

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.

(R.S.Sharma)
Director (Prov)

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

महानिदेशक सचिव डायरी संख्या.....	459/10000
DG's Sectt. Diary No.	
महानिदेशक / Director General.....	
अ. महानिदेशक / Add. D.G.	
तिथि / Date	12 MAR 2010
य.नि. कार्मिक / परि० / प्रशि. / संमरण / प्रशा. / निर्माण.....	
वि.सं. / निदेशक (चिकित्सा).....	
IG-Pers/Ops/Trg/Prov/Adm/Works.....	
रि. निदेशक (Medical).....	

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CENTRAL RESERVE POLICE FORCE (CoBRA) STANDARD



SPECIFICATION FOR “POUCH FOR AMMUNITION AND GRENADES MADE OF DISRUPTIVE PATTERN NYLON 6 6 MATERIALS”

Submitted to :

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

Prepared by :

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**SPECIFICATION FOR “POUCH FOR AMMUNITION AND
GRENADES MADE OF DISRUPTIVE PATTERN NYLON 66
MATERIALS”**

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 “Pouch for ammunition and Grenades made of disruptive pattern Nylon 6 6 material”. 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 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 46 pages which describe the technical specifications of “Pouch for ammunition and Grenades made of disruptive pattern Nylon 66 material” 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 “Pouch for ammunition and Grenades made of disruptive pattern Nylon 6 6 material” and final inspection as well.

**SPECIFICATION FOR “POUCH FOR AMMUNITION AND
GRENADES MADE OF DISRUPTIVE PATTERN NYLON 66
MATERIALS”**

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0.0 FORWARD

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

- 0.5. 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

- 0.6. 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.

1.0 SCOPE

1.1 The specification prescribes the requirement of “Pouches for ammunition and Grenades made of disruptive pattern Nylon 6 6 material” herein referred as “Pouch”.

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

2.0 MATERIAL AND MANUFACTURE

2.1 The design and shape of the “Pouch” shall be as per Fig. 1 to 17.

2.2 Following are the components used in the manufacture of “Pouch” :

Component No.	Name of the component	Description
1	Disruptive pattern printed Nylon 6 6 plain weave fabric	1. Nylon 6 6 multifilament texturised yarn shall be used. 2.For guidance i) warp count: 600 Denier, ii) weft count: 600 Denier 3.Water proof and water repellent fabric 4. The fabric shall be ‘Heat set’ and fully shrunk. 5. Disruptive printed
2	Base fabric	1. Nylon 6 6 multifilament texturised yarn shall be used. 2.For guidance i) warp count: 600 Denier, ii) weft count: 600 Denier 3.Water proof and water repellent fabric 4. The fabric shall be ‘Heat set’ and fully shrunk. 5. Green Colour
3	Nylon mesh (warp knit)	1. Nylon 6 6 multifilament texturised yarn shall be used. 2. For guidance 350 Denier yarn may be used. 3. Nos. of hole/Inch ² : 36±1 4. Green Colour

Component No.	Name of the component	Description
4	Binding or Piping cloth 25±5% mm wide	1. Nylon 6 6 multifilament yarn shall be used. 2. For guidance multifilament Nylon 6 6 yarn of approximately 225 Denier may be used in warp and weft direction. 3. Weave: Plain, Needle loom shall be used for the manufacture of piping.
5	Nylon Tape 50±1 mm wide	1. Nylon multifilament yarn shall be used. 2. For guidance: i) Warp count: 850 Denier ii) Binding yarn (Warp): 850 Denier, iii) Weft count 450 Denier, 3. Total ends (full width): 404 (348 warp ends + 56 binding warp ends), Picks per dm: 330 4. Weave: Refer Fig. 17. Needle loom shall be used for the manufacture. 5. Green Colour
6	Nylon Tape 25±1 mm wide	1. Nylon multifilament yarn shall be used. 2. For guidance i) Warp count: 850 Denier ii) Binding yarn (Warp): 850 Denier, iii) Weft count 450 Denier 3. Total ends(full width): 203 (175 warp ends + 28 binding warp ends), Picks per dm: 340 4. Weave: Refer Fig. 17. Needle loom shall be used for the manufacture 5. Green Colour
7	Nylon Tape 19±1 mm wide	1. Nylon multifilament yarn shall be used. 2. For guidance i) Warp count: 850 Denier ii) binding yarn (Warp): 500 Denier, iii) Weft count 850 Denier 3. Total ends: 110 (88 warp ends + 22 binding warp ends), Picks per dm: 320 4. Weave: Refer Fig. 17 5. Green Colour

Component No.	Name of the component	Description
8	Hook fastener 50±1 mm wide	1. Comply with the acceptance criteria specified in IS 8156: 1994 RA 2004 2. Green Colour
9	Loop fastener 50±1 mm wide	1. Comply with the acceptance criteria specified in IS 8156: 1994 RA 2004 2. Green Colour
10	Hook fastener 25±1 mm wide	1. Comply with the acceptance criteria specified in IS 8156: 1994 RA 2004 2. Green Colour
11	Loop fastener 25±1 mm wide	1. Comply with the acceptance criteria specified in IS 8156: 1994 RA 2004 2. Green Colour
12	Elastic Tape 25±1 mm wide	1. Comply with the acceptance criteria specified in IS: 1986:1980 2. Green Colour
13	Slide fastener 25±1cm length (open end)	1. Comply with the acceptance criteria specified in IS 14181 2. 'Medium Special' designation as per IS 14181(Pt. 1) 3. Black Colour
14	Slide fastener 25±1 cm length	1. Comply with the acceptance criteria specified in IS 14181 2. Black Colour
15	Slide fastener 20±1cm length	1. Comply with the acceptance criteria specified in IS 14181 2. Black Colour
16	Side release (Quick release) buckle (SRB)-male	1. Made out of Nylon, 2. For dimension refer Fig. 16. 3. Black Colour
17	Side release (Quick release) buckle (SRB)-female (For chest & waist strap)	1. Made out of Nylon, 2. For dimension refer Fig. 16. 3. Black Colour
18	Side release (Quick release) buckle (SRB)-female (For pocket)	1. Made out of Nylon, 2. For dimension refer Fig. 16. 3. Black Colour
19	Ladder lock	1. Made out of Nylon, 2. For dimension refer Fig. 16. 3. Black Colour

Component No.	Name of the component	Description
20	Snap fastener –Male	1. Outer diameter 13 mm 2. Black Colour
21	Snap fastener –Female	1. Outer diameter 13 mm 2. Black Colour
22	Eyelet Black	1. Internal diameter: 10 mm, Outer diameter 13 mm 2. Black Colour
23	Sewing Thread	1. Nylon sewing thread conforming variety no. H ₁ of IS: 4229. 2. Green Colour

2.2.1 The front and back portions of “*Pouch*” are made of three sections. The front portion is made of two sections, one for the right hand side and the other for left hand side; while the back portion is made of one section. The assembly of the three sections is shown in Fig. 1. The dimensions of “pouch” shall be as shown in Fig 2 to 7.

2.2.2 Each of the left hand side and right hand side section of the “Pouch” shall have two fabric layers. The outer layer shall be made of Component-2, while the inner layer shall be of Component-3. Component -4 shall be used as piping (Refer Fig. 9 and 10).

2.2.3 The back portion of the “Pouch” shall be made of two layers of component-3. The two layers are joined together in such a way that it can be used as a pocket(Refer Fig 8). The pocket shall be closed with the help of components-10 and 11. Component -4 shall be used as piping.

2.2.4 Pockets: The “Pouch” shall have six main pockets numbered as Pocket - 1 to 6 as shown in the Fig 2, Fig. 4, Fig 9 and Fig 10. The details pertaining to these pockets are given below:

2.2.4.1 Pocket No.-1:

- i) For design, dimension and stitching of Pocket-1, refer Fig.11.
- ii) The Pocket-1 has two additional pockets referred as Pocket- 1A and 1B (Refer Fig. 11).
- iii) Fabric: Component-1 shall be used
- iv) Binding or Piping: Component -4 shall be used
- v) Ventilator: Component-22 shall be used as a ventilator; it shall be positioned at exactly bottom centre of the Pocket-1.
- vi) The Pocket-1 shall be closed with the help of components-8 and 9. An extra closing system shall also be provided with the help of Components -6, 12, 16 and 18 (Refer Fig 11).
- vii) The Pocket 1A and 1B shall be closed with the help of components-10 and 11.

2.2.4.2 Pockets Nos. -2, 3 and 4:

- i) For design, dimension and stitching of Pocket-2 to 4, refer Fig.12.
- ii) Fabric: Component-1 shall be used
- iii) Binding or Piping: Component -4 shall be used.
- iv) Ventilator: Component-22 shall be used as a ventilator; it shall be positioned at exactly bottom centre of the Pockets-2, 3 and 4.
- v) The Pockets-2, 3 and 4 shall be closed with the help of components-8 and 9. An extra closing system shall

also be provided with the help of Component -6, 12, 16 and 18 (Refer Fig 12).

- vi) The Pocket-3 has one additional pocket referred as Pocket-3A (Refer Fig. 12).
- vii) At the opening of pocket-3A, component -12 shall be used (Refer Fig 12). A two layer of component 4 shall be used in the pocket as shown in the Fig 12.

2.2.4.2 Pockets-5 and 6:

- i) For design, dimension and stitching of Pockets-5 and 6, refer Fig.13
- ii) Fabric: Component-1 shall be used
- iii) Binding or Piping: Component -4 shall be used.
- iv) Ventilator: Component-22 shall be provided as a ventilator; it shall be positioned at exactly bottom centre of the Pocket- 5 and 6.
- v) The Pocket-5 and 6 shall be closed with the help of Components-20 and 21. Component- 20 shall be attached to the Component-7 and then stitched to the pocket flap, while Component-21 shall be attached to the pocket as shown in the Fig 13.

2.2.5 Printing of Component-1: 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. 15. The colours to be used in the disruptive pattern print are shown in Fig. 16.

2.2.6 Shoulder strap: Two layers of Component-3 shall be used as shoulder strap which shall be attached to the three sections of "*Pouch*" as shown in Fig. 9 to 11. The dimensions shall be as given in Fig. 3 and 5. To ascertain the shape of mesh refer the sample held under the custody of CRPF(CoBRA).

2.2.7 All three sections of "*Pouch*" are held together with the help three straps made out of Component-7 and 19. The positioning and the dimensions of straps (strap-1, strap-2 and strap-3) are shown in Fig. 2, 4 and 6.

2.2.8 Chest & Waist straps: "*Pouch*" shall have two adjustable green colour straps (chest strap & waist strap) as shown in Fig 2 and 4. These straps shall be made of Component-6, Component-12, Component 16 and Component-17. The position and dimensions of these straps are shown in the Fig. 2 and 4.

2.2.9 Binding tape or piping: Component-4 shall be used as piping to finish outer edges of "*Pouch*" (Fig. 4 and Fig.11). The finished width of piping on face side of "*Pouch*" shall be $12 \pm 5\%$ mm.

2.2.10 Slide fasteners: Three slide fasteners (Component-13, Component-14 and Component-15) shall be used in different portions of the "*Pouch*". The right hand and left hand sections of the front portion of the "*Pouch*" shall be provided with Component-13 (shown as Slide Fastener No. 1 in Fig. 2), to open and close "*Pouch*". The position and dimensions of other two slide fasteners-Slide

Fastener No 2 (Component-14) and 3 (Component-15) are shown in Fig 2 and Fig 4.

3.0 STITCHING:

3.1 Lock stitch and Bartack shall be employed to assemble components of “Pouch”. Location and types of stitch can be seen in the “Pouch” sample held in the custody of CRPF-CoBRA. In the case of Lock stitch, four stitches per cm shall be employed wherever stitching has to be carried out. The width of the Bartack shall be 2mm and for length, refer Fig. 2. The stitching shall be done with even tension and all loose ends shall be securely fastened off.

3.2 Nylon sewing thread (Component-23) shall be used.

4.0 FREEDOM FROM DEFECT:

The “Pouch” 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 “Pouch” shall be free from dyeing & printing defects.

The “Pouch” shall be free from any other defect which may significantly mark the appearance or serviceability.

5.0 REQUIREMENTS

5.1 The Component-1 used in the “Pouch” shall conform to the requirements as given in Table 3. Specification for colour used in Component-1 shall be as given in Table 4A to 4D.

5.2 The Component-2 used in the “Pouch” shall comply with the requirement as mentioned in the Table 3. The colour difference (ΔE) of this fabric shall not

be more than 3 from the dark green colour (refer Table 4A) of the Component-1.

5.3 Component-3 shall comply with the requirement given in the Table 5. The colour difference (ΔE) shall not be more than 3 from the dark green colour (Table 4A) of the Component-1.

5.4 The Component-4 shall meet the requirements as given in Table 6 and 7.

5.5 The Component-5, Component-6 and Component-7 used in the “Pouch” shall comply with the requirement given in the Table 8. The colour of these Components shall be green. Specification for colour shall be as given in Table 9.

5.6 The Component-8, Component-9, Component-10 and Component-11 shall meet the requirements as given in IS 8156: 1994 RA 2004. The colour difference (ΔE) shall not be more than 3 from the dark green colour (Table 4A) of the Component-1.

5.7 The Component-12 of the “Pouch” shall meet the requirement of IS: 1986:1980. The colour difference (ΔE) shall not be more than 3 from the dark green colour (Table 4A) of the Component-1.

5.8 Component-13, Component-14 and Component-15 used in the “Pouch” shall comply with the acceptance criteria specified in IS 14181. Specification for colour shall be as given in Table 10.

5.9 The quality requirements of Component-16, Component-17, Component-18 and Component-19 are given in Table 11. Specification for colour shall be as given in Table 12

5.10 Sealed Sample: In order to illustrate or specify the indeterminable characteristics such as general appearance, luster, feel and print design of

the “Pouch”, a sample has been agreed upon and sealed; the supply shall be conformity with the sample in such respects.

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

6.0 MARKING

The “Pouch” shall be legibly and indelibly marked with the following information:

- (a) Manufacturer’s name, initials or trade-mark;
- (b) Instructions for storage and care;
- (c) Date of manufacture; and
- (d) Any other information required by the law in force and/or by the buyers.

7.0 PACKAGING & PACKING

The “Pouch” shall be delivered in a clean and dry condition. Ten such “Pouch” shall be made into one unit pack (bundle) by suitably folding, placing one over the other and then suitably tying them with three ply twine jute (IS: 1912).

Four such bundles shall form one bale. These bales shall be packed in such a way that it ensures full protection to the contents of the bale. Hessian cloth shall be used to cover the bale. This cloth shall securely sewn around the bale. The bale shall be stitched with double three ply jute twine with not less than twelve stitches per dm, taking care not to pierce the inner wrapping during stitching. Sufficient Hessian cloth shall be pulled out each other to form ‘ears’ of about fifteen cms in length. The bale shall be suitably secured by fastening with 12 mm polypropylene strap.

Before dispatch each bale/package shall be legibly marked by stencil showing the following information:

- i) Nomenclature and Category number of the store
- ii) Quantity packed in the bale/package
- iii) Serial number of the bale/package
- iv) Month & Year of packing
- v) Name/Trademark of the Manufacture
- vi) Gross weight of the bale/package 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 “Pouch” 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 “Pouch” 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: “Pouch” to be selected from a lot and permissible number of non-conforming Pouch(s)

Lot size	Non – Destructive Testing		Destructive Testing	
	No. of Pouch(s) to be selected	Permissible number of non-conforming Pouch(s)	No. of Sling(s) to be selected	Permissible number of non-conforming Pouch(s)
(1)	(2)	(3)	(4)	(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 and picks and freedom from defects	All the Pouch(s) selected according to the column 2 of table-1	Non-conforming Pouch(s) not to exceed the corresponding number given in column 3 of table-1
Weight and mass per linear meter	All the Pouch(s) selected according to the column 2 of table-1	Each observed value satisfies the relevant requirement
Dimensional change, pH value, colour fastness to various agencies	All the Pouch(s) selected according to the column 4 of table-1	Non-conforming Pouch(s) not to exceed the corresponding number given in column 5 of table-1

Table 3 : Requirements of “Pouch”- Component-1and Component-2

Sl. No.	Characteristics	Requirements	Test Method
1	Nature of fibre/filament	Nylon 6 6	AATCC 20 & 20A
2	Nature of coating	Polyurethane	See Annexure-1
3	Weave	Plain-1 up 1 down*	Visual
4	End/dm	154±2 double**	IS 1963:1981
5	Picks/dm	110±2 double**	IS 1963:1981
6	Mass, g/m ²	420±20	IS 1964 : 1970
7	Tearing Strength, Newton (Minimum) - Warp-wise - Weft-wise	140 140	IS 7016 Pt III, Method-A2
8	Abrasion Resistance (Martindale) -Using Abradant “Emery Paper No. 600” at Load of 200 gm on Uncoated surface	Number of revolutions required for rupture of one or more thread on Uncoated surface should be minimum 10000	(ASTM D:4966-98)
9	Colour fastness to washing - Change in colour - Staining on adjacent fabric	4 or better 4 or better	IS 764 : 1979
10	Colour fastness to perspiration - Change in colour - Staining on adjacent fabric	4 or better 4 or better	IS 971:1983
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 60 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 air circulating oven	No sign of cracks, wrinkle or flaking should be observed	IS: 7016 Pt. VIII: :1975
18	Resistance to damage by flexing after 1,00,000 cycles	No sign of cracks, softening or signs of brittleness should be observed	IS: 7016 Pt. IV: :1987

*1 double = 2 parallel yarn, ** 2 parallel yarns are laid as one in warp and weft both

**Table-4A: Specification of colour of “Pouch”-Disruptive pattern printed
Nylon 6 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	:	<table border="1"> <tr> <td align="center">X</td><td align="center">Y</td><td align="center">Z</td></tr> <tr> <td align="center">5.234</td><td align="center">5.964</td><td align="center">4.813</td></tr> </table>	X	Y	Z	5.234	5.964	4.813
X	Y	Z						
5.234	5.964	4.813						
L C H	:	<table border="1"> <tr> <td align="center">L</td><td align="center">C</td><td align="center">H</td></tr> <tr> <td align="center">29.321</td><td align="center">8.650</td><td align="center">124.923</td></tr> </table>	L	C	H	29.321	8.650	124.923
L	C	H						
29.321	8.650	124.923						
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 4B: Specification of colour of “Pouch”-Disruptive pattern printed
Nylon 6 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	:	<table border="1"> <tr> <td align="center">X</td><td align="center">Y</td><td align="center">Z</td></tr> <tr> <td align="center">13.838</td><td align="center">14.418</td><td align="center">11.139</td></tr> </table>	X	Y	Z	13.838	14.418	11.139
X	Y	Z						
13.838	14.418	11.139						
L C H	:	<table border="1"> <tr> <td align="center">L</td><td align="center">C</td><td align="center">H</td></tr> <tr> <td align="center">44.827</td><td align="center">10.951</td><td align="center">84.217</td></tr> </table>	L	C	H	44.827	10.951	84.217
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 “Pouch”-Disruptive pattern printed
Nylon 6 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	:	<table border="1"> <tr> <td>X</td><td>Y</td><td>Z</td></tr> <tr> <td>10.410</td><td>10.217</td><td>6.302</td></tr> </table>	X	Y	Z	10.410	10.217	6.302
X	Y	Z						
10.410	10.217	6.302						
L C H	:	<table border="1"> <tr> <td>L</td><td>C</td><td>H</td></tr> <tr> <td>38.229</td><td>16.771</td><td>70.096</td></tr> </table>	L	C	H	38.229	16.771	70.096
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 “Pouch”- Disruptive pattern printed
Nylon 6 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	:	<table border="1"> <tr> <td align="center">X</td><td align="center">Y</td><td align="center">Z</td></tr> <tr> <td align="center">2.294</td><td align="center">2.393</td><td align="center">2.994</td></tr> </table>	X	Y	Z	2.294	2.393	2.994
X	Y	Z						
2.294	2.393	2.994						
L C H	:	<table border="1"> <tr> <td align="center">L</td><td align="center">C</td><td align="center">H</td></tr> <tr> <td align="center">17.428</td><td align="center">3.064</td><td align="center">280.297</td></tr> </table>	L	C	H	17.428	3.064	280.297
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 “Pouch” – Component-3

Sl. No.	Characteristics	Requirements	Test Method
1	Nature of fibre/filament	Nylon 6 6 filament	AATCC 20 & AATCC 20A
2	Number of holes/ Sq. Inch (Rectangular in shape)	36±1	Guideline of IS 1963: 1981
3	Mass, g/ m ²	270±5%	IS 1964 : 1970
4	Colour fastness to Washing - Change in colour - Staining on adjacent fabric	4 or better 4 or better	IS 764 : 1979
5	Colour fastness to Perspiration - Change in colour - Staining on adjacent fabric	4 or better 4 or better	IS 971:1983
6	Colour fastness to Light	4 or better	IS 2454:1985
7	Dimensional Change due to relaxation, both directions, percentage, maximum	2.0	IS 2977:1989
8	pH value of aqueous extract	6.0-8.0	IS 1390 (Cold method) :1983

Table 6 : Requirements of “Pouch” – Component-4

Sl. No.	Characteristics	Requirements	Test Method
1	Nature of fibre/filament	Nylon 6 6 filament	AATCC 20 & AATCC 20A
2	End/dm	800±5%	IS 1963:1981
3	Picks/dm	150±5%	IS 1963:1981
4	Mass/ Linear meter, g	7.5±5%	IS 1964 : 1970
5	Breaking strength, N (Minimum)	2500	IS 1969:1985 (2.5 cm x full width fabric between grips)
6	Colour fastness to Washing - Change in colour - Staining on adjacent fabric	4 or better 4 or better	IS 764 : 1979
7	Colour fastness to Light	5 or better	IS 2454:1985
8	pH value of aqueous extract	6.0-8.0	IS 1390 (Cold method) :1983

Table 7: Specification of colour of “Pouch”- Component-4

(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	:	<table> <tr> <th>X</th><th>Y</th><th>Z</th></tr> <tr> <td>6.170</td><td>7.202</td><td>4.893</td></tr> </table>	X	Y	Z	6.170	7.202	4.893
X	Y	Z						
6.170	7.202	4.893						
L C H	:	<table> <tr> <th>L</th><th>C</th><th>H</th></tr> <tr> <td>32.262</td><td>13.642</td><td>120.369</td></tr> </table>	L	C	H	32.262	13.642	120.369
L	C	H						
32.262	13.642	120.369						
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 8 : Requirements of “Pouch” – Component- 5,Component-6 and Component-7

Sl. No.	Characteristics	Requirements	Test Method
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1	Nature of fibre/filament	Nylon	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, both directions, percentage, maximum	2.0	IS 2977 :1989
5	pH value of aqueous extract	6.0-8.0	IS 1390 (Cold method) :1983

Table 9: Specification of colour “Pouch”- Component- 5,Component-6 and Component-7

(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	:	<table> <tr> <th>X</th><th>Y</th><th>Z</th></tr> <tr> <td>6.783</td><td>7.622</td><td>5.770</td></tr> </table>	X	Y	Z	6.783	7.622	5.770
X	Y	Z						
6.783	7.622	5.770						
L C H	:	<table> <tr> <th>L</th><th>C</th><th>H</th></tr> <tr> <td>33.183</td><td>10.313</td><td>115.329</td></tr> </table>	L	C	H	33.183	10.313	115.329
L	C	H						
33.183	10.313	115.329						
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 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 10: Specification of colour of “Pouch”- Component-13, Component-14 and Component-15

(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	:	<table> <tr> <td>X</td><td>Y</td><td>Z</td></tr> <tr> <td>2.654</td><td>2.792</td><td>3.118</td></tr> </table>	X	Y	Z	2.654	2.792	3.118
X	Y	Z						
2.654	2.792	3.118						
L C H	:	<table> <tr> <td>L</td><td>C</td><td>H</td></tr> <tr> <td>19.191</td><td>0.814</td><td>280.431</td></tr> </table>	L	C	H	19.191	0.814	280.431
L	C	H						
19.191	0.814	280.431						
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 11: Requirements of “Pouch” – Component-16, Component-17, Component-18 and Component-19

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) for quick release buckle only	45 (The male and female part shall not in any case come out either due to slippage or breakage)	By applying load between male and female part of the buckle at a speed of 100 mm/minute.

Table 12: Specification of colour of “Pouch”- Component-16, Component-17, Component-18 and Component-19

(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	:	<table> <tr> <td>X</td><td>Y</td><td>Z</td></tr> <tr> <td>4.384</td><td>4.628</td><td>5.054</td></tr> </table>	X	Y	Z	4.384	4.628	5.054
X	Y	Z						
4.384	4.628	5.054						
L C H	:	<table> <tr> <td>L</td><td>C</td><td>H</td></tr> <tr> <td>25.648</td><td>0.408</td><td>265.190</td></tr> </table>	L	C	H	25.648	0.408	265.190
L	C	H						
25.648	0.408	265.190						
CMC (l:c)	:	2:1						
Colour difference, ΔE_{cmc}	:	≤ 3.0						

Interpretation of Results :

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

9.0 REFERENCES

LIST OF REFERED STANDARDS

Sl. No.	Method/Spec. number	Title
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1	IS:397(Part I) : 2003	Method for statistical quality control during production : Part I Control charts for variable
2	IS:3596 : 1967 (RA 2004)	Glossary of terms relating to hosiery
3	IS:14452:1997 (RA 2006)	Textiles-Care Labeling code using symbols
4	IS:397 (Part II): 2003	Method for statically quality control during production: Part 2 Control charts for attributes and count of defects
5	IS:6359: 1971 (RA 2004)	Method for conditioning of Textiles
6	IS:10789:2000 (RA 2007)	Classification and terminology of stitch types used in seams
7	IS:11161:2000 (RA 2007)	Textiles-seam types-classification and terminology
8	IS:3442:1980 (RA 2004)	Methods for identification of crimp and count of yarn removed from fabric
9	IS:1963:1981 (RA 2004)	Method for determination of thread per unit length in woven fabric
10	IS:1964:1970 (RA 2006)	Methods for determination of weight per square meter and weight per linear meter of fabric
11	IS: 1954:1990 (RA 2007)	Determination of length and width of woven fabric
12	IS 764 : 1979, Reaffirmed 2008	Method for determination of colour fastness of textile material to washing
13	IS 971:1983, Reaffirmed 2004	Method for determination of colour fastness of textile material to perspiration
14	IS 766:1988, Reaffirmed 2004	Method for determination of colour fastness of textile material to rubbing
15	IS 2454:1985, Reaffirmed 2006	Method for determination of colour fastness of textile material to artificial light (Xenon lamp) pressing
16	IS 1390 : 1983 (RA 2004)	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
22	AATCC Evaluation	Instrumental assessment of the change in colour of a test specimen

	Procedure 7 : 2003	
23	AATCC Test method 20:2007	Fibre analysis: qualitative
24	AATCC Test method 20A	Fibre analysis: quantitative

10.0 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-dimethyamino benzaldehyde. The solution is further heated for 2-3 minutes. The solution turns yellow indicates presence of polyurethane.



Figure 1 : Assembly of three sections of “Pouch”

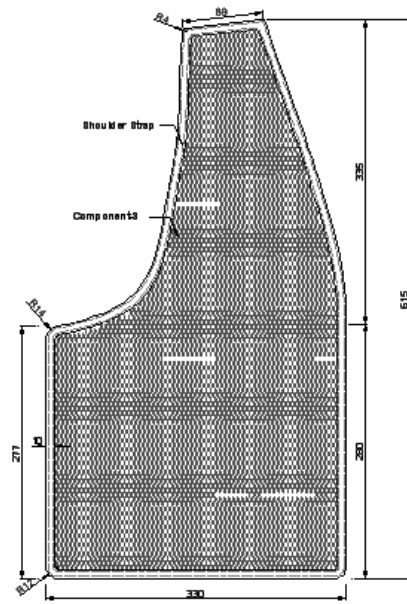


Fig-3 Right hand Section (Back) of "Pouch"
(All the dimensions are in mm)

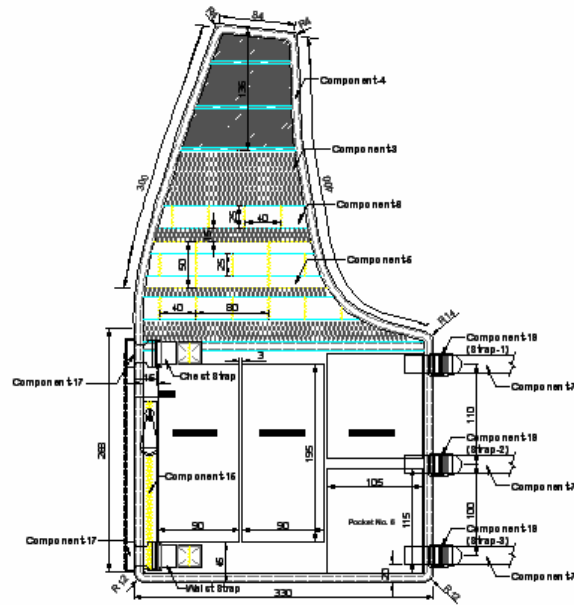


Fig-4 Left hand side Section (Front) of "Pouch"
(All the dimensions are in mm)

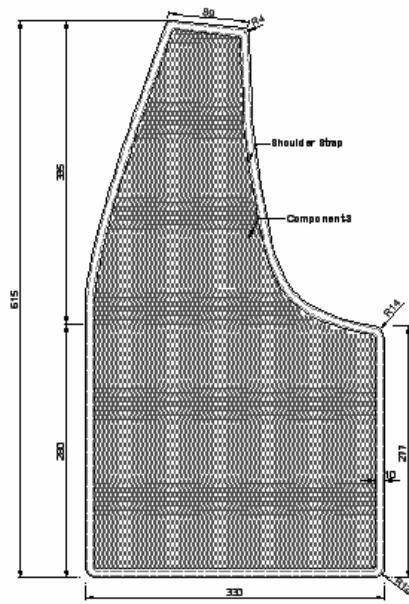


Fig-5 Left hand side Section (Back) of "Pouch"
(All the dimensions are in mm)

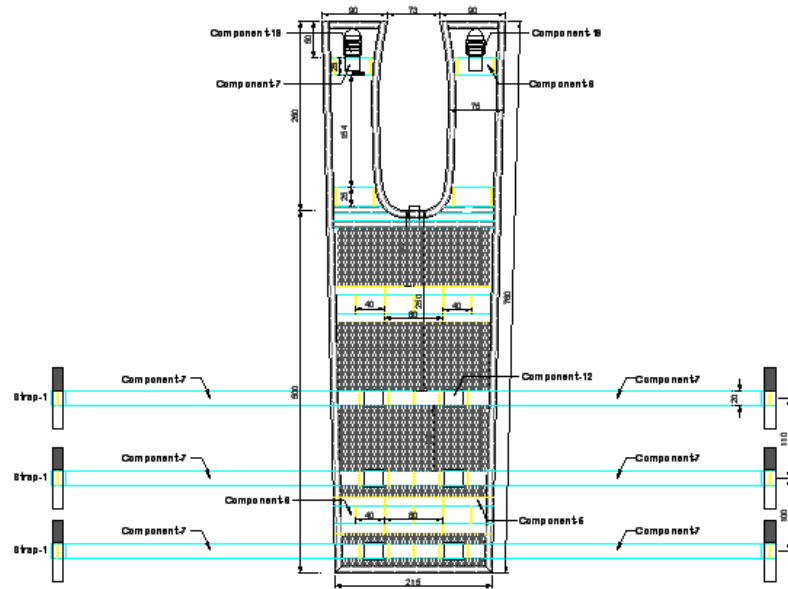


Fig-6 Back (Outer View) of "Pouch"
(All the dimensions are in mm)

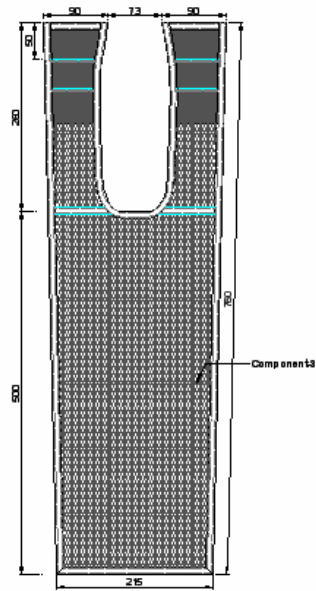


Fig-7 Back (Inner View) of "Pouch"
(All the dimensions are in mm.)

Shoulder strap

Component-9



Outer



Inner

Fig. 8 Back side portion

Pocket

Component-4



Fig. 9 Right hand side section



Fig. 10 Left hand side section

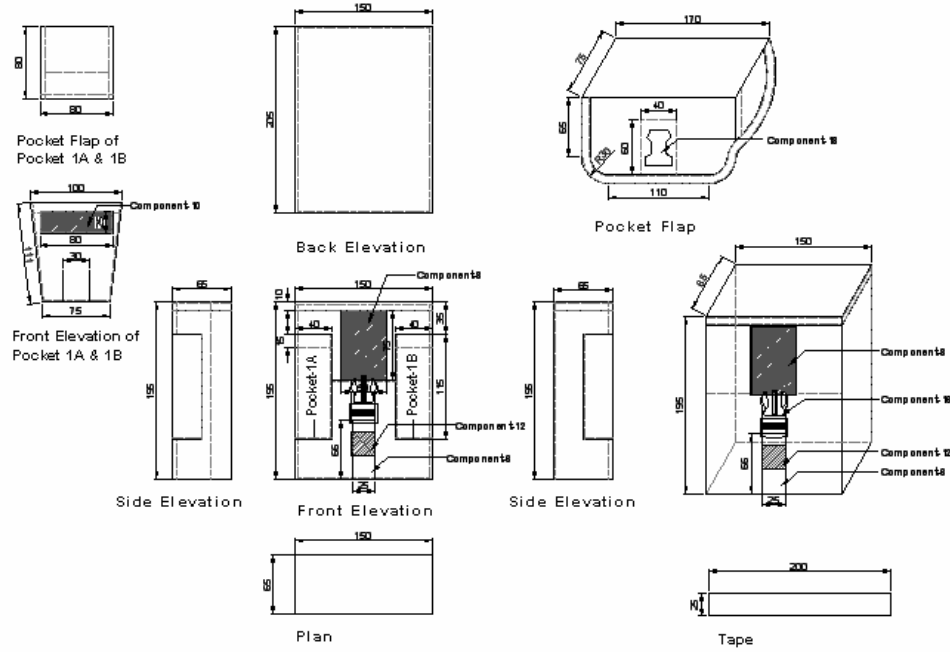


Fig-11 Dimensions of Pocket No. 1, 1A & 1B
(All the dimensions are in mm)

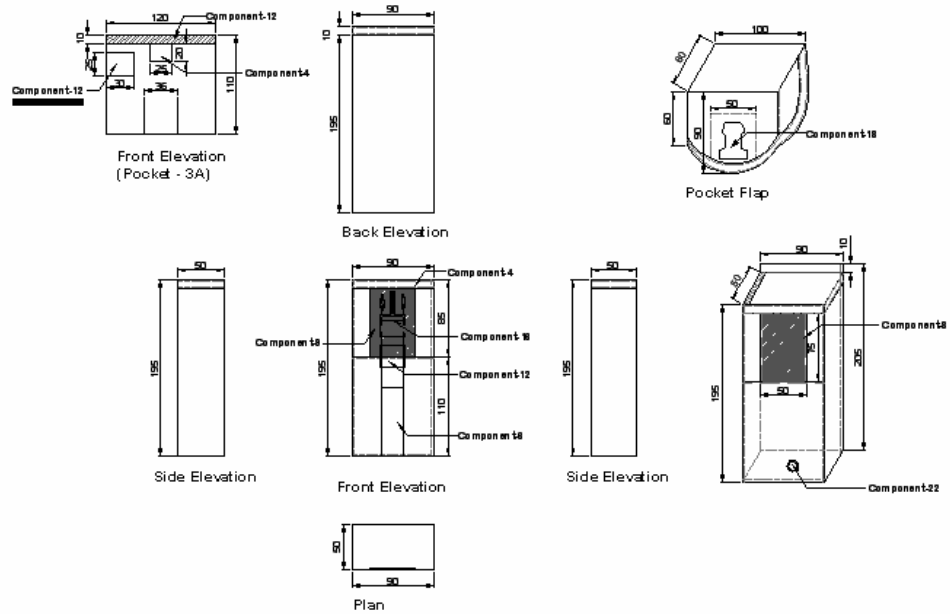


Fig-12 Dimensions of Pocket No. 2, 3, 3A & 4
(All the dimensions are in mm)

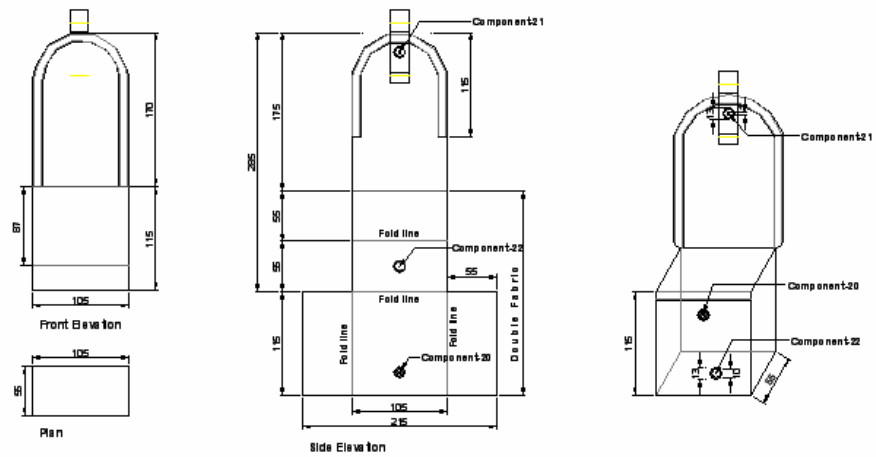
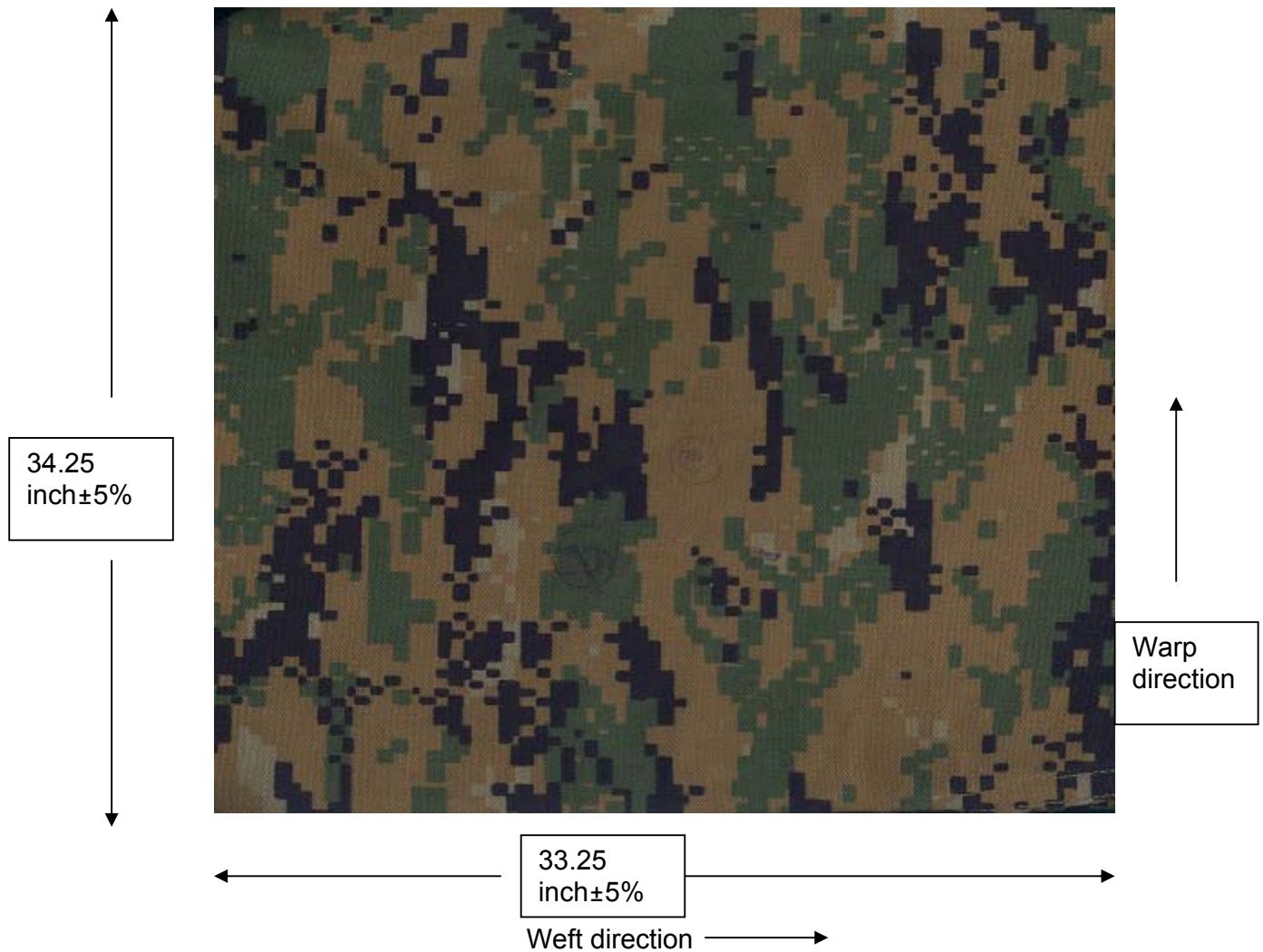


Fig-13 Dimensions of Pocket No. 5 & 6
(All the dimensions are in mm)



Scale:

Warpwise: 1cm=approx. 2.36 inch

Weftwise: 1 cm-approx 2.30 inch

**Fig.14 : Disruptive Print (Component-1) –One repeat of the design for guidance only
(For true colours refer sealed fabric sample)**

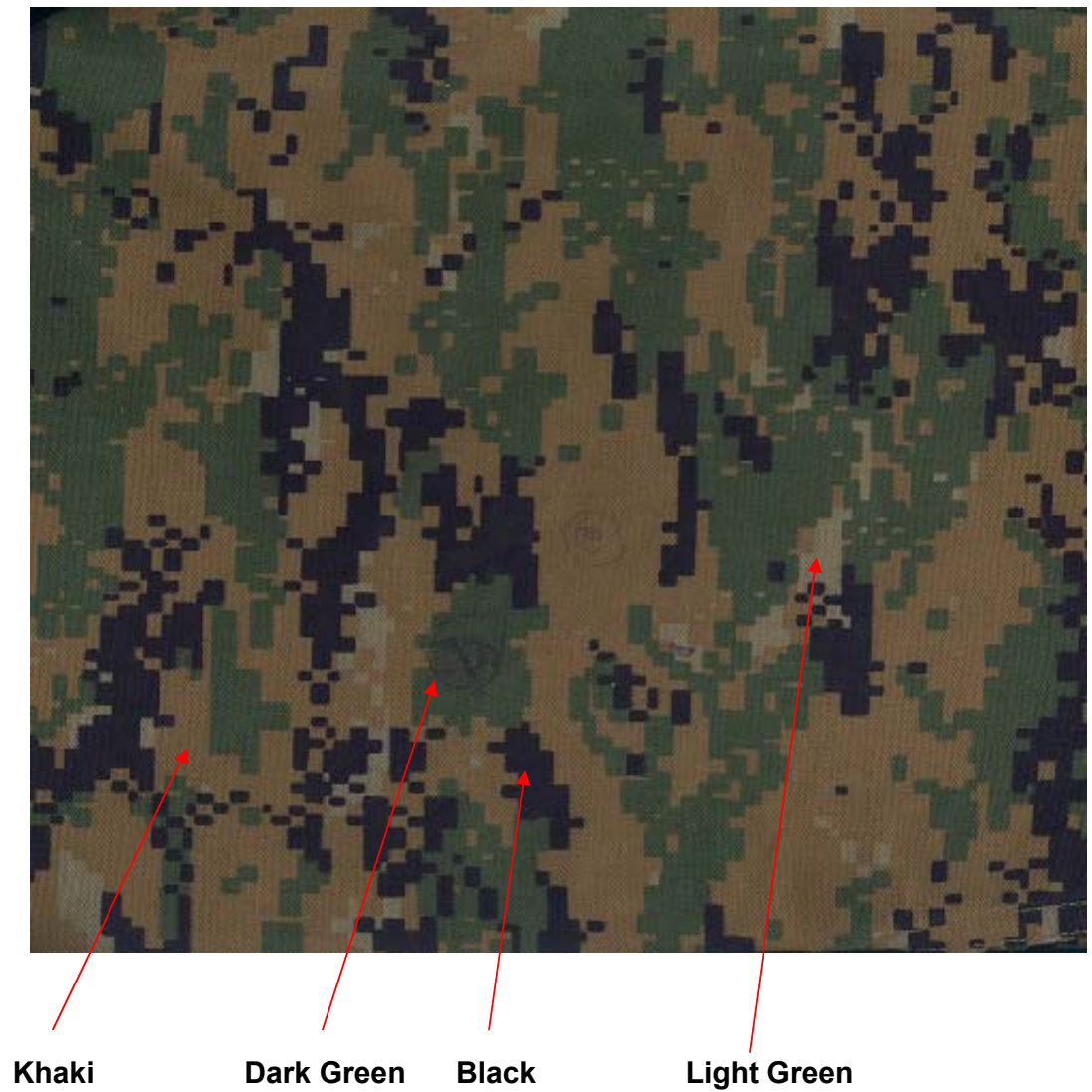


Fig. 15 Component-1 (For colour identification only)
(For true colours refer sealed fabric sample)

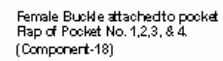
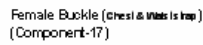
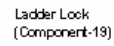
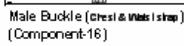


Fig-16 Plastic Buckle & Ladder Lock
(All the dimensions are in mm)

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

Fig -17 Nylon Tape (19mm, 25mm and 50mm 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.