 2008	Fibre analysis
(m)	IS 14424: 1997, RA 2007	Rubber threads – specification
(n)	IS 6359:1971, RA 2004	Method for Conditioning of Textiles



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ORGANISATION

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