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15/3/10 (144)

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

26, Man Singh Road, Jaisalmer House,
New Delhi, 10.3.2010

To
The DG: CRPF

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

The QRs/ Technical Specifications in respect of the following Special Equipments for CoBRA Bns as per Appendix, has been accepted by the Competent Authority in MHA.

(1) Durable combat rucksack made of 'Cordura' which is highly abrasive resistant and lighter than web (40 Ltr capacity)
(2) Multi purpose light weight load bearing frame with carrier facilities and convertibility as stretcher (Made of aluminum)
(3) Pouches for Ammunition and Grenades made of disruptive pattern cordura material
(4) Light weight ridge tactical boots
(5) Light weight running shoes
(6) Light Weight Ground Sheet

2. Henceforth, CRPF should procure the above equipments required by them strictly as per the laid down Technical Specifications/QRs.

10/3/10

(R.S.Sharma)
Director (Prov)

Prov.

4/3/3

महानिदेशक सचिव डायरी संख्या
DG's Sectt. Diary No. 459 (10/10)
महानिदेशक / Director General
अ. महानिदेशक / Add. D.G.
तिथि / Date 12 MAR 2010
म.नि. कार्मिक / परि० / प्रशि. / संभरण / प्रशा. / निर्माण
वि.सं. / निदेशक (चिकित्सा)
IG-Pers/Ops/Trg/Prov/Adm/Works
P/[redacted]ector (Medical)

IGP (P & W P/Dy.No
Date 6.00 13.03.10

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Convey to SAF

CENTRAL RESERVE POLICE FORCE (CoBRA) STANDARD

SPECIFICATION FOR “LIGHT WEIGHT GROUND SHEET”

Submitted to :

Office of the Inspector General of police, CRPF-CoBRA Sector
New Delhi-110017

Prepared by :

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SPECIFICATION FOR “LIGHT WEIGHT GROUND SHEET”

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 “Light weight ground sheet”. The specification describes the performance requirements and material properties – Ends/dm, picks/dm, weave, weight, yarn count, fibre composition, dimensions, color fastness to light, washing, and crocking; dimensional change due to washing, adhesion strength, flexing, cold cracking 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 12 pages which describe the technical specifications of “Light weight ground sheet” 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 “Light weight ground sheet” and final inspection as well.

SPECIFICATION FOR “LIGHT WEIGHT GROUND SHEET”

C O N T E N T S

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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 The specification prescribes the requirement of “Light weight ground sheet” herein referred as “Sheet”.

1.2 This specification does not specify the general appearance, lusture, feel, type of finish of “Sheet”

2.0 MATERIAL AND MANUFACTURE

2.1 The “Sheet” shall conform to the dimensions as shown in Fig. 1.

2.2 The “Sheet” shall be manufactured from the material as per details given below:

Item	Name of the component	Description
1	Base cloth	1. Polypropylene multifilament yarn shall be used. 2. Weave: Plain 3.For guidance i) warp count: 340 Denier, ii) weft count: 340 Denier 4. Green colour
2	Eyelets	Aluminum eyelets with washer, NS-3 alloy (chemically passivated in alkaline chromate bath) No. 24 and conforming IS 4084

2.3 In the manufacture of “Sheet”, base fabric may be initially coated on one side with thermo plastic polyolefin (TPO) polymer (Rubber shall not be used as coating material) and two such coated fabrics shall be conjugated on coated facing sides by lamination process. The laminated fabric shall be flexible it shall be free from creases, wrinkles, oil/stain, joiner, pinholes and other manufacturing defects.

2.4 The “Sheet” shall be made from one rectangular piece of above laminated fabric. The hem shall be formed on the four sides by heat sealing as shown in the Fig.1.

2.5 The eyelets shall be free from manufacturing defects and shall be affixed on hemming (as shown in Fig. 1) and properly closed to a smooth finish. The washers shall be placed centrally with respect to eyelets. The hem and eyelet with washer shall be securely fixed.

3.0 WORKMANSHIP

The “Sheet” shall be flexible and free from cuts, objectionable weaving flaws such as broken or missing ends or picks or knots in the base fabric and from creases, wrinkle, oil and other stains, pinholes, thick and thin places, joints and other manufacturing defects. In appearance, general workmanship and finish shall conform to the sealed sample held in the custody of CRPF-CoBRA.

4.0 REQUIREMENTS

4.1 The length and the width of the sheet shall be 2000±20 mm and 1050±10 mm respectively.

4.2 The “Sheet” shall meet the requirements as given in the Tables 3. The “Sheet” shall be green in colour and meet the colour specification as given in Table 4.

4.3 The eyelets used in the “sheet” shall be of Aluminum eyelets with washer, NS-3 alloy (chemically Passivated in alkaline chromate bath) No. 24 and conforming IS 4084

5.0 SEALED SAMPLE

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

6.0 SAMPLING AND CRITERIA FOR CONFORMITY

6.1 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 through pre-inspection of each lot before actually tendering the same for inspection to the inspecting officer nominated by the CRPF-CoBRA. 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.

6.2 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 "Sheet" tendered by him for inspection comply with the requirements of this standard in all respects.

6.3In any consignment, all "Sheet" are of the same size and colour, delivered to a buyer against a dispatch note shall constitute a lot.

6.3.1 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.

6.4 Unless otherwise agreed to between the buyer and the seller, the number of “Sheet” depending upon the size of the lot, shall be selected at random in accordance with the col 2 Table 2.

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

Table-1: Criterion for conformity

Characteristics	**Number of test samples**	**Criteria for conformity**
Dimensions and freedom from defects	All the “Sheet” selected according to the column 2 of Table 2	Non-conforming “Sheet” not to exceed the corresponding number given in column 3 of Table 2
Dimensional change, pH value, weight, colour fastness to various agencies	All the “Sheet” selected according to the column 4 of above Table 2	Non-conforming “Sheet” not to exceed the corresponding number given in column 5 of Table 2

Table-2: Number of "Sheet" to be selected from a lot and permissible number of non-conforming "Sheet"

No. of sheet in the lot	Non – Destructive Testing		Destructive Testing (Chemical Testing)	
	No. of "Sheet" to be selected	Permissible number of non-conforming "Sheet"	No. of "Sheet" to be selected	Permissible number of non-conforming "Sheet"
(1)	(2)	(3)	(4)	(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 & above	80	5	13	1

7.0 MARKING AND LABELLING

Before dispatch each bale shall be legibly marked by stencil showing:

a) Nomenclature and category no. of the store
b) Quantity packed in the bale
c) Serial number of the bale
d) Manufacturer's name or trade-mark, if any; and
e) Month and Year of manufacture

f) Gross weight of the bale in Kg.

g) Name & address of the consignee

h) Inspection note no. and date

8.0 PACKAGING & PACKING

8.1 The ““Sheet”” shall be packed in clean and dry condition.

8.2 Each “Sheet” shall be delivered in new, clean and dry condition & packed properly. Five such “Sheets” placed one over the other shall be rolled and tied neatly and securely with 3 ply jute twine (IS 1912) or polypropylene twine (IS 2734) an appropriate places to form a unit pack. A suitable numbers of such unit packs (as per the requirement of CRPF-CoBRA) shall then be wrapped with a layer of cloth Cee heavy or double layer of cloth hessian medium to form a compact package (bale) as far as possible. The overlap of inner wrapping shall be at least 10 cm so as to ensure full protection to the contents of the package. The over lapping of the outer layer shall be such that it can be conveniently and securely sewn around the package. The overlap of the outer layer of the wrapping shall be such that it can be properly and securely sewn with 3 ply jute twine or polypropylene twine with not less than 10 stitches/dm taking care not to pierce the inner wrapping during stitching. Sufficient Hessian cloth shall be pulled out at each corner to form ears 15cm long to facilitate easy handling during transit. In all cases the mass of the package (bale) shall not exceeded 40 Kg.

Table-3 : Requirements of "Sheet"

S. No.	Parameters	Requirements	Method of Testing
1.	Nature of fibres	Polypropylene	IS 667: 1981 and ISO 1833: 1977/A1-1980(E)
2.	Dimensional Change (due to relaxation), in both direction percentage, Maximum	2.0	IS 2977:1989
3	Ends/dm, (minimum)	190	IS 1963:1981
4	Picks/dm, (minimum)	160	IS 1963:1981
5	Mass, g/m^2	375±5%	IS 7016 Part I
6	Breaking strength, Newton (Minimum) -warp way -weft way	 1000 800	IS 7016 Part II (5 x 20 cm specimen size)
7	Water proofness (water columns height 100 cm for 60 minutes)	No percolation of water through the fabric or wetting of the outer surface	IS: 7016 Pt VII: :1986-Method A-2
8	Adhesion strength between two layers of fabric, Newton (Minimum) -At normal state -After ageing	 15 10	IS 7016 Part V and IS 7016 Part III (For ageing sample shall be kept at 70±1°C for 168 hours in an hot air oven)
9	Flexing at 75000 cycles	No crack and de-lamination	IS 7016 Part IV
10	Cold cracking at (-)50°C for 5 hours	No crack	IS 7016 Part X
11	Colour Fastness to i). Light (on blue wool Standards) ii). Washing - Change in shade - Staining on cotton iii) Crocking - Dry - Wet	 4 or better 4 or better 4 or better 4 or better 4 or better	 IS 2454:1985 IS 764:1979 IS 766:1988
12	Colour specification	≤ 1.5	See Table 4

Table-4: Colour specification of "Sheet" (*Fabric*)
(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**
		6.852	**8.040**	**6.657**
L C H	:	**L**	**C**	**H**
		34.066	**10.380**	**136.388**
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.

9.0 RELATED TEST METHODS & SPECIFICATIONS

Sl. No.	SPEC. /TEST METHOD No.	DESCRIPTION
(a)	IS 667: 1981, RA 2008	Methods for identification of textile fibres
(b)	IS 2454: 1985, RA 2006	Methods for determining of colour fastness of textile materials to artificial light (xenon lamp)
(c)	IS 2500 (Part 2): 1965, RA 2006	Sampling inspection tables
(d)	IS 764: 1979, RA 2004	Method for determination of colour fastness of textile material to washing
(e)	IS 4905: 1968, RA 2006	Method of random Sampling
(f)	IS 766: 1988 RA 2004	Method for determination of colour fastness of textile material to Rubbing (dry & wet)
(g)	IS : 2977:1989, RA 2005	Method for determination of dimensional changes on soaking in water
(h)	IS 6359:1971, RA 2004	Method for Conditioning of Textiles
(i)	ISO 1833: 1977/A1-1980(E)	Binary fibre mixtures-Quantitative chemical analysis
(j)	IS:7016 :1987)	Method of test for coated and treated fabrics
(k)	AATCC Test method 173 : 2005	CMC: Calculation of small colour differences for acceptability
(k)	AATCC Evaluation Procedure 7 : 2003	Instrumental assessment of the change in colour of a test specimen

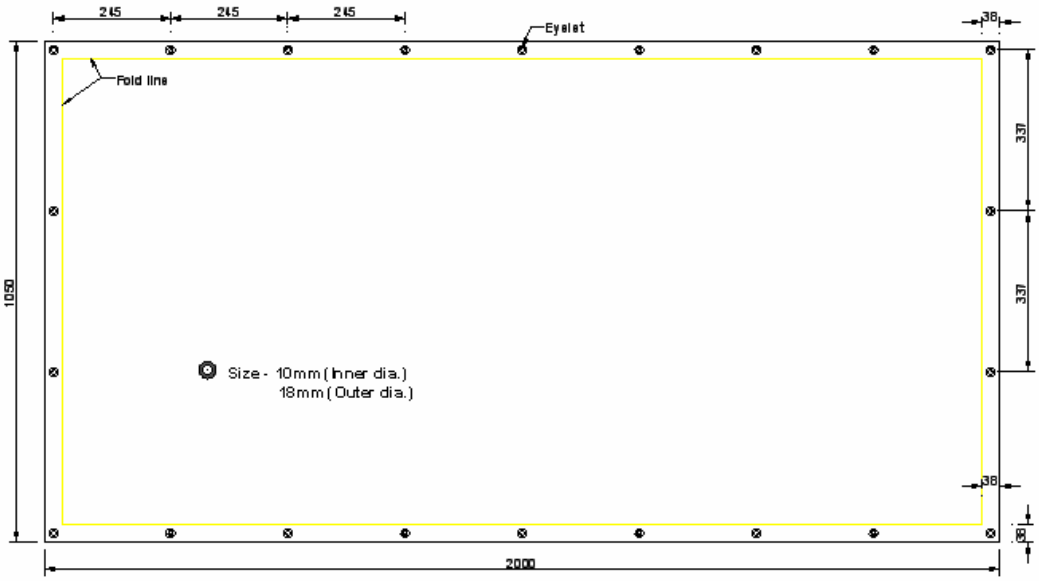

Fig- 1 Light weight ground sheet
(All the dimensions are in mm)

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