PAKISTAN NAVY SPECIFICATIONS 06/2023
PROMULGATION DATE: 03 DECEMBER 2023

BOOT DMS

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PROMULGATION ORDER

1. PN Specifications of Boot DMS 02/2020 promulgated in 2020, has been revised and updated.

2. This Specifications is hereby approved and promulgated for information, guidance and compliance by the relevant stakeholders. The details contained in the Specifications are to be studied, interpreted and implemented with due regards to the interest of the Service.

3. The PN Specifications contained herein supersede the PN Specifications - 02/2020 promulgated earlier.

SUGGESTIONS FOR AMENDMENT

1. The Specifications 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 H. 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

RECORD OF CHANGES /AMENDMENT

Amd No	Date	Letter of amendment and description	Signature and Date

PN SPECIFICATIONS NO 06/2023
(BOOT DMS)

0101. DESIGNATION

1. Boot DMS (Direct Molded Sole).

0102. USAGE

1. These Boots will be used by General Service CPOs/Sailors with Dress 4 for drill purpose only on special occasion like, JS Parade, Ceremonial Guards at PN Unit etc.

0103. INTRODUCTION

1. This Specifications is prepared by Directorate of Indigenous Technical Development, Karachi, to provide necessary guidance to the potential manufacturers/ suppliers of the items mentioned herein. This Specifications is to be used for testing and deciding upon acceptance, or otherwise, of the items mentioned. Any alteration or addition in this Specifications can be suggested to ITD wing (NRDI). However, it cannot be implemented without prior approval from DNS. This Specifications supersedes and replaces PN Specifications P-SC/ 611 (J) dated 07 Jun 12 referred vide letter PD/2400/10/BOOT DMS/09/117 dated 22 Jan 18. Promulgated earlier in relation to the item mentioned herein. This Specifications supersede PN Specifications 02/2020 promulgated earlier. These Specifications are based on sample approved by Dress Committee.

2. This Specifications booklet includes **08** Annexes and consists **35** pages, including the cover.

0104. SCOPE

1. This Specifications covers the technical/ manufacturing requirements of Boot DMS to be used by General Service CPOs/Sailors with Dress 4 for drill purpose only on special occasion like JS Parade, Ceremonial Guards at PN Unit etc. 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.

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

0105. **RELATED DOCUMENTS**

1. The latest standards documents that have been referred to in this Specifications are:

a.	AATCC-20 A	Fiber Analysis –Qualitative.
b.	ASTM E- 478-08	Standard test method for chemical analysis of Copper alloys.
c.	ASTM D 2810	Method for pH for leather
d.	ASTM D-2240-04	Test method for Rubber Property- Durometer Hardness. Rubber, Vulcanized or thermoplastic.
e.	ASTM D 3776	Mass per unit area.
f.	BS EN ISO 20344	Personal Protective Equipment –Test Method
g.	BS EN ISO 20345	Personal Protective Equipment-Safety footwear
h.	BS EN ISO 17235	Leather -Determination of Softness.
j.	BS EN ISO	AZO Colorants in Dyed Leather
k.	BS EN ISO 17131	Leather – identification of leather with microscopy.
l.	EN ISO 14184	Free and Hydrolysis Formaldehyde(Water Extraction)
m.	EN ISO 4047	Water soluble / Sulphated Ash
n.	ISO 1817	Determination of the effect of liquid / solvent on rubber, thermoplastic.
p.	ISO 23606	Knitted fabric
q.	ISO 7211/5	Determination of linear density of yarn removed from fabric.
r.	ISO 105-E01	Colour fastness to water.
s.	ISO 105 E02	Colour fastness to sea water
t.	ISO 105 E03	Colour Fastness to Chlorinated Water (Swimming Pool)
u.	ISO 105 E04	Colour Fastness To Perspiration
v.	ISO 13934-01	Textile- Determination of maximum force and elongation at maximum force using the strip method.
w.	ISO 17075	Leather –Chromium (VI) content in leather by colorimetric method
x.	ISO 5398	Chromium oxide content- through titration method
y.	ISO 4674 – 1	Rubber or plastic – coated fabrics - Determination of tear resistance. Constant rate of tear method.
z.	ISO 20864:2004	Footwear – Test Method for stiffeners and toe puffs.
aa.	ISO 14268	Leather – Water Vapor Permeability
ab.	SATRA TM 5	Stitch tear test
ac.	SATRA TM 68	Density of cellular material
ad.	SATRA TM 346	Amount of grease
ae.	SATRA TM 64	Compression set –constant stress

af.	SATRA TM 65	Split Tear Strength
ag.	SATRA TM 92	Resistance of footwear to flexing.
ah.	SATRA TM 83	Measurement of the area shape retention and collapsing load of formed Toe puff and stiffener material.
aj.	SATRA TM 144	Slip resistance of footwear
ak.	SATRA TM 230	Water resistance in foot wear
al.	SATRA TM 323	Qualitative test for acidity in Leather
am.	SATRA TM 404	Rapid Sole Adhesion test.
an.	SATRA TM77	Flexing Machine- Water Penetration test.
ap.	SATRA TM 31	Abrasion resistance Martindale method
aq.	SATRA TM 8	Circular Rub Fastness Tester.
ar.	SATRA TM 319	Determination of para-nitro phenol in leather by infra-red analysis

0106. DEFINITIONS & ABBREVIATIONS

1. Definitions for the terms used in this standard are given at Annex A of this Specifications.

0107. TECHNICAL DETAILS OF BOOT DMS

1. The Technical Details of Boot DMS are mentioned at Annex B of this Specifications.

0108. SCHEDULE OF MEASUREMENT

1. All measurement schedule of Boot DMS is given at Annex D.

0109. TECHNICAL DRAWINGS

1. All dimension of drawing is given at Annex E.

0110. GUIDE LINE FOR BOOTS MANUFACTURING

1. Design. The design of Boot shall be Derby with the Toe Cap and Outside Counter, full Bellowed tongue modified as 1'' (25.4 mm) curved from top side unlined, back strap having a join above the counter point and conforming to the Sealed Pattern.

2. Last. All sizes of last should be equal to the one mentioned at Annex D to this Specifications.

a. Last made of plastic/ wooden will be used. The Boot shall be made with a hard material 04 mm (approximately) thick to be added on bottom of the last in order to provide space for inserting detachable socks.

b. The suppliers/ manufacturer must intimate the size roll of the last/ molding foot in their possession conforming to the specified particulars and representative samples of last is approved by the Inspecting Authority before commencing manufacturing (if asked by Inspecting Authority).

c. Details of dimensions of specified lasts of various sizes and fittings i.e. from (39-45) are given at Annex D of this Specifications.

3. Construction. The construction shall be lack/ cement lasted and Direct Molded Rubber Sole are mentioned at Annex C.

4. Upper components. All components should be made of specified Leather as per thickness detail at Annex B. Leather used in making upper shall be of good quality, Plain Full Grain Cow Leather and should be suitable for very hard wear. The minimum thickness of various components of upper should be as mentioned in Annex B of this Specifications.

a. Leather properties mentioned at Annex B have to achieved by the manufacturer and submit a test report to Inspecting Authority (if asked by inspector). If there is a deviation in parameters from the specified limit then CINS may counter check the parameters (if desired) from PNCTA or any accredited lab.

b. Leather deeply snuffed i.e. fiber structure damaged (minor buffing that doesn't damage grains is permitted).

c. Leather does not have grub or tick mark or opened healed.

d. Inferior quality of leather i.e. Scratches, Flay cut, brands, bony loose, or other defects are not allowed.

e. Wrinkle marks are not allowed on new Boots.

f. The upper components should be properly skived and fitted. Skiving on the grain side is prohibited.

g. Tongue shall be full bellowed modified as 1'' (25.4 mm) curved from top side and fitted in such a manner that wrinkles are not formed when it is joined to the vamp. Tongue will be properly skived and stitched right up to the top edge of uppers.

h. The Toe puff stiffener shall be incorporated in the footwear in such a manner that they cannot be removed without damaging the footwear.

5. Stitching.

a. Number of stitches will be 7-9 per 25 mm.

b. The upper components shall be closed by lock stitching with Thread Nylon.

c. Quarter shall be joined with ‘’Vamp with two (2) rows of stitching, approximately 3 mm apart.

d. Vamp with tongue shall be joined with two (2) rows of stitching, approximately 3mm apart.

e. Toe Cap and Counter shall be stitched with two (2) rows of stitching, approximately 3mm apart.

f. Back seam shall be stitched, taped and again stitched with single row of stitching on either side.

g. Outside back strap shall have double row of stitching approximately 2 mm apart and each side.

h. Facing shall be made by single row of stitching on each side of Eyelets and speed Lacing Hooks. The width of the facing shall be approximately 24 mm± 2mm.

j. All seams should be properly hammered off and all loose ends secured properly.

6. Eyelets and Speed Lacing Hooks.

a. Three pairs of Eyelets Brass Black Japanned shall be fitted on each facing that will be clinched properly without being distorted or de shaped. The Eyelets shall be spaced equidistant. The facing puttee will be Vee cut.

b. Five Pairs of speed Lacing Hook Brass Black with Snap and Washer shall be fitted on each facing, first hook being, approximately 19 mm from top of the edge of the quarter and approximately 08 mm away from edge of the facing. The hooks shall be spaced equidistant.

7. Lasting.

a. All sizes to be newly lasted.

b. Lasting shall be done with machine at both part toe and heal area by hot melted cementing and side part shall be done by hand lasting.

c. Lasting allowance of upper shall in no position be less than 13 mm. Surplus material in lasting allowance shall be trimmed and sanded to produce flat surface.

d. Lasting shall be done with machine at both part toe and heal area by hot melted cementing. And side part shall be done by hand lasting.

e. Toe Cap height when lasted shall be as per Annex D & E.

f. The length of leg when lasted shall be as per Annex D & E.

g. Difference in length of leg with in same size /pair of boots is strictly prohibited.

h. Any uneven lasting at the toe or seat shall be pounded.

j. The lasted overlay and feathered edge shall be well roughened, the roughening of feathered edge shall extend over the feather edge right round the Boot, but shall not exceed nip line of molds.

k. Shank shall be made to shape and attached properly at correct position. No bottom filling shall be used. (Define in Annex E).

l. The entire TPR (Thermoplastic Rubber) sole shall be fixed properly and covered with sufficient compounds.

m. Lasting shall be done on Plastic/ Wooden last and then slipped off for final packaging.

n. The boots shall remain on last for at least 1 hour as conveyer should be contained heating and then cooling chamber to maintain the shape of boot.

p. Flash and spun on edge of the molding last and the supplies materials on the sole and heel shall be properly trimmed/ removed.

q. All the outer seams of the Boots shall be dressed with seam Filler.

r. The edge of the Sole and Heel shall be smooth and clean.

s. The detachable In-socks shall be made from close cell foam (EVA) laminated with knitted fabric. The thickness of finished in socks shall be 5 ± 1mm thickness having density 0.2g/cc ± 0.01g/cc and shall be provided with Boots.

t. An extra pair of Laces Nylon Black 200 cm with good quality Plastic tips and fused ends shall be supplied with each pair of Boots. Finish of Tips shall be good.

u. Insole shall be made off TEXON board, having thickness 3 mm± 0.5mm and should be permanently attached. It shall not be possible to remove it without damaging the footwear.

Note: Manufacture is liable to pay all the testing charges.

0111. QUALITY OF WORKMANSHIP AND FINISHING

1. Workmanship and finish of the Boots shall be equal to the sealed/ approved sample. It shall be best of its class and to the entire satisfaction of the CINS. The Boot shall confirm the parameters define at Annex B of this Specifications. All properties and qualities which may not be defined in this Specifications i.e. feel /finish etc. should be as per sealed /approved sample. Sealed/ Approved sample is either obtained from DNS/PNCSD/ CINS or accepted/approved from bulk supply inspected by Inspecting Officer or held with DNS /PNCSD/ CINS, for future reference /inspection/ stock sample etc.

0112. TESTING

1. The material shall be subjected to tests laid down in this Specifications at Annex B of this Specifications and related documents. At least ten pair of Boot of same or different sizes along with accessories will be required to complete relevant tests mentioned at Annex B of this Specifications. 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 i.e. Toe puff /Counter strength, Copper, Chromium VI , Azo dyes, Formaldehyde etc. may also be conducted in order to check its suitability. Firm is liable to pay all the testing charges.

2. No tests on the Rubber Sole and Heel shall be made before 24 hours of completion of Molding.

3. Tread design, Cleat area, Cleat Height ,Thickness, Sole of the shoes is resistant to fuel& oil, Resistance to hot contact, Abrasion resistance of Insole, pH value of Insole and socks, Water absorption and desorption, Specific ergonomic feature of the shoes, Outer Sole abrasion etc. have to be assured/ tested as per BS EN ISO 20344 and BS EN ISO 20345.

4. Toe puff and counter stiffener (Shape retention properties and compression strength) of a domed test specimen is to be assured i.a.w. SATRA TM 83.

5. Stitch tear test is to be assured/ tested i.a.w. SATRA TM 5.

6. Slip resistance is to be assured/ tested i.a.w. SATRA TM 144.

7. Acidity in leather is to be assured/tested i.a.w. SATRA TM 323.

8. Tearing load is specified as Kg/cm thickness, thus for determining tearing load for any item, e.g. tongue, its thickness is to be measured and then tearing load be calculated as follows:

a. Tongue thickness = 1.0mm=0.1cm.
b. Minimum tearing load desired =45 kg/cm * 0.1cm = 4.5 Kg.

0113. DRAWING OF BOOT SAMPLES FROM LOTS/ BATCHES

1. Sample quantity will depend upon lot/batch quantity. Numerous sizes/design drawn from offered quantity/ production for testing **or** as per instruction of Inspecting Officer (if deemed appropriate) as per following table:

Lot Size	**No. Samples x each size**
300 ≥1300	03
1301 ≥3200	04
3201≥110000	05

0114. TENDER SAMPLE

1. Tender sample to be approved by TSR Committee.

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

a.	Boot DMS	05 x pairs(two different sizes)
b.	Manufacturing last	One pair of respective size
c.	Pattern (cut component complete set)	Two set of the respective sizes
d.	Leather for uppers	1’ x 1’ (02 pieces)
e.	Thread for upper closing	100 mt
f.	Eyelets & speed lacing Hook	10 in number (each)
g.	Laces	05 in Nos.
h.	Sole	02 Pairs (two different sizes)
j.	Toe Puff and counter stiffener	02 each
k.	In socks	02 Pairs (two different sizes)
l.	Shank	05 x No. of shanks
m.	Rubber Sheet	0.5 kg
n.	Binding Adhesive & Seam Filler	0.5 kg

0115. ADVANCE SAMPLE

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 Annexes B, C

and D and approved by CINS. The minimum quantities required are 10 pairs along with samples of materials used in manufacturing of Boot DMS as mentioned above.

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 or his representative an initial delivery of One % of the contract or ten pair along with samples of accessories/ materials for inspection and testing.

3. 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 Specifications. One approved sample 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).

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

5. 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.

0116. **INSPECTION**

1. Bulk representative sample (B/R) random sampling will be carried out as per rules in vogue.

2. Bulk inspection will be carried out after satisfactory completion of Visual Examination and Testing of B/R Sample as per Annexes B, C, D and E.

3. Boots shall be tested and examined, as Inspector may consider necessary, during manufacturing or after bulk production or after delivery to determine whether they conform to PN Specifications or not.

4. Inspection of Boots. The guidelines for Inspector w.r.t general defects are defined at Annex F. Stage inspection of Boot DMS may be carried out by CINS, if deemed necessary.

5. Stage inspection /Third party inspection for Boots 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 Specifications.

6. Inspection/ Acceptance and Rejection of Stores. Inspection/ acceptance is to be carried out to the entire satisfaction of Chief Inspector of Naval Stores or as per instruction/ procedure laid down in unit/department Standing Order

7. Common defects (Critical, Major and Minor), Acceptance Quality level (AQL) and Feedback Performa for Boots are enclosed as Annexes F to H respectively, for consultation/ guideline. However these guide lines may be considered by Inspecting officer as deemed appropriate.

8. 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 Specifications or the quality of product does not seems up to the mark.

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

10. All stores and packing NOT fully in accordance with this Specifications shall be rejected.

11. Inspection/acceptance is to be carried out up to the satisfaction of Chief Inspector Naval Stores.

12. The Boots shall be examined for the correctness of material, shape, design, pattern, dimension, size, fitting construction workmanship and finish.

13. Boot will be accepted either based on AQLs as specified in Annex G or based upon 100 % inspection as here to fore depending on discretion of Inspecting Authority.

14. For acceptance a lot/ batch have to pass all three AQLs of critical, major, and minor defects simultaneously.

15. All Boots shall be inspected in pairs and shall be accepted and rejected as pairs. Defective lasting, moldings and damages to upper and insoles during molding are to be especially checked.

16. 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 Specifications where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

17. Responsibility for Compliance. The inspection set forth in this Specifications shall become a part of the supplier's overall inspection system or quality program. The absence of any inspection requirements in the Specifications 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).

18. 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 Specifications 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.

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

20. The CINS is the authority in all matters pertaining to Inspection.

0117. STAMPING OF ACCEPTED/ REJECTED STORES BY THE INSPECTOR

1. While stamping of accepted/ rejected stores following instructions are to be followed:

a. Stamping of Accepted Stores. The acceptable Boots shall be stamped with Inspector's Individual Acceptance Mark's on inside of the quarter right side or as per instructions of inspecting officer. The stamping shall be legible.

b. Stamping of Rejected Stores. The rejected Boots shall be marked with Inspector's Rejection Mark's inside of the quarter at left side or as per instructions of inspecting officer to avoid re-submission by the supplier.

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

d. Each package containing accepted stores shall be clearly stamped on front with individual acceptance mark.

0118. SPECIAL INSTRUCTIONS

1. Care Label Instructions. Boot DMS are capable of being cleaned by using conventional means to maintain smart & functional appearance. Following care instructions in the form of leaflet shall be provided in English and Urdu with each pair of shoe:

a. To extend the life and maintain suppleness of the upper, apply a shoe care product appropriate to the upper.

b. The sole of Boots shall be cleaned frequently when feel necessary using conventional means to maintain smart and functional appearance.

0119. **PACKING AND PRESERVATION DETAILS**

1. Preservative treatment and quality of packing shall be examined/ tested as the inspector may consider necessary in order to determine whether they conform to this Specifications.

a. Preservation. The items will be preserved as per following criteria:

(1) Uppers Boots upper shall be treated with 1% solution of para-nitro phenol or Penta - Chloro phenol by spraying it (if the same has not been incorporated during tanning of the leather).

(2) Sole Thermoplastic Rubber Sole shall be sprayed with matt finish during production.

(3) 07 Ply carton or Cases Wood Packing (CWP) Boots shall be packed in 07 ply cartoon or if it consider appropriate by Depot/ INS then CWP is used for packing and CWP is treated with Copper Naphtanate (100% solution) mixed in kerosene Oil or Solignum or Hepta Chloro.

b. Packing. The store when ordered to be delivered 'PACKED' shall be packed as follows:

(1) The Boots shall be packed in a neat dry and clean condition each pair tied together.

(2) Ten pair of one size and fitting only shall be packed in each case wood carton. Packing of mixed sizes and fittings, shall be avoided and shall not be normally permitted.

(3) The Boots shall be packed in carton (07 x ply) / CWP of suitable size which shall be lined with Polythene Sheet thickness 0.13 mm in such a manner that the contents are completely covered and there is an overlap of at least 15 cm.

(4) Empty spaces, if any, shall be stuffed with suitable cushioning material.

(5) Banding/ Wiring shall be done as per procedure in vogue or as per instructions of Inspecting Officer.

(6) Strapping shall be done as per procedure in vogue or as per instruction of Inspecting officer.

(7) The total weight of package shall not exceed 35kg.

(8) Each Box Board packing shall be securely and properly packed.

(9) An extra pair of laces have to be supplied with the Boots.

c. Packing Slip. A Packing Slip shall be enclosed in each package giving full details about the store packed i.e. Cat No. designation, quantity packed, contract No, Challan No and date 1/Note No or Voucher No. and date, consignee, consignor, date of packing and packer's signature.

0120. IDENTIFICATION LABEL

1. Each Boot shall bear following clear and indelible information on Main Label attached on inside edge:

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.

0121. PACKING LIST

1. Firm is bound to provide a packing list of store offered for inspection along with the challan, which include complete details about the store i.e. Pattern No., Description of stores, size, quantity, contract No., and Date, Challan No. date and I/Note No. or voucher no. and date, consignee, Manufacturer/ firm's name, date of packing and packer's signature, QA certificate /Lab test report from any accredited lab.

0122. MARKING OF STORES

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 Specifications 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) Stowage / Stacking Instructions.
(5) Quantity of the Item packed.
(6) Signature along with stamp of Packaging Manager/ rep of firm.

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.
(6) Destination i.e. Railway station/ (Navy).

0123. **DELIVERY**

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

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

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

XXXXXSDXXXXX

M. YASSAR YAHYA
Captain Pakistan Navy
DID

Annexes:

ANNEX A TO
PN SPECIFICATIONS NO.06/2023

PROMULGATION DATE 03 DEC 23

DEFINITIONS & ABBREVIATION

1. CINS. Chief Inspector of Naval Stores.

2. DITD. Directorate of Indigenous Technical Development.

3. DNS. Directorate of Naval Store.

4. PNCSD. Pakistan Navy Clothing Store Depot.

5. PNCTA. Pakistan Navy Central Testing Authority.

6. Inspector. The term inspector shall include the ‘’inspection Authority’’, inspecting officer and their representatives, duly authorized for the purpose of discharging inspection duties involved.

7. Inspection Authority. Chief Inspector of Naval Stores (CINS). His verdict in respect of Sealed Inspection matters is to be taken as final.

8. 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.

9. 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.

10. 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.

11. 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.

12. Critical Defects. They pose a threat to user safety. AQL tolerance for these type of defects are zero.

13. Girth. It is the circumference of the widest toe part.

14. Catastrophic Damage. Sudden great damage mark on shoes upper (leather).

15. Corrected Grain Leather. Corrected grain leather refers to hides that have been buffed or sanded on the grain surface in order to remove marks or imperfections.
16. Flay cut. It means to strip off the skin or surface of skin.
17. Skiving. It refers to cut off (a material, such as leather or rubber) in thin layers or pieces.
18. Puckering. It means to tighten skin or cloth until small folds appear or (of skin or cloth) to form small folds.

ANNEX B TO
PN SPECIFICATIONS NO.06/2023

PROMULGATION DATE 03 DEC 23

TECHNICAL DETAILS OF BOOT DMS

S.NO	ITEM	REQUIREMENT
1.	**UPPER LEATHER (VAMP, QUARTER , COUNTER, TONGUE , COLLAR & TOE CAP)**	
a.	Leather properties	
	(1) Grease and uncombined Sulphur % by wt	3.0-6.0 (14 % moisture basis)
	(2) Cr (Cr_2O_3) by wt	3.7-6.0 (14% moisture basis)
	(3) Crackles on grain(double folding)	Shall not crack
	(4) Tightness of grain	Shall be tight
	(5) Formaldehyde	Not present
b.	Identification of leather	Cow Full Grain , (Leather) plain
c.	Finish	Sand with Semi Aniline Finish
d.	Colour	Black
e.	Thickness	
	(1) Vamp	1.8 -2.0 mm
	(2) Quarter	1.8 -2.0mm
	(3) Counter	1.8 -2.0 mm (Aniline finish)
	(4) Tongue	1.0- 1.2 mm
	(5) Collar	1.0-1.2 mm
	(6) Toe Cap	1.4 -1.6 mm (Corrected Grain)
f.	Softness	7.2-7.4 mm
g.	Chromium %	3.7- 6.0%
j.	Shrinkage/ leading/welling	03.%
k.	Tensile Strength	225 kg/cm^2 (minimum)
l.	Tearing load	45 Kgf/cm (min)
m.	Dye fastness to Rubbing	
	(1) Dry (500 revs)	GS 4 or better
	(2) Wet (50 revs)	GS 4 or better
n.	Flexibility (at 50,000 cycles)	No crack
p.	Para-nitro Phenol	Shall be present
q.	Water Vapor Permeability	≥3.5g/m^2
r.	Harmful Materials	
	(1) Azo Dyes	Should not present

	(2) Formaldehyde Content	Less than 22 mg/Kg
s.	PH	Suitable for human use >3.2 and <9.5
2.	**EYELETS, SPEED LACING HOOKS AND SHANK**	
a.	Material	Brass Japanned AA-20 A, AA-19C
b.	Composition (1) Copper (2) Zinc	 70% ± 5 30% ± 5
c.	Dia (1) Inner (2) Outer	 6 ± 0.5 mm 10 ± 0.5 mm
d.	Coating	Powder Coated
e.	Colour	Black
f.	Shank (1) Material (2) Thickness (3) Length of Shank from size 5 to 10 (4) Length of Shank from size 11 to 14 (5) Width (6) Internal grove width (7) Length of grove	 Mild Steel 3±1 mm 100±1mm 120 ± 1mm 18±1mm 5±1mm 95±1mm
3.	**LACES**	
a.	Material	Nylon 100%
b.	Construction	16 thread, 4 fold each multifilament
c.	Cross-Sectional Shape	Circular
d.	Nature of Dye	Disperse
e.	Dye Fastness to Washing	GS 4 or better
f.	Dye Fastness to Light	GS 4 or better
g.	Breaking Strength (7'' B.G)	70 kg (Min)
h.	Length with Tips	200 cm ± 5 cm
j.	Tip (1) Material (2) Length (3) Color	 Plastic 1.5 ± 0.2 cm Black
k. .	Abrasion resistance (1100 cycles)	04 or better
4.	**IN SOCKS**	
a.	Material	Closed Cell Foam (EVA) Laminated with Knitted Fabric

b.	Thickness (complete)	05±1 mm
c.	Foam Density	0.2g/cc ± 0.01g/cc
d.	Knitted Fabric (1) Material (2) Wt / Sq m (3) Weave (4) Shade	 100% Polyester 180± 0.5 GMS Knitted Black
e.	pH value	≥3.2 and ≤9.5
f.	Water (1) Absorption (2) De absorption of insole	 > 70 mg/cm^2 water absorption < 80% water de absorption
g.	Hardness of socks	35-40 IRHD
5.	**IN SOLE**	
a.	Material	Texon Board (non-woven) along with Shank Board on heal part.
b.	Thickness	2.5 – 3.0 mm
c.	Split Tear	30 N / cm (Min)
d.	Flex Index	3.5 (Min)
6.	**STITCHING THREAD**	
a.	Material	Nylon
b.	Construction	3 cord each multifilament
c.	Linear density	3/ 500 ± 30 Den
d.	Shade	Black
e.	Colour fastness to water	GS 4 or better
f.	Colour fastness to sea water	GS 4 or better
g.	Colour fastness to chlorinated water	GS 4 or better
h.	Colour fastness to perspiration	GS 4 or better
j.	Dye Fastness to Light	Class IV or better
k.	Breaking Strength (BG 24 inch)	8 ± 2 kg/cm^2 Min
l.	Nature of dye	Acid dye
7.	**COUNTERS STIFFENER**	
a.	Material	Non-woven thermoplastic, double face adhesive coated (TP-8) or equivalent.
b.	Thickness	1.8 - 2.0 mm
8.	**OUTER SOLE**	
a.	Material	Thermoplastic Rubber
b.	Hardness	60 – 65 IRHD
c.	Density	0.99 ± 0.02 g/cm^3
d.	Shade	Black

e.	Design	TIMBER LAND
j.	Resistance to hot contact	70^0 C ± 2ºC
k.	Thickness of Sole for size 44 (1) At Toe (2) At Heel	 19mm ± 1mm 34mm ± 1mm
l.	Tread design	As per Annex E
9.	**WHOLE SHOE**	
a.	Water Resistivity	Water Repellency of Upper Leather
b.	Flexing/ Cracking of upper & Sole (80,000 cycles)	No damage
c.	Stitch / 25 mm	7-9
d.	Height of upper (for size 44)	210 +5 mm
e.	Bond Test (1) At Toe (2) At heel	 27 kg ± 2 kg 32 kg ± 2 kg
f.	Seepage Test	Seepage Test (3 minutes)
g.	Abrasion	$280mm^3$ max
h.	Compression test of shoe sole	No change in dimension
j.	Effect of Solvent on outer sole	No change
10.	**SEAM FILLER**	
a.	Paraffin Wax	30 %
b.	Stearic Acid	30 %
c.	Solvent Oil	40 %

ANNEX C TO
PN SPECIFICATIONS NO.06/2023

PROMULGATION DATE 03 DEC 23

TECHNICAL DETAILS OF BOOT DMS (ISOPRENE RUBBER COMPOUND SOLE WITH HEEL)

Formulation of mixed (as per chemical composition given below) has been recommended in DEFSTAND. The exact mix required to achieve desired physical properties, as numerated below. Will be decided by the contractor:

a. Chemical Composition (styrene of mix not to be more than 15% by mass of isoprene rubber).

b. Isoprene rubber [high quality plantation nature rubber (Hevea) or Synthetic cis-poly isoprene.

c. Reinforced with C-black.

d. High styrene-butadiene resin (styrene should not be less than 50%).

e. Shall contain at least 1 part of a suitable antioxidant/ 100 parts of rubber, by mass.

f. Shall be vulcanized with suitable sulfur/ accelerator/ activator system.

g. The formulation, manufacturing procedure and source of ingredients along with a test feet will be provided to IAS&C.

h. **Note**: Above composition will not be the sentencing criteria during inspections, provided the as red physical properties are fully realized.

Mandatory Physical Properties:

Properties	**Requirement**			**Test Method**
	Cured 11 mins@$$			
	140 ^{O}C	150 ^{O}C	155 ^{O}C	
Harness, 1RHD	-	73± 3	–	DEFSTAND 93-91
Density, gm/ cc	1.18±02			BS 903 Part A1, method A

Tensil stress, (a) 200% elongation, Mpa**	Not less than 75% of value@ 150 ^{O}C	8.3 min	Not less than value@ 150 ^{O}C	BS 903: Part 2 Dumb Bell Test Pieces
Tensil strength Mpa	14.0 min	15.5 min	15.5 min	-
Elongation @ break %	300 min	250 min	250 min	-
Compression set 24 hrs @ 70 ^{O}C	-	40 max	-	DEFSTAND 93-91
Resistance to heat aging 168 hrs @ 70 ^{O}C				BS 903 Part A19, method A or B
Apartment Hardness, IRHD	-	$\pm$ 4 of the original value.	-	DEFSTAND 93-91
Tensil strength	-	Not less than 80% of the original value.	-	BS 903: Part 2 Dumb Bell Test Pieces
Elongation at break	-	Not less than 70% of the original value.	-	
Contractor may very this time period Mpa=145.4psi=10.2kg/cm^2				

ANNEX D TO
PN SPECIFICATIONS NO.06/2023

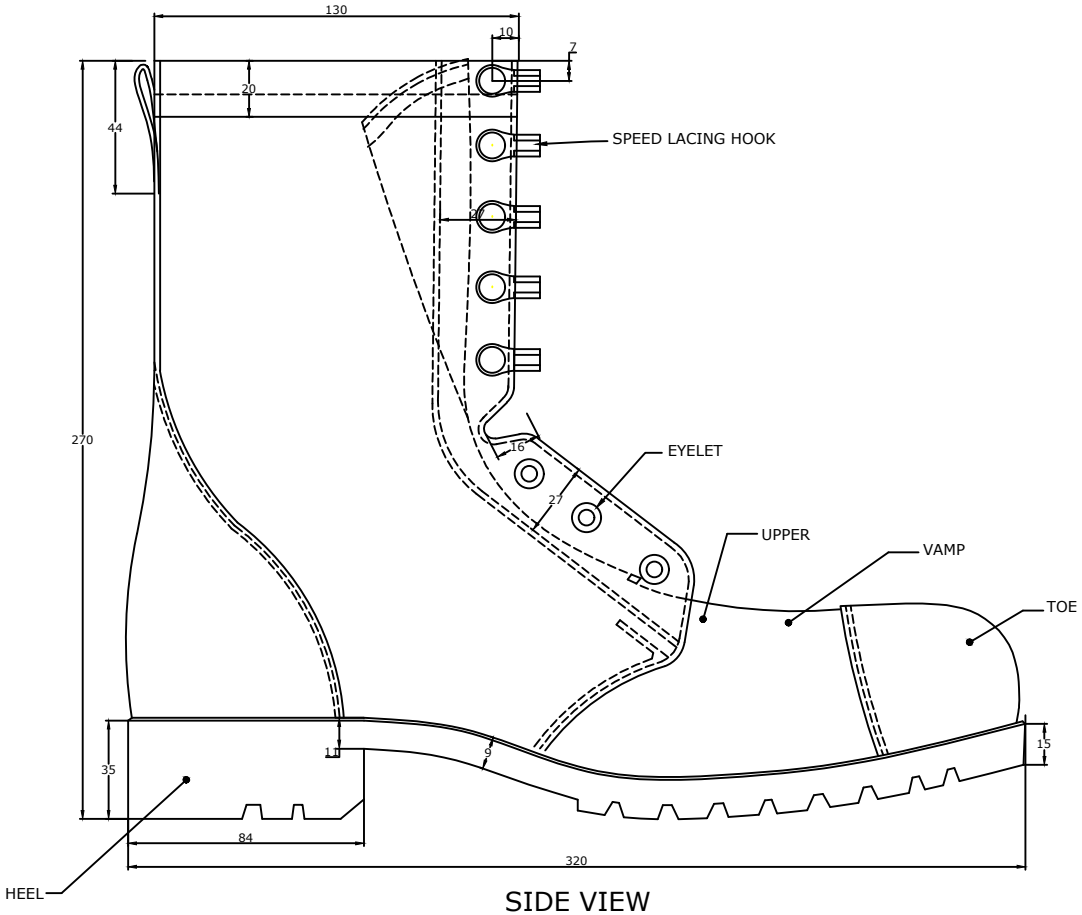
PROMULGATION DATE 03 DEC 23

MEASUREMENTS AND DIMENSIONS

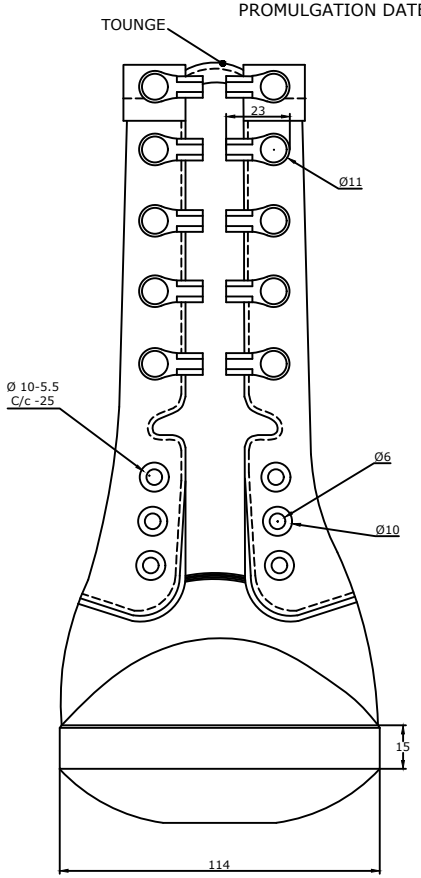
S No	DIMENSIONS				
A	SIZE ROLL OF LAST MEASUREMENTS				
	Size of foot wear		Girth	Bottom length	Stick length
	UK	Europe			
1.	3	36	220±	239	240
2.	4	37	225±	245	246
3.	5	38	230±	251	252
4.	6	39	238 ± 1mm	257 ± 1mm	258 ± 1mm
5.	7	41	243 ± 1mm	264 ± 1mm	265 ± 1mm
6.	8	42	248 ± 1mm	271 ± 1mm	272 ± 1mm
7.	9	43	253 ± 1mm	278 ± 1mm	279 ± 1mm
8.	10	44	258 ± 1mm	285 ± 1mm	286 ± 1mm
9.	11	45	263 ± 1mm	292 ± 1mm	293 ± 1mm
10.	12	46	268 ± 1mm	299 ± 1mm	300 ± 1mm
11.	13	47	273 ± 1mm	306 ± 1mm	307 ± 1mm
12.	14	48	278 ±1mm	313 ± 1mm	314 ± 1mm
13.	15	49	283 ±1mm	320 ±1mm	321 ± 1mm
B	BOOT DMS				
	Size Of Footwear		Upper Height from outside	Toe Height	
	UK	Europe			
1.	3	36	175 ±5mm	68±2mm	
2.	4	37	180 ±5mm	70±2mm	
3.	5	38	185 ±5mm	73±2mm	
4.	6	39	190 ±5mm	86±2mm	
5.	7	41	194 ±+5 mm	88±2mm	
6.	8	42	198 ±5mm	91±2mm	
7.	9	43	202 ±5mm	94±2mm	
8.	10	44	206 ±5mm	97±2mm	
9.	11	45	210 ±5 mm	100±2mm	
10.	12	46	214 ±5mm	103±2mm	
11.	13	47	218 ± 5mm	106±2mm	
12.	14	48	222 ±5mm	109±2mm	
13.	15	49	226 ±5mm	112±2mm	

TECHNICAL DRAWING

ANNEX E TO
PN SPECIFICATION NO 06/2023
PROMULGATION DATE 27-11-2023

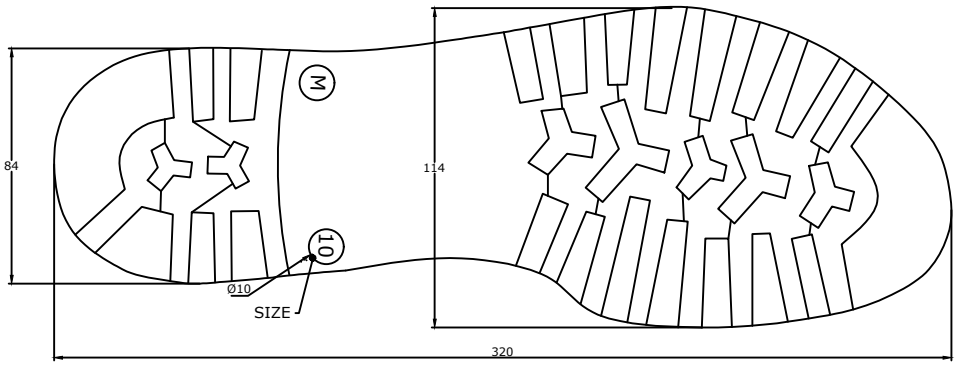


SIDE VIEW



FRONT VIEW

1543



BOTTOM VIEW

NOTE:
FOR FURTHER DETAILS SEE STOCK SAMPLE

I T D WING SOUTH		
TITLE: BOOT DMS (SIZE:10)		
DWG.NO. TD-2735/2023	DIMENSIONS: mm	
DATE: 24-08-2023	SCALE: NTS	
REVESION NO. - -	REVESION DATE: - -	
DRAWN BY	CHECKED BY	APPROVED BY
xxxsdxxx HDM M.ASGHAR	xxxsdxxx LT CDR SANA KANWAL SO.TEXTILE	xxxsdxxx CAPTAIN M YASSAR YAHYA DID

ANNEX F TO
PN SPECIFICATIONS NO.06/2023

PROMULGATION DATE 03 DEC 23

GUIDELINES FOR INSPECTION – GENERAL DEFECTS

S. No	Defect	Description	Critical	Major	Minor
1.	Pairing	Not property paired i.e. right and left not of the same size and fitting.	X		
		Wide variation in appearance of color in same pair.	X		
		Overall length of the shoe differ.	X		
		Toe length vary by 3mm	X		
		Height of heel vary by 3mm	X		
		Length of leg vary by 3mm	X		
2.	Color cleanliness and finish	Not specified color.		X	
		Color not uniform, spots and stains clearly noticeable at a distance of 3 feet (914mm).		X	
		Color not uniform, spots and stains not plainly visible at a distance of 3 feet (914mm).			X
		Sole and heel edges not properly finished.			X
3.	Design, pattern, size	Not as per specification.		X	
		Foreign Object Damage (FOD) free, as same can cause catastrophic damage particularly while working in confined areas.	X		
		Incorrectly lasted upper.		X	
4.	Material	Any components or items not fabricated from the specified materials.		X	
		Lining is not clean and properly fixed		X	
5.	Upper leather	Leather not chrome full grain Cow Leather deeply snuffed i.e. fiber structure damaged.		X	

		Grub or tick marks opened or badly healed scratches, flay cut, brands, bony, loose, wrinkles or other inferior leather.		X	
		Wrinkles			
		a. Affecting appearance or serviceability	X		
		b. Not affecting appearance or serviceability			X
		Stretchy vamp.		X	
		Stiff tongue.		X	
		Flesh side with rough fiber.		X	
		Skiving not done or excessively done.		X	
		Damage to upper compounds.		X	
6.	Construction and workman ship	Any Component or assembly misplaced. Operation committed or not properly performed seriously affecting serviceability or appearance.		X	
		Components poorly positioned.		X	
		Excessive roughness.		X	
7.	Sole	Poor sole adhesion.	X		
		Improper trimming of molded surface.		X	
		Damaged outer sole design.		X	
		Pits or air bubbles observed sole.		X	
		Improper /wrong size marking.	X		
8.	Stitching	Any open seam.	X		
		Stitching omitted where required.		X	
		Loose/ tension resulting in puckering or damaging the leather.		X	
		Stitching incorrectly finished off.		X	
9.	Counters and toe puff stiffener	Soft counter or stiffeners.		X	
		Sharp edge	X		
10.	Inner sole	Insoles not properly feathered, not likely to affect comfort.			X
11.	Socks	Not finished		X	
		Not leveled		X	
		Not according to size		X	

12.	Eyelets	Not the same number of eyelets in each row.		X	
		Eyelets not properly spaced within the row or misalignment between the rows to an extent interfering proper locking.		X	
		Number of eyelets less than specified but each row having the same number.		X	
		Not specified size.		X	
		Poor quality of eyelets.		X	
13.	Marking	Missing incomplete, incorrect, and illegible.		X	
		Special instructions are missing.		X	
14.	Laces	Missing.		X	
		Length of laces differ in same pair of shoes	X		
		Spare pair of laces missing.		X	
		Rough and substandard.	X		
		Cut marks observed.	X		
		Length is not according to specification		X	
15.	Identification label	Missing.		X	
16.	Packing	Not as per specification and substandard.		X	
		Not packed in proper box	X		

ANNEX GTO
PN SPECIFICATION NO.06/2023

PROMULGATION DATE 03 DEC 23

ACCEPTABLE QUALITY LEVELS (AQLS)-MATERIALS AND FINISHED BOOTS

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 by the QC professionals. AQL standard is depend on the quality of the product to be inspected, random sampling, and experience of inspector Following AQL table is used to determine lot size/ offered store quantity, least No. of sample to be inspected, AQL %, and acceptance & rejection points:

Lot/Batch Size	**Sample Size**	**Materials**		**Finished Boots** • **Acceptable/ Allowable defective sample (Ac)** • **Rejected /Exceed allowable limit of defective item (Re)**					
				Critical Defects		**Major Defects**		**Minor Defects**	
		Ac	**Re**	**Ac**	**Re**	**Ac**	**Re**	**Ac**	**Re**
2 - 8	2	0	1	0	1	0	1	0	1
9 ~ 15	3	0	1	0	1	0	1	0	1
16 ~ 25	5	0	1	0	1	1	2	1	2
26 ~ 50	8	0	1	0	1	1	2	1	2
51 ~ 90	13	1	2	1	2	1	2	2	3
91 ~ 150	20	1	2	1	2	2	3	3	4
151 ~280	32	2	3	2	3	3	4	5	6
281 ~ 500	50	3	4	3	4	5	6	7	8
501 ~ 1200	80	5	6	5	6	7	8	10	11
1201 ~ 3200	125	7	8	7	8	10	11	14	15
3201 ~ 10000	200	10	11	10	11	14	15	21	22
10001 ~ 35000	315	14	15	14	15	21	22	21	22
35001 ~ 150000	500	21	22	21	22	21	22	21	22
150001 ~ 500000	800	21	22	21	22	21	22	21	22
500001 ~ Over	1250	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:

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

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

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

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 H TO
PN SPECIFICATION NO.06/2023

PROMULGATION DATE 03 DEC 23

FEEDBACK 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/TYPE Cdr/Admin Authority

Name Stamp

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