Specification of Cloth NYCO for NSG

0.0 Forward

0.1 This specification has been prepared by Office of the Directorate General, NSG on the authority of DG, NSG.

0.2 This specification is for use by the NSG.

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 Directorate General, NSG, New Delhi. All enquiries regarding this specification, including those relating to any contractual condition at the following address:-

Office of the Inspector General, NSG
HQ NSG, Mehram nagar, Palam,
Delhi -110037

0.5 Copies of the specification can be obtained from:-

Office of the Inspector General, NSG
HQ NSG, Mehram nagar, Palam,
Delhi -110037

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 NSG for Anti Terrorism operations and Anti Hijacking 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 NSG pattern cloth.

1.3 This specification does not specify general appearance feel etc. of the NSG Pattern Cloth.

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2.0 Manufacture and Finish

2.1 The NSG Pattern Cloth shall have Rib stop weave (IS-13510:2000 Figure 1). It shall be made from uniform blend 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.

2.2 The NSG Pattern Cloth may be obtained by repeats of the design of **34.25 inch ± 5% in warp direction and 33.25 inch ± 5% in weft direction**. The repeat of the design in both the light and dark colour variants is the 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 pattern 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 **IS:14466:1997 (Fabrics-Description of Defects-Vocabulary)**. 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 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 NSG 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 NSG Pattern Cloth 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 stitches (see IS 10789:2000 Reaffirmed 2007) at various portions of NSG Pattern Cloth Uniform may be as per the requirement of buyer. The uniform may be assembled throughout with lock stitches regulated at 35 to 40 stitches per 10 cm. The stitches shall be even tension with all loose ends fastened. However, selection of type of stitch and sewing thread shall be as agreed to between the buyer and seller. The NSG Pattern Cloth uniform shall be visually examined and shall be evenly sewn or stitched and shall be free from missed stitches, holes, cuts and free from puckering defects. The colour of the sewing thread used in the disruptive pattern uniform shall not bleed or stain.

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3.0 Requirements

3.1 The NSG Pattern Cloth Uniform shall conform to the requirements given in Table-1. Specification for colour used in printing shall be complete dark Z Black shade.

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

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 NSG 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 from the selvedge;

c. Length and width;

d. Manufacturer'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 NSG Pattern Cloth shall be packed in polyethylene or polypropylene bags and or in box, as required by the buyer (see IS 293:2025)

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 2. 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 is homogeneous. To achieve this the manufacturer shall maintain a system of process control at all stages of manufacturing ensuring the NSG Pattern Cloth tendering by him for inspection to comply with the requirement of this standard in all respects.

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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 1):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 from 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-2	All the pieces of cloth selected according to col 2 to Table-2 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 of non-conforming pieces not to exceed corresponding number given in col 3 of Table-2.
ii) Construction, Ends picks, mass length and width	According to col 4 of Table-2	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-2	All specimens shall satisfy the relevant requirements.

7.0 Terminology

For the purpose of this specification the definition given in IS-2364 : 1987 shall apply.

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Table 1 - Requirement of NSG NYCO Cloth (Dark Z Black Shade)

Sl. No.	Characteristics	Requirements	Test Method
1	Approximate count of yarn (For guidance only) NE -Warp -Weft	 20s x 2 (2/40s) 16s	**IS: 3442:2023**
2	Composition, % -Nylon 6.6 -Cotton	 50 ± 5 Remainder	**IS 2005:2024**
3	Ends/dm (minimum)	400	**IS-1963:2025**
4	Picks/dm (minimum)	180	**IS 1963:2025**
5	Width, cm	150 and above	**IS 1954:2024**
6	Mass, gm/m²	220 ± 15	**IS 1964:2025**
7	Breaking Strength, Newton (Minimum) -Warp-wise -Weft-wise	 1000 500	**IS-1969 (Part-1): 2018**
8	Elongation at break % (Minimum) -Warp-wise -Weft-wise	 35 20	**IS-1969 (Part-1): 2018**
9	Tearing Strength, Newton (Minimum) -Warp-wise -Weft-wise	 35 35	**IS-6489 (Part-1): 2011**
10	Abrasion Resistance -up to 50,000 cycles	No thread breakage	**IS 12673 (Part-2): 2022**

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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
12	Colour fastness to perspiration -Change in colour -Staining on adjacent fabric	4 or better 4 or better	**IS/ISO 105-E04:2013**
13	Colour Fastness to Hot pressing (200°C only dry press) -Change in colour -Staining on adjacent fabric	4 or better 4 or better	**IS/ISO 105-X11 : 1994**
14	Colour fastness to rubbing -Dry -Wet	4 or better 4 or better	**IS/ISO 105-X12: 2016**
15	Colour fastness to sea water -Change in colour -Staining on adjacent fabric	4 or better 4 or better	**IS/ISO 105-E02:2013**
16	Colour Fastness to light	5 or better	**IS/ISO 105 (Part B02):2014**
17	Dimensional Change due to relaxation, both directions, percentage, maximum	1	**IS 2977:2026**
18	Heat Shrinkage both directions, percentage, maximum	2	IS 12170:1967 (Temperature 150 ± 2°C)
19	pH Value	6.0-8.0	**IS 1390 : 2022**
20	Pilling (after 5 hour of test), Minimum	4	**IS 10971 (Part-1):2022**
21	Wrinkle Recovery (after 24 hours), Minimum	3	**IS 16575 : 2025**
22	Air permeability, cc/sec/cm² Minimum	3	**IS 11056:2013**

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23	Water vapor permeability (water method), g/m²/day, Minimum	1400	ASTM E-96/E-96 M-05. (Water method, Temperature: 32 ± 2°C RH 50 ± 2% Upright Method, Air velocity 0.02-0.3 m/sec)
24	Nature of dyes	Acid and VAT dyes Dyeing Dark Z Black Shade in VAT Color for better fastness properties	**IS 4472 (Part-1) 2021**

Note:- LCH Value not applicable for Black Shade.

Table -2: Sample size and permissible number of non-conforming NSG Pattern Cloth

Lot Size (1)	Sample Size (2)	Permissible Max Non-Conforming (3)	Sub-Sample Size (4)	Sub-sub Sample Size (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

8.0 References

8.1 The list of referred standards is given below:

LIST OF REFERRED STANDARDS

BPR&D CISF SSB BSF ITBP

BIS VC NITRA VC CRPF CTR NSG Scord NSG GC Proc NSG

Sl. No	Method/Spec. number	Title
1.	IS:397(Part-1): 2003	Method statistical for quality control during production: Part 1 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: 3442:2023**	Method for identification of crimp and count of yarn removed from fabric.
11.	**IS: 1963:2025**	Methods for determination of thread per unit length in woven fabric.
12.	**IS 1964:2025**	Method for determination of weight per square meter and weight per linear meter of fabric.
13.	**IS: 1954:2024**	Determination of length and width of woven fabric
14.	**IS: 1969 (Part-1):2018**	Method for determination of breaking strength and elongation of woven fabrics
15.	**IS:6489 (Part-1):2011**	Textiles-woven fabrics-determination of tear resistance by the failing pendulum method.
16.	**IS: 12673 (Part-2):2022**	Textile fabrics-Abrasion resistance-method for determination,
17.	**IS:10971 (Part-1):2022**	Method determination of pilling resistance of fabrics
18.	**IS:11056:2013**	Method for determination of air permeability of fabrics
19.	IS:11248:1995 (RA 2007)	Textiles-Polyester blend suiting for uniform-specification
20.	**IS/ISO 105-C10:2006**	Method for determination of colour fastness of textile material to washing-Test3

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21.	**IS/ISO 105-E04:2013**	Method for determination of colour fastness of textile material to perspiration
22.	**IS/ISO 105-X11 : 1994**	Method for determination of colour fastness of textile material to hot pressing
23.	**IS/ISO 105-X12:2016**	Method for determination of colour fastness of textile material to rubbing
24.	**IS/ISO105-E02:2013**	Method for determination of colour fastness of textile material to sea water
25.	**IS/ISO 105 (Part B02):2014**	Method for determination of colour fastness of textile material to artificial light (Xenon lamp) pressing
26.	**IS: 1390:2022**	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 F96	Standard test method for water vapor transmission

8.2 The vendors to provide certificate for compliance of all IS/ISO standards as specified in the QR/TDs.

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