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Government of India
Ministry of Home Affairs

26, Man Singh Road, Jaisalmer House,
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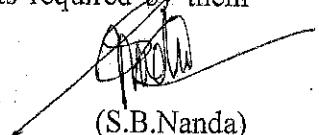
To
The DG: CRPF

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, have been approved by the Competent Authority in MHA:-

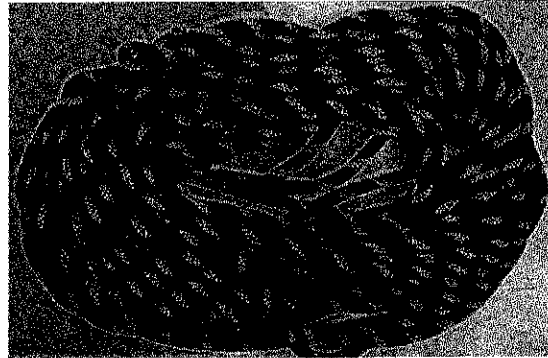
1. Compact light weight Blanket with good insulating properties.
2. Special operations rope & Carry Bag.

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


(S.B.Nanda)
Under Secretary

SL
13/12
AS No - 20/07

**CENTRAL RESERVE POLICE FORCE (CoBRA)
STANDARD**



**SPECIFICATION FOR "SPECIAL OPERATION
ROPE" AND "CARRY BAG"**

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 "SPECIAL OPERATION ROPE"
AND "CARRY BAG"**

RECORD OF AMENDMENTS

Amendment No. and Date	Amendment pertains to SI.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 "SPECIAL OPERATION ROPE" and "CARRY BAG". The specification describes the performance requirements and material properties – rope structure, dynamic performance of rope, static strength of rope, yarn count, fibre composition, dimensions, weave structure, ends/dm, picks/dm, , weight, color fastness to light, and washing; 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 28 pages which describe the technical specifications of "SPECIAL OPERATION ROPE" and "CARRY BAG" 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 "SPECIAL OPERATION ROPE" and "CARRY BAG" and final inspection as well.

**SPECIFICATION FOR "SPECIAL OPERATION ROPE"
and "CARRY BAG"**

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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
New Delhi-110017

0.4 Copies of the specification can be obtained from:

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

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 "SPECIAL OPERATION ROPE" herein referred as "ROPE" and "CARRY BAG".

1.2 This specification does not specify the general appearance, lustre, feel, type of finish of "ROPE" and "CARRY BAG".

2.0 MATERIAL AND MANUFACTURE

2.1 The shape dimensions and design of the "ROPE" and "CARRY BAG" are shown in the Fig. 1 to 7.

2.2 The "Rope" shall be manufactured using Nylon-6 multifilament yarns.

2.2.1 The "Rope" shall have a sheath and core (Refer Fig. 1).

2.2.2 Core: The core shall be of Nylon 6 filaments. For guidance it may be made of 1600 denier multifilament yarns. Five multifilament yarns are twisted (2.4 Turn per inch) to form a single thread. Three threads are twisted (2.9 Turn per inch) together to form a strand (S_1). The core is made of 16 such strands. Out of 16 strands eight of them are "S" twist and the remaining eight of them are "Z" twist. For guidance the resultant strand denier may be 26000.

2.2.3 Sheath: It shall be braided with 48 strands (S_2). Each strand shall be five threads (1.8 Turn per inch). For guidance the resultant denier of the strand may be 4600.

2.3 Carry Bag: The "CARRY BAG" shall be made out of PU coated disruptive printed nylon fabric. The weave of the fabric shall be 1 up 1 down plain. For guidance 1000 Denier Nylon 6 multifilament yarn shall be used in both warp and weft. The fabric shall be 'Heat set' and fully shrunk. The printed pattern shall

meet the color fastness properties as given in Table 3. Dyes used for dyeing and printing shall be free from banned amines (Test method IS 15570: 2005). For guidance the disruptive pattern may be obtained by repeats of the design of 25.25 inch \pm 5% in warp direction and 23.25 inch \pm 5% weft direction as shown in Fig. 2. The colours to be used in the disruptive pattern print are shown in Fig. 3. The face side of the base fabric shall be water repellent and back side of the base fabric shall be uniformly coated with polyurethane. The coating shall be smooth and it should firmly adhere to the fabric. The coated fabric shall be pliable and free from tackiness, stain, pinholes, surface irregularities, wrinkles, patches and all other coating defects. The coating shall not have any objectionable odor. Shape, dimensions and design of the "CARRY BAG" are given in the Fig. 4.

To close and open the bag an open end black colour polyester slide fasteners of 'Medium Special' designation (IS 14181 Part 1) shall be employed. It shall comply with the acceptance criteria specified in IS 14181. The length of the slide fastener shall be 50 \pm 5% cm.

The carry bag is provided with shoulder straps as shown in Fig 4. For this purpose 45 \pm 1 mm wide green colour nylon tape may be used. For guidance 350 denier warp yarn and 850 denier weft yarn may be used for manufacturing of Nylon tape on needle loom. The total ends (full width) shall be 150 \pm 2 and picks per dm shall be 150 \pm 2. The weave of the tape shall as shown in the Fig-5.

The weave of the 25 \pm 1 mm wide green colour nylon tape used in the bag is shown in the Fig 6. Needle loom shall be used to manufacture the tape. For guidance following weave particulars may be used:

- i) Warp count: 1850 Denier
- ii) Binding yarn (Warp): 1850 Denier,
- iii) Weft count 1000 Denier
- iv) Total ends(full width): 123 (104 warp ends + 19 binding warp ends),
Picks per dm: 320

The dimension of plastic male and female buckles, plastic tape length adjuster and metallic D-ring used in the carry bag are shown in the Fig-7.

3.0 STITCHING:

The "CARRY BAG" shall be stitched using lock stitch throughout and loose ends securely fastened off. The number of stitches per decimeter shall be 30 to 38. The stitching shall be done with even tension and all loose ends shall be securely fastened off. Nylon sewing thread of green shade confirming variety no. L2 of IS: 4229: 1992, RA 2003 shall be used.

4.0 WORKMANSHIP AND FINISH

The "ROPE" and "CARRY BAG" shall be free from workmanship defects i.e. texture, chemical damages, dyeing defect, such as uneven dyeing and streakiness etc. In appearance, shape, workmanship and finish in all respects not defined in this specification the "ROPE" shall conform to the sealed sample.

5.0 SEALED SAMPLE

In order to illustrate or specify the indeterminable characteristics such as general appearance, luster, feel and design of the "ROPE", 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.

6.0 REQUIREMENTS

6.1 "ROPE" shall conform to the requirements as given in Table 1.

6.2 The sheath of the rope shall have black and gray stripes. The specification for colour used in sheath of the "ROPE" shall be as given in Table 2A and 2B.

6.3 The fabric used in the bag shall conform to the requirement as given in the Table 3. The specification of colour used in the disruptive print shall be as given in Table 4A, 4B, 4C and 4D.

6.4 The nylon tape used in the bag shall conform to the requirements as given in the Table 5.

6.5 The black colour of the polyester slide fasteners shall visually matched with the black colour of the disruptive printed fabric.

6.6 Quick release plastic buckle (male and Female) and Tape length adjuster shall be dark green in colour. The colour of the items shall visually match with the dark green colour of the disruptive printed fabric. The quality requirements of these items are given in Table 6.

6.7. The metallic D-ring shall be made of mild steel confirming to IS: 280 (H₂).

Table 1 : Requirements of "ROPE"

Sl. No.	Characteristics	Requirements	Test Method
1	Nature of fibre/filament	Nylon-6 filament	IS: 667 & IS 2005
2	Diameter, mm	11.75 to 12.00	5.3 of EN 1891:1998
3	Length, meter, Minimum	35	Meter tape or any suitable means
4	Knotability, Minimum	1.2	5.4 of EN 1891:1998
5	Sheath slippage, mm, Maximum	50	5.5 of EN 1891:1998
6	Elongation, Minimum, %	5	5.6 of EN 1891:1998
7	Shrinkage, Minimum, %	5	5.7 of EN 1891:1998
8	Mass per linear meter, g	85 ± 5%	IS 1964 : 1970
9	Mass of outer sheath material, Minimum, %	30	5.8 of EN 1891:1998 (Type A Ropes)
10	Mass of the core material, Minimum, %	33	5.8 of EN 1891:1998 (Type A Ropes)
11	Fall arrest peak force, Maximum, kN	6	5.9.4 of EN 1891:1998 (Type A Ropes)
12	Dynamic performance, Minimum	Withstand five falls without releasing the mass	5.9.5 of EN 1891:1998 (Type A Ropes)
13	Static strength -Without terminations, Minimum, kN -With termination, kN	22 15.0 to 15.5	EN 919:1995 5.10 of EN 1891:1998 (Type A Ropes)
14	Colour fastness to Washing - Change in colour - Staining on adjacent fabric	4 or better 4 or better	IS 764 : 1979
15	Colour fastness to Light	4 or better	IS 2454:1985
16	pH value of aqueous extract	6.0-8.0	IS 1390 (Cold method) :1983

Table-2A: Specification of colour of Sheath of the "Rope"-Black colour
(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
		2.269	2.390	2.581
L C H	:	L	C	H
		17.414	0.136	304.877
CMC (l:c)	:	2:1		
Colour difference, ΔE_{cmc}	:	≤ 3.0		

Interpretation of Results:

- i) If ΔE_{cmc} is less than or equal to 3, then sample is acceptable.
- ii) If ΔE_{cmc} is greater than 3, 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 construction parameters and filament/ fibre composition.

Note-2 : Test should be carried out after proper conditioning as per AATCC 173.

Note-3 : The colour specification shall be tested on the black filament yarn after reveling from the rope sheath

Table-2B: Specification of colour of Sheath of the "Rope"-Gray colour
(AATCC Test method 173 : 2005 & AATCC Evaluation Procedure 7 : 2003)

Colour	:	Gray		
System	:	CIE LCH		
Illuminant Observer	:	D 65		
Standard Observer	:	10 Degree		
Tristimulus Values	:	X	Y	Z
		11.150	12.231	13.171
LCH	:	L	C	H
		41.581	3.202	181.753
CMC (l:c)	:	2:1		
Colour difference, ΔE_{cmc}	:	≤ 3.0		

Interpretation of Results:

- i) If ΔE_{cmc} is less than or equal to 3, then sample is acceptable.
- ii) If ΔE_{cmc} is greater than 3, 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 construction parameters and filament/ fibre composition.

Note-2 : Test should be carried out after proper conditioning as per AATCC 173.

Note-3 : The colour specification shall be tested on the grey filament yarn after revealing from the rope sheath

Table 3 : Requirements of Disruptive pattern printed Nylon 6 plain weave fabric for bag

Sl. No.	Characteristics	Requirements	Test Method
1	Nature of fibre/filament	Nylon 6	AATCC 20 & 20A
2	Nature of coating	Polyurethane	See Annexure-1
3	Weave	Plain-1 up 1 down	Visual
4	End/dm	146±2	IS 1963:1981
5	Picks/dm	114±2	IS 1963:1981
6	Weight of coated fabric, g/m ²	390±10	IS 1964 : 1970
7	Breaking load, Kg, Minimum -Warp-wise -Weft-wise	250 200	IS:7016 Pt II
7	Tearing Strength, Kg, Minimum - Warp-wise - Weft-wise	35 35	IS 6489: 1993
8	Abrasion Resistance (Martindale) -After 50,000 cycles	No thread breakage	IS: 12673 : 1989
9	Colour fastness to washing - Change in colour - Staining on adjacent fabric	4 or better 4 or better	IS 764 : 1979
11	Colour fastness to rubbing - Dry - Wet	4 or better 4 or better	IS 766:1988
12	Colour fastness to light	5 or better	IS 2454:1985
13	Dimensional Change due to relaxation, both directions, percentage, maximum	2.0	IS 2977: 1989
14	Water Proof ness at 30 cm water column height for 30 min.	No Percolation of water through the fabric or wetting of the outer surface.	IS:7016 Pt VII (A-2)
15	Water repellency (uncoated face)	Spray rating Min. 80	IS 390: 1975
16	Separation of PU firm	On fraying threads in warp and weft directions up to 5 mm after cutting the fabric from any portion, there shall not be a continuous PU film on the areas where from where the threads have been removed.	
17	Resistance to accelerated ageing at 70°C ± 1°C for 168 hrs in hot air circulating oven	There shall not be any softening, stiffening, tackiness, discoloration and objectionable odour	IS: 7016 Pt. VIII: :1975
18	Resistance to damage by flexing after 1,00,000 cycles	There shall not be any wrinkling, cracking and flaking	IS: 7016 Pt. IV: :1987
19	pH value of aqueous extract	6.0-8.0	IS1390 (Cold method) :1983

Table-4A: Specification of colour of Disruptive pattern printed Nylon 6 plain weave fabric – Dark Green)

(AATCC Test method 173 : 2005 & AATCC Evaluation Procedure 7 : 2003)

Colour	:	Dark Green		
System	:	CIE LCH		
Illuminant Observer	:	D 65		
Standard Observer	:	10 Degree		
Tristimulus Values	:	X	Y	Z
		5.234	5.964	4.813
LCH	:	L	C	H
		29.321	8.650	124.923
CMC (l:c)	:	2:1		
Colour difference, ΔE_{cmc}	:	≤ 3.0		

Interpretation of Results :

- iii) If ΔE_{cmc} is less than or equal to 3, then sample is acceptable.
- iv) If ΔE_{cmc} is greater than 3, 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.

Table 4B: Specification of colour of Disruptive pattern printed Nylon 6 plain weave fabric – Light Green)

(AATCC Test method 173 : 2005 & AATCC Evaluation Procedure 7 : 2003)

Colour	:	Light Green		
System	:	CIE LCH		
Illuminant Observer	:	D 65		
Standard Observer	:	10 Degree		
Tristimulus Values	:	X	Y	Z
		13.838	14.418	11.139
LCH	:	L	C	H
		44.827	10.951	84.217
CMC (l:c)	:	2:1		
Colour difference, ΔE_{cmc}	:	≤ 3.0		

Interpretation of Results :

- i) If ΔE_{cmc} is less than or equal to 3, then sample is acceptable.
- ii) If ΔE_{cmc} is greater than 3, 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.

**Table-4C: Specification of colour of Disruptive pattern printed Nylon 6
plain weave fabric – Khaki)**

(AATCC Test method 173 : 2005 & AATCC Evaluation Procedure 7 : 2003)

Colour	:	Khaki		
System	:	CIE LCH		
Illuminant Observer	:	D 65		
Standard Observer	:	10 Degree		
Tristimulus Values	:	X	Y	Z
		10.410	10.217	6.302
LCH	:	L	C	H
		38.229	16.771	70.096
CMC (l:c)	:	2:1		
Colour difference, ΔE_{cmc}	:	≤ 3.0		

Interpretation of Results :

- i) If ΔE_{cmc} is less than or equal to 3, then sample is acceptable.
- ii) If ΔE_{cmc} is greater than 3, 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.

Table-4D: Specification of colour of Disruptive pattern printed Nylon 6 plain weave fabric – Black

(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
		2.294	2.393	2.994
L C H	:	L	C	H
		17.428	3.064	280.297
CMC (l:c)	:	2:1		
Colour difference, ΔE_{cmc}	:	≤ 3.0		

Interpretation of Results :

- i) If ΔE_{cmc} is less than or equal to 3, then sample is acceptable.
- ii) If ΔE_{cmc} is greater than 3, 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.

Table 5 : Requirements of Nylon tape (25 mm wide and 45 m wide) used in the bag

Sl. No.	Characteristics	Requirements	Test Method
1	Nature of fibre/filament	Nylon 6	AATCC 20 & AATCC 20A
2	Colour fastness to Washing - Change in colour - Staining on adjacent fabric	4 or better 4 or better	IS 764 : 1979
3	Colour fastness to Light	4 or better	IS 2454:1985
4	Dimensional Change due to relaxation, Longitudinal direction, percentage, maximum	2.0	Guideline of IS 2977 :1989
5	pH value of aqueous extract	6.0-8.0	IS 1390 (Cold method) :1983
6	Colour	Match with dark green colour. - Table 4A	Visual

Table 6 : Requirements of Plastic Buckle (Male & Female) and Tape length adjuster used in carry bag

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 sample in 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 2454:1985
5	Pull load, Kgf. (Min)	45 (The male and female part shall not in any case come out due to slippage without breakage)	Annexure-2

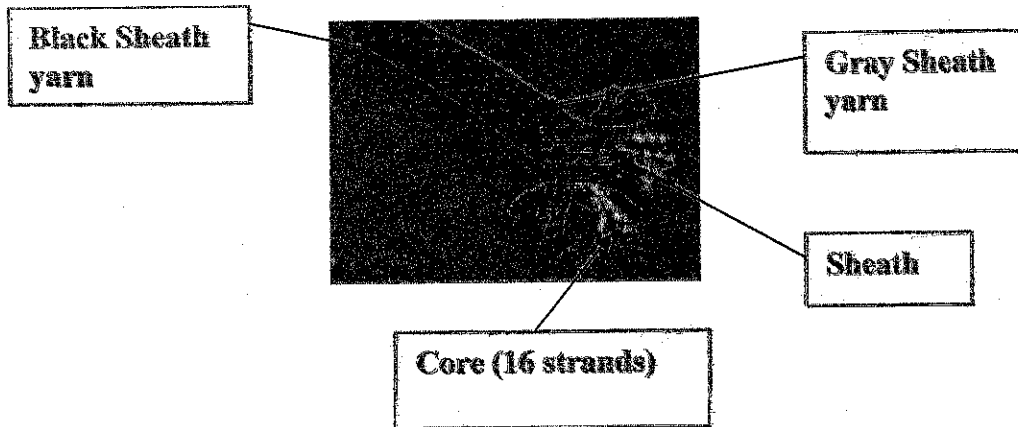
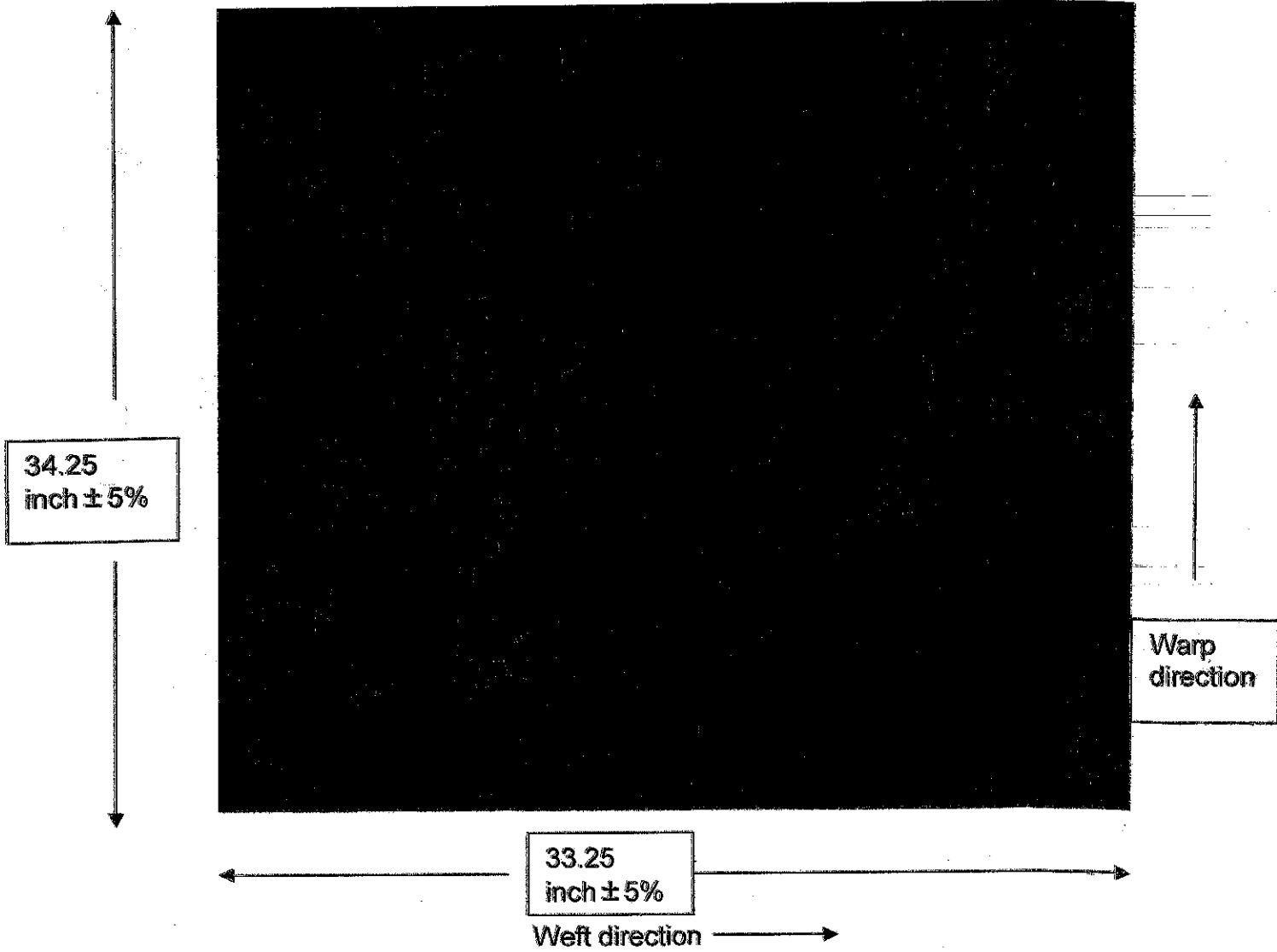


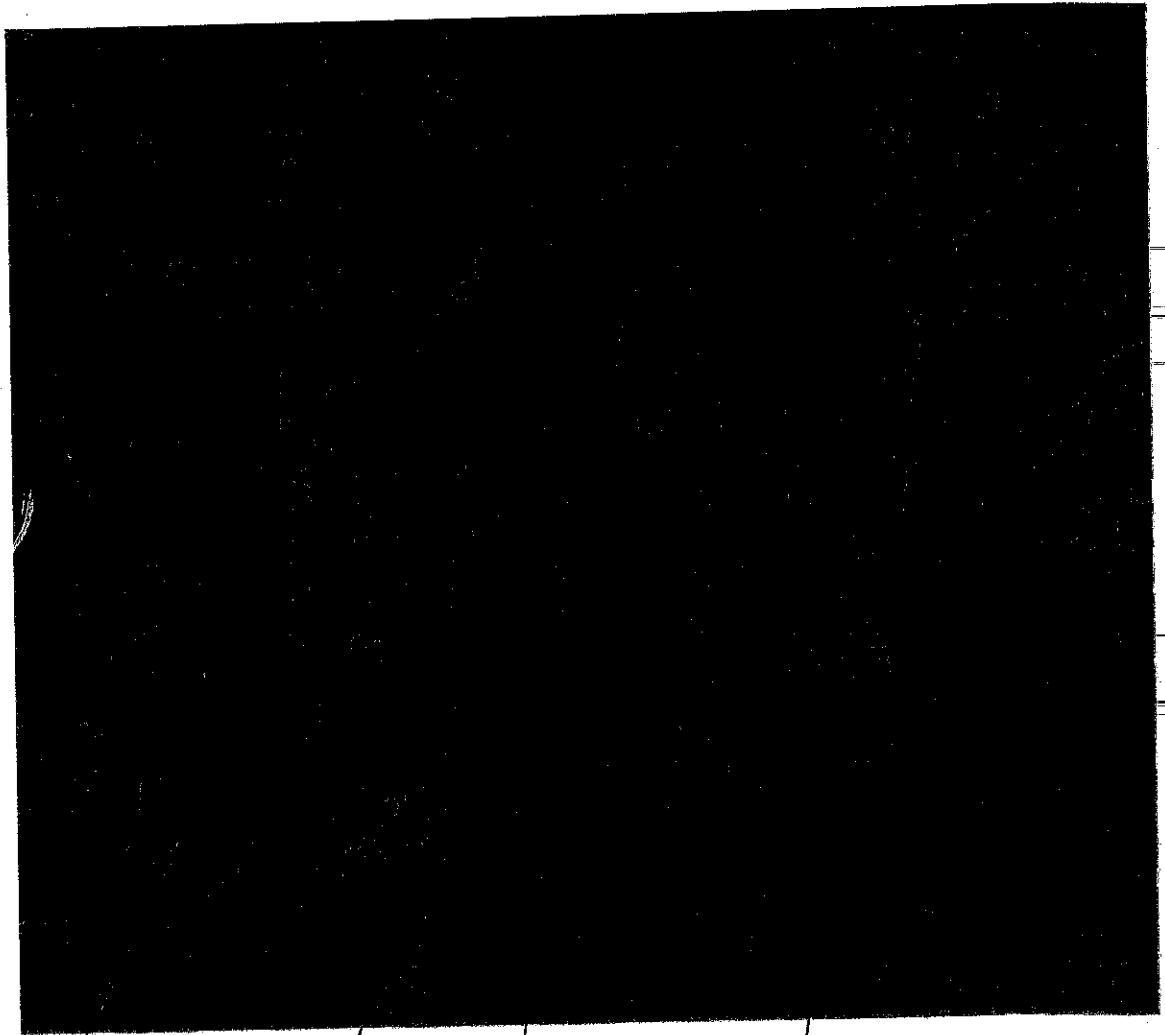
Fig. 1: Manufacture of rope



Scale:

Warpwise: 1cm=approx. 2.36 inch
Weftwise: 1 cm-approx 2.30 inch

Fig.2 : Disruptive Print (Carry bag) –One repeat of the design for guidance only



Khaki

Dark Green

Black

Light Green

Fig. 3 Disruptive Print (Carry bag) (For colour identification only)

(For true colours refer sealed fabric sample)

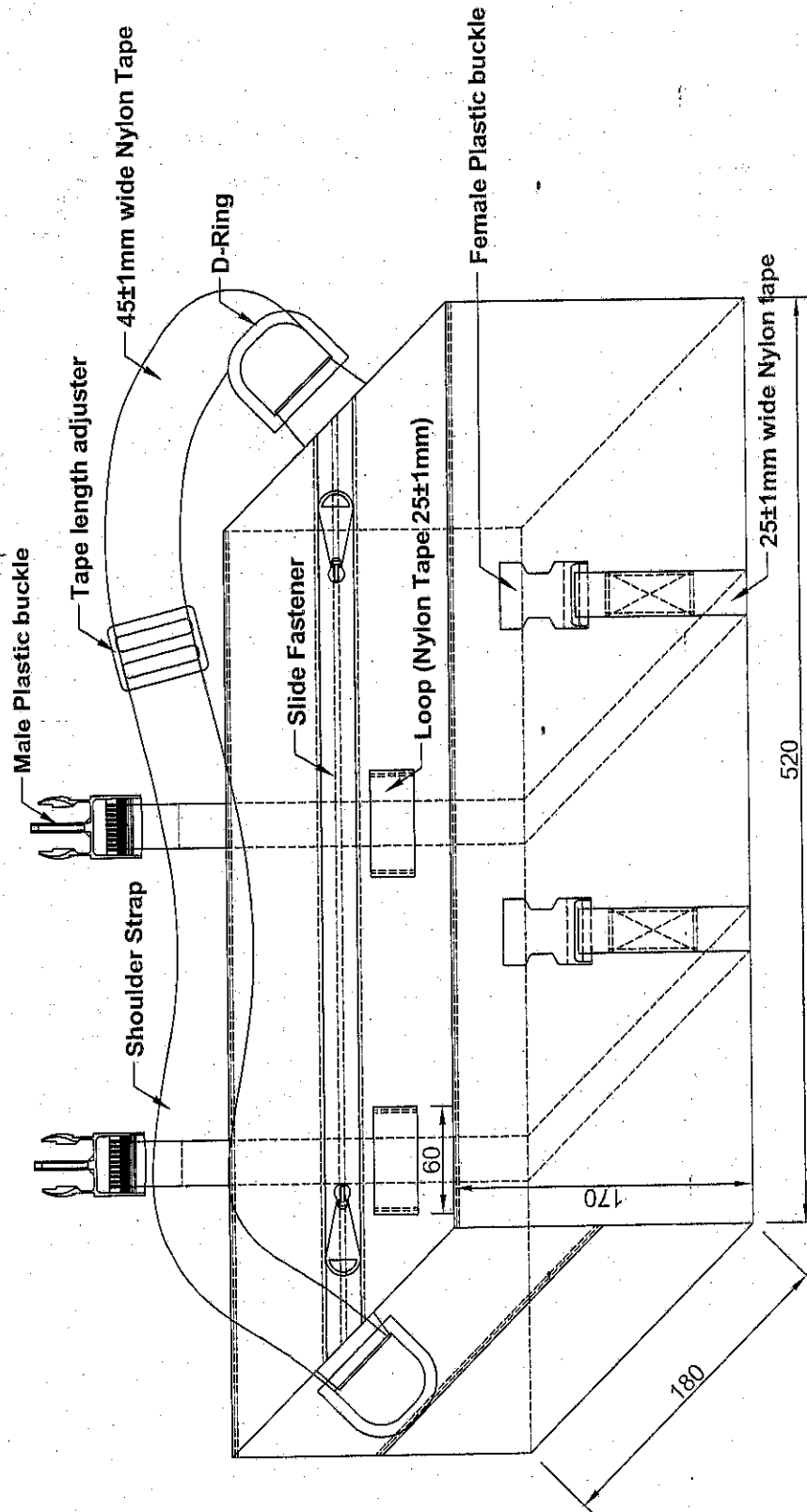


Fig-4 Carry Bag
 (All the dimensions are in mm)

B	X	X	X	X
F		X	X	
B	X		X	
F	X			X
	F	B	F	B

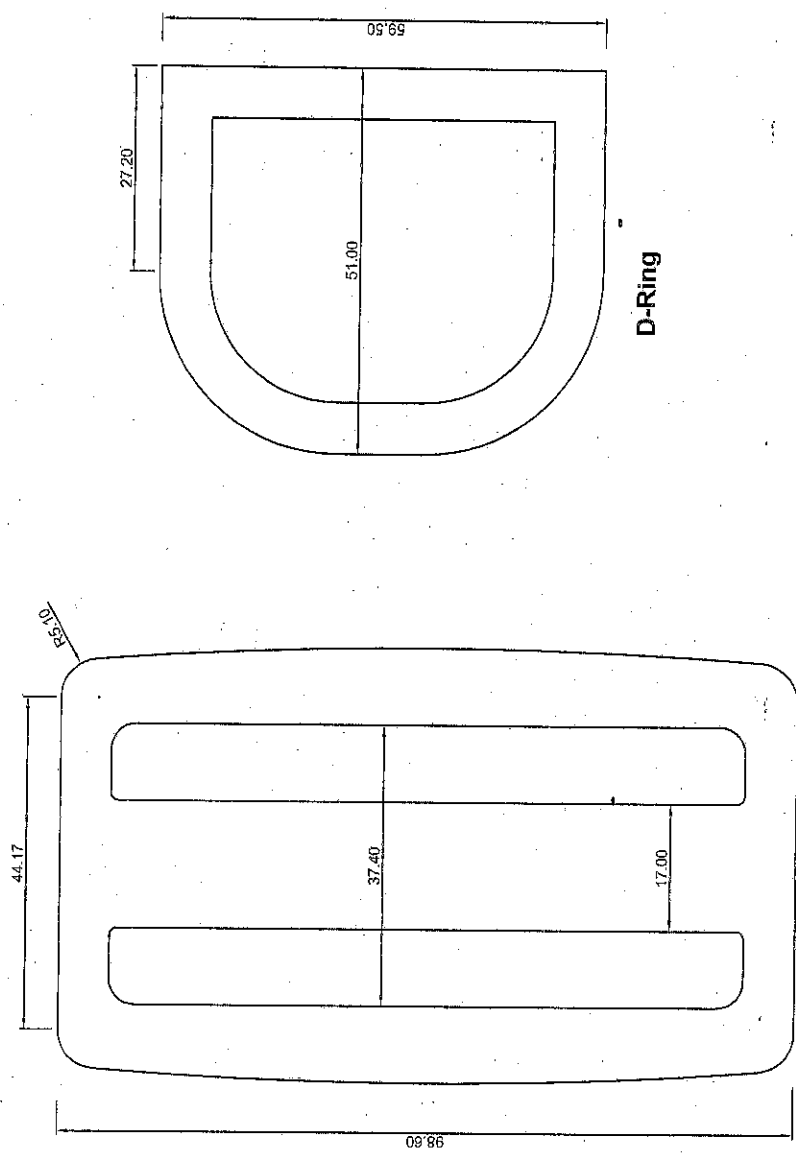
Fig -5 Nylon Tape 45±1mm wide - Weave repeats

- Note:**
- The weave repeat completes on 151 ends and 4 picks.
 - The weave is based on 2/2 twill as shown above which is repeated 19 times and then reversed.
 - One pick in the weave repeat represents two picks in the fabric.
 - The fabric to be woven on needle loom.

B	X	X	X	X	X					
F			X	X					X	X
B	X		X	X	X					
F	X								X	
	F	B	F	B	B	b	b	b	b	b

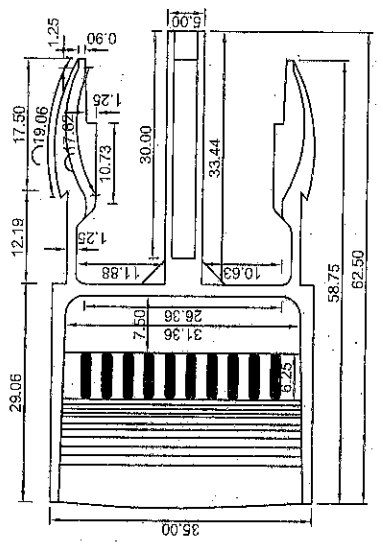
Fig -6 Nylon Tape 25±1mm wide - Weave repeat
(F-Face, B-Back, b-Binding)

- Note:**
- One pick in the weave repeat represents two picks in the fabric.
 - One end in the weave repeat represents two ends in the fabric.
 - The fabric to be woven on needle loom.

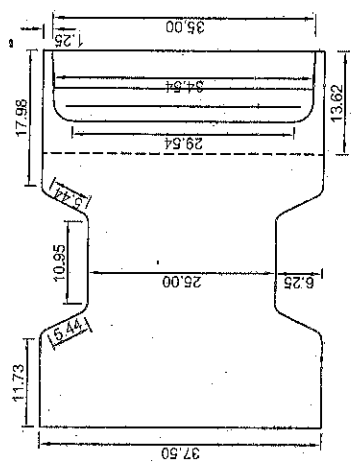


D-Ring

Tape length adjuster



Male Buckle



Female Buckle

Fig-7 Plastic Buckle & D-Ring
(All the dimensions are in mm)

7.0 SAMPLING AND CRITERIA FOR CONFORMITY

7.1 Lot: For the purpose of conformance inspection and test sampling, a lot is defined as all the completed "ROPE" along with carry 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.

7.2 For assessing the conformity of the lot to the requirements of the specification, the samples as given in Table 8 and Table 9 (for carry bag only) shall be drawn at random from the lot for inspection. To ensure the randomness of selection, methods given in IS 4905 shall be followed.

7.3 The lot shall be considered as conforming to the requirements of this specification if all the samples of "Rope" meet the requirements specified in this standard. While for the carry bags criterion of conformity is given in the Table 10.

Table-8: Sample size

No. of "Rope" in the lot	Non – Destructive Testing (For freedom from defects, and dimensions)	Destructive Testing (For nature of fibre/filament, mass, Knotability, sheath slippage, elongation, shrinkage, mass of sheath and core, dynamic performance, static strength, pH value, colour fastness to various agencies etc.)
	No. of "Rope" to be selected	No. of "Rope" to be selected
(1)	(2)	(3)
Up to 100	8	1
101 – 150	13	1
151-300	20	2
301 and above	32	3

Note: Sampling officer will select sampling unit randomly and select ultimate items from each sampling unit as per the above table.

Table 9: Carry bags to be selected from a lot and permissible number of non-conforming carry bag(s)

Lot size (1)	Non – Destructive Testing		Destructive Testing	
	No. of Carry bag (s) to be selected (2)	Permissible number of non-conforming carry bag (s) (3)	No. of carry bag (s) to be selected (4)	Permissible number of non-conforming carry bag (s) (5)
Up to 100	8	1	2	0
101 – 150	13	2	3	0
151-300	20	3	5	1
301 and above	32	5	8	1

Table 10: Criterion for conformity of carry bag(s)

Characteristics	Number of test samples	Criteria for conformity
Dimensions, Nos. of ends & picks, visual colour inspection and freedom from defects	All the carry bag(s) selected according to the column 2 of table-9	Non-conforming carry bag(s) not to exceed the corresponding number given in column 3 of table-9
Dimensional change, pH value, mass, colour fastness to various agencies etc.	All the carry bag(s) selected according to the column 4 of table-9	Non-conforming carry bag(s) not to exceed the corresponding number given in column 5 of table-9

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

7.4 The CRPF (CoBRA) reserves the right to carry out inspection of bigger lot sizes, even to the extent of 100% inspection, if considered necessary.

8.0 MARKING

8.1 "Rope" shall have external bands at both ends which shall have the following permanent markings:

- a) Diameter in mm of the rope e.g. D 12
- b) Name of the buyer i.e CRPF-CoBRA

8.2 "Rope" shall have the following internal marking repeated at least every one meter throughout the length. For this purpose a strip may be provided inside the rope having requisite information's. (For clarification rope held in the custody of CRPF-CoBRA may be referred)

- a) Name / Trademark of the manufacturer
- b) Name of the buyer i.e CRPF-CoBRA
- c) The year of manufacture
- d) Material from which rope is made i.e Nylon
- c) Any other information required by the buyer

NOTE: The Quality Assurance Authority of CRPF-CoBRA reserves the right of any addition or deletion in the marking instruction.

9.0 PACKAGING & PACKING

9.1 Each length of rope shall be coiled, flattened and tied into hank not exceeding 24 inches in length. Each coiled length of "Rope" shall then be first wrapped with one layer of polyethylene film of minimum 40 microns (see IS: 2508-1963) and then placed in the bag to form a unit pack.

9.2 Four such unit packs shall be packed in a corrugated box, as required by the buyer (see IS 2194 and IS 2195).

10. 0 RELATED TEST METHODS AND SPECIFICATIONS

Sl. No.	SPEC. /TEST METHOD No.	DESCRIPTION
(a)	AATCC 20 : 2007	Fibre analysis: Qualitative
(b)	AATCC 20A: 2008	Fibre analysis: Quantitative
(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 764: 1979, RA 2004	Method for determination of colour fastness of textile material to washing
(g)	IS 4905: 1968, RA 2006	Method of random Sampling
(h)	IS 6359:1971, RA 2004	Method for Conditioning of Textiles
(i)	EN 1891:1998	Low stretch kernmantel ropes
(j)	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

11.0 ANNEXURE

Annex-1

Identification of polyurethane coating

Take approximately 5 g of the coated fabric. Treat it with 50 ml glacial acetic acid .by warming for several minutes. To this add 0.1 g p-dimethymino benzaldehyde. The solution is further heated for 2-3 minutes. The solution turns yellow indicates presence of polyurethane.

Annex-2

Determination of pull load of quick release Buckle plastic

The buckle shall be tested for pull load by applying static load between male and female part of the buckle at a speed of 100 mm/minute.



4 4 2

6 4 2