No. IV-21011/3/2010-Prov-I 9832

भारत सरकार/Government of India

गृह मंत्रालय/Ministry of Home Affairs

पुलिस आधुनिकीकरण प्रभाग /Police Modernization Division

संभरण-I डेस्क /Prov.I Desk

26, Man Singh Road, Jaisalmer House,
New Delhi, the 15 December, 2014

To,

The DsG: AR (through LOAR), BSF, CISF, CRPF, ITBP, SSB, NSG & BPR&D.

Subject: Revised QRs/Specifications of Water Proof Multi Purpose Rain Poncho Convertibility as Bivouac.

The undersigned is directed to refer to the subject mentioned above and to say that the revised QRs/Specifications of Water Proof Multipurpose Rain Poncho Convertibility as Bivouac as per Annex-I has been approved by the competent authority in MHA.

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

3. The concerned CAPF will be accountable for correctness of QRs/Specification of Water Proof Multipurpose Rain Poncho Convertibility as Bivouac.

4. The QRs/Specifications of Water Proof Multipurpose Rain Poncho Convertibility as Bivouac issued earlier vide MHA letter of even number dated 16.03.2011 is rescinded.

Yours faithfully,

(P. K. Srivastava)
Under Secretary to the Govt. of India

Encl: As above.

Copy forwarded for necessary action to:

SO (IT), MHA - with the request to host the revised QRs/Specifications on official website of MHA (under the page of Organizational Set up, Police Modernization Division- clothing items) and remove earlier QRs/Specifications vide letter of even number dated 16.03.2011 (http://mha1.nic.in/QRs/clothings/WaterProofMultiPurposeRainPonchos.pdf). Soft copy is being sent through email also.

(R. K. Soni)
Section officer (Prov-I)

Copy to: DDG (Procurement), MHA

Annex - F

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Specification of Water Proof Multi Purpose Rain Poncho with Convertibility as Bivouc (Revised 2014)

1.0 SCOPE

1.1 The specification prescribes the requirement of "Water proof multi purpose rain poncho with convertibility as bivouac" and a pouch to pack the poncho herein referred as "Poncho" and "Pouch" respectively.

1.2 This specification does not specify general appearance; feel etc of the "Poncho" and "Pouch".

2.0 MATERIAL AND MANUFACTURE

2.1 The design and shape of the "Poncho" and "Pouch" shall be as per Fig.1 to 7.

2.2 PONCHO:

2.2.1 The "Poncho" shall be made of 100% Polyamide woven fabric (width: 180 to 182 centimeter) having 1 up 1 down plain weave. Continuous multifilament yarn of polyamide (for guidance 80 Denier with multifilament yarn in both directions) shall be used for this purpose. The selvedges of the fabric shall be firm and straight. The fabric shall be 'Heat set' and fully shrunk.

2.2.2 The polyamide fabric shall be printed in disruptive pattern and shall be water repellent. 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 amine (Test method IS 15570: 2005). **The printing pattern will be force specific**. However for guidance the disruptive pattern may be obtained by repeats of the design of 25.25 inch ± 5% in warp direction and 32.25 inch ± 5% weft direction as shown in Fig. 1. The colours used in the disruptive pattern print are shown in Fig. 2 for CoBRA, Fig. 8 & 9 for CRPF & Fig. 10 for BSF.

2.2.3 The back side of the polyamide fabric shall be uniformly coated with polyurethane (PU). The coating shall be smooth and it should firmly adhere to the fabric. The coated fabric shall be pliable and free from tackiness, stains, pinholes, surface irregularities, wrinkles, patches and all other coating defects. The coating shall not have any objectionable odor.

2.2.4 The water repellent finish and polyurethane coating should not mask the colors used in dyeing and printing.

2.2.5 The finished disruptive printed PU coated polyamide fabric shall be used in the manufacture of "Poncho". The poncho should be manufactured using two layers of disruptive printed PU coated polyamide fabrics. The coated sides of both the fabrics should face each others. The outer and inner sides of the poncho should be water repellent disruptive printed. All the four sides of the body should be finished with the fold of 30±10 mm as shown in the Figures 3A and 3B. The assembly of the coated layers may be seen in the "Poncho" sample held in the custody of CRPF.

2.2.6 The dimensions of "Poncho" with hood are shown in Fig 3A & 3B and 4A & 4B.

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2.2.7 Hood: The dimensions and location of hood are shown in the Fig. 3A & 3B and 4A & 4B. The hood shall be made of double layers of PU coated disruptive printed polyamide fabric. In the face periphery of the hood, a 25 mm fold shall be provided and through this fold there shall be arrangement of passing a green colour cord can reduce or increase the opening of the face of the hood using cord length adjuster and cord lock. The cord length adjuster and cord lock shall be of black in colour and made out of nylon. The placement of cord length adjuster and cord lock are shown in the Fig. 4A. For more information the sample held in the custody of CRPF may be seen. Further reducing or increasing the face opening of hood it shall be provided with a green colour slide fastener as shown in the Fig 4A and 4B. The inner layer of the hood also provided with two triangular ear vent made out of net mesh for ventilation purpose. The place and dimension of the net fabric is shown in the Fig. 4B. The ear vent shall be covered from outside with an inverted patch pocket made of double layer of same material having opening at the bottom. For more clarity, the "Poncho" sample held in the custody of CRPF may be seen.

2.2.8 Pockets: The "Poncho" shall be provided with six pockets as shown in the Fig. 3A. The dimensions of the pockets are shown in the Fig. 3A. The closing and opening of the pocket shall be done with the help of 25 ± 1 mm wide black colour Hook and Loop fastener. The "Poncho" shall also be provided a pocket back of the inner side of the Poncho. The dimensions of the pockets are shown in the Fig. 3B.The assembly of Pockets may be seen in the "Poncho" sample held in the custody of CRPF.

2.2.9 Cord: Each pocket of the "Poncho" shall be provided with a braided cord made out of polyamide filament yarn. For guidance the cord may have a sheath and core. The core shall be made of multifilament polyamide yarns. For guidance it may be made of 840 denier multifilament polyamide yarns. The core may have two such yarns. Sheath shall be braided with 16 number of polyamide multifilament yarn (for guidance 1700 denier). The cord shall be attached to the inner side of the pocket. The sample held in the custody of the CRPF may be referred to know the style in which the cord is attached

2.2.10 Eyelet and Snap fastener: "Poncho" shall be provided with black colour six brass eyelets with washer bronzed confirming IS 4084, fixed in each corner and centre on the fold. The placement of these eyelets is shown in the Fig. 3A and 3B. There shall be 8 sets of green colour plastic snap fasteners (eight male snap fasteners and eight female snap fasteners confirming IS 4741 with pull strength more than 40Kgf). The dimensions of the Eyelets and Snap fastener (male and female) are also shown in the Fig.3A and 3B.

2.3 POUCH: The pouch (Fig. 5) is made out of single layer finished disruptive printed PU coated polyamide fabric as specified for the "Poncho". The dimension of pouch should be 300±10 mm X 250±10mm so the folded poncho can be packed in this pouch. To close and open the pouch, an open end green colour polyester slide fastener of 'Medium Special' designation (IS 14181 Part 1 to 3, Amendment No 2 March 2008) shall be attached to the front side of the pouch. It shall comply with the acceptance criteria specified in IS 14181. The length of the slide fastener shall be 210 ±10 mm. The back side of pouch shall be provided with two loops (Fig. 6) made out of 25 ± 1 mm wide polyamide tape, whose weave particulars are shown in Fig. 7. A handle (pouch hanging loop) shall also be provided with the pouch as shown in Fig.6.It shall be a single folded disruptive printed PU coated polyamide fabric having 10 ± 1 mm width and loop length of 150 ± 10 mm as shown in the Fig. 6.

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3.0 STITCHING:

Lock stitch shall be employed to assemble components of "Poncho" Location and types of stitch can be seen in the "Poncho" sample held in the custody of CRPF. In the case of Lock stitch, four stitches per cm shall be employed wherever stitching has to be carried out. The stitching shall be done with even tension and all loose ends shall be securely fastened off. Polyamide sewing thread of green shade confirming variety no. L2 of IS: 4229: 1992, RA 2003 shall be used.

4.0 REQUIREMENTS

4.1 The disruptive printed polyamide fabric used in the "Poncho" and pouch shall conform to the requirements given in Table 3. Specification for colour used in printing of outer fabric shall be as given in Table 4A, 4B, 4C & 4D for CoBRA, Table 5,5A & 5B for CRPF and 6,6A & 6B for BSF.

4.2 The green colour cord shall be used in the "Poncho" and it shall meet the requirement as given in the Table 3.

4.3 The 25 ± 1 mm wide polyamide tape used in the loops of pouch shall comply with the requirement given in the Table 6. The colour of the polyamide tape shall be green and shall be visually matched with dark green colour of the disruptive printed polyamide fabric.

4.4 Slide fastener shall comply with the acceptance criteria specified in IS 14181 (latest version). The slide fastener shall be green in colour. The colour of the slide fastener shall be visually matched with the dark green colour of the disruptive printed polyamide fabric.

4.5 The hook and loop fastener (25 ± 1 mm wide) shall be black in color and shall meet the requirements as given in IS 8156: 1994 RA 2004. It shall be visually matched with the black colour of the disruptive printed fabric.

4.6 Sealed Sample: In order to illustrate or specify the indeterminable characteristics such as general appearance, luster, feel and print design of the "Poncho", a sample has been agreed upon and sealed; the supply shall be conformity with the sample in such respects.

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

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Table 1: Requirements of disruptive print PU Coated fabric for "Poncho" and "Pouch"

Sl. No.	Characteristics	Requirements	Test Method
1	Nature of fibre/filament	Polyamide (Nylon 6 or Nylon 66)	AATCC 20: 2010
2	Nature of coating	Polyurethane	See Annex-1
3	Width, cm	180 to 182	IS: 1954: 1990
4	End/dm, Minimum	360	IS 1963:1981
5	Picks/dm, Minimum	270	IS 1963:1981
6	Mass (Single layer), g/m^2	85 ± 5%	IS 1964 : 1970
7	Mass of de-proofed fabric, g/m^2	70 ± 8%	After de-proofing determine mass as per IS 1964 : 1970 (For de-proofing see Annex-2)
8	Breaking strength Newton (Minimum) - Warp-wise - Weft-wise	 800 650	IS 7016 Pt II:1981 (5 x 20 cm fabric between grips)
9	Tearing Strength, Newton (Minimum) - Warp-wise - Weft-wise	 90 90	IS 7016 Pt III:1981, Method A-1
10	Colour fastness to Washing - Change in colour - Staining on adjacent fabric	 4 or better 4 or better	IS/ISO 105 C10, C(3)
11	Colour fastness to Rubbing - Dry - Wet	 4 or better 4 or better	IS 766:1988
12	Colour fastness to Light	4 or better	IS 2454:1985
13	Dimensional Change due to relaxation, both directions, percentage, maximum	2.0	IS 2977 :1989
14	Resistance to accelerated ageing at 70°C ± 1°C for 168 hrs in hot air circulating oven	No cracks should be observed	IS: 7016 Pt. VIII: :1975
15	Resistance to low temperature {(-)30±2°C} for 6 hours	No cracks should be observed	IS: 7016 Pt X
16	Resistance to damage by flexing (after 100,000 cycle)	No cracks should be observed	IS: 7016 Pt. IV: :1987
17	Blocking	No peeling of coating on separation	ISO 5978: 1990
18	pH value of aqueous extract	6.0-8.0	IS1390:1983 (Cold method)
19	Water repellency (face side-uncoated)	Spray rating Min. 90	IS 390: 1975
20	Hydrostatic Pressure Head Test (Water Column Height at 60 cm for 60 min.) (face side- uncoated)	No percolation of water through the fabric or wetting of the outer surface	IS : 7016 (Pt. VII-A2) Low Pressure

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21	Bundesmann-Shower test (Double layers as used in the poncho- face side-uncoated) - Amount of water absorption (Maximum), % - Amount of water penetration, ml - Wetting of Inner Surface	 40 Nil No	IS : 392 : 1989 (Expose the specimen to the shower for 30 minutes)
22	Moisture Vapour Transmission, (Minimum)	2.0 mg/cm^2/hour	ASTM E 96/E 96M-05 (Water method), Temp. (32±2)°C, RH:50±2% (Upright method), Air velocity: 0.02-0.3m/sec)
23	Bending length, cm (Maximum) - Warp-wise - Weft-wise	 2.2 2.2	IS: 6490: 1971
24	Separation of Polyurethane (PU) film	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.	

NOTE: All the tests should be carried out on single layer except Bundesmann-Shower test

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Table-2 A: Specification of colour of Disruptive Pattern PU coated *fabric*
(AATCC Test method 173 : 2009 & AATCC Evaluation Procedure 7 : 2009)

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

Tristimulus Values :

X	Y	Z
5.155	5.809	4.702

L C H :

L	C	H
28.925	8.132	121.153

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.

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Table 2 B: Specification of colour of Disruptive Pattern PU coated *fabric*

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

Colour	:	Light Khaki
System	:	CIE LCH
Illuminant Observer	:	D 65
Standard Observer	:	10 Degree

Tristimulus Values :

X	Y	Z
19.537	20.364	16.024

L C H :

L	C	H
52.246	11.640	84.089

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 using Diffuse (sphere) geometry spectrophotometer.

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Table-2 C: Specification of colour of Disruptive Pattern PU coated *fabric*
(AATCC Test method 173 : 2009 & AATCC Evaluation Procedure 7 : 2009)

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

Tristimulus Values :

X	Y	Z
13.243	13.134	8.023

L C H :

L	C	H
42.964	18.210	73.066

CMC (l:c)	:	2:1
Colour difference, ΔE_{cmc}	:	≤ 3.0

Interpretation of Results :

v) If ΔE_{cmc} is less than or equal to 3, then sample is acceptable.
vi) 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 using Diffuse (sphere) geometry spectrophotometer.

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Table-2 D: Specification of colour of Disruptive Pattern PU coated *fabric*

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

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

Tristimulus Values :

X	Y	Z
2.833	2.950	3.168

L C H :

L	C	H
19.843	0.677	359.662

CMC (l:c)	:	2:1
Colour difference, ΔE_{cmc}	:	≤ 3.0

Interpretation of Results :

vii) If ΔE_{cmc} is less than or equal to 3, then sample is acceptable.
viii) 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 using Diffuse (sphere) geometry spectrophotometer.

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Table 3 : Requirements of cord

Sl. No.	Characteristics	Requirements	Test Method
1	Nature of fibre/filament	Polyamide (Nylon-6 or Nylon 66)	AATCC 20: 2010
2	Length, cm	250 ± 5%	IS 1954:1990
3	Mass per linear meter, g	3.5 ± 5%	Guideline of IS 1964 : 1970
5	Breaking strength, Newton (Minimum)	900	IS 1969:1985 (20 cm gauge length)
6	Colour fastness to Washing - Change in colour - Staining on adjacent fabric	 4 or better 4 or better	IS/ISO 105 C10, C(3)
7	Colour fastness to Light	4 or better	IS 2454:1985
8	Dimensional Change due to relaxation - length wise directions, %, maximum	2.0	As per guideline of IS 2977:1989
9	pH value of aqueous extract	6.0-8.0	IS1390:1983 (Cold method)
10	Colour	Match with green colour of disruptive print outer fabric	Visual

Table 4: Requirements of 25±1 mm wide Polyamide Tape

Sl. No.	Characteristics	Requirements	Test Method
1	Nature of fibre/filament	Polyamide (Nylon-6 or Nylon 66)	AATCC 20: 2010
2	Number of Ends in full width (minimum)	78	IS 1963:1981
3	Number of Picks/dm (minimum)	340	
4	Width, cm	2.5 ± 5%	IS 1994
5	Mass per linear meter, g	25 ± 5%	IS 1964 : 1970
6	Colour fastness to Washing - Change in colour - Staining on adjacent fabric	 4 or better 4 or better	IS/ISO 105 C10, C(3)
7	Colour fastness to Light	4 or better	IS 2454:1985

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5.0 ANNEXURE

Annex-1

Identification of polyurethane coating

Take approximately 0.1 To 0.5 g of the coated fabric. Treat it with 10 to 20 ml glacial acetic acid by warming for several minutes. To this add 0.1 g p-dimethyamino benzaldehyde. The solution is further warmed for 2-3 minutes. If the solution turns yellow, indicates presence of polyurethane.

Annex-2

De-proofing of PU coated fabric

Treat PU coated fabric for appropriate time with suitable de-proofing solvent like Tetrahydrofuran, Dichloromethane, Methylene Chloride etc.

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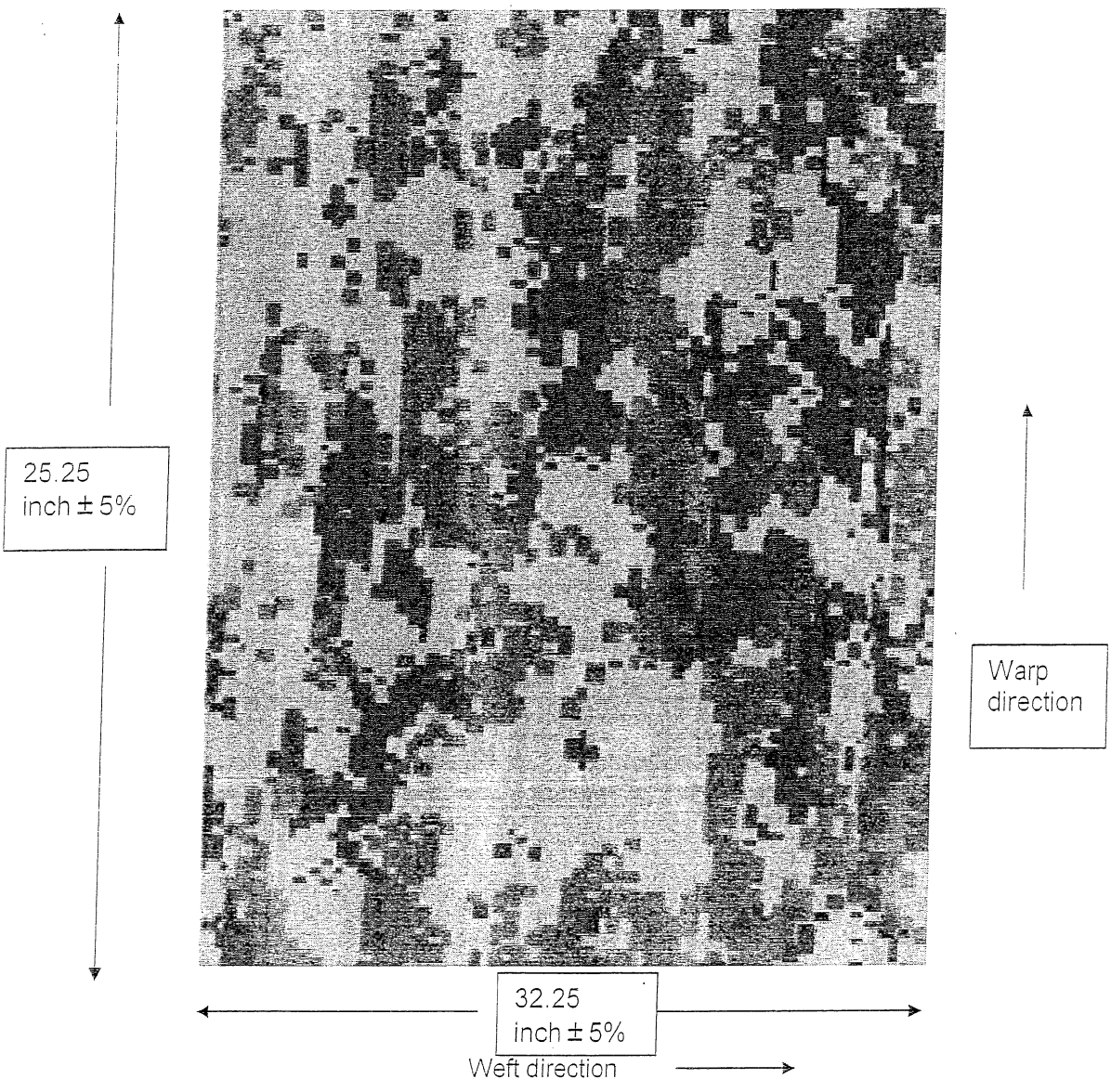


Fig.1: Disruptive Print –One repeat of the design
(Colours shown in the figure may not be the true colours)

CRPF BSF CISF SSB ITBP A/Rifle BPR&D NSG

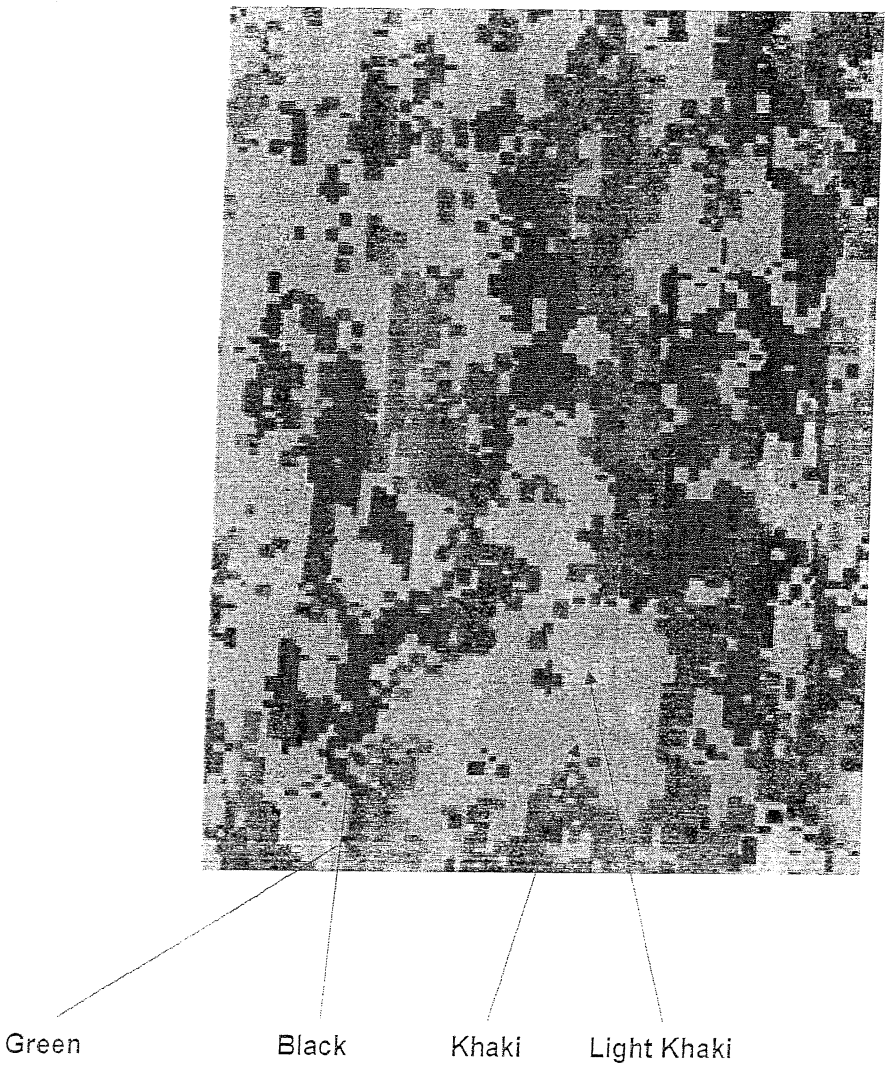


Fig. 2 : Disruptive Print (For colour identification only)

(Colours shown in the figure may not be the true colours)

CRPF BSF CISF SSB ITBP A/Rifle BPR&D NSG

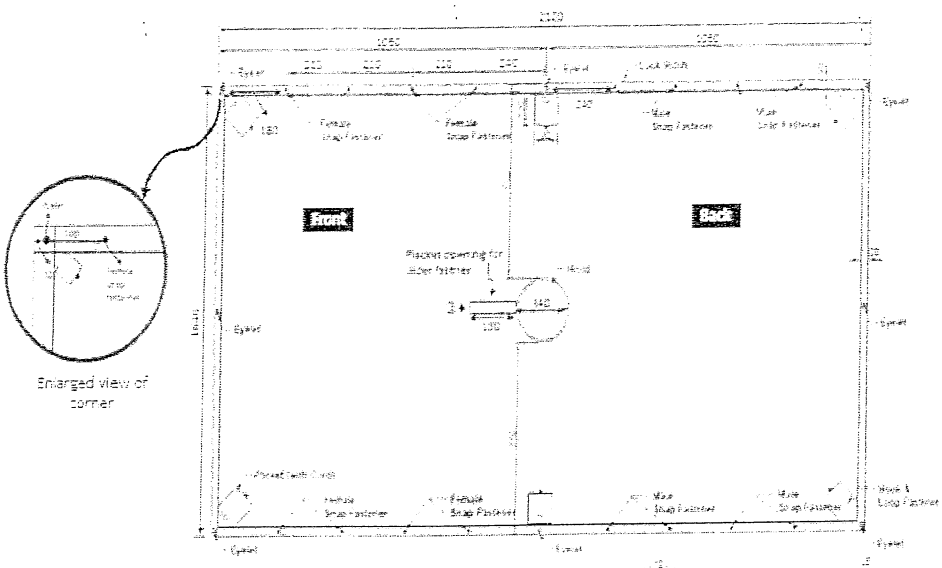


Fig: 3A Poncho (Outerview)

All dimensions in mm
Finish length of Poncho=2120+20
Finish width of Poncho=1620+20
Fabric width to be used =1800+20

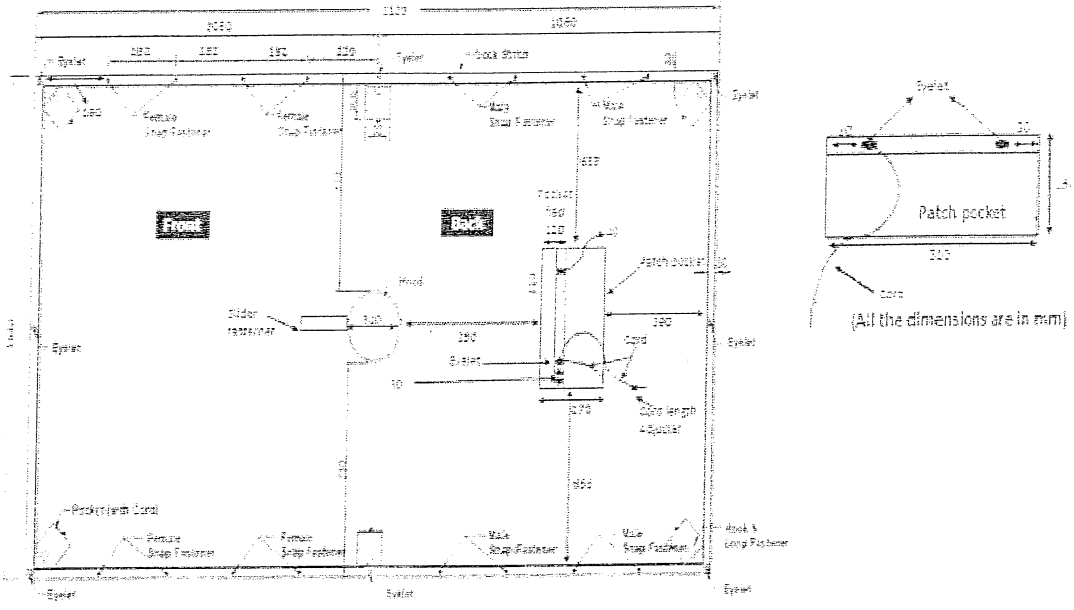


Fig: 3B Poncho (Inner view))

All dimensions in mm
Finish length of Poncho=2120+20
Finish width of Poncho=1620+20
Fabric width to be used =1800+20

Fig-3 A & 3 B Poncho (All the dimensions are in mm)

CRPF BSF CISF SSB ITBP A/Rifle BPR&D NSG

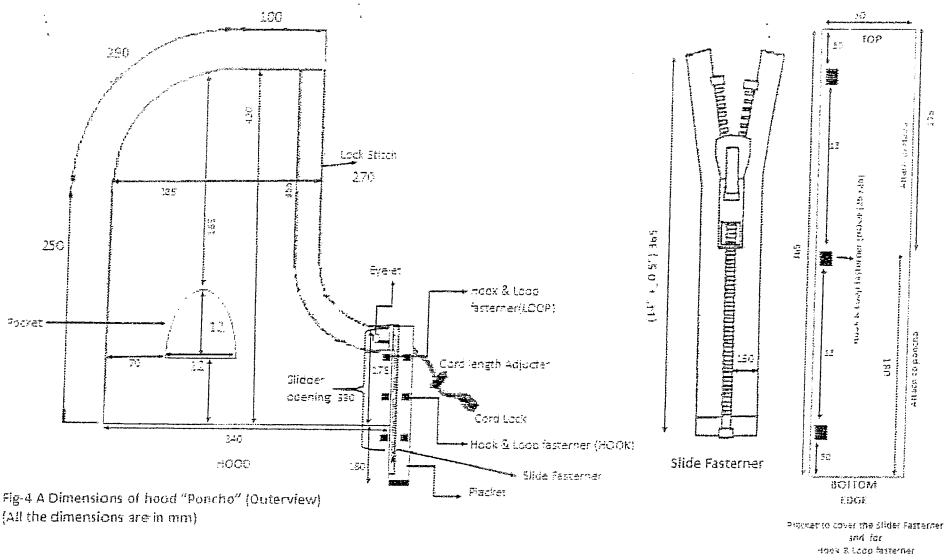


Fig-4 A Dimensions of hood "Poncho" (Outerview)
(All the dimensions are in mm)

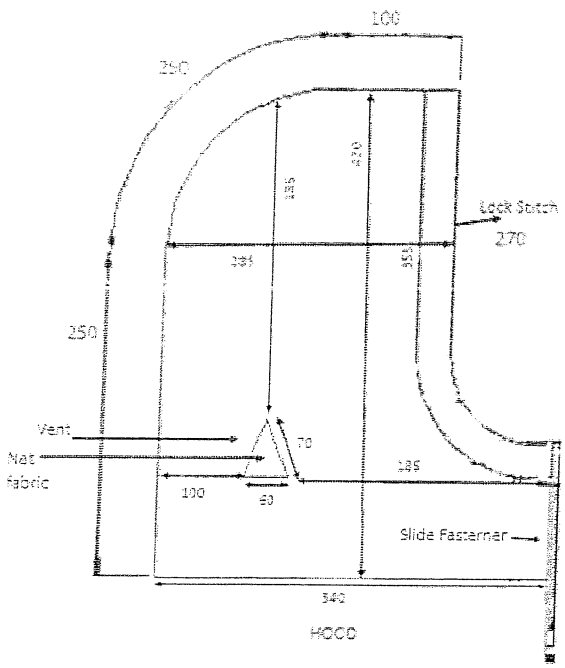


Fig-4B Dimensions of hood "Poncho" (Innerview)
(All the dimensions are in mm)

Fig-4A & 4B Dimensions of hood "Poncho"
(All the dimensions are in mm)

CRPF BSF CISF SSB ITBP A/Rifle BPR&D NJ4

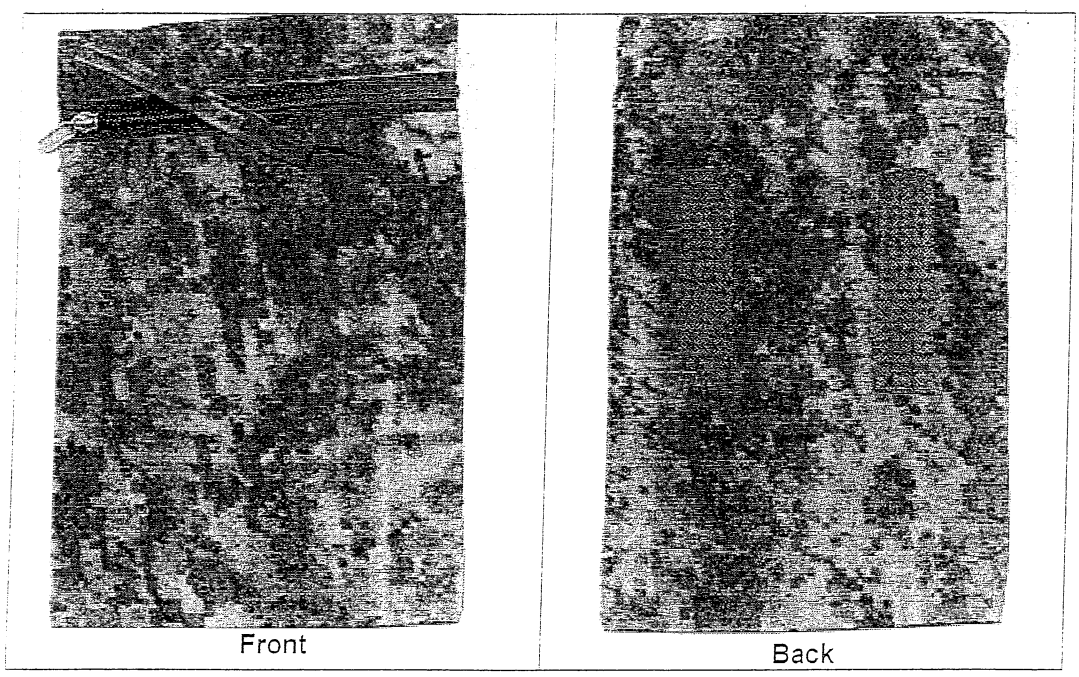


Fig.5 Pouch
(Colours shown in the figure may not be the true colours)

CRPF BSF CISF SSB ITBP A/Rifle BPR&D NSG

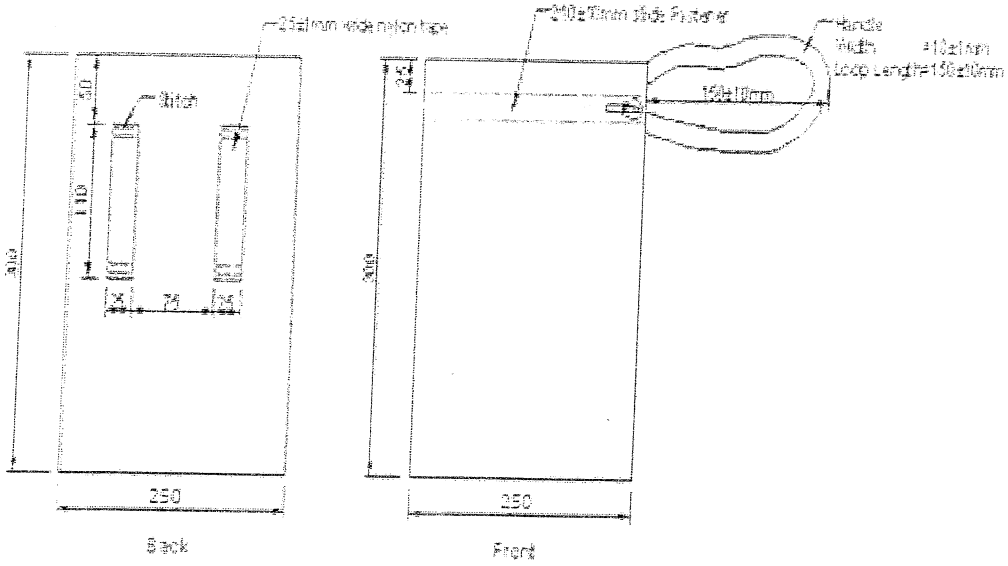


Fig-6 Pouch of "Poncho"
(All the dimensions are in mm)

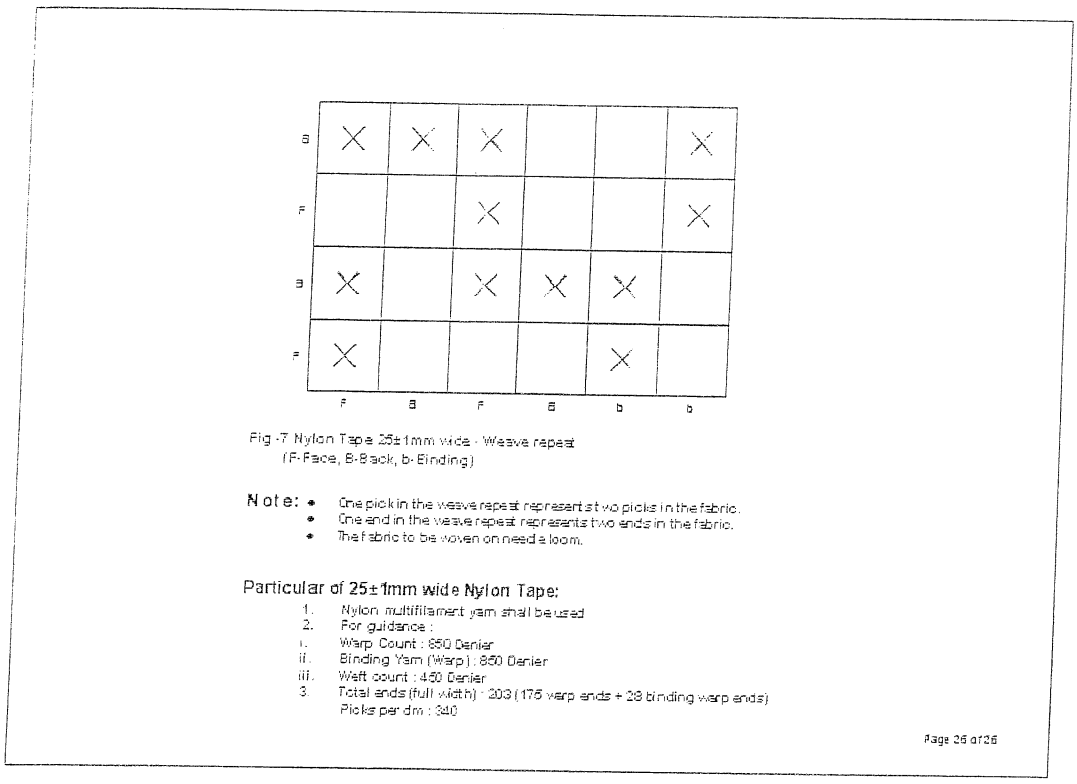
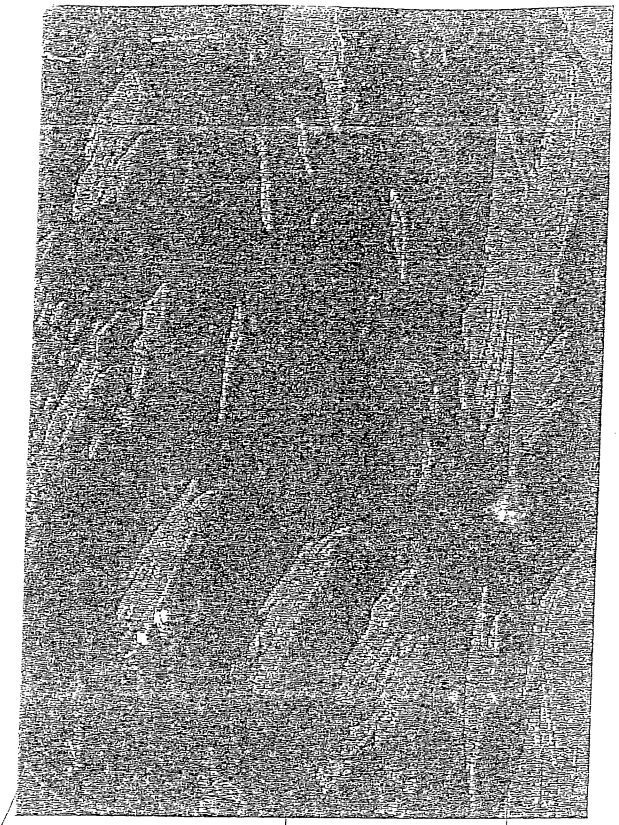


Fig-7: Nylon Tape 25±1 mm wide-Weave repeat
(All the dimensions are in mm)

CRPF BSF CISF SSB ITBP A/Rifle BPR&D NSG



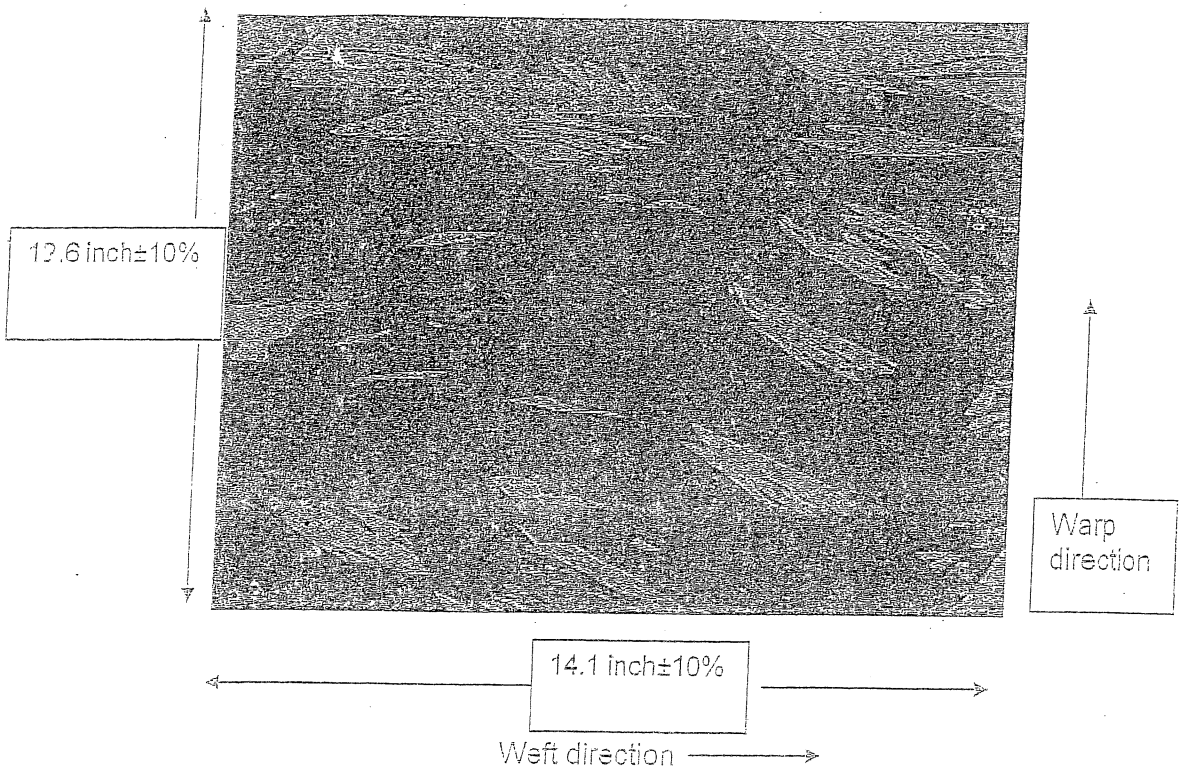
Green Khaki Brown

[Fig - 8]

: Disruptive Print –LIGHT COLOUR (For colour identification only)

(For true colours refer sealed fabric sample)

CRPF BSF CISF SSB ITBP A/Rifle BPR&D NSG



[Fig-9]

: Disruptive Print –One repeat of the design
(For true colours refer sealed fabric sample)

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Table - 5

Disruptive Print –Colur specification

: Specification of colour of Disruptive Pattern Uniform- Green

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

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

Tristimulus Values :

X	Y	Z
4.385	4.766	3.826

L C H :

L	C	H
26.057	6.933	104.977

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.

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[Table - 5-A]

Table 5A. Specification of colour of Disruptive Pattern Uniform- Brown
(AATCC Test method 173 : 2009 & AATCC Evaluation Procedure 7 : 2009)

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

Tristimulus Values :

X	Y	Z
5.262	5.192	4.030

L C H :

L	C	H
27.275	8.731	61.138

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.

CRPF BSF CISF SSB ITBP AR&Tle BPR&D NSG

Table - 5-B

Table-5B: Specification of colour of Disruptive Pattern Uniform- Khaki
(AATCC Test method 173 : 2009 & AATCC Evaluation Procedure 7 : 2009)

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

Tristimulus Values :

X	Y	Z
19.478	19.974	12.295

L C H :

L	C	H
51.808	19.983	81.959

CMC (l:c)	:	2:1
Colour difference, ΔE_{cmc}	:	≤ 3.0

Interpretation of Results :

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

VI) 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.

CRPF BSF CISF SSB ITBP A/Rifle BPR&D NSG

BSP - Distributive pattern sheath

CRPF BSF CISF [Fig SSB] ITBP A/Rifle BPR&D

NSG

Table-6

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TABLE-6 Specification of colour of Cloth Polyester cotton disruptive pattern (LFCD) 50:50 (Brown colour)

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

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

Tristimulus Values :

X	Y	Z
5.664	5.640	4.432

L C H :

L	C	H
28.435	8.449	63.758

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 using Diffuse (sphere) geometry spectrophotometer.

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Table-6A

TABLE -6A Specification of colour of Cloth Polyester cotton disruptive pattern (LFCD) 50:50 (Green colour)

(Guideline of 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
4.103	4.664	4.176

L C H :

L	C	H
25.725	5.988	135.782

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 using Diffuse (sphere) geometry spectrophotometer.

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(28) (BFJ) (383)

Table - 6B

TABLE 6B Specification of colour of Cloth Polyester cotton disruptive pattern (DPCP) 50:50, (Khaki colour)

(Guideline of AATCC Test Method 173-2003 & AATCC Evaluation Procedure 7 : 2003)

Colour	:	KHAKI	
System		CIE LCH	
Illuminant Observer		D 65	
Standard Observer		10 Degree	
Tristimulus Values	X	Y	Z
	16.910	17.722	10.822
L C H	L	C	H
	47.157	13.270	87.970
CMC (l:c)	2:1		
Colour difference, ΔE_{cmc}	≤ 3.0		

Interpretation of Results :

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

vi) 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 using Diffuse (sphere) geometry spectrophotometer.

CRPF BSF CISF SSB ITBP A/Rifle BPR&D NSG