



PAKISTAN NAVY SPECIFICATION 04/2019

PROMULGATION DATE: 22 MAY 2019

JERSEY BLACK

Prepared by:

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AMENDMENT RECORD

Amd No	Date	Text	Signature and Date

REVISION NOTE

The specification has been prepared to bring the test methods and procedures in line with up-to-date PN requirements and facilities held in Pakistan. CINS may request to amend any test requirement/ test procedure in light of the experience emanating from its inspection history, through the feedback form placed at Annex F. However, such an alteration will be effective when the amendment is promulgated by this Directorate, and will be effective on the contracts which materialize after the promulgation date of respective amendment.

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1. **DESIGNATION**

1.1 Jersey Black.

2. **USAGE**

2.1 This item will be used by personnel of Pakistan Navy during winter season.

3. **INTRODUCTION**

3.1 This specification is prepared by Directorate of Indigenous Technical Development, Karachi, to provide necessary guidance to the potential manufacturers/ suppliers of the items mentioned herein. This specification is to be used for testing and deciding upon acceptance, or otherwise, of the items mentioned. Any alteration or addition in this specification can be suggested to ITD Directorate. However, it cannot be implemented without prior approval of DNS. This specification supersedes and replaces PN Specification Pakistan Navy PN/UNIFORM/11/98 dated 03 Nov 98 promulgated earlier in relation to the item mentioned herein. These specifications are based on sample approved by Dress Committee.

3.2 This specification booklet includes 06 Annexes and consists 21 pages, including the cover.

4. **SCOPE**

4.1 This specification covers the technical/ manufacturing requirements of Jersey Black to be used by personnel of Pakistan Navy. It defines and lays down the quality standards, and details of materials, workmanship and finish. It also defines briefly requirement and process of sampling, testing, inspection acceptance/rejection, marking, preservation, packing and delivery etc.

4.2 The supplier/ manufacturer shall comply in every respect with the terms of this specification and ensure that the stores conform to it, in all respects.

5. **RELATED DOCUMENTS**

5.1 The standards and documents that have been referred to in this specification are:

- | | | |
|----|-------------|---|
| b. | ISO 1833 | Textile – Quantitative chemical analysis. |
| c. | ISO-3801 | Determination of mass per unit length and area. |
| d. | ISO-7211/2 | Determination of number of threads per unit length. |
| e. | ISO-7211/5 | Determination of linear density of yarn removed from fabric. |
| f. | ISO 105-E01 | Color fastness to water. |
| g. | ISO 105-C03 | Colorfastness to Washing test No.3 |
| h. | ISO 105-X12 | Colorfastness to Rubbing test. |
| j. | ISO 105-E04 | Colorfastness to Perspiration. |
| k. | ISO 105 D01 | Colorfastness to dry cleaning using perchloroethylene solvent |

- m. ISO 13934-2 1999 Textile- Tensile properties of fabrics (Grab method).
- n. ISO 6330 (3A) Domestic washing and drying procedures for textile testing.
- o. BS EN 25077 Determination of Dimensional Change in washing and drying.
- p. ISO 3071 Determination of pH of aqueous extract.
- r. AATCC 16 option 3 Colorfastness to light
- s. BS 4162 Methods of test for buttons
- t. AATCC 133 Colorfastness to hot press
- u. ASTM D 5171 Standard test method for impact resistance of plastic sew through buttons

6. **TERMS & DEFINITIONS**

6.1 Definitions for the terms used in this standard are given at Annex A of this specification.

7. **TECHNICAL DETAILS OF JERSEY BLACK**

7.1 The Technical Details of Jersey Black are mentioned at Annex B of this specification.

8. **MANUFACTURING DETAILS OF JERSEY BLACK**

8.1 The jersey shall be knitted in ribbed pattern with two type of yarns as follows:

- (a) 70% Wool and 30% Acrylic
- (b) 100% Polyester

8.2 The yarn shall be of good quality evenly spun on worsted system, free from spinning defects.

8.3 **Knitting of Body.** 02 plies of 70% Wool and 30% Acrylic double yarn folded with single ply 150 denier polyester splicing yarn shall be used.

8.4 **Knitting of Border and cuff.** 03 plies of 70% Wool and 30% Acrylic double yarn folded with single ply 150 denier Polyester Splicing yarn with elastic at the edges shall be used.

8.5 The Jersey black shall be made according to the shape and design as per size/measurement chart at Annex C and drawing at Annex D of this specification.

8.6 Jersey Black shall be knitted in ribbed pattern.

8.7 The average no of ribs/10 inches should be 35 ± 2 .

8.8 The Jersey shall have a 'V' shaped neck with double welting, fitted with 2/2 rib attached by linking machine and not over locked.

8.9 The sleeve shall have reinforcement patch at elbow as per shape and design in the drawing. The patch shall have two stitching lines running parallel around the patch.

8.10 Sleeves shall not be loose at any part of the arm.

8.11 The jersey shall have two packets with flaps. Pockets shall be made of black drill cloth. Size of the pockets shall be as per drawing. Pockets flaps shall be made of same wool material and pattern with black cloth reinforcement underneath.

8.12 Pockets flaps shall have button holes.

8.13 The shoulder flaps shall be made of wool material and drill cloth reinforcement underneath. The flaps shall be stitched at crow of sleeve such that centre of flap base lies on shoulder seam. The flaps shall be secured with buttons on the other end 1" inch from neck.

8.14 Jersey bottom border shall also be knitted with increased tension same as cuffs. In addition bottom border shall be reinforced with splicing yarn of 1/80.5 tex.

8.15 Each jersey shall have manufacturer's label stitched as indicated in drawing. Jersey size shall be indicated on the same label.

8.16 The seams and joints shall withstand stretching in all directions to the full extent of the knitted fabric without breaking and allowing the loops of the fabric to run or distort.

8.17 Polyester Buttons used should be Mat finished, 4 holes with 15 mm dia (24) ligne and black in colour. The button is to be fastened with same matching black colour thread with cross sewing neatly.

9. **QUALITY OF WORKMANSHIP AND FINISHING**

9.1 Workmanship and finish of the jersey shall be equal to the sealed sample. It shall be best of its class and to the entire satisfaction of the inspector. Sealed/ Approved sample is either held with DNS/ CINS or accepted/approved from bulk supply held with CINS.

10. **TESTING**

10.1 The material shall be subjected to tests laid down in this specification at Annex B of this specification and related documents. At least two jerseys will be required to complete relevant tests mentioned at Annex B of this specification. The material may also be subjected to such tests which are deemed necessary by the inspection authority in order to determine their suitability. Inspecting Authority reserves the right to get the B/R samples tested from any reputable laboratory other than PN. However, any test considered important by Inspecting Authority other than Annex B may also be conducted in order to check its suitability.

11. **TENDER SAMPLE**

11.1 Tender sample to be approved by TSR Committee.

11.2 For each contract 05 samples of Jersey Black shall be supplied by

the manufacturer at the time of tendering alongwith samples of materials used in manufacturing of garments for inspection as follows:

- | | |
|--|-----------|
| • Cloth used for elbow patch, shoulder flap lining, pocket and pocket flaps lining | 03 meters |
| • Sewing thread | 50 grms |
| • Button plastic round | 06 Nos |

12. **ADVANCE SAMPLE**

12.1 Advance sample or pre-production sample, when required, shall be submitted in accordance with terms of the contract for inspection and testing as per Annex B, C and D and approved by CINS. The minimum quantities required are 05 samples of Jersey Black alongwith materials used in manufacturing of jerseys for inspection as mentioned above.

12.2 Whenever Tender, Advance or pre-production sample is not required, the suppliers / manufacturer are advised in their own interest to submit to the Inspecting Officer an initial delivery of One % of the contract or ten jerseys whichever ever are more alongwith samples of materials for inspection.

12.3 The approval of the sample mentioned in Para 11 & 12 authorizes the commencement of bulk production but does not relieve the suppliers/ manufactures from compliance with all the provisions of this specification. One approved sample after rectification of all observations highlighted by Inspecting Officer shall be properly sealed by INS and returned to the firm for guidance; rest of the approved sample shall be retained by INS for future use in bulk inspection.

12.4 The Pre-production sample shall be manufactured by the manufacturer with the same facilities which will be used for manufacture of the bulk items.

12.5 Firm shall provide advance sample along with quality verification reports of jersey from an accredited laboratory.

13. **INSPECTION**

13.1 **Bulk representative sample.** B/R random sampling will be carried out as per rules in vogue.

13.2 **Bulk Inspection.** Bulk inspection will be carried out after satisfactory completion of Visual Examination and Testing of B/R Sample as per Annex B, C and D.

13.3 **Inspection of Jersey.** 100% of the offered store shall be inspected. The guide lines for such examination/inspection are listed at Annex E. Stage inspection of Jersey Black may be carried out by CINS if deemed necessary.

13.4 **Inspection/ Acceptance and Rejection of Stores.** Inspection/ acceptance is to

be carried out up to the satisfaction of Chief Inspector Naval Stores.

13.5 The jerseys shall be examined for the correctness of material, shape, design, dimension, workmanship and finish.

13.7 CINS reserves the right to reject the whole supply in case, upon examination, material or packing of any sample or portion of the consignment is found NOT CONFORMING to this specification.

13.8 If on examination of 5% of any delivery, 20% of those examined from bulk supply are found NOT CONFORMING to this specification in respect of the material, pattern, dimensions, workmanship and finish, the whole consignment may be rejected without any compromise.

13.9 All stores and packing NOT fully in accordance with this specification shall be rejected.

13.10 Jerseys with defects as described in Annex E of this specification will be considered for rejection by Inspecting authority. Inspection authority can reject the supply based on defect other than mention at Annex E.

13.11 **Responsibility for Inspection.** The supplier is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. PN reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

13.12 **Replacement by the Contractor.** The supplier /manufacture is responsible for replacement of the consignment or any part thereof whenever it is found to be not conforming to this specification. The supplies so tendered in replacement, shall be subjected to testing/Inspection and acceptance by the Inspecting Officer.

13.13 **Responsibility for Safety.** The supplier/manufacture is wholly responsible for the safety of supplies during inspection, storage at firm's premises, proper packing, dispatch and delivery up to consignee.

14. **STAMPING OF ACCEPTED/ REJECTED STORES BY THE INSPECTOR**

14.1 While stamping of accepted/ rejected stores following instructions will be followed:

14.2 **Stamping of Accepted Stores.** The acceptable stores shall be stamped with Inspector's Individual Acceptance Mark's. The stamping shall be legible.

14.3. **Stamping of Rejected Stores.** The rejected stores shall be marked with Inspector's Rejection Mark's to avoid re-submission by the supplier.

14.4 The Inspector is the authority in all matters pertaining to inspection.

15. PACKING DETAILS

15.1 The store when ordered to be delivered 'PACKED' shall be packed as follows:

- The jerseys shall be packed in clean and dry condition.
- Jerseys shall be folded to a suitable size.
- Each jersey shall be packed with two naphthalene balls in Polyethylene packing.
- 10 X jerseys shall be combined to form a bundle
- Each bundle is further wrapped in polyethylene sheeting.
- Bundle of jerseys shall be further packed in a strong 07 ply corrugated carton.
- Each carton shall be securely and properly packed with strong masking tape.

16. CARE INSTRUCTION LABEL

16.1 Care instructions in English and Urdu shall be attached with each jersey as per drawing having minimum requirement as follows:

- Washing procedure.
- Drying procedure.
- Any Prohibition.

17. IDENTIFICATION LABEL

17.1 Each jersey shall bear following clear and indelible information on Main Label attached with individual jersey as per drawing at Annex D:

- a. Item name/ item description with size and NSN/ patt no.
- b. Contract number and Date.
- c. Year of manufacture.
- d. Firm's name, initials, or trade mark.
- e. Batch no.

18. PACKING LIST

18.1 Firm is bound to provide a packing list of store offered for inspection alongwith the challan, which include complete details about the store i.e Pattern No., Description of stores, size, quantity, contract no., and date, Challan No. and Date. A packing list shall be enclosed after completion of inspection with each packed box giving full details about the stores packed i.e. Pattern No. Description of stores, size, quantity, contract no, and date, I/Note No. or voucher no. and date, consignee, Manufacturer/ firm's name, date of packing and packer's signature.

19. MARKING OF STORES

19.1 In addition to any special marking required by contract or order, the marking of packages shall be stenciled with quick drying Black ink/ Paint in accordance with Specification No. NS/MISC/002/80 with clearly defined characters as described below:

- a. On Front and Top

- (1) Consignee Address.
- (2) Contract No and date.
- (3) Description of Stores Packed and NSN/Patt no.
- (4) Quantity of the Item packed.

b. On Back

- (1) Manufacturers name / Firm's name.
- (2) Voucher No. or inspection note no. and date.
- (3) The No. of individual Package and the total No of Packages in the consignment joined by the word 'of 'e.g. 2 of 300.
- (4) Weight of the package.
- (5) Month and year of packing.

20. **DELIVERY**

20.1 The consignment of store will be delivered in accordance with the terms of contract.

20.2 The store shall be delivered in Brand new, clean and dry condition.

20.3 The contractor/ manufacturer is fully responsible for the safety of the supplies during inspection, storage at firm's premises, dispatch and delivery up to consignee.

XXXXXXXXSDXXXX
ASIF ALI PIRZADA
 Commander Pakistan Navy
 Director Inventory Deletion

Annexes:

Distribution:

DP (N)

CINS

DNS

CO PNCSD

Annexes:

- A. Terms & Definitions
- B. Technical Details of Jersey Black
- C. Measurement Schedule of Jersey Black
- D. Drawing of Jersey Black
- E. Guidelines for Inspection
- F. Feed Back Form

ANNEX A TO
PN SPECIFICATION NO.04/2019
PROMULGATION DATE 22 May 2019

TERMS & DEFINITIONS

1. **Inspection Authority.** Chief Inspector of Naval Stores (CINS). His verdict in respect of inspection matters is to be taken as final.
2. **Inspecting Officer.** An officer nominated by the Chief Inspector of Naval Stores (CINS) for carrying out inspection of stores supplied by the supplier, against a specified contract or order, in accordance with the particulars stipulated therein.
3. **Inspector.** The term inspector shall include the “Inspection Authority”, inspecting officer and their representatives, duly authorized for the purpose of discharging inspection duties involved.
4. **Sealed Sample.** It denotes a sample, sealed and signed by the Inspection Authority & held in his custody, and represents the standard of store in respect of materials, dimensions, design, workmanship and finish, etc. There is only one sealed pattern for each store, which cannot be removed from custody of the inspection authority.

ANNEX B TO
PN SPECIFICATION NO.04/2019
PROMULGATION DATE 22 May 2019

TECHNICAL DETAILS OF JERSEY BLACK

S NO	ITEM	REQUIREMENT
<u>MATERIAL SPECIFICATION OF BASE FABRIC</u>		
a.	Material	Wool 60% \pm 3% Acrylic 32% \pm 2% Polyester 08% (Balance)
b.	Colour	Black Pantone 19-4006 TCX
d.	Type of Wool	High Quality Wool
e.	No of Microns	21 - 22.5
f.	Count of Yarn Body Cuff and Border	2/36 \pm 1.5 Tex (2 ply) 2/36 \pm 1.5 Tex (3 ply)
g.	Quality of yarn	Worsted
h.	Grade Wool Acrylic	64 ^S 3-4 Denier
j.	Fiber length (mm)	Wool 80 Acrylic 80-120
k.	Evenness (U%) of yarn	8.45
m.	Average breaking strength	677 cN
n.	Thick places	1
p.	Thin places	Nil
q.	Neps	14
r.	Splicing Yarn	100 % Polyester 150 \pm 7 Denier
<u>PERFORMANCE TESTING OF BASE FABRIC</u>		
a.	Colour fastness to Washing No.3 (1) Staining on attached pieces. (2) Change in Shade	GS 4/5 (Min) GS 4 (Min)
b.	Colour fastness to Perspiration Acid & Alkaline Solution (1) Staining on attached pieces.	GS 4/5 (Min) GS 4 (Min)

	(2) Change in Shade	
c.	Color fastness to dry cleaning (1) Staining on attached pieces. (2) Change in Shade	GS 4/5(Min) GS 4 (Min)
d.	Color Fastness to light Change in Shade	GS: 4 or better
e.	Color Fastness to Rubbing (Dry) Staining	GS: 4 or better
f.	Color Fastness to Rubbing (Wet) Staining	GS: 3 or better
g.	Color fastness to water	GS: 4 or better
h.	pH level	6-8

REINFORCEMENT FABRIC AT ELBOWS, SHOULDER FLAPS LINING, POCKETS, AND POCKET FLAPS LINING

a.	Material	60% Cotton – 40% Polyester
b.	Colour	Black Pantone 19-4006 TCX
c.	Weave	Twill 1x 2
d.	Nature of Dye	Vat disperse
e.	Weight (gm/sq m)	250 \pm 10
f.	Count of Yarn (1) Warp (2) Weft	16 ^s /2 12 ^s /2
g.	Dimensional Stability (1) Warp (2) Weft	\pm 2% \pm 2%
h.	Threads/inch Warp Weft	120 \pm 2 50 \pm 2
j.	Scouring Loss	2% (Max)
k.	Manufacturing Process	Grade 'A' fabric using high quality yarn, weaved on shuttle less looms, mercerized and sanforized finish.

PERFORMANCE TESTING OF REINFORCEMENT FABRIC

a.	Colour fastness to Washing No.3 (1) Staining on attached pieces. (2) Change in Shade	GS 4/5 (Min) GS 4 (Min)
b.	Colour fastness to Perspiration Acid & Alkaline Solution (1) Staining on attached pieces. (2) Change in Shade	GS 4/5 GS 4 (Min)

c.	pH level	6-8
d.	Pilling resistance after 5,000 cycles	Grade 4
e.	Abrasion resistance after 6,000 cycles	No thread break
f.	Color Fastness to Rubbing (Dry) Staining	GS: 4 or better
g.	Color Fastness to Rubbing (Wet) Staining	GS: 3 or better
h.	Breaking Strength (1) Warp (2) Weft	100 kg 50 kg

STITCHING/ OVER LOCKING THREAD

a.	Material	25% Polyester & 75% Woolen
b.	Shade	Black Pantone 19-4006 TCX
c.	Count	3/24 ^s

PERFORMANCE TESTING OF STICING AND OVERLOCKING

a.	Breakage Strength	3 lbs (Min)
b.	Color fastness to washing (Test No. 3)	
	a. Change in Shade	GS: 4
	b. Staining	GS: 4

BUTTONS

a.	Material	Plastic
b.	Shade	Black 19-4006 TCX

PERFORMANCE TESTING OF BUTTON

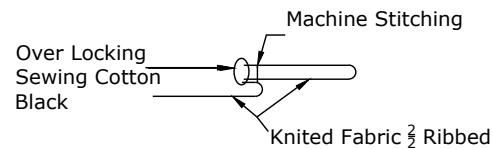
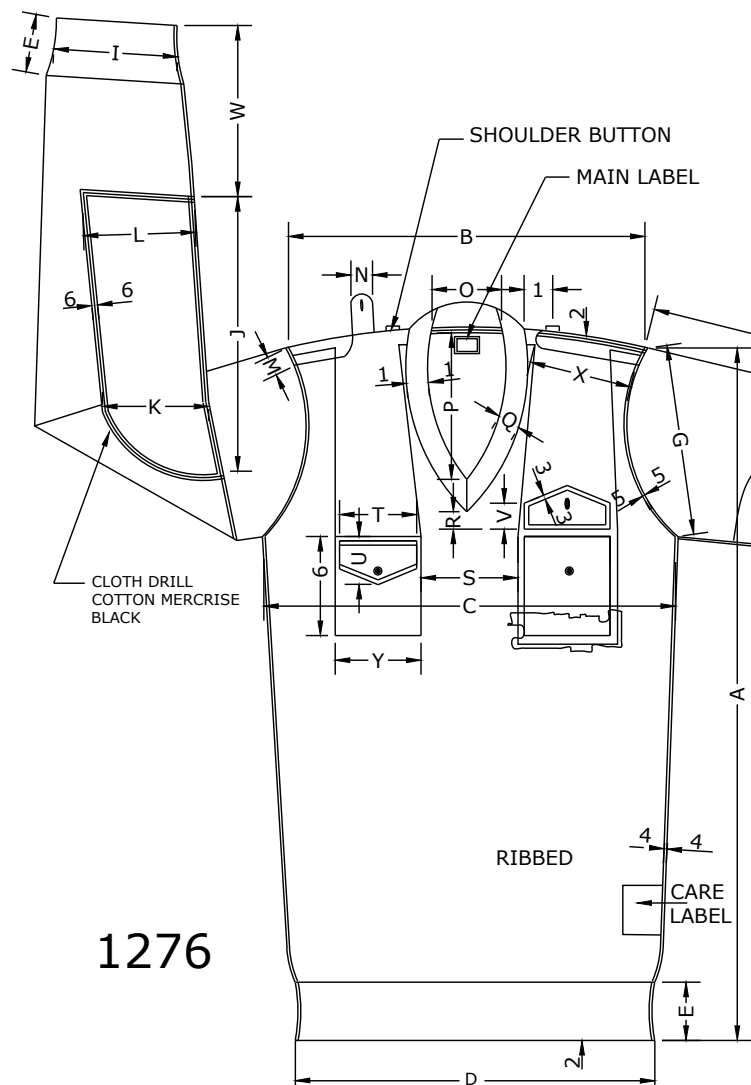
a.	Color fastness to water	GS 4 or better
b.	Pull test at 90 N	No crack, chips or breakage No structural failure No center break out
c.	Impact resistance	No crack, chips or breakage
d.	Color fastness to heat (hot pressing)	GS 4
e.	Appearance after dry cleaning	No color transfer on fabric

ANNEX C TO
PN SPECIFICATION NO.04/2019
PROMULGATION DATE 22 May 2019

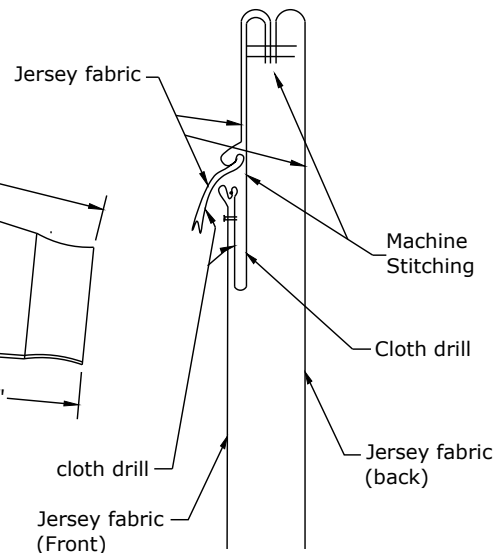
MEASUREMENT SCHEDULE OF JERSEY BLACK

Drg Ref	Description	Sizes (inches)									Tolerances
		30	32	34	36	38	40	42	44	46	
A	Length	25.5	26	26.5	27	27.5	28	28.5	29	30	± 0.5
B	Shoulder	14	15	16	17	18	19	20	21	22	± 0.5
C	Chest 1" below Arm hole	15	16	17	18	19	20	21	22	23	± 0.5
D	Width of jersey from upper side of Border	14	14.5	15	15.5	16	16.5	17	17.5	17.5	± 0.5
E	Width of border and length of cuff	3	3	3	3	3	3	3	3	3	± 0.25
F	Sleeve length including cuff	20	20.5	21	22	23	24	25	25.5	26	± 0.25
G	Arm hole	8.5	9	9	9.5	10	10	10.5	11	11	± 0.25
H	Elbow width 11" from cuff	5.5	5.5	6	6	6	6	6.5	6.5	6.5	± 0.5
I	Width of cuff from centre	2.5	2.5	2.5	2.5	3	3	3.5	3.5	3.5	± 0.25
J	Elbow patch Length	10	10	10	10	10	10	10	10	10	± 0.1
K	Elbow patch upper width	5	5	5	5	5	5	5	5	5	± 0.1
L	Elbow patch lower width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	± 0.1
M	Shoulder flap width at Base	2	2	2	2	2	2	2	2	2	± 0.1
N	Shoulder flap width at tip/button	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	± 0.1
O	Neck opening inside	3	3.5	3.5	4	4	4	4.5	4.5	4.5	± 0.25
P	Depth of neck	5	5.5	5.5	6	6	6	6.5	6.5	6.5	± 0.25
Q	Width Neck rib	1	1	1	1	1	1	1	1	1	± 0.1

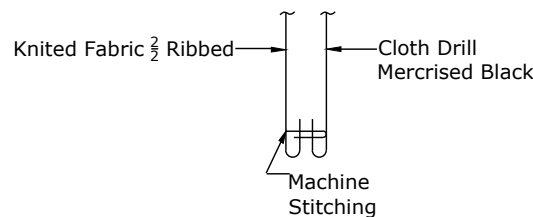
R	Distance of pocket flap line from V neck	1	1	1	1	1	1	1	1	1	± 0.1
S	Distance between pocket flap	3	3.5	3.5	3.5	4	4	4	4	4.5	± 0.15
T	Pocket flap width	4.5	4.5	5	5	5	5	5	5	5	± 0.1
U	Pocket flap length at centre	3	3	3	3	3	3	3	3	3	± 0.1
V	Pocket flap side length	2	2	2	2	2	2	2	2	2	± 5
W	Elbow patch distance from cuff	5	5.5	5.5	5.5	5.5	6	6.5	6.5	6.5	± 0.25
X	Shoulder Flap Length	6	6	6	6	6.5	6.7	6.7	6.7	7	± 0.25
Y	Size of pocket	4.75 x 6	4.75 x 6	5.25 x 6	5.25 x 6	5.25 x 6	5.25 x 6	5.25 x 6	5.25 x 6	5.25 x6	± 0.1
Z	Weight of 10 Jerseys in kgs approx	7.75	8.00	8.25	8.50	8.75	9.00	9.25	9.50	9.75	<u>Approx</u>



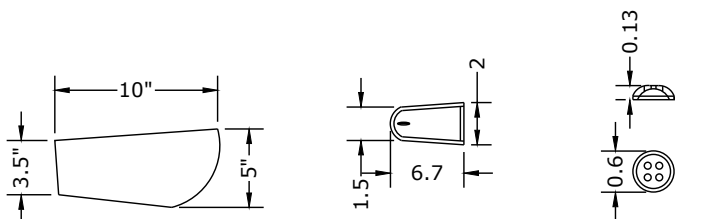
SECTION-1



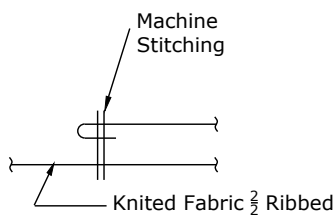
SECTION-2



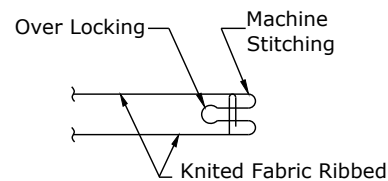
SECTION-3



ELBOW PATCH SHOULDER FLAP BUTTON



SECTION-6



SECTION:4&5

NOTE:-
FOR FURTHER DETAILS SEE STOCK SAMPLE.

ANNEX D TO
PN SPECIFICATION NO 04/2019
PROMULGATION DATED 22-05-2019

Y	SIZE OF POCKET	5.25x6
X	SHOULDER FLAP LENGTH	6.7
W	ELBOW PATCH DISTANCE FROM CUFF OPENING	6
V	POCKET FLAP SIDE LENGTH	2
U	POCKET FLAP LENGTH AT CENTRE	3
T	POCKET FLAP WIDTH	5
S	DISTANCE BETWEEN POCKET FLAP	4
R	DISTANCE OF POCKET FLAP LINE FROM 'V' NECK	1
Q	WIDTH OF NECK RIB	1
P	DEPTH OF NECK	6
O	NECK OPENING INSIDE	4
N	SHOULDER FLAP WIDTH AT TIP/BUTTON	1.5
M	SHOULDER FLAP WIDTH AT BASE	2
L	ELBOW PATCH LOWER WIDTH	3.5
K	ELBOW PATCH UPPER WIDTH	5
J	ELBOW PATCH LENGTH	10
I	WIDTH OF CUFF FROM CENTER	3
H	ELBOW WITH 11 INCH FROM CUFF OPENING	6
G	ARM HOLE STRAIGHT	10
F	SLEEVE LENGTH INCLUDING CUFF	24
E	WIDTH OF BORDER AND LENGTH OF CUFF	3
D	WIDTH OF JERSEY FROM UPPER SIDE OF BORDER	16.5
C	CHEST ONE INCH BELOW FROM ARM HOLE	20
B	SHOULDER	19
A	LENGTH	28

DITD NHQ KARACHI

TITLE:- **JERSEY BLACK OFFICERS CPOs/SAILORS** SIZE:-40

DWG NO: TD-2469/2019 DIMENSION: INCHES

DATE: 04-03-2019 SCALE: NTS

DRAWN BY	CHECKED BY	APPROVED BY
--SD--	--SD--	--SD--
HDM M.ASGHAR I/C DWG	LT CDR ASMA SOHAIL SO TEX	CDR ASIF ALI PIRZADA GMID

ANNEX E TO
PN SPECIFICATION NO.04/2019
PROMULGATION DATED 22 May 2019

GUIDELINES FOR INSPECTION – GENERAL DEFECTS

S.No.	Defect	Description
1.	Drop Stitches (Holes)	Drop Stitches are randomly appearing small or big holes of the same or different size which appear as defects in the knitted fabrics.
2.	Barriness	Barriness defect appear in the knitted fabric in the form of horizontal stripes of uniform or variable width.
3.	Streakiness	Streaks in the knitted fabrics appear as; irregularly spaced & sized, thin horizontal lines.
4.	Imperfections	Imperfections appear on the fabric surface in the form of unevenly placed or randomly appearing knots, slubs & Neps, Thick & Thin places in the yarn
5.	Snarls	Snarls appear on the fabric surface in the form of big loops of yarn getting twisted due to the high twist in the yarn.
6.	Contaminations	Contaminations appear in the form of foreign matter such as; dyed fibers, husk, dead fibers etc. in the staple spun yarn or embedded in the knitted fabric structure.
7.	Spirality	Spirality appears in the form of a twisted garment after washing. The seams on both the sides of the garment displace from their position & appear on the front & back of the garment.
8.	Needle lines	Needle Lines are prominent vertical lines along the length of the fabric which are easily visible in the grey as well as finished fabric.
9.	Broken Needles/ Laddering	Defects caused by the broken needles show prominently as vertical lines parallel to the wales. There are no loops formed in the wales which has a broken needle.
10	Sinker Lines	Sinker lines are prominent or feeble vertical lines appearing parallel to the wales along the length of the knitted fabric tube.
11.	Oil Lines	Oil Lines are prominent vertical lines which appear along the length of the knitted fabric tube. The lines becomes permanent if the needle oil used is not washable & gets baked due to the heat during the finishing of the fabric.

12.	Broken Ends	Broken ends appear as equidistant prominent horizontal lines along width of the fabric tube when a yarn breaks or is exhausted.
13.	Fabric Press Off	Fabric press off appears as a big or small hole in the fabric caused due to the interruption of the loop forming process as a result of the yarn breakage or closed needle hooks.
14.	Surface Hairiness & Piling	Surface hairiness appears in the form of excess superfluous fibers, on the surface of the knitted fabrics, which have either been reprocessed, or tumble dried.
15.	Snagging	Snagging appears on the knitted fabric surface as a pulled up yarn float showing up in the form of a large loop.
16.	Bowing	Bowing appears as rows of courses or yarn dyed stripes forming a bow shape along the fabric width.
17.	Dyeing Patches	Dyeing Patches appear, as random irregular patches on the surface of dyed fabrics.
18.	Softener Marks	Softener marks appear as distinct irregular patches in the dried fabric after the application of softener.
19.	Stains	Stains appear as spots or patches of grease oil or dyes of different color, in a neat & clean finished fabric surface.
20.	Color Fading (Poor Color Fastness)	The color of the garment or the fabric appear lighter & pale in comparison to the original color of the product after a few uses.
21.	Shade Variation	Sometimes there appear to be a difference in the depth of shade between the roll to roll & from place to place in the same roll. The defect will show up clearly in the garments manufactured from such fabric.
22.	Tonal Variation	Roll to roll or within the same roll difference in the color perception i.e. Greenish, Bluish, Reddish, or Yellowish etc. is attributed as tonal variation in the shade.
23.	Folding Marks	Fold marks appear as distinct pressure marks along the length of the fabric.
24.	Crease Marks	Crease marks appear in the knitted fabric, as dark haphazard broken or continuous lines.
25.	High Shrinkage	The original intended measurements of the garment go, haywire, during storage or after the very first wash.
26.	GSM Variation	The fabric will appear to have a visible variation in the density, from roll to roll or within the same roll of, the same dye lot.

27.	Stitching	Any open seam. Loose/ tension resulting in puckering or damaging the jersey. Stitching incorrectly finished off.
28.	Marking	Missing incomplete, incorrect, and illegible.
29.	Identification label and care label	Missing.
30.	Packing	Not as per specification and substandard.

ANNEX F TO
PN SPECIFICATION NO.04/2019
PROMULGATION DATED 22 May 2019

FEED BACK FORM

Item Designation: _____

Pattern #: _____

Parent Equipment: _____

PN SPEC #: _____

Problem Faced: _____

Technical Solution: _____

Financial Effect (if any): _____

Name Stamp

COUNTERSIGNED

Name Stamp

TECHNICAL DETAILS OF JERSEY BLACK

S NO	ITEM	REQUIREMENT
<u>MATERIAL SPECIFICATION OF BASE FABRIC</u>		
a.	Material	Wool 60% \pm 3% Acrylic 32% \pm 2% Polyester 08% (Balance)
b.	Colour	Black Pantone 19-4006 TCX
d.	Type of Wool	High Quality Wool
e.	No of Microns	21 - 22.5
f.	Count of Yarn Body Cuff and Border	2/36 \pm 1.5 Tex (2 ply) 2/36 \pm 1.5 Tex (3 ply)
g.	Quality of yarn	Worsted
h.	Grade Wool Acrylic	64 ^S 3-4 Denier
j.	Fiber length (mm)	Wool 80 Acrylic 80-120
k.	Evenness (U%) of yarn	8.45
m.	Average breaking strength	677 cN
n.	Thick places	1
p.	Thin places	Nil
q.	Neps	14
r.	Splicing Yarn	100 % Polyester 150 \pm 7 Denier
<u>PERFORMANCE TESTING OF BASE FABRIC</u>		
a.	Colour fastness to Washing No.3 (1) Staining on attached pieces. (2) Change in Shade	GS 4/5 (Min) GS 4 (Min)
b.	Colour fastness to Perspiration Acid & Alkaline Solution (1) Staining on attached pieces.	GS 4/5 (Min) GS 4 (Min)

	(2) Change in Shade	
c.	Color fastness to dry cleaning (1) Staining on attached pieces. (2) Change in Shade	GS 4/5(Min) GS 4 (Min)
d.	Color Fastness to light Change in Shade	GS: 4 or better
e.	Color Fastness to Rubbing (Dry) Staining	GS: 4 or better
f.	Color Fastness to Rubbing (Wet) Staining	GS: 3 or better
g.	Color fastness to water	GS: 4 or better
h.	pH level	6-8

REINFORCEMENT FABRIC AT ELBOWS, SHOULDER FLAPS LINING, POCKETS, AND POCKET FLAPS LINING

a.	Material	100% Polyester
b.	Colour	Black Pantone 19-4006 TCX
c.	Weave	Plain (Dobby)
d.	Nature of Dye	Disperse Dye
e.	Weight (gm/sq m)	250 \pm 15
f.	Count of Yarn (1) Warp (2) Weft	300 x 300 Denier 300 x 300 Denier
g.	Dimensional Stability (1) Warp (2) Weft	\pm 2% \pm 2%
h.	Threads/inch Warp Weft	120 \pm 2 72 \pm 2

PERFORMANCE TESTING OF REINFORCEMENT FABRIC

a.	Colour fastness to Washing No.3 (1) Staining on attached pieces. (2) Change in Shade	GS 4 (Min) GS 4 (Min)
b.	Colour fastness to Perspiration Acid & Alkaline Solution (1) Staining on attached pieces. (2) Change in Shade	GS 4 GS 4 (Min)
c.	pH level	6-8
d.	Pilling resistance after 5,000 cycles	Grade 4

e.	Abrasion resistance after 6,000 cycles	No thread break
f.	Color Fastness to Rubbing (Dry) Staining	GS: 4 or better
g.	Color Fastness to Rubbing (Wet) Staining	GS: 3 or better
h.	Breaking Strength (1) Warp (2) Weft	100 kg 50 kg
<u>STITCHING/ OVER LOCKING THREAD</u>		
a.	Material	25% Polyester & 75% Woolen
b.	Shade	Black Pantone 19-4006 TCX
c.	Count	3/24 ^s
<u>PERFORMANCE TESTING OF STICING AND OVERLOCKING</u>		
a.	Breakage Strength	3 lbs (Min)
b.	Color fastness to washing (Test No. 3) a. Change in Shade b. Staining	GS: 4 GS: 4
<u>BUTTONS</u>		
a.	Material	Plastic
b.	Shade	Black 19-4006 TCX
<u>PREFORMANCE TESTING OF BUTTON</u>		
a.	Color fastness to water	GS 4 or better
b.	Pull test at 90 N	No crack, chips or breakage No structural failure No center break out
c.	Impact resistance	No crack, chips or breakage
d.	Color fastness to heat (hot pressing)	GS 4
e.	Appearance after dry cleaning	No color transfer on fabric

MEASUREMENT SCHEDULE OF JERSEY BLACK

Drg Ref	Description	Sizes (inches)									Tolerances
		30	32	34	36	38	40	42	44	46	
A	Length	25.5	26	26.5	27	27.5	28	28.5	29	30	± 0.5
B	Shoulder	14	15	16	17	18	19	19.5	20	21	± 0.5
C	Chest 1" below Arm hole	15	16	17	18	19	20	21	22	23	± 0.5
D	Width of jersey from upper side of Border	14	14.5	15	15.5	16	16.5	17	17.5	18	± 0.5
E	Width of border and length of cuff	3	3	3	3	3	3	3	3	3	± 0.25
F	Sleeve length including cuff	20.5	21	22	22.5	23	24	24	25	25	± 0.50
G	Arm hole	8.5	9	9	9.5	10	10	10.5	11	11	± 0.50
H	Elbow width 11" from cuff	5	5.5	6	6	6	6	6.5	6.5	6.5	± 0.5
I	Width of cuff from centre	2.5	2.5	3	3	3	3.25	3.25	3.5	3.5	± 0.25
J	Elbow patch Length	10	10	10	10	10	10	10	10	10	± 0.25
K	Elbow patch upper width	5	5	5	5	5	5	5	5	5	± 0.15
L	Elbow patch lower width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	± 0.1
M	Shoulder flap width at Base	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	± 0.1
N	Shoulder flap width at tip/button	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	± 0.1
O	Neck opening side	3	3	3.5	4	4	4	4.5	4.5	5	± 0.25
P	Depth of neck	5	5.5	5.5	6	6	6	6.5	6.5	6.5	± 0.25
Q	Width Neck rib	1	1	1	1	1	1	1	1	1	± 0.15
R	Distance of pocket flap	1	1	1	1	1	1	1	1	1	± 0.1

	line from V neck										
S	Distance between pocket flap	3	3	3.5	3.5	3.5	4	4	4	4.5	± 0.15
T	Pocket flap width	4.5	4.5	5	5	5	5	5	5	5	± 0.1
U	Pocket flap length at centre	2.5	2.5	3	3	3	3	3	3	3	± 0.1
V	Pocket flap side length	1.5	1.5	2	2	2	2	2	2	2	± 0.15
W	Elbow patch distance from cuff	5	5	5.5	5.5	5.5	6	6.5	6.5	6.5	± 0.25
X	Shoulder Flap Length	5	5	5.5	6	6	6.5	6.5	6.75	6.75	± 0.25
Y	Size of pocket	4.75 x 6	4.75 x 6	5.25 x 6	5.25 x 6	5.25 x 6	5.25 x 6	5.25 x 6	5.25 x 6	5.25 x6	± 0.25
Z	(1) Weight of 10 Jerseys in kgs approx.	7.30	7.55	7.80	8.05	8.30	8.55	8.80	9.05	9.30	± 15 Grams Per Pcs <u>Approx</u>
	(2) Per Piece Weight	730	755	780	805	830	855	880	905	930	± 15 Grams Per Pcs