



PAKISTAN NAVY SPECIFICATION No. 01/2020

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T-SHIRTS (FOR GSDC, SSG N AND PAK MARINES)

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AMENDMENT RECORD

Amd No	Date	Text Effected	Signature and Date

REVISION NOTE

This Standard has been revised to bring the test methods and procedures into 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. 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.

CONTENTS

<u>Description</u>	<u>Page</u>
Contents	03

Details

Designation	04
Usage	04
Introduction	04
Scope	04
Related Document	04
Terms & Definition	05
Technical Details of T-Shirt for GSDC, SSG (N) & PAK MARINES	05
Schedule of Measurement	05
Drawing	05
Garment Manufacturing guide line	05
Quality of Workmanship and finish	07
Testing	07
Batch/ Lot size	07
Tender Sample	07
Advance Sample	08
Inspection	08
Special Instruction	10
Packing Details	10
Identification Label	10
Packing List	10
Marking of Stores	11
Delivery	11

Annexes:

A. Terms & Definition	12
B. Technical Detail of T-Shirt for GSDC, SSG (N) & Pak Marines	13
C. Dimensions & Measurement Schedule	16
D. Drawing	17
E. Common defects in Knitted Fabric	24
F. Guide line for fabric inspection	26
G. Acceptance Quality levels	27
H. Feed Back Performa	29

1. **DESIGNATION**

- a. T-Shirt for GSDC, SSG (N) & Pak Marines.

2. **USAGE**

- a. T-Shirt are used by PN Officers/ CPOs and Sailors of General service, SSG (N) and Pak Marines.

3. **INTRODUCTION**

a. This specification is promulgated by Directorate of Indigenous Technical Development. Naval Headquarters 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 Wing Directorate. However, it cannot be implemented without prior approval of DITD. This specification supersedes and replace PN Specification No 03/2013 dated 28 Mar 13 for T-Shirt Medium Grey, PN Specification No 07/2013 dated 28 Mar 13 T-Shirt for SSG (N) and PN Specification No 05/2013 dated 28 Mar 13 T-Shirt for Pak Marines. All other specifications promulgated earlier in relation to the items mentioned herein.

b. This specification includes **08** Annexes and consists **29** pages, including the cover.

4. **SCOPE**

a. This specification covers manufacturing/ inspection requirements of T-Shirt for GSDC, SSG (N) & Pak Marines cotton. This specification lays down the standards to which the store shown under designation above should conform to. It defines and lays down the quality, standards and details of materials, manufacturing, workmanship and finish. It also lays down the details of testing, inspection, rejection, marking, packing and delivery, etc.

b. 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**

a. The latest standards and documents that have been referred to in this specification are:

1)	AATCC-128	Wrinkle Recovery of fabric
2)	AATCC-20A	Fiber analysis Quantitative
3)	AATCC-79	Absorbency of Textiles
4)	ASTM D-230	Flammability of Apparels
5)	ASTM D-3776	Test method for Mass per unit Area
6)	ASTM D 5430-07	Test method for Visually inspecting and grading fabrics
7)	BS EN ISO-13938-2	Pneumatic method for determination of Bursting strength and Bursting distension
8)	BS EN ISO-12945-2	Determination of fabric propensity to surface fuzzing and to pilling
9)	BS EN ISO-12947-4	Determination of the abrasion resistance of fabrics by the Martindale method
10)	BS EN ISO-6330	Domestic Washing and Drying procedure

11)	BS EN ISO-5077	Determination of Dimensional Change in washing and drying
12)	BS ISO-675	Determination of Dimensional change on commercial laundering
13)	BS ISO-16322-1	Determination of Spirality after laundering.
14)	ISO-7211/2	Determination of number of Threads per unit Length
15)	ISO-7211/5	Determination of linear density of yarn removed from fabric
16)	ISO 7211-6	Determination of the Mass of Warp and Weft per unit Area of fabric
17)	BS 1006 1-8	Colour fastness to light
18)	ISO-105-C08	Colour fastness to Domestic and Commercial laundering
19)	ISO-105-C10	Colour fastness to Washing
20)	ISO-105-E02	Colour fastness to Seawater test
21)	ISO-105-X12	Colour fastness to Rubbing test
22)	ISO-105-E03	Colour fastness to Chlorinated water
23)	ISO-105-E04	Colour fastness to Perspiration
24)	ISO-105-J03	Calculation of Colour Difference
25)	ISO-3801	Determination of Mass per unit Length and Mass per unit Area
26)	ISO 2061	Determination of Twist in yarn (Direct Counting Method)
27)	ISO-13937-01	Textile- Tear properties of fabric (Elmendorf)
28)	ISO-9237:	Determination of Permeability of Fabric to Air
29)	ISO-3071	Determination of pH of Aqueous Extract
30)	ISO 2859-1	Sampling Procedure for Inspection by attributes
31)	MIL Spec A-A-5512613	Velcro Tape Quality Parameters
32)	MIL STD 105	Sampling Procedure and Table for Inspection by Attributes.

6. **TERMS & DEFINITIONS**

- a. Definitions for the terms used in this standard are given at Annex A.

7. **TECHNICAL DETAILS OF T-SHIRT FOR GSDC, SSG (N) & PAK MARINES DARK GREY**

- a. The technical details of T-Shirt for GSDC, SSG (N) & Pak Marines are given at Annex B of this specification.

8. **SCHEDULE OF MEASUREMENT**

- a. All measurement Schedule of T-Shirt for GSDC, SSG (N) & Pak Marines is given at Annex C.

9. **DRAWING**

- a. All Dimensions of Drawing is given at Annex D.

10. **GARMENT MANUFACTURING GUIDE LINE**

- a. The T-Shirt Men's Cotton Knitted Half Sleeves /Full sleeves shall be manufactured from the specified knitted fabric to the shape and design of the sealed pattern/sample and as shown in the separate drawing.

- b. The T-Shirt shall be manufactured with side seam.
- c. The T-Shirt shall conform to the Technical detail and Measurements are given in Annexure 'B and C' respectively, attached to this specification.
- d. The seams shall be secured with over lock stitching having four threads using Sewing Thread Polyester 3/14 Tex.
- e. The Neck line/ Welt 2.54 cm wide at neck having 5% Lycra (70 denier) shall be stitched as shown in the drawing. No of stitches per 25 mm should be 7 to 9.
- f. The Cuff / Welt 5 cm wide at cuff of full sleeves having 5% Lycra (70 denier)
- g. Neck line and cuff will be sewn by over lock and secured by flat lock machine.
- h. The T-Shirt and its accessories (Neck line / stitching thread) shall be properly dyed and shade should conform to shade Pantone Shade. The T-Shirt shall be washed after dyeing and must be free from soap, Oil, Grease and Stains etc.
- j. Tape textile of self-fabric 10-12 mm wide at back of neck and inner side of shoulder seam.
- k. Sleeves and Bottom will be hammed 20mm wide with five thread flat lock machine.
- l. Velcro Tape (Male/Female) must qualifies the quality parameters laid down in Annex B and MIL Spec AA- 5512613
- m. Finished product of T-Shirt for GSDC, SSG (N) & Pak Marines will be as per Annex B, C & D of this Specification.
- n. Dyes used for the dyeing purpose of the fabric should comply OEKO Tex standards i.e. dyes that are not harmful for human and also have high washing fastness properties.
- p. Strict AQL standard shall be implemented for Internal Audit/ Inspection of finished product/garment.
- q. Guide line for Fabric Inspection is given at Annex F for ease of fabric manufacturer/ supplier.
- r. A standard pattern T-Shirts for GSDC, SSG (N) & Pak Marines may be requested/obtained from DNS/ PNCSD/ CINS to provide the criteria for all materials, components or manufacturing features that may not be fully defined in this Specification i.e. feel /finish, etc.
- s. **Name Tally**
 - 1) Velcro Tape male/ female, 4 cm wide and 10.5 cm in length. The male portion will be stitched on right side
 - 2) Rank/ Name will be embroidered with black color embroidery thread in capital letters with abbreviation of rank above and name below. First letter of rank will be in line with first letter in the name.

- 3) T-shirt will be issued without Name tally Velcro. However, designated shops have facility to fabricate Velcro as per drawing at Annex D.

Note: Fabric for Neckline & T-shirt should be dye with same facility and with same dyes and dyeing of the fabric should be done with the dyes having high fastness properties except Chlorine bleach/ chlorinated water fastness. Good quality of dyes from good manufacturer CIBA, Clariant, SDC or equivalent are to be used for dyeing of fabric. Colour of T-Shirts does not have any gross change after 15 home launderings w.r.t ISO 105 C08 and BS EN ISO 6330.

11. **QUALITY OF WORKMANSHIP AND FINISH**

a. Workmanship and finish of the T-Shirt for GSDC, SSG (N) & Pak Marines shall be equal to the approved sample/ sealed pattern. It shall be the best of its class and to the enter satisfaction of the INS. The T-Shirt for GSDC, SSG (N) & Pak Marines shall confirm the parameters define at Annex B of this specification. All properties and qualities which may not be defined in this specification i.e. feel /finish etc should be as per sealed /approved sample. Sealed approved sample is obtained from DNS/ PNCSD and held with DNS /PNCSD/ CINS, for future reference /inspection/ stock sample etc.

12. **TESTING:**

a. The material shall be subjected to tests laid down in this specification at Annex B of this specification and related documents. 05x T-Shirts for GSDC, SSG (N) & Pak Marines along with accessories for manufacturing of T-Shirts for GSDC, SSG (N) & Pak Marines will be required to complete all the 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, reserves the right to get any B/R samples tested from any reputable Laboratory other than PN. However, any test considered important by inspecting Authority other than Annex B. e.g. Tear Strength, Seam Strength for fabric, Breaking Strength, Twist /2.5cm of Thread etc. Or the test laid down in Annex B may also be conducted in order to check its suitability/ quality. Firm is liable to pay all the testing charges.

13. **BATCH/ LOT SIZE AND NO OF SAMPLE**

a. No of samples drawn from bulk quantity/ offered store are as per instruction of Inspecting Officer or according to following table for the Inspection/ testing:

Lot Size	No. Sample
300 ≥ 500	03
501 ≥ 800	05
801 ≥ 1300	07
1301 ≥ 3200	10
3201 ≥ 8000	15
8001 ≥ 22000	30
22001 ≥ 110000	40

14. **TENDER SAMPLE:**

a. For each contract following material shall be supplied by the manufacturer at the time of tendering.

1)	Finished Product	05 Nos.
2)	Base Cloth	03 Meter
3)	Stitching Thread	50 Grams
4)	Neckline fabric	03 Meter
5)	Velcro tape(each type)	03 Meter
6)	Polythene Bag	02 Bags
7)	Cartons Corrugated Card Board	05 Cartons

15. **ADVANCE SAMPLE**

- a. 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 pairs along with accessories used in manufacturing of T-Shirts for GSDC, SSG (N) & Pak Marines for inspection as mentioned above.
- b. 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 or his representative an initial delivery of One % of the contract or 10 T- Shirts for GSDC, SSG (N) & Pak Marines along with accessories used in the manufacturing of the garment.
- c. The approval of the sample, 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.(If deemed necessary).
- d. The Pre-production sample shall be manufactured by the manufacturer with the same facilities which will be used for manufacturing of the bulk items.
- e. Firm shall provide advance sample along with quality verification reports from an accredited laboratory, whenever asked/ required by Inspecting authority to ensure compliance of quality assurance parameters during production/ final internal inspection.

16. **INSPECTION**

- a. **Bulk representative sample** B/R random sampling will be carried out as per rules in vogue.
- b. **Bulk Inspection** Bulk inspection will be carried out after satisfactory completion of Visual Examination and Testing of B/R Sample.
- c. **Inspection of T-Shirts for GSDC, SSG (N) & Pak Marines** 100% of the offered store shall be inspected or as per predefine AQL standards.
- d. Stage inspection /Third party inspection for T-Shirts for GSDC, SSG (N) & Pak Marines may be carried out (if desired) by Inspection Authority. However, Inspecting Authority have the right to accept /reject sample or portion of the consignment is found NOT CONFORMING the parameters laid down in this specification.

- e. **Inspection/ Acceptance and Rejection of Stores.** Inspection/ acceptance is to be carried out to the entire satisfaction of Chief Inspector of Naval Stores and also as per instruction/ procedure laid down in Standing Order & PBR 5010 A.
- f. Common defects in knitted fabric/ garment, Guide line for fabric inspection and Acceptance Quality level (AQL) for T-shirt are enclosed as Annex E, F & G respectively for consultation/ guideline. However these guide lines may be considered by inspecting officer in addition to Standing Order and PBR 5010 A or as per order of Inspecting Authority.
- g. The T-Shirts for GSDC, SSG (N) & Pak Marines shall be examined for the correctness of material, shape, design, dimension, size, workmanship and finish.
- h. All T-Shirts for GSDC, SSG(N) & Pak Marines shall be inspected w.r.t defective shape, discoloration/ fading, pinholes, puckering of T-Shirts for GSDC, SSG(N) & Pak Marines are to be especially checked.
- j. 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 the parameters laid down in this specification or the quality of product does not seems up to the mark.
- k. 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 pattern, dimensions, workmanship and finish, the whole consignment may be rejected without any compromise.
- l. All stores and packing NOT fully in accordance with this specification shall be rejected.
- m. **Responsibility for Compliance.** The inspection set forth in this specification shall become a part of the supplier's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to PN for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements. However, this does not authorize submission of known defective material, either indicated or actual, nor does it commit PN to acceptance of defective stores (material).
- n. **Replacement by the Contractor.** The supplier/ manufacture is responsible for replacement of the consignment or any part there of whenever it is found to be not conforming to this specification or does not curtain its quality till the useful life of an item. The supplies so tendered in replacement, shall be subjected to testing/Inspection and acceptance by the Inspecting Officer.
- p. **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.
- q. The CINS is the authority in all matters pertaining to Inspection.
- r. **Stamping Of Accepted/ Rejected Stores By The Inspector** Following instructions are to be followed:

1) **Stamping of Accepted Stores.** Each acceptable T-Shirts for GSDC, SSG (N) & Pak Marines shall be stamped with Inspector's Individual Acceptance Mark or as per Instructing of Inspecting Authority. The stamping shall be legible.

2) **Stamping of Rejected Stores.** The rejected T-Shirts for GSDC, SSG (N) & Pak Marines shall be marked with Inspector's Rejection Mark at the back/ visible place of T-Shirts for GSDC, SSG (N) & Pak Marines to avoid re-submission by the supplier.

17. **SPECIAL INSTRUCTIONS**

a. **Care Instructions** Care instructions in English and Urdu shall be attached with each T-Shirts for GSDC, SSG (N) & Pak Marines as indicated in the drawing and have minimum requirement as follows:

- 1) Washing procedure.
- 2) Ironing Procedure
- 3) Drying procedure.
- 4) Any Prohibition i.e. Do not use bleach / chlorinated water.

18. **PACKING DETAILS**

a. The store when ordered to be delivered 'PACKED' shall be packed as per following instructions:

- 1) Each T-Shirts for GSDC, SSG (N) & Pak Marines shall be properly folded length wise.
- 2) The T-Shirts for GSDC, SSG (N) & Pak Marines shall be packed in a neat, dry and clean condition in polyethylene bag of suitable size.
- 3) 50 T-Shirts for GSDC, SSG (N) & Pak Marines shall be further packed in a thick Boxboard/Flouring/ cartoon of 07 ply.
- 4) Each Box Board packing shall be securely / properly packed or wrapped with plastic sheet to ensure additional safety.
- 5) Each box board shall consist of same size.

19. **IDENTIFICATION LABEL**

a. Each T-Shirts for GSDC, SSG(N) & Pak Marines shall bear following minimum information attached with T-Shirts for GSDC, SSG(N) & Pak Marines:

- 1) Item name/ item description with NSN/Pattern No.
- 2) Material Composition.
- 3) Contract number and Date.
- 4) Year of manufacture.
- 5) Contractor's name, initials, or trade mark.
- 6) Batch no.

20. **PACKING LIST**

a. Firm is bound to provide a packing list of store offered for inspection along with the challan and each packed box giving full, which include complete details about the store i.e. Pattern No., Description of Store, size, quantity, Contract No, & date, challan No & date, I/Note No. or Voucher No. with date, Consignee, Firm's Name, Date of packing, Packer's Signature and Stowage/ Stacking Instruction.

21. **MARKING OF STORES**

a. 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:

1) On Front and Top

- a) Consignee Address.
- b) Contract No and date.
- c) Description of Stores Packed and NSN/Patt no.
- d) Stowage / Stacking Instruction.
- e) Quantity of the Item/ T-shirt packed.
- f) Weight of the Carton

2) On Back

- a) Manufacturers name / Firm's name.
- b) Voucher No. or Inspection Note No. and date.
- c) The No. of individual Package and the total No of Packages in the consignment joined by the word 'of 'e.g. 2 of 300.
- d) Weight of the package.
- e) Month and year of packing.

22. **DELIVERY**

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

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

c. The contractor / manufacturer is fully responsible for the safety of the supplies during inspection, storage at firms and consignee premises proper packing, dispatch and delivery up to consignee.

Xxxx SD xxxxx

ASIF ALI PIRZADA

Commander Pakistan Navy

Director Inventory Deletion

DITD

Annexes:

A.	Terms & Definition	12
B.	Technical Detail of T-Shirt for GSDC, SSG (N) & Pak Marines	13
C.	Dimensions & Measurement Schedule	16
D.	Drawing	17
E.	Common defects in knitted fabric	24
F.	Guide line for fabric inspection	26
G.	Acceptance Quality levels	27
H.	Feed Back Performa	29

TERMS & DEFINITIONS

1. **CINS:** Chief Inspector of Naval Stores
2. **PNCTA:** Pakistan Navy Central Testing Authority
3. **PNCSD:** Pakistan Navy Clothing Store Depot
4. **DNS:** Directorate of Naval Store.
5. **GSDC:** General Service Digital Camouflage
6. **SSG (N):** Special Service Group (Navy)
7. **INSPECTOR:** The term inspector shall include the "inspection Authority", inspecting officer and their representatives, duly authorized for the purpose of discharging inspection duties involved.
8. **INSPECTION AUTHORITY:** Chief Inspector of Naval Stores (CINS). His verdict in respect of Sealed Inspection matters is to be taken as final.
9. **INSPECTING OFFICER:** An officer nominated by the CINS for carrying out inspection of stores supplied by the supplier, against a specified contract or order, in accordance with the particulars stipulated therein.
10. **ACCEPTANCE QUALITY LEVEL (AQL):** It represent allowable limit/ tolerance of defects or non-conformities in an offered store/ lot/batch. It represent in percentage, also known as Allowable Quality Limits.
11. **MINOR DEFECTS:** They are small insignificant issues that don't affect the function or form of the item. Highest tolerance of AQL has been set for minor defects e.g. broken stitch, drop stitch etc.
12. **MAJOR DEFECTS:** They would likely result in product return but don't poses safety risk. AQL tolerance depend upon the description/ quality of finished product e.g. laddering, skewness etc.
13. **CRITICAL DEFECTS:** They pose a threat to user safety. AQL tolerance for these type of defects are zero .e.g. sharp object, pin, etc.
14. **OEKO STANDARD:** International Association for Research and Testing in the field of Textile and Leather Ecology also known as OEKO -Tex

TECHNICAL DETAIL OF T-SHIRT FOR GSDC, SSG (N) & PAK MARINES

S.No	Item	Requirement
1.	Fabric of T-Shirt	
a.	Material Of Body 1) Cotton 2) Lycra	95±2% 5 ±1%
b.	Dyes 1) Cotton 2) Lycra	Reactive (high fastness properties) Disperse
c.	Colors for: 1) GSDC Quiet Shade 2) SSG (N) Wren 3) Pak Black Forest Marines	Pantone # TCX (18-4006) Pantone # TCX (19-0614) Pantone # TCX (19-0315)
d.	Colour tolerance	$\Delta E = 1$
e.	Linear Density 1) Cotton 2) Lycra	30 Single ± 2 ccc(Compact Combed Cotton) & Mercerized 40 Denier
f.	Fabric Type	Single Jersey
g.	Weight of Fabric (gm/m ²)	210±10 gm
h.	Thread per 2.5cm 1) Wales 2) Course	36±2 28±2
j.	Performance criteria	
	1) Dimension Stability	±2%
	2) Appearance a) Wrinkle b) Colour change (after 10 washes)	Grade 4 or Better
	3) Spirality/ skewness	±2%
	4) Absorbency drop test	Maximum 3-5 Second/ Drop
	5) Pilling and Fuzzing (10,000 cycles)	Grade 3 or better
	6) Color fastness to light	GS-4 or better
	7) Color fastness to Washing a) Change in shade b) Staining on cotton	GS-4/5 or better GS-4/5 or better
	8) Colour fastness to perspiration a) Change in shade b) Staining on Cotton	GS-4/5 or better GS-4/5 or better
	9) Colour fastness to sea water a) Change in shade b) Staining on cotton	GS-4/5 or better GS-4/5 or better
	10) Colour fastness to rubbing a) Wet b) Dry	GS-4/5 or better GS-4/5 or better
	11) Bursting strength	160± 20 Kpa

2.	<u>Fabric of Neckline</u>	
a.	Material Of Body 1) Cotton 2) Lycra	95±2% 5 ± 2%
b.	Dyes 1) Cotton 2) Lycra	Reactive Disperse
c.	Colors for: 1) GSDC 2) SSG 3) Pak Marines	Pantone # TCX (18-4006) Pantone # TCX (19-0614) Pantone # TCX (19-0315)
d.	Linear Density 1) Cotton 2) Lycra	30Single ± 2 ccc(Compact Combed Cotton) & Mercerized 70 Denier
e.	Fabric Type	1x1 Rib
f.	Weight of Fabric (gm/m ²)	350±10 grams
g.	<u>Performance criteria</u>	
	1) Dimension Stability	2%
	2) Appearance a) Wrinkle b) Colour change (after 10 washes)	Grade 4 or better
	3) Spiral/ity/ skewness	±2%
	4) Absorbency drop test	Maximum 3-5 Second/ Drop
	5) Pilling and Fuzzing (10,000 cycles)	Grade 4 or better
	6) Color fastness to light	GS-4 or better
	7) Color fastness to Washing a) Change in shade b) Staining on cotton	GS-4/5 or better GS-4/5 or better
	8) Colour fastness to perspiration a) Change in shade b) Staining on Cotton	GS-4/5 or better GS-4/5 or better
	9) Colour fastness to sea water a) Change in shade b) Staining on cotton	GS-4/5 or better GS-4/5 or better
	10) Colour fastness to rubbing a) Wet b) Dry	GS-4/5 or better GS-4/5 or better
	11) Bursting strength	200±20 Kpa
3.	<u>Accessories/(Material Used)</u>	
a.	Thread for stitching	100% Polyester
	1) Colors	Pantone Shade as per main fabric
	2) Linear Density (Thread Count)	3/14 Tex
b.	Tape 1) At Back of Neck 2) At inner side of Shoulder Seam	Self- fabric/Herring bon tape 10-12 mm 10-12 mm
c.	Name tally 1) Length of name tally 2) Width of name tally 3) Height of each letter 4) Width of each letter	10.5 cm 04 cm 01cm 0.2 cm

	5) Width of black border all around	0.3 cm
d.	Velcro Tape	
	1) Material	
	a) Male	Nylon
	b) Female	Nylon
	2) Color	As per main/body of the fabric
	3) Performance Testing	
	a) Before sticking / unsticking 300 times at 300 g.	Satisfactory
	b) After sticking / unsticking 300 times at 300g.	Satisfactory
	c) Peel Strength (lbs per in width)	1.5
	d) Shear Strength(PSI)	10
e.	Main label For	
	1) Material	
	a) SSG(N)	Printed, soft foam binder material
	b) Pak Marines	
	2) Colour	
	a) SSG(N)	Pantone # TPG (15-1215)
	b) Pak Marines	
f.	Carton Card Board	
	a) No of Plies	07
	b) Outer ply weight / m ²	180± 5 gm
	c) Inner paper ply weight /m ²	180± 5 gm
	d) Corrugated paper weight/m ²	120± 5 gm
	e) Paper pasted with corrugated sheet	120± 5 gm
	f) Gauge of stapler pin	22 SWG
	g) Thickness of pin	02 mm
	h) Size	60cm x 35cm x27 cm
4.	Flame Spread Time (class :1)	<3.5 sec
5.	Width of Cuff (full sleeves)	5 ± 0.25 cm

SCHEDULE OF MEASUREMENTS FOR T- SHIRT 100% COTTON KNITTED							
S. No	Part Description	S	M	L	XL	XXL	TOLERANCES
1.	<u>HALF SLEEVE</u>						
a.	Length	68	72	74	78	82	± 1
b.	Round Bottom/ bottom	90	96	104	110	114	± 2
c.	Round chest/ chest	90	96	104	110	114	± 2
d.	Width across Shoulder/ shoulder	44	46	48	50	52	± 1
e.	Sleeve width at end/ Sleeve width	18	19	19	20	20	± 0.5
f.	Width of Neck/ Neck hole	11.5	12	12	12	12.5	± 0.5
g.	Sleeve length	23	24	25	26	27	± 0.5
h.	Width of arm Hole/ Arm hole	25.5	26.5	27.5	28	28.5	± 0.1
j.	Depth of neck at front/depth of neck hole	7.5	8	9	9.5	9.5	± 0.5
2.	<u>FULL SLEEVES</u>						
a.	Arm Hole	22	23	24.5	26	27	± 0.1
b.	Length of sleeves including cuff	56	58.5	61	62	63	± 0.1
c.	Width of sleeve 5cm above cuff	12	12.5	13	13.5	14	± 0.5
d.	Width of cuff	6.5	7	7.5	8	8.5	± 0.5
e.	Depth of cuff	7	7	7	7	7	± 0.5
3.	<u>STANDARD MEASUREMENTS</u>						
a.	Neck hemmed size	2	2	2	2	2	± 0.25
b.	Bottom hemmed size	2	2	2	2	2	± 0.25
c.	Sleeve hemmed size	2	2	2	2	2	± 0.25

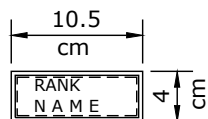
Note: All Measurements size in cm

APPENDIX II TO
ANNEX D OF
PN SPECIFICATION NO.01/2020
PROMULGATION DATE :29-04-2020

DOUBLE MACHINE STITCHING
FLAT LOCK
BACK OF THE NECK
SELF MATERIAL PIECE 12 MM
OR TAOE TEXTILE COTTON
10MM WIDE
SECTION -AA

FLAT LOCK
MACHINE STITCHING
SECTION -BB

WIDTH OF EMBROIDERY
(FOR NAME & RANK 0.2CM)

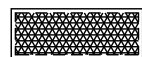


HEIGHT OF EACH LTR 1CM
WIDTH OF BORDER 0.3CM
DISTANCE FROM EACH SIDE OF BORDER 0.4 cm

SECTION -KK



VELCRO FEMALE

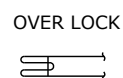


VELCRO MALE

NAME PLATE



SECTION -CC

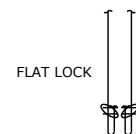


SECTION -DD

STAY PIECE OF TAPE
TEXTILE 5MM WIDE



SECTION -EE



SECTION -FF

1330

e	DEPTH OF CUFF	
d	WIDTH OF CUFF	
c	WIDTH OF SLEEVE 5CM ABOVE CUFF	
b	LENGTH OF SLEEVE INCLUDING CUFF	
a	ARM HOLE	
SCHEDULE AS PER MEASUREMENT AT PARA 2 OF ANNEX-C		

DITD KARACHI

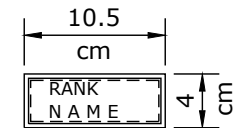
TITLE: **FULL SLEEVE T SHIRT 4B**

SIZE: MEDIUM (DWG.2)

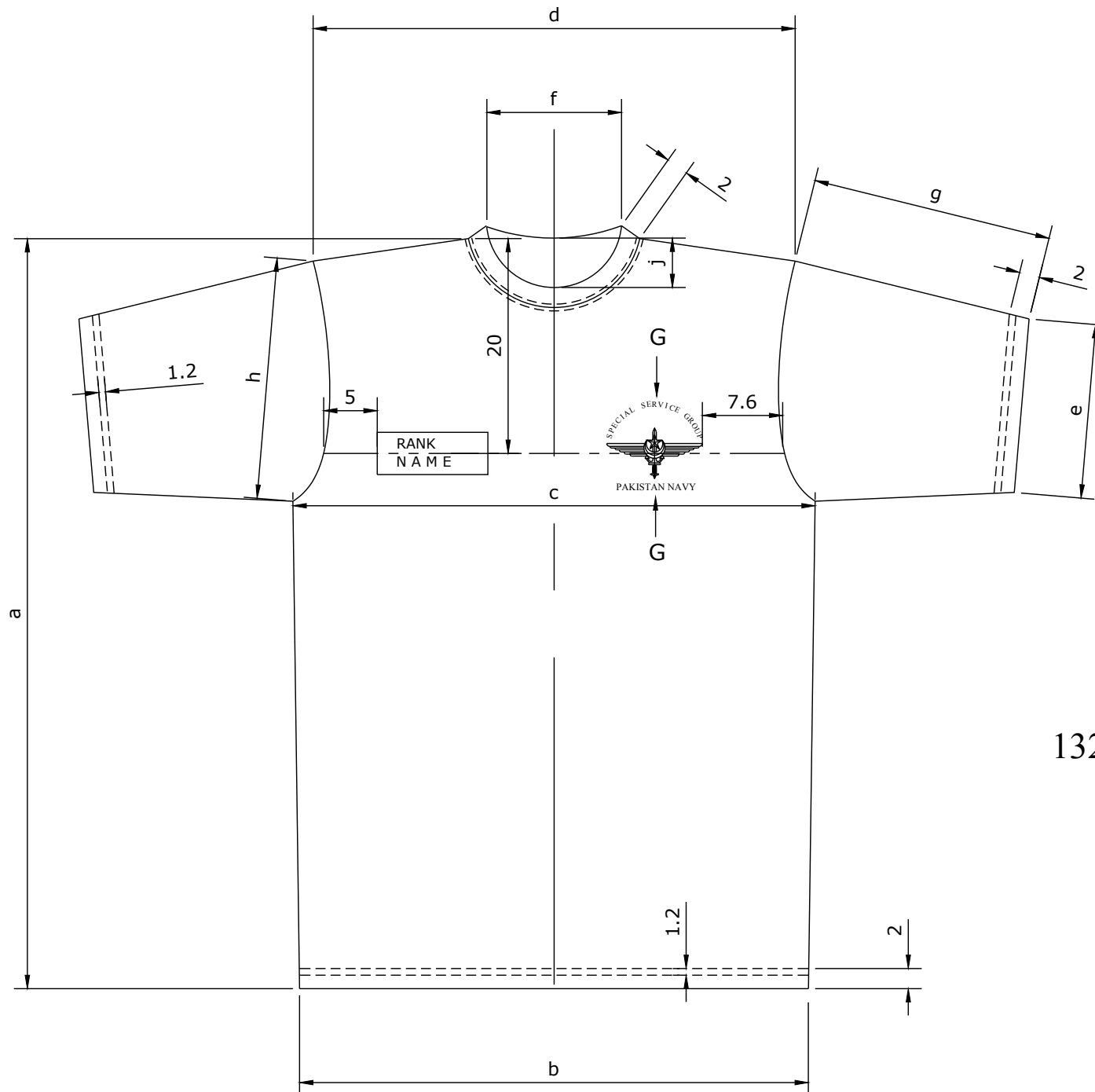
DWG.NO. TD-2523/2020	DIMENSIONS: CM	
DATE: 01-04-2020	SCALE: NTS	
DRAWN BY --SD-- H D/M M. ASGHAR I/c DWG.	CHECKED BY --SD-- LT SANA KANWAL SO. TEXTILE	APPROVED BY --SD-- CDR ASIF ALI PIRZADA DID

APPENDIX III TO
ANNEX D OF
PN SPECIFICATION NO.01/2020
PROMULGATION DATE :29-04-2020

WIDTH OF EMBROIDERY
(FOR NAME & RANK 0.2CM)



HEIGHT OF EACH LTR 1CM
WIDTH OF BORDER 0.3CM



j	DEPTH OF NECK HOLE	
h	ARM HOLE	
g	SLEEVE LENGTH	
f	NECK HOLE	
e	SLEEVE WIDTH	
d	SHOULDER	
c	CHEST	
b	BOTTOM	
a	LENGTH	
SCHEDULE AS PER MEASUREMENT AT PARA 1 OF ANNEX-C		

DITD KARACHI

TITLE: **HALF SLEEVE T- SHIRT SSG (N)**
SIZE: MEDIUM (DWG.1)

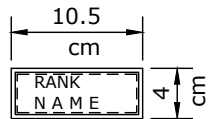
DWG.NO. TD-2519/2020 DIMENSIONS: CM
DATE: 22-01-2020 SCALE: NTS

DRAWN BY --SD-- H D/M M. ASGHAR I/c DWG.	CHECKED BY --SD-- LT SANA KANWAL SO. TEXTILE	APPROVED BY --SD-- CDR ASIF ALI PIRZADA DID
--	--	---

DOUBLE MACHINE STITCHING
FLAT LOCK
BACK OF THE NECK
SELF MATERIAL PIECE 12 MM
OR TAOE TEXTILE COTTON
10MM WIDE
SECTION -AA

FLAT LOCK
MACHINE STITCHING
SECTION -BB

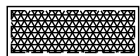
WIDTH OF EMBROIDERY
(FOR NAME & RANK 0.2CM)



HEIGHT OF EACH LTR 1CM
WIDTH OF BORDER 0.3CM
DISTANCE FROM EACH SIDE OF BORDER 0.4 cm



VELCRO FEMALE

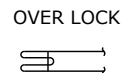


VELCRO MALE

NAME PLATE



SECTION -CC

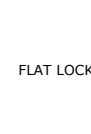


SECTION -DD

STAY PIECE OF TAPE
TEXTILE 5MM WIDE



SECTION -EE



SECTION -FF

1332

e	DEPTH OF CUFF	
d	WIDTH OF CUFF	
c	WIDTH OF SLEEVE 5CM ABOVE CUFF	
b	LENGTH OF SLEEVE INCLUDING CUFF	
a	ARM HOLE	
SCHEDULE AS PER MEASUREMENT AT PARA 2 OF ANNEX-C		

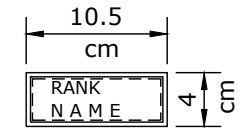
DITD KARACHI

TITLE: **FULL SLEEVE T SHIRT SSG (N)**

SIZE: MEDIUM (DWG.2)

DWG.NO. TD-2525/2020	DIMENSIONS: CM	
DATE: 03-04-2020	SCALE: NTS	
DRAWN BY --SD--	CHECKED BY --SD--	APPROVED BY --SD--
H D/M M. ASGHAR I/c DWG.	LT SANA KANWAL SO. TEXTILE	CDR ASIF ALI PIRZADA DID

WIDTH OF EMBROIDERY
(FOR NAME & RANK 0.2CM)



HEIGHT OF EACH LTR 1CM
WIDTH OF BORDER 0.3CM

1325

j	DEPTH OF NECK HOLE	
h	ARM HOLE	
g	SLEEVE LENGTH	
f	NECK HOLE	
e	SLEEVE WIDTH	
d	SHOULDER	
c	CHEST	
b	BOTTOM	
a	LENGTH	

SCHEDULE AS PER MEASUREMENT AT PARA 1 OF ANNEX-C

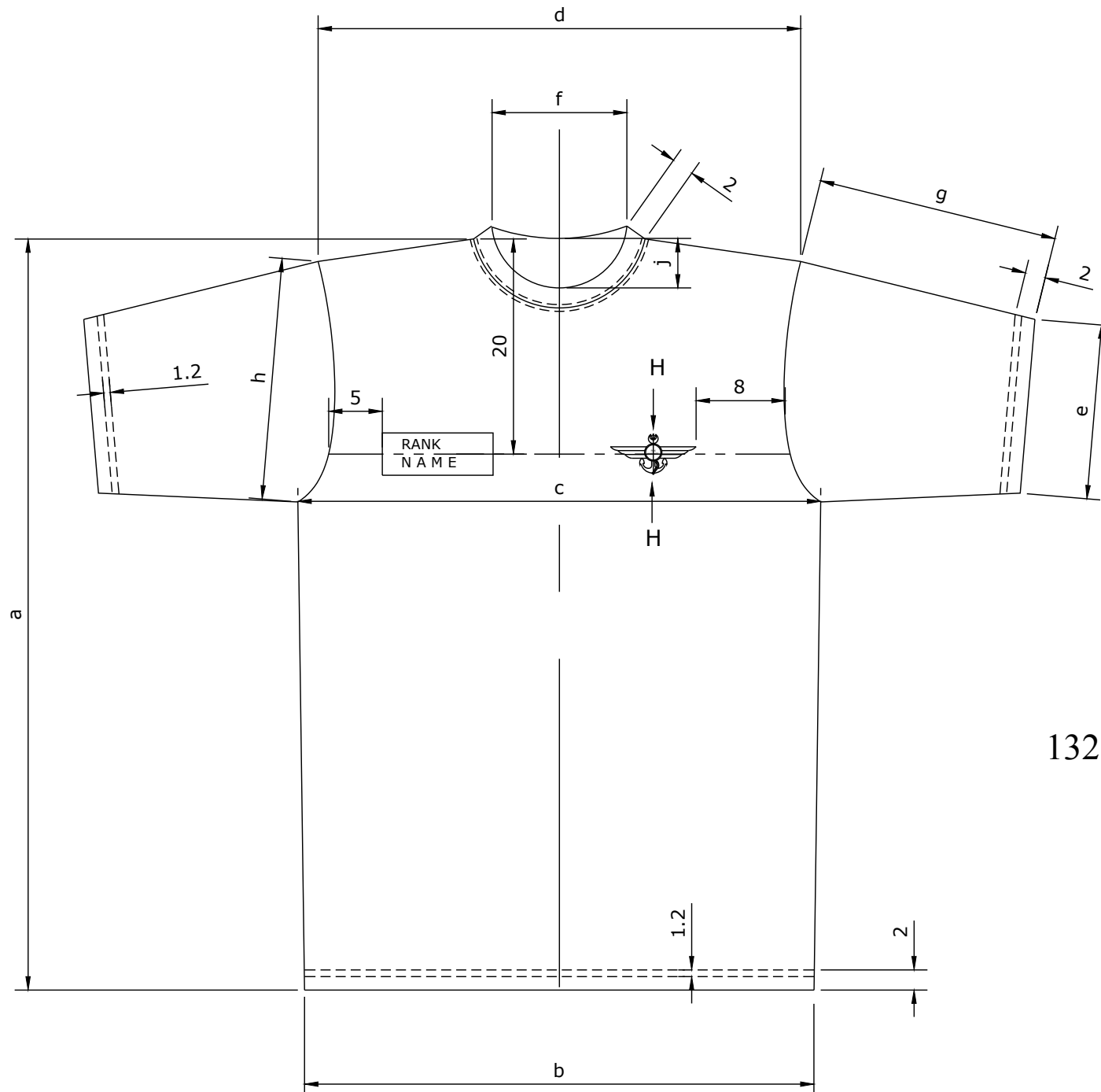
DITD KARACHI

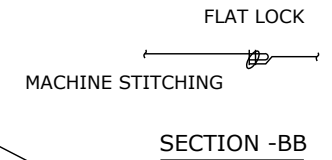
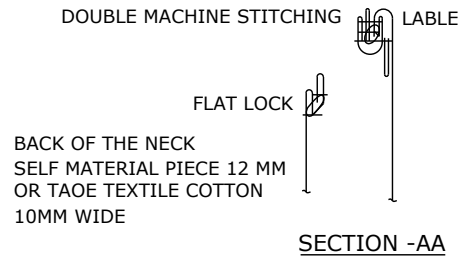
TITLE:
HALF SLEEVE T- SHIRT PAK MARINE
SIZE: LARGE (DWG.1)

DWG.NO. TD-2518/2020 DIMENSIONS: CM

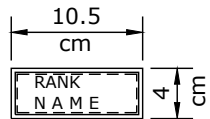
DATE: 21-01-2020 SCALE: NTS

DRAWN BY --SD--	CHECKED BY --SD--	APPROVED BY --SD--
H D/M M. ASGHAR I/c DWG.	LT SANA KANWAL SO. TEXTILE	CDR ASIF ALI PIRZADA DID

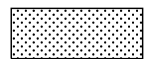




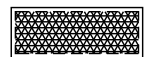
WIDTH OF EMBROIDERY
(FOR NAME & RANK 0.2CM)



HEIGHT OF EACH LTR 1CM
WIDTH OF BORDER 0.3CM
DISTANCE FROM EACH SIDE OF BORDER 0.4 cm

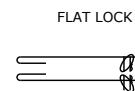


VELCRO FEMALE

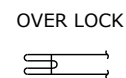


VELCRO MALE

NAME PLATE



SECTION -CC

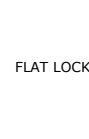


SECTION -DD

STAY PIECE OF TAPE
TEXTILE 5MM WIDE



SECTION -EE



SECTION -FF

Detail on Page No 23

SECTION -HH

1331

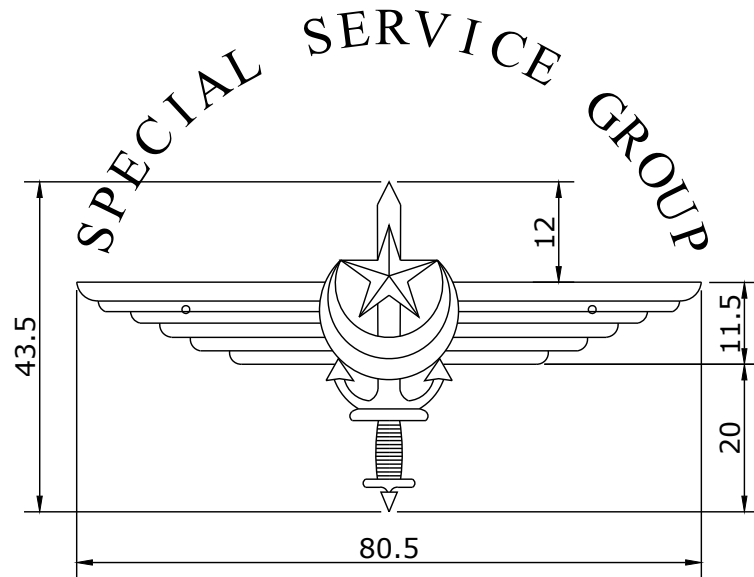
e	DEPTH OF CUFF	
d	WIDTH OF CUFF	
c	WIDTH OF SLEEVE 5CM ABOVE CUFF	
b	LENGTH OF SLEEVE INCLUDING CUFF	
a	ARM HOLE	
SCHEDULE AS PER MEASUREMENT AT PARA 2 OF ANNEX-C		

DITD KARACHI

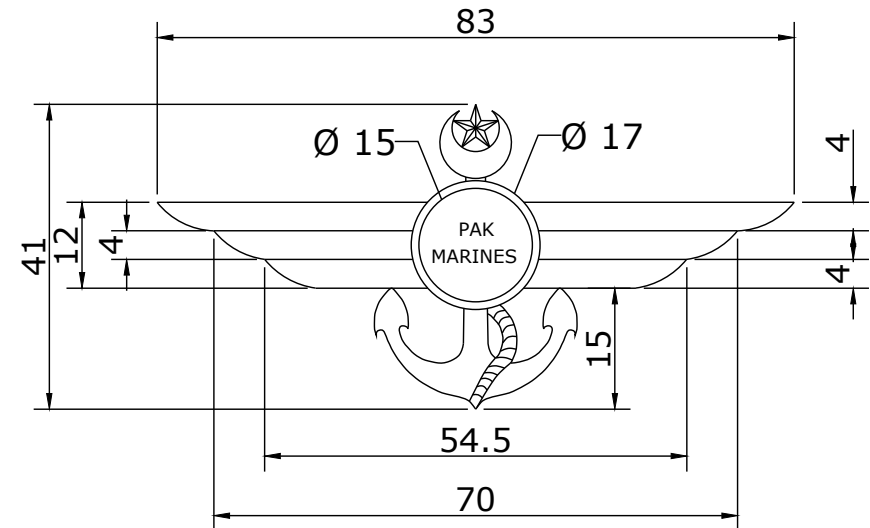
TITLE: **FULL SLEEVE T SHIRT PAK MARINE**

SIZE: MEDIUM (DWG.2)

DWG.NO. TD-2524/2020	DIMENSIONS: CM	
DATE: 02-04-2020	SCALE: NTS	
DRAWN BY --SD-- H D/M M. ASGHAR I/c DWG.	CHECKED BY --SD-- LT SANA KANWAL SO. TEXTILE	APPROVED BY --SD-- CDR ASIF ALI PIRZADA DID



DETAIL OF SECTION G-G



DETAIL OF SECTION H-H

DITD KARACHI		
TITLE: SECTION DRAWING OF DETAILG-G & H-H		
DWG.NO. TD- 2526/2020	DIMENSIONS: CM	
DATE: 27-04-2020	SCALE: NTS	
DRAWN BY --SD--	CHECKED BY --SD--	APPROVED BY --SD--
ADNAN NISAR D/MAN	LT SANA KANWAL SO. TEXTILE	CDR ASIF ALI PIRZADA DID

COMMON DEFECTS IN KNITTED FABRIC/ GARMENT

<u>S.No</u>	<u>Defects</u>	<u>Possible Cause</u>	<u>Type of Defects</u> <u>Major/Minor</u>
1.	<u>KNITTING FABRIC</u>		
a.	Barre: horizontal stripes of uniform or variable width in Fabric or periodic lateral irregularity	<ul style="list-style-type: none"> Possible due to lower tension in one of the feeders, loops formed in the knitted cycle initiated by that particular feeder were slightly larger than the rest thus causing an embossed appearance in the form of stripes. Individual yarns differ w.r.t count properties or structure. Different course Length. 	Major
b.	Skewed fabric: The shape of the fabric is distorted. Wales and courses are angular.	<ul style="list-style-type: none"> This can be a result of uneven take down roller setting. It is a generic feature of circular knits because of the spiral movement of the needles. 	Within allowable limit then minor otherwise major.
c.	Foreign Fly between loops of constructed fabric	<ul style="list-style-type: none"> Unclean environment or improper maintenance of machine can cause fly to end up in the knitting zone where it becomes part of the fabric. 	Major if it is visible.
d.	Thin Yarn/ Thick yarn	<ul style="list-style-type: none"> One of the feeder is receiving yarn from a spool that has finer yarn or coarser yarn. 	Major
e.	Horizontal band of different color on bottom of T-Shirt	<ul style="list-style-type: none"> This happens due to a change of bobbin in the knitting machine. Different lots of yarn can have slight shade variations which can produced shade differences in fabric. 	Major
f.	Laddering: Vertical stripes can be observed as longitude lineal gap in fabric	<ul style="list-style-type: none"> Continued knitting with a broken needle. Incorrect closing of the hook by the latch. Shift latches and needles. 	Major
g.	Deliberate cut placed in fabric	A rib defect occurred during knitting which was detected by QC who placed a cut on the defect to ensure that the garment does not go through further stages.	Major
h.	Hole: Crack of yarn or breakage	<ul style="list-style-type: none"> High yarn irregularity, poorly lubricated yarn, weak knot or slub present in yarn. 	Depend upon the size. If it's visible and larger in size then its major.

2. PRE-TREATMENT			
a.	Pinhole	<ul style="list-style-type: none"> The presence of Fe^{2+} ions accelerates peroxide bleaching. If the fabric has just residue on it or localized iron contamination the bleaching process will damage the fibers causing a hole. 	Depend upon the frequency of the fault, if it occur frequently then its major.
3. PRINTING			
a.	The letters have a cut off corner and cut on the edge.	<ul style="list-style-type: none"> The presence of a stray yarn on the fabric during transfer printing caused the design to be printed on the yarn which when later removed caused the defect. 	Minor
4. DYEING			
a.	Shade difference neck line, sleeves main body & cuff	<ul style="list-style-type: none"> This occur due to the variation in dye or dyeing procedure. Improper cutting of pieces, bundling and numbering. Different batch mixing. 	Major
b.	Stain of oil, food, drink, ink etc.	<ul style="list-style-type: none"> This occur due to spill of oil, ink, food, drinks on the garment. 	If it is easily washable then minor.
5. STITCHING			
a.	Seam puckering: gathering of a seam either just after sewing or after laundering.	<ul style="list-style-type: none"> Due to uneven stitching on to plies of fabric, improper thread tension, wrong sewing thread etc. 	Minor when it is not visible
b.	Open Seam or broke seam: Portion of garment that has not been covered by sewing thread.	<ul style="list-style-type: none"> Due to improper handling of the part/ piece of fabric, improper setting and timing between needle and looped or rook etc. 	Major
c.	Broken Stitch: Non continuous Sewing thread	<ul style="list-style-type: none"> Due to improper timing or machine usage. 	Minor
d.	Drop stitched/ skipped Stitched Irregular stitching along the seam	<ul style="list-style-type: none"> It appears due to improper handling of cut pieces or machine usage. 	Minor
6. VELCRO TAPE			
a.	Defective/ Wrong/ Miss aligned Velcro	<ul style="list-style-type: none"> Quality parameters has not been as certain by QC department. 	Major
b.	Uneven Embroidery at Velcro	<ul style="list-style-type: none"> Due to miss alignment of word template machine or man. 	Major

ANNEX F TOPN SPECIFICATION NO 01/2020PROMULGATION DATE 14 MAY 2020**GUIDE LINE FOR FABRIC INSPECTION**

1. **Fabric Inspection** Fabric inspection is usually done on fabric inspection machines. These machines are designed so that rolls of fabric can be mounted behind the inspection table under adequate light and rerolled as they leave the table. Defects in a fabric can be seen readily with these machines, as the inspector has a very good view of the fabric and the fabric does not need to be reversed to detect defects. There are various fabric inspection systems,

- a. 4-Point system (Usually recommended by International firm).
- b. 10-Point system

2. **4-Point System** The 4-point system, also called the American Apparel Manufacturers Association (AAMA) point-grading system for determining fabric quality, is widely used by producers/manufacturers of apparel fabrics and by the Department of Defense in the United States and is endorsed by the AAMA.

- a. Criteria of giving penalty points based on defects and defect length. Penalty points are assessed to a piece of fabric according to the length of defects measured in inches. Fabric flaws or defects are assigned point values based on the following as stated:

<u>Point Values For Fabric Defects (4-Point System) Criteria Of Giving Penalty</u>	
<u>Length of fabric to be Inspected</u>	<u>Points Allotted</u>
Length of defect in fabric, either length or width	
Upto 3 in	1
Over 3 in up to 6 in	2
Over 6 in up to 9 in	3
Over 9 in	4
Holes and openings (largest dimension)	
1 in or less	2
Over 1 in	4

- b. **Calculation:** Total defect points per 100 yd² are calculated, and normally those fabric rolls containing more than 40 points/100 yd² are considered "seconds." However, a garment manufacturer, based on the price line and type of garments produced, may use more or less than 40 points/100 yd² as an acceptance criteria. **e.g.** A fabric roll 120 yard long and 48 inch wide contains, the following defects:

2 defects up to 3 inch.	2 x 1 = 2 points
5 defects over 3 inch. but less than 6 in	5 x 2 = 10 points
1 defect over 6 inch. but less than 9 in.	1 x 3 = 3 points
1 defect over 9 inch.	1 x 4 = 4 points
Total defect points	19
Therefore,	
$\text{Points/100yd}^2 = \frac{\text{Total points scored in the roll} \times 3600}{\text{Fabric width in inches} \times \text{Total yards inspected}}$	
$= 19 \times 3600 / 48 \times 120$	
$= 11.9 \text{ defect points/ } 100 \text{ yd}^2$	
So if the acceptance criteria are 40 points/100 yd ² , then this roll is acceptable.	

ACCEPTABLE QUALITY LEVELS (AQL)

1. Acceptable Quality Level (AQL) is maximum average defective items in a lot or limit / percentage of defective items in product /offered store. It is expressed in a percentage. Number of average defective items is determined by following formula:

$$\text{Average defective item} = \frac{\text{No.of defective item found during inspection}}{\text{Total no.of item to be inspected}} \times 100$$

2. AQL process: it is used for inspection of finished product / garment by the QC professionals. AQL standard is depend on the quality of the product to be inspected, random sampling, and experience of inspector. Normally lower figure AQL standard e.g. 01% is used for high quality products/ garments and high figure AQL standard e.g. 10% for low quality product/ garment. AQL standard 2.5% means that allowable limit of defective item is 2.5 % of total items inspected .Usually AQL 2.5% is used for major defects, AQL 4.0 % is used for minor defects and AQL 6.5% is used for slight defects, however zero acceptance for critical defects Allowable limit of Major defects are less than minor defects and it depends upon nature of item /offered store. It can be less than 01% or greater than 10%. .Following AQL table is used to determine lot size/ offered store quantity, least No. of sample to be inspected, AQL %, and acceptance & rejection points:

<u>SINGLE SAMPLING PLAN FOR NORMAL INSPECTION OR AS PER ORDER OF INSPECTING OFFICER.</u>											
Lot size	Least No. of sample to be Inspected	Allowable Quality levels(AQL) %									
		<ul style="list-style-type: none"> Acceptable/ Allowable defective sample (Ac) Rejected /Exceed allowable limit of defective item (Re) 									
		1.5%		2.5%		04%		6.5%		10%	
		Ac	Re	Ac	Re	Ac	Re	Ac	Re	Ac	Re
281-500	20-80	1-3	2-4	1-5	2-6	2-7	3-8	3-10	4-11	5-14	6-15
501-1200	32-125	1-5	2-6	2-7	3-8	3-10	4-11	5-14	6-15	7-21	8-22
1201-3200	50-200	2-7	3-8	3-10	4-11	5-14	6-15	7-21	8-22	10-21	11-22
3201-10000	80-315	3-10	4-11	5-14	6-15	7-21	8-22	10-21	11-22	14-21	15-22
10001-35000	125-500	5-14	6-15	7-21	8-22	10-21	11-22	14-21	15-22	21	22
35001-150000	200-800	7-21	8-22	10-21	11-22	14-21	15-22	21	22	21	22
150001-500000	315-1250	10-21	11-22	14-21	15-22	21	22	21	22	21	22
500001-above	500-2000	14-21	15-22	21	22	21	22	21	22	21	22

3. If the inspector have time constrain then AQL is beneficial/ helpful in inspection of whole lot/ offered store. It safe time, cost and give effective/ statistical result of product /offered store
e.g. If inspector needs 5 minutes to check the item , the quantity to be inspected is 2,500 items

then it took 208 hours to check the whole consignment/ offered store.it means 26 days approx. for one store. Calculation is as follows:

$$\frac{5 \text{ min} \times 1 \text{ hr}}{1 \text{ item} \times 60 \text{ min}} \times 2,500 \text{ items} = 208.33 \text{ hrs} \cong 26 \text{ days}$$

After Implementing AQL standard so the sample taken from the lot/ offered store is 200 items/ sample:

$$\frac{5 \text{ min} \times 1 \text{ hr}}{1 \text{ item} \times 60 \text{ min}} \times 2,00 \text{ items} = 16.66 \text{ hrs} \cong 02 \text{ days}$$

4. Quality parameters/ AQL limits may be defined by Inspecting Authority (if deemed appropriate) and communicate to the manufacturer, so the manufacturer set their quality levels (AQL limits) accordingly for their internal audit. Therefore, good quality product is ready for inspection.

ANNEX E TO

PN SPECIFICATION No 01/2020

PROMULGATION DATE 14 MAY 2020

FEED BACK FORM

Unit Name: _____

Item Description#: _____

Issue/Problem occurred: _____

PN SPEC #: _____

Possibility to resolve Issue: _____

Any Other Remarks: _____

Note:

- It's good to give feedback for improvement in any clothing Item.
- Recurring problem will also be intimated through this form.

Name Stamp

COUNTERSIGNED By CO/Admin Authority

Name Stamp