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ORDNANCE CLOTHING FACTORY
GOVERNMENT OF INDIA, MINISTRY OF DEFENCE
ORDNANCE FACTORY BOARD - OEF HQ
AVADI, CHENNAI - 600 054.

SPECIFICATION FOR

CLOTH POLYESTER AND COTTON (20:80)
DISRUPTIVE (JUNGLE PATTERN WITH ARMY LOGO) 250 GSM

CAT NO. NIV

ISSUED BY

MB

CONTROLLER OF CUSTOMER SERVICE CENTRE
ORDNANCE CLOTHING FACTORY,
AVADI, CHENNAI - 600 054

February - 2008

Price : Rs. 250/-

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RECORD OF AMENDMENTS

AMENDMENT NO.	DATE	DETAILS OF AMENDMENT	AMENDMENT CARRIED OUT BY & DATE		

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01. FOREWORD

- 1.1 This specification containing 14 pages has been prepared by
**The Controller,
Customer Service Centre,
Ordnance Clothing Factory,
Avadi, Chennai – 600 054.**
(Hereafter referred as CCS)
- 1.2 This specification is liable to amendment at any time and therefore, is applicable only to specific enquiry made at any time. For any specific enquiry, a fresh copy of the specification is to be obtained.
- 1.3 This is a restricted document and therefore, should not be communicated to any one who is not authorized to receive it.
- 1.4 This specification can be used for tender-enquiry, procurement, manufacture and quality assurance.
- 1.5 Enquiries regarding this specification relating to technical or any other contractual conditions shall be referred to **Quality Assurance Authority (QAA)** named in the purchase document viz. tender or contract.
- 1.6 Any deviation from this specification will not be resorted to without the express written sanction of the **QAA** or his authorized representative

02. SCOPE

2.1 This specification covers the requirements of *Cloth Polyester & Cotton (20:80) Disruptive (Jungle Pattern with Army Logo) 250 GSM* meant to be used in the fabrication of combat uniforms (i.e. Jacket and Trousers Combat Disruptive) for defence services personnel or any other use as deemed fit.

03. RELATED SPECIFICATION/REFERENCES

3.1 Reference is made in this specification to:

- i. IS: 687 : Method for determination of colour fastness to Washing.
- ii. IS: 766 : Method for determination of colour fastness to textile materials rubbing.
- iii. IS: 971 : Method for determination of colour fastness of textiles materials to perspiration.
- iv. IS: 1383 : Method for determination of Scouring Loss on grey & finish Cotton Textile material.
- v. IS: 1390 : Method for determination of pH value of aqueous extract of textile materials
- vi. IS: 1954 : Method of determination of length and width of fabrics
- vii. IS: 1963 : Method for determination of threads per unit length in woven fabrics
- viii. IS: 1964 : Method for determination of Mass per metre and mass per linear metre of fabrics
- ix. IS: 1969 : Method for determination of breaking load and elongation at break of woven fabric.
- x. IS: 2454 : Method for determination of colour fastness of textiles materials to artificial light (xenon lamp)
- xi. IS: 2977 : Method for determination of relaxation shrinkage in woven fabric.
- xii. IS: 3416 : Method for quantitative chemical analysis of mixtures of polyester fibres with cotton or regenerated cellulose.
- xiii. IS: 3442 : Method for determination of count of yarn of woven fabrics
- xiv. IS: 3456 : Method for determination of water soluble matters of textile materials.
- xv. IS: 4905 : Method for random sampling
- xvi. CQA(T&C) Sch No : Method for packing & marking
CQA(T&C)/PMS/35(d)
- xvii. IS: 447 : For identification of dyes

04. STANDARD SHADE

The shade of the khaki base and three blotches (i.e. green, brown & black) in the fabric shall conform to the sealed sample held in the custody of CCS. There shall not be any tonal variation from selvedge to centre, from place to place and from face to face in the same bolt.

05. STANDARD PATTERN

The standard pattern held in the custody of CCS shall constitute the standard as regards to any particulars or properties not noted/defined in this specification.

06. MATERIAL

6.1 The fabric shall be woven from spun yarn made from uniform and intimate blend of approximately 20 percent polyester and approximately 80 percent of combed cotton of good quality. The composition of the finished fabric shall comply with the requirements given in the Clause – 8 of this specification.

6.2 Vat and Disperse dyes shall be used for dyeing and printing of the fabric.

6.3 The fabric can be supplied in the width of ¹⁵³~~150~~ cms (minimum). The length of each piece shall be 40 meters or as agreed between supplier and purchaser.

07. PROCESSING

7.1 The cloth shall be woven in 2/1 Twill weave and shall be printed in three colours disruptive design. The disruptive pattern shall be obtained by repeats of the design shown in plate 'A' using vat and disperse dyes. The khaki dyed fabric shall be suitably printed with brown, green and black colour blotch designs represented by plate 'A' to obtain complete pattern depicted by sealed sample. The individual shades of the fabric shall satisfy the requirements of dye fastness as laid down in test Clause - 8 of this specification.

08. DIMENSION & TOLERANCE

The finished cloth shall conform to the following particulars and shall satisfy tests details below:

S. No.	CHARACTERISTICS	REQUIREMENTS	TOLERANCE	METHOD OF TESTS (LATEST VERSION)
1	Weave	2/1 Twill	--	
2	Width (minimum)	150 150 cm @	+ 2 %	IS: 1954
3	Count of Yarn Warp Weft	2/32 ^s Ne 2/32 ^s Ne	± 2%	IS: 3442
4	Threads/cm Warp Weft	42 22	± 5%	IS: 1963
5	Mass/m ² (g)	250	+5% - 2.5 %	IS: 1964
6	Breaking Load 'N' (Min.) (5 cm X 20 cm between grip) Warp Weft	1200 550	-	IS: 1969
7	Relaxational Shrinkage or Elongation % (max) Warp Weft	1.5 %	-	IS : 2977
9	Heat Shrinkage % (max) (160 ± 4 Deg. C – for 15 min) Warp Weft	1 %	-	Annexure 'A' of this specification
10	Tearing strength 'Kgf' (min) Warp Weft	3.5 3.0	-	IS:6489
11	Pilling Resistance (18,000 revolutions)#	Rating 4 or better	-	IS 10971
12	Crease recovery	155-170 degree		IS: 4681

Note: 152

@ 150 cm minimum excluding selvages or as agreed between customer and supplier.

Care Instruction: Machine Wash, Inside out, with like colours, Gentle Cycles, Non - chlorine bleach when needed.

1. Single yarn used before doubling shall be combed yarn.
2. Manufacturing process shall be verified if required to verify whether combed yarn is used.

The chemical parameters and other requirements of the cloth shall satisfy the tests detailed below:

S No.	CHARACTERISTICS	REQUIREMENTS	TOLERANCE	METHOD OF TESTS (LATEST VERSION)
1.	Blend Composition (%)	Cotton – 80 % Polyester – 20%	± 3	IS: 3416
2.	pH value of aqueous extracts	6.0 – 8.5	-	IS: 1390 (Cold method)
3.	Colour Fastness to Light	Rating 5 or better	--	IS: 2454
4.	Colour Fastness to Washing	Rating 4 or better	---	IS: 3417 (Repeated four times)
5.	Staining on cotton	Rating 4 or better	---	
6.	Colour Fastness to Perspiration Acid solution Alkali solution	Rating 4 or better Rating 4 or better	--	IS: 971
7.	Colour Fastness to Rubbing (Dry & Wet) i. Ground: Khaki ii. Print :Green, Brown & Black	Rating 4 or better Rating 4 or better	---	IS: 766
8.	Scouring Loss	2% (Max)		IS: 1383 Mild Method

09. WORKMANSHIP AND FINISH

- 1.2 The general workmanship and finish shall be of high standard and similar to sealed sample held with CCS.
- 1.3 The cloth shall be well singed, uniformly woven and the selvedge shall be firm and straight.
- 1.4 The finished cloth shall be free from sizing, filling and dressing materials and substance liable to cause subsequent tendering.
- 1.5 The cloth shall be free from spinning, weaving and processing defects like slubs, neps, reed mark, patchiness, fuzzy appearance etc.
- 1.6 The cloth shall be heat-set and fully shrunk.

10. MARKING

Each piece prior to being offered for inspection shall be legibly and indelibly marked with indelible *Textile Marking Ink* by the supplier at both the ends with his 'Name'/Initials'/Recognized Trade Mark', 'Month and Year of Manufacture', 'Nomenclature', 'Cat Part No.', 'Batch/Lot No' and 'Length of Piece' and 'No. of flags'. In addition, supplier shall get their firm's name and/or trademark woven all along the selvedge at suitable distance as agreed between purchaser and supplier.

11. ACCEPTANCE MARK:

The acceptance authority shall put their acceptance marks on both the ends as well as all along the bolt. The distance between two such acceptance marks shall not exceed 2 Mtrs. The acceptance marks shall be as near as possible to the selvedge.

12. ADVANCE SAMPLE

The firms shall submit two meters of cloth as advance sample for approval by CCS or appropriate authority as mentioned in the contract prior to commencement of bulk production.

13. PRE-INSPECTION OF SUPPLIES BY PRODUCER:

- 13.1 The suppliers must satisfy themselves first that the store manufactured are in accordance with the contract and fully conform to the specification by carrying out thorough pre-inspection of each lot/batch before being offered for inspection to the Inspection Authority.
- 13.2 The supplier shall furnish a declaration that necessary pre-inspection/tests have been carried out on the store being offered and same is fit for inspection. Test and findings shall be submitted alongwith the challans.
- 13.3 If the Quality Assurance Officer finds that pre-inspection of the consignment as required above have not been carried out, the consignment is liable for rejection.

14. QUALITY ASSURANCE

- 14.1 Examination of the samples taken from any portion of the consignment or during surveillance inspection shall conform to the requirements, when tested in accordance with the methods mentioned against each in Clause-8 of the specification.
- 14.2 Samples shall be forwarded to CCS from bulk supplies to check/monitor the quality whenever required.

15 SAMPLING

- 15.1 **FORMATION OF LOTS:** The delivery shall be visually inspected by the Quality Assurance Officer on the spot in the first instance to ascertain its homogeneity in respect of nature, source, year of manufacture, batch, uniformity of production etc. If the product units are homogeneous, the delivery shall be treated as one lot. If not, the product units shall be segregated by supplier into separate group so that each group is homogeneous within itself so as to form a sub lot. The supplier shall arrange the units of the homogeneous lot in such a way that all the product units are easily accessible to the sampling officer from all the sides to enable him to draw samples at random from any portion of the homogenous lot.
- 15.2 **SAMPLING PROCEDURE:** Sampling of the stores shall be carried out by adopting appropriate sampling method as per IS: 4905.
- 15.3 **SAMPLE SIZE:** The scale of sampling as given in Appendix 'B' shall be followed in respect of physical and chemical parameters.
- 15.4 **LOT SIZE:** 25,000 meters maximum.

16. TEST METHODS

The specification mentioned in Clause-08 against each parameter shall be followed for test methods.

17. CRITERIA OF CONFORMITY:

All the sample units drawn shall be tested/examined to the specific requirements. If all the samples units are found to conform to the requirements of this specification the lot shall be considered to be in conformity to the specification.

18. PACKING & MARKING

18.1 Packaging of the store shall be done as per Packing & Marking Schedule No. CQA(T&C)/PMS/35(d) except that material shall be supplied in roll form only.

18.2 MARKING OF PACKAGE

Each bale shall be legibly marked by stencil with Indelible Marking Ink/Paint showing the following details:

- i. Nomenclature & Cat No. of the store.
- ii. Quantity packed in the bale
- iii. Lot and serial No. of the Bale
- iv. Month and Year of packing
- v. Name and Trade Mark of the Manufacturer
- vi. Gross Weight of the Bale
- vii. Name and Address of the Consignee
- viii. S.O. No. & Date
- ix. Inspection Note No. and Date.

19. WARRANTY:

19.1 Except as otherwise provided in the invitation to the tender, contractor/supplier shall declare that the fabric supplied to the purchaser against this specification is of best quality and workmanship and new in all respect and is strictly in accordance with the specification particulars contained/mentioned in the contract.

19.2 The contractor/supplier shall guarantee that the fabric would continue to conform to the description and quality aforesaid for a period of twelve months from the date of delivery of the fabric to the purchaser or fifteen months from the date of despatch from supplier's premises, whichever is earlier and that notwithstanding the fact that the purchaser (Inspector) may have inspected and/or approved the consignments. If during the aforesaid period of 12/15 months the said consignment is discovered not conforming to the description and quality aforesaid or not giving satisfactory performance or have deteriorated and the decision of the purchaser in the behalf shall be final and binding on the contractor/supplier to rectify/replace by acceptable goods or such portion or portions thereof as is found to be defective by the purchaser within a reasonable period not exceeding three months or as may be decided by the purchaser. And in such an event the warranty period shall apply to the fabrics replaced from the date of replacement or otherwise the contractor/supplier shall pay the purchaser, such compensation as determined by the purchaser as may arise by reason of breach of the warranty contained herein.

20. DRAWING/SKETCHES (GREEN, BROWN & BLACK BLOTCHES)

20.1 Drawing Plate 'A' shows all the three blotches i.e. Green blotch, Brown blotch & Black blotch.

21. SUGGESTION FOR IMPROVEMENT:

Any suggestion for improvement of this document may kindly be forwarded to:

**The Controller,
Customer Service Centre,
Ordnance Clothing Factory,
Avadi, Chennai – 600 054.**

PLACE: AVADI

Annexure – A

METHOD FOR DETERMINING SHRINKAGE WHEN HEATED

A sample fabric shall be cut 30 cm square and brought to equilibrium by conditioning in the standard atmosphere for testing i.e. $65 \pm 2\%$ RH and $27^{\circ} \pm 2^{\circ}$ Temp. A 25 cm square shall be marked on the fabric. On each side of the square, four reference points shall be marked at five centimetre intervals, so that by including the side of the square, six determinations in each of the warp and weft directions may be made. Two slits shall be made 1.25 cm from opposite edges of the fabric and a rod passed through the slits. The sample shall be mounted in a ventilated oven by means of the rod so that air circulates freely around the sides of the sample. The oven shall be brought up to a temperature of $160 \pm 4^{\circ}$ C. The sample shall then be withdrawn, removed from the rod and laid flat upon a smooth surface to cool. The distance between each pair of marks shall then be measured to the nearest 0.25 cm and the change in dimensions recorded. The average of the six determinations in the warp and weft directions shall be calculated and expressed as a percentage of the original length.

Annexure - B

SAMPLING PLAN
(BASED ON AQL OF 4% ISO - 2859)

Lots size in Rolls of 40 m or as agreed	Sampling Plan for					
	Visual Parameters		Physical Parameters (for laboratory tests)		Chemical Parameters and other physical parameters * Requiring long testing time (for lab. Tests)	
	Sample Size	Acceptance No.	Sample Size	Acceptance No.	Sample Size	Acceptance No.
1	2	3	4	5	6	7
Below 151	13	1	13	1	3	0
151 to 280	13	1	13	1	5	0
281 to 500	20	2	13	1	5	0
501 to 1200	32	5	20	2	5	0
1201 to 3200	50	5	32	3	13	1

* Times consuming physical parameters are (i) Shrinkage (ii) Spray rating test.

Note:

- i. Sample drawn as per column (2) to be first examined visually. If found satisfactory, the samples for lab testing as per the column (4) be drawn out from the samples originally drawn as per column (2) by the sampling officer and marked by him accordingly.
- ii. Samples for lab testing will be drawn from the samples drawn as mentioned in column (2) only.
- iii. For chemical parameters samples to be drawn at random as per IS: 4905 from those samples drawn as per column (4).