Directorate General CRPF
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No. U.II-98(Spec)/2024-25-Prov(CoBRA)-14 Dated, the 16th July' 2024

To

The DsG: AR, BSF, CISF, ITBP, NSG, SSB and BPR&D

Subject: QRs/Specification of "Cloth (NYCO) Disruptive Digital Print for CoBRA personnel".

It is to inform that revision of QRs/Specification of "**Cloth (NYCO) Disruptive Pattern for CoBRA"** has been approved by the competent authority. Henceforth, CoBRA will procure the above item required by them, strictly as per the parameters laid down in the QRs/Specification.

2. Further, earlier QRs/Specification of "Cloth (NYCO) Disruptive Pattern for CoBRA" **approved vide MHA letter No. U-II-3(Spec)/2013-14-Prov(CoBRA)2011 dated 15/10/2015 is rescinded**.

3. This has the approval of DG, CRPF on 12/07/2024 (empowered vide MHA letter F. No. 11012/02/2009-Fin-I-17 dated 02/01/2018).

Encl: As above.

(Shahnawaz Khan)
DIG (Prov) Dte

No. U.II-98(Spec)/2024-25-Prov(CoBRA)-14 Dated, the 16 July' 2024

Copy forwarded to:-

1. SO (IT), North Block-with request to upload the approved QRs/Specification of **"Cloth (NYCO) Disruptive Pattern for CoBRA"** on MHA Website (e-mail ID : soit@nic.in).
2. **Sh. Paritosh Singhal, ACEO(GeM), and Sh. Abhishek Kakkar, Director - Category Management,** Government of India, Ministry of Commerce & Industry, GeM, Jeevan Tara Building, New Delhi-110001 with request to upload the approved QRs/Specification of "Cloth (NYCO) Disruptive Pattern for CoBRA" on GeM Portal.
3. DIG (IT), Dte Genl., CRPF-with request to upload this approved QRs/Specification of "Cloth (NYCO) Disruptive Pattern for CoBRA" on CRPF Portal and Selo Module.
4. All Zones/Sectors/GCs/Units HQr for information and necessary action.

(Shahnawaz Khan)
DIG (Prov) Dte

Specification of Cloth NYCO Disruptive Pattern for CoBRA

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 condition at the following address:-

Office of the Inspector General of Police, CoBRA Sector
CRPF, Sector-IV, Push Vihar,
New Delhi-110017

0.5 Copies of the specification can be obtained from:-

Office of the Inspector General of Police, CoBRA Sector
CRPF, Sector-IV, Push Vihar,
New Delhi-110017

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 observe or calculated expressing the result of the 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 Disruptive Pattern (Camouflage pattern) Cloth (Dark & Light colour) for jungle operations made of Nylon and Cotton blended material, in general known as NYCO.

1.2 This specification does not specify the design/pattern and stitching of uniform from the disruptive pattern cloth.

1.3 This specification does not specify general appearance feel etc. of the Disruptive Pattern cloth.

2.0 **Manufacture and Finish**

2.1 The Disruptive Pattern cloth shall have Rib stop wave (IS-13510:2000). It shall be made from uniform bland of 50% Nylon fibers with 50% Cotton. The selvedges shall be firm and straight. The cloth shall be well singed. The fabric shall be Heat set and fully shrunk. The blend composition of the cloth shall conform to the requirements given in the Table -1.

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2.2 The disruptive pattern may be obtained my repeats of the design of 34.25 inch±5% in warp direction and 33.25 inch ±5% in weft direction (see Figure-1). Figure- 2 and Figure-3 indicate various colour of the light and dark colour disruptive pattern cloths respectively. The repeat of the design in both the colour is same. The pattern shall be printed using dyes having fastness properties as given in Table-1. The various areas of the pattern shall be properly registered in relation to each other and shall present definite sharp demarcations with a minimum of feathering or spew. Each patter shall show solid coverage. Dyes used in the dyeing and printing shall be free from banned amine (Test method IS-15570:2005).

2.3 The fabric should be supplied in the width of 150 cm and above. The length of each piece shall be 40 meters or as agreed between supplier and purchaser.

2.4 Freedom from Defect. The cloth shall be free from major flaws (defects) which shall not exceed 10 per 100 meters length (see Note). A list of major flaws (defects) is given in Appendix-A of IS:4125. The allowance for providing extra length of cloth in lieu of the flaws (defects) not exceeding the permissible limit may be agreed between the buyer and seller. It shall also be free from dyeing defects such as streaks, stains and uneven dyeing defects such as streaks, stains and uneven dyeing and improper printing in case of printed design etc. The finished cloth shall be free from sizing, filling and dressing materials and substance liable to cause subsequent tendering.

The Disruptive Pattern cloth shall be free from any other defects which may significantly mark the appearance or serviceability.

Note- The number of defects shall be determined on all pieces under test and converted into number of defects per 100 meter length (See 6.4)

2.5 The design and shape of the Disruptive Pattern Uniform shall be as per the buyer requirement. The type of stitch (see IS-11161:2000 Reaffirmed 2007) and count of sewing thread for seams and stiches (see IS 10789:2000 Reaffirmed 2007) at various portions of Disruptive Pattern Uniform may be as per the requirement of buyer. The uniform may be assembled throughout with lock stiches regulated at 35 to 40 stiches per 10 cm. The stitches shall be even tension with all loose ends fastened. However, selection of type of stich and sewing thread shall be as agreed to between the buyer and seller. The disruptive patter uniform shall be visually examined and shall be evenly sewn or stitched and shall be free from missed stiches, holes, cuts and free form puckering defects. The colour of the sewing thread used in the disruptive pattern uniform shall not bleed or stain.

3.0 **Requirements**

3.1 The Disruptive Patter Uniform cloth shall conform to the requirements given in Table-1. Specification for colour used in printing shall be given in Table 2A, 2B and 2C for light colour disruptive printed cloth and Table 3A, 3B and 3C for dark colour disruptive printed cloth.

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

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

4.0 **Marking**

Each piece of cloth shall be marked with the following:

a. Name of the material, namely disruptive pattern cloth- Nylon/Cotton blended material;
b. Composition, namely Nylon 50 percent and Cotton 50 percent to be marked on every alternate meter of the cloth at a height not exceeding 2.5 cm form the selvedge;
c. Length and width;
d. Manufacture's name initials or trade-mark;
e. Any other information required by the law in force and/or by the buyers;

5.0 **Packaging & Packing**

The Disruptive Pattern Uniform cloth shall be packed in polyethylene or polypropylene bags and or in box, as required by the buyer (see IS 2194 and IS 2195)

6.0 **Sampling and criteria for conformity**

6.1 The number of pieces to be selected at random from a lot for inspection shall be according to col 1 and 2 of Table 4. To ensure randomness of selection procedure given is IS:4905 shall be followed.

6.2 The sampling procedure detailed in 6.2 to 6.4 shall give desired protection to the buyer and the seller, provided that the lot submitted for inspection id homogeneous. To achieve this, the manufacturer shall maintain a system of process control at all stages of manufacturing ensuring the Disruptive pattern cloth tendering by him for inspection to comply with the requirement of this standard in all respects.

NOTE: For effective process control the use of statistical quality control technique is recommended and helpful guidance may be obtained in this respect from 397(Part I):2003 and IS 397(Part II):2003

6.3 Lot: The number of pieces of cloth of same composition and constructional particulars delivered to a buyer against a dispatch note shall constitute a lot.

6.3.1 The conformity of a lot to the requirements of this specification shall be determined on the basis of the test carried out on the samples selected form the lot.

6.4 The number of pieces to be tested at criterion for conformity for each of the characteristic shall be as follows:-

Characteristics	No. of Samples	Criterion for conformity
i) Visual inspection for freedom from major flaws (defects)	According to col 2 of Table -4	All the pieces of cloth selected according to col 2 to Table-4 shall be visually examined for major flaws, meter by meter. The Total number of defects observed on sample piece shall be converted into number of defects per 100 meter length. Permissible number

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		of non-conforming pieces not to exceed corresponding number given in col 3 of Table-4.
ii) Construction, Ends picks, mass length and width	According to col 4 of Table -4	All specimens shall satisfy the relevant requirement.
iii) Blend composition shrinkage, breaking strength, tearing strength colour fastness pH etc.	According to col 5 of Table -4	All specimens shall satisfy the relevant requirements.

7.0 **Terminology**

For the purpose of this specification the definition given in IS-3596:1967 (RA 2004) shall be apply.

Table 1: Requirement of Disruptive Pattern Cloth

Sl. No.	Characteristics	Requirements	Test Method
1	Approximate count of yarn (For guidance only) Ne -Warp -Weft	 20s X 2(2/40^s) 16s	 IS-3442:1980
2	Composition, % -Nylon 6.6 -Cotton	 50±5 Remainder	AATCC Test method 20 and 20A
3	End/dm(minimum)	400	IS-1963:1981
4	Picks/dm (minimum)	180	IS 1963:1981
5	Width, cm	150 and above	IS 1954:1990
6	Mass, gm/m2	220±15	IS 1964:1970
7	Breaking Strength, Newton (Minimum) -Warp-wise -Weft-wise	 1100 600	IS-1969:1985
8	Elongation at break % (Minimum) -Warp-wise -Weft-wise	 35 20	IS-1969:1985
9	Tearing Strength, Newton (Minimum) -Warp-wise -Weft-wise	 35 35	IS-6489:1993
10	Abrasion Resistance -up to 50,000 cycles	-No thread breakage	IS 12673:1989
11	Colour fastness to washing -Change in colour -Staining on adjacent fabric	 4 or better 4 or better	IS/ISO 105 C10, C(3)2006

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12	Colour fastness to perspiration -Change in colour -Staining on adjacent fabric	 4 or better 4 or better	IS 971:1983
13	Colour Fastness to Hot pressing (200^{0}C only dry press) -Change in colour -Staining on adjacent fabric	 4 or better 4 or better	IS 689:1988
14	Colour fastness to rubbing -Dry -Wet	 4 or better 4 or better	IS 766:1988
15	Colour fastness to see water -Change in colour -Staining on adjacent fabric	 4 or better 4 or better	IS 690:1988
16	Colour Fastness to light	5 or better	IS 2454:1985
17	Dimensional Change due to relaxation, both directions, percentage, maximum	1	IS 2977:1967
18	Heat Shrinkage both directions, percentage, maximum	2	IS 12170:1967 (Temperature 150±2^{0}C)
19	pH Value	6.0-8.0	IS 1390 (Cold method):1983
20	Pilling (after 5 hour of test), Minimum	4	IS 10971:1984
21	Wrinkle Recover (after 24 hours), Minimum	3	AATCC 128-2004
22	Air permeability, cc/sec/cm^2 Minimum	3	IS 11056:1984
23	Water vapor permeability (water method), g/m^2/day. Minimum	1400	ASTM E-96/E-96 M-05, (Water method, Temperature:32±2^{0}C, RH 50±2% Upright Method, Air velocity 0.02-0.3 m/Sec)
24	Colour difference (for all colour) (ΔE)	≤3.0	See Table 2 and 3
25	Nature of dyes	For Ground – Acid and VAT dyes For Print – VAT dyes	IS 4472 (Part-1) 1667

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Table- 2 Disruptive Print – Light Colour

Table 2A: Specification of colour of Disruptive Pattern Uniform- 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
12.113	13.044	12.675

LCH :

L	C	H
42.829	3.739	117.481

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, the sample is unacceptable

Note-1 : Absorbance/ reflectance/ transmittance are affected by surface characteristic features of the substrate. Therefore comparison should be made between sample 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 2B: Specification of colour of Disruptive Pattern Uniform- 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
19.319	20.577	18.966

LCH :

L	C	H
52.483	5.930	99.085

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, the sample is unacceptable

Note-1: Absorbance/ reflectance/ transmittance are affected by surface characteristic features of the substrate. Therefore comparison should be made between sample 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 2C: Specification of colour of Disruptive Pattern Uniform- 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
31.643	32.716	28.306

LCH :

L	C	H
63.930	9.848	76.272

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, the sample is unacceptable

Note-1 : Absorbance/ reflectance/ transmittance are affected by surface characteristic features of the substrate. Therefore comparison should be made between sample 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- 3 Disruptive Print – Dark Colour

Table 3A: Specification of colour of Disruptive Pattern Uniform- 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:

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

ii) If ΔE_{cmc} is greater than 3, the sample is unacceptable

Note-1 : Absorbance/ reflectance/ transmittance are affected by surface characteristic features of the substrate. Therefore comparison should be made between sample 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 3B: Specification of colour of Disruptive Pattern Uniform- 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, the sample is unacceptable

Note-1 : Absorbance/ reflectance/ transmittance are affected by surface characteristic features of the substrate. Therefore comparison should be made between sample 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 3C: Specification of colour of Disruptive Pattern Uniform- 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, the sample is unacceptable

Note-1 : Absorbance/ reflectance/ transmittance are affected by surface characteristic features of the substrate. Therefore comparison should be made between sample 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 3D: Specification of colour of Disruptive Pattern Uniform- 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

LCH :

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, the sample is unacceptable

Note-1 : Absorbance/ reflectance/ transmittance are affected by surface characteristic features of the substrate. Therefore comparison should be made between sample 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 -4: Sample size and permissible number of non-conforming Disruptive Printed Uniform Cloth

Lot size	Sample size	Permissible number of non-conforming pieces	Sub-Sample Size	Sub-sub sample size
(1)	(2)	(3)	(4)	(5)
Upto 100	5	0	3	3
101-150	8	0	3	3
151-300	13	1	5	3
301-500	20	1	5	3
501-1000	32	2	8	5
1001 and above	50	3	13	5

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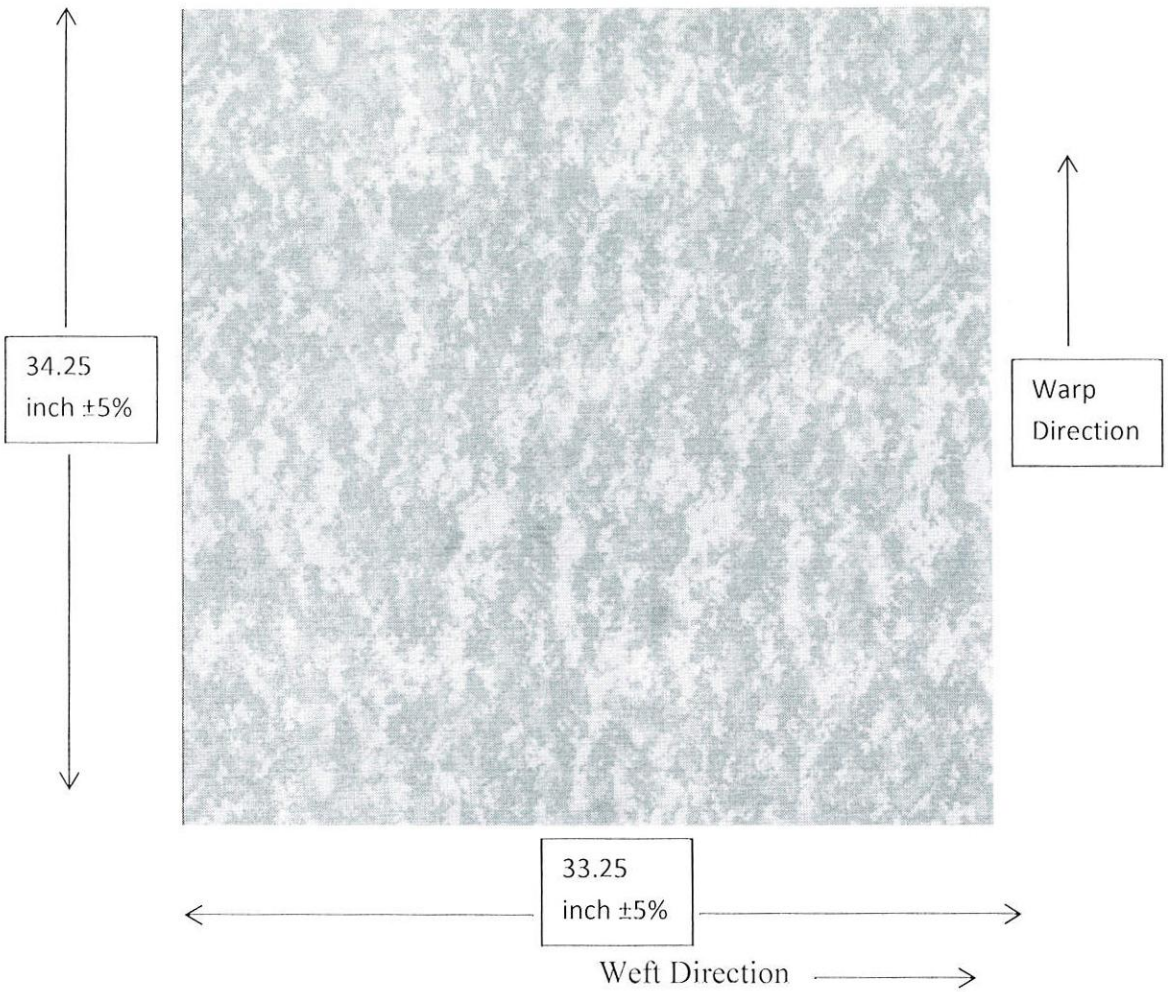

Scale :-

Warpwise: 1 cm= approx. 2.36 inch

Weftwise: 1cm=approx. 2.30 inch

Fig. 1: Disruptive Print – One repeat of the design
(For true colours refer sealed fabric sample)

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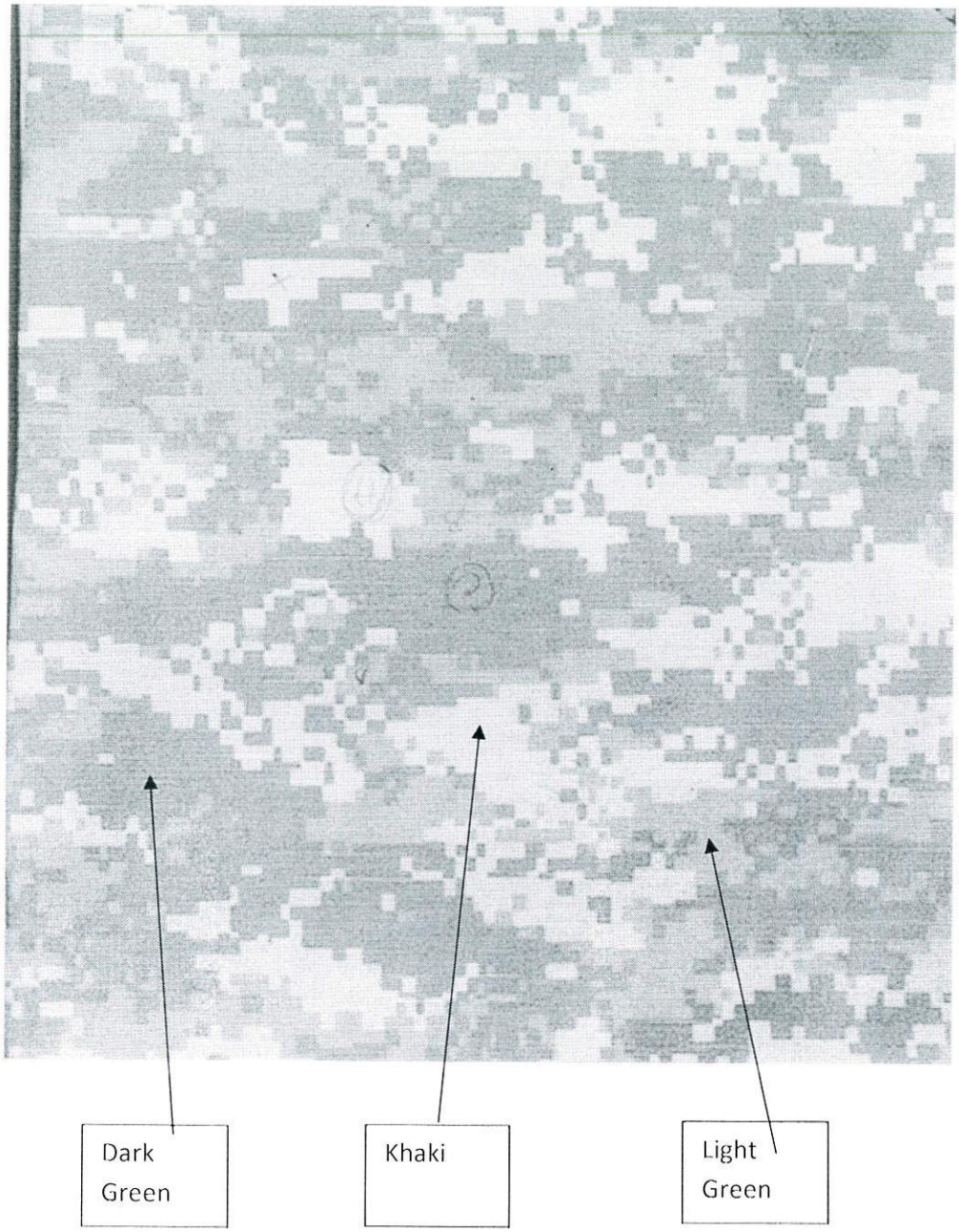

Fig. 2: Disruptive Print- Light Colour (For colour identification only)
(For true colours refer sealed fabric sample)

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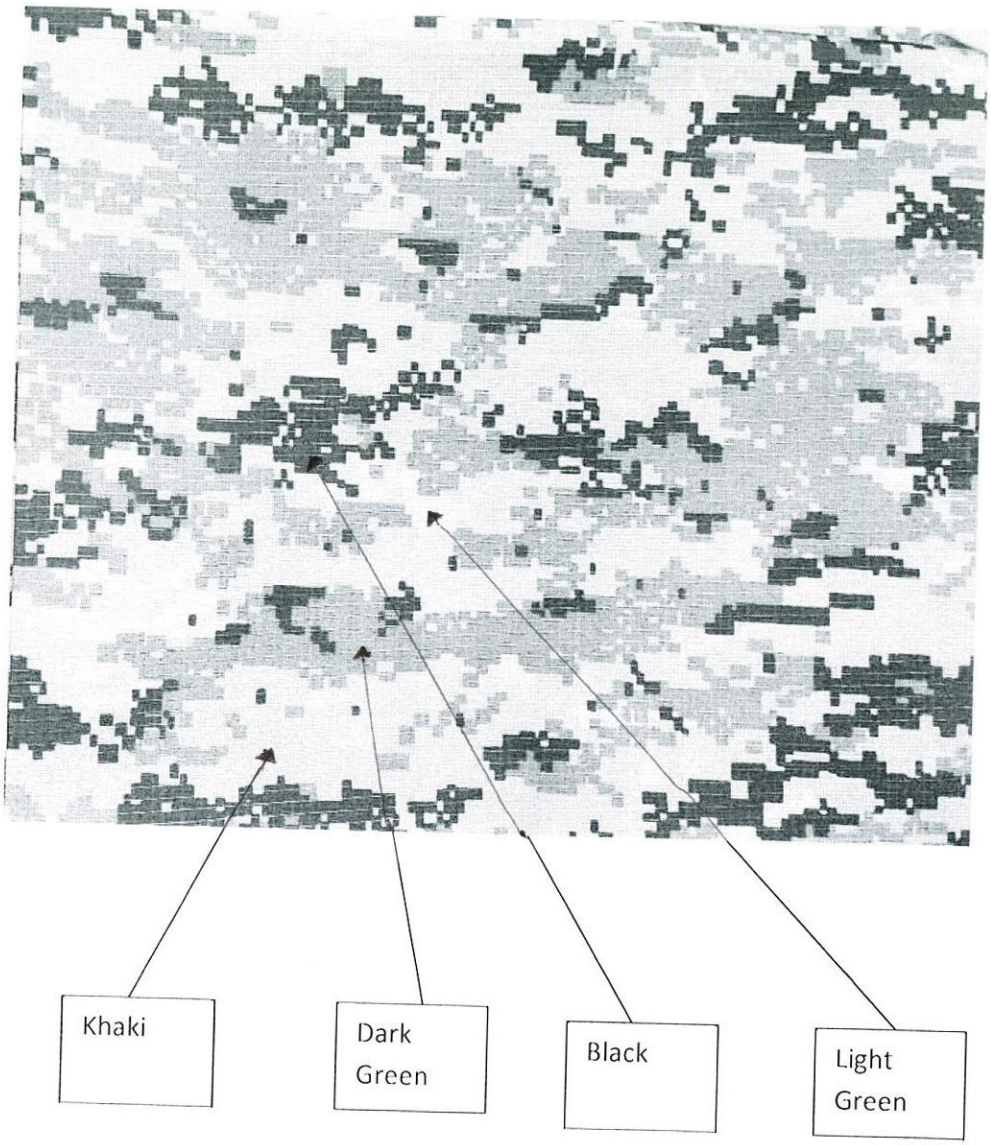

Fig. 3: Disruptive Print- Dark Colour (For colour identification only)
(For true colours refer sealed fabric sample)

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8.0 **References**

8.1 The list of referred standards is given below:

LIST OF REFERED STANDARDS

Sl. No	Method/Spec. number	Title
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 of 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 :13510:2000 (RA 2006)	Textile-duck, Polyester/Cotton blended, Rib-stop-Specification.
7.	IS:9543:1980 (RA 2004)	Spun polyester sewing threads
8.	IS:10789:2000 (RA 2007)	Classification and terminology of stich types used in seams.
9.	IS:11161:2000 (RA 2007)	Textiles-Seam types-classification and terminology
10.	IS: 3442:1980 (RA 2004)	Method for identification of crimp and count of yarn removed from fabric.
11.	IS: 1963:1981 (RA 2004)	Methods for determination of thread per unit length in woven fabric.
12.	IS 1964:1970 (RA 2006)	Method for determination of weight per square meter and weight per linear meter of fabric.
13.	IS: 1954:1990 (RA 2007)	Determination of length and width of woven fabric
14.	IS:1969:1986 (RA 2006)	Method for determination of breaking strength and elongation of woven fabrics
15.	IS:6489:1993 (RA 2006)	Textiles-woven fabrics-determination of tear resistance by the failing pendulum method.
16.	IS: 12673:1989 (RA 2005)	Textile fabrics-Abrasion resistance-method for determination.
17.	IS:110971:1984 (RA2006)	Method determination of pilling resistance of fabrics
18.	IS:11056:1984 (RA 2006)	Method for determination of air permeability of fabrics
19.	IS:11248:1995 (RA 2007)	Textiles-Polyester blend suiting for uniform-specification
20.	IS:764:1979 (Reaffirmed 2008)	Method for determination of colour fastness of textile material to washing-Test3

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21.	IS:971:1983 (Reaffirmed 2004)	Method for determination of colour fastness of textile material to perspiration
22.	IS :689:1988 (Reaffirmed 2004)	Method for determination of colour fastness of textile material to hot pressing
23.	IS:766:1988 (Reaffirmed 2004)	Method for determination of colour fastness of textile material to rubbing
24.	IS:690:1988 (Reaffirmed 2004)	Method for determination of colour fastness of textile material to sea water
25.	IS: 2454:1985 (Reaffirmed 2006)	Method for determination of colour fastness of textile material to artificial light (Xenon lamp) pressing
26.	IS: 1390:1983(RA 2004)	Method for determination of pH value of aqueous extract to textile materials
27.	AATCC Test method 173:2005	CMC calculation of small colour differences for acceptability
28.	AATCC Evaluation procedure 7: 2003	Instrumental assessment of the change in colour of a test specimen
29.	AATCC Test method 20:2007	Fiber analysis qualitative
30.	AATCC Test method 20A	Fiber analysis qualitative
31.	AATCC test method 128:2004	Wrinkle recovery of fabrics Appearance Method
32.	ASTM E96	Standard test method for water vapor transmission

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Approved/~~Not Approved~~

12/7/24

Anish Dayal Singh, IPS
Director General, CRPF