INTEGRATED HEADQUARTERS OF MINISTRY OF DEFENCE (NAVY)

DIRECTORATE OF CLOTHING & VICTUALLING

INDIAN NAVY SPECIFICATION

ON

BOOT ANKLE BLACK

CAT NO. CNCMT- PSF0011 to 0018

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DIRECTORATE OF CLOTHING AND VICTUALLING

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MINISTRY OF DEFENCE (NAVY)

NEW DELHI – 110 011

(NOTE: THIS SPECIFICATIONS CONTAINS 17 PAGES INCLUDING THIS PAGE)

RECORD OF AMENDMENT

SNO	DATE	AMENDMENT NO	DETAILS OF AMENDMENT	AMENDMENT CARRIED OUT BY AND DATE

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FOREWORD

1. This specification is the property of Government of India and is a restricted document, not to be communicated to anyone who is not authorised to receive it. This specification or any drawings, pattern or other information issued in connection therewith may only be used for manufacture and quality assurance against specific procurement order placed by competent authority. It is not be used for any other purpose whatsoever without the expressed written sanction of the Chief of Naval Staff or his representative.

2. This specification has been prepared on the basis of commercially available similar products available with reputed Indian manufacturers and exporters, existing specification **JSS:8430-12:2010** and Naval Headquarters Specs **DCV/CG/Navy/12/2013 on Shoes Black Non-Slip** prepared by the Directorate of Clothing and Victualling on the authority of Controller of Logistics, Indian Navy. The Authority Holding Sealed Particulars (AHSP) for the item covered in this specification is Principal Director of Clothing & Victualling (PDCV), Sena Bhawan, New Delhi, for the Indian Navy. The AHSP would be the Quality Assurance Authority for all enquiries related to make and shape regarding this specification.

3. All clauses in this specification shall be complied with in every respect, irrespective of the source of supply or the material and/or components. Any deviation from this specification will not be resorted to without the express written sanction of Quality Assurance Authority. Should any discrepancy be found between this specifications and any sample or pattern, loaned for any purpose, then decision of the AHSP in this regard would be final.

4. Unauthorised departures from this specification may involve rejection of the store, which will be inspected during and after, manufacture and shall be subjected to testing for the final approval of the Quality Assurance Officer before dispatch to the consignee.

5. All the Specifications/drawings referred to in this specification for any tender or contract shall mean the edition current of the date of such tender or contract. The PDCV reserves the right to amend or modify this specification as and when necessary without any prior intimation to any parties associated/affected by the amendment/modification so being carried out.

6. While sending/informing procurement agencies about change in specifications, the AHSP shall ensure that such an action is not linked to any existing/under progress contract cases, unless it is inescapable, in terms of DPM-2009 Para 4.10.1. Notwithstanding the above, the procurement agencies would remain the best judge on whether to include the changes brought in the specification or otherwise for all such existing/under progress contract cases.

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SCOPE

7. This specification covers the requirement of Boot, Ankle, Leather, Drill with Direct Moulded PU-PU Sole in sizes 5 – 12. The footwear is to be as per Classification I, Design 'C' of ISO:20345 and to be made by direct moulding process with bucket type sole having Dual Density Polyether Polyurethane(**PU**).

8. This specification covers the material requirements, construction particulars and overall boot general requirements used in the manufacture of Boot Ankle Black.

REFERENCES

9. The succeeding paragraphs refer to the following specifications which in turn sub-refer to the relevant specifications as applicable for the parameter being detailed:-

Table 1 : Applicable Documents

Sl.No.	Specifications	Description
(a)	IS: 2050	Glossary of terms relating to footwear. For the purpose of this specification the definitions and **terminology** given in IS:2050are applicable.
(b)	IS: 5041-1978	Specification for Footwear and Stationery Eyelets/D-Rings
(c)	IS:4905-1968	Method of random sampling
(d)	IS:5677	Shoes Upper Leather For Direct Moulding Process
(e)	IS:9543	Spun Polyester Sewing Thread
(f)	IS:11195	Blend Compositions of Textiles
(g)	ISO:20345-2011	Personal Protective Equipment – Safety Footwear
(h)	ISO 2062	Determination of single-end breaking force and break
(j)	ISO 5402	Flexing resistance of upper leather (Bally Flexing)
(k)	ISO 3376	Leather – Determination of tensile strength and elongation
(l)	ISO 11644	Finish Adhesion Test
(m)	ISO 426/1	Wrought copper-zinc alloys – Chemical composition and forms of wrought products – Part 1: Non-leaded and special copper zinc alloys.
(n)	SATRA TM 36	Break/ Pipiness of Leather
(p)	SATRA TM 92	Resistance To Whole Shoe Flexing
(q)	SATRA TM 94	Breaking force and extension at break of shoe laces
(r)	SATRA TM140	Scuff resistance - chisel method
(s)	SATRA TM149	Strength of eyelet facings and other laced fastenings
(t)	SATRA TM150	Attachment Strength of Eyelets
(u)	SATRA TM154	Shoe lace to shoe lace and shoe lace to lace carrier abrasion
(v)	SATRA TM 186	Shape Retention Properties of Toe Caps of Finished Footwear
(w)	SATRA TM195	Knot Slippage Test
(x)	SATRA TM310	Atmospheric Sulphide Tarnishing and Salt Water Corrosion
(y)	SATRA TM 401	Peel Strength of Adhesive Bonds

10. The Standards mentioned above or anywhere in this specification contain provisions which through reference in this text, constitute provisions of this standard.

In case of any discrepancy/contra-indication the interpretation of the buyer will be considered to be final. For the purpose of this specification, the terminology, definitions and symbols given in the relevant applicable standards shall apply. Those edition of referred standards would be applicable which are the most latest wrt the date of such tender or contract referring to this specification.

STANDARD PATTERN

11. The standard pattern of Boot shall be made to derby design on broad toe and padded dual collar, on broad-toe 'H' fitting last with stroble construction and directly moulded dual density PU sole. The standard pattern held in the custody of IHQ of MoD(N)/DCV shall constitute the standard as regards to any particulars or properties not noted/defined in this specification. An illustrative diagram for reference guidance purposes only is placed at Appendix "A".

12. The standard pattern held by the AHSP would define the general appearances, workmanship, feel finish, shape, design and pattern and for other aspects not defined in this specification.

MATERIALS

13. The general description of materials to be used for manufacture of the boot is as indicated at the following Table 2. The physical and chemical properties that these materials have to conform to have been placed at Appendix 'B'.

Table 2 : Material Description

Sl.No.	Component	Requirement
(a)	**Upper**	**All Upper Components except Tongue**: Chrome tanned Black Colour Smooth Leather. **For Tongue**: Chrome tanned Black Colour Smooth Softy Leather.
(b)	**Lining**	100% Polyamide Black Colour Non-Woven material (Cambrelle type) with anti-microbial and anti-fungal properties for **Vamp, Quarters and Tongue**. Physical and Chemical Properties indicated at Appendix "B" An additional **Heel Grip Lining** of Grey Colour Split Leather is to be provided.
(c)	**Foam Insert**	Polyurethane Foam of **min 5 mm** Thickness between Upper and Lining Components. Padded Collars are to have PU Foam of **15 mm** thickness. Physical and Chemical properties are placed at Appendix "B"
(e)	**Toe and Counter Stiffner**	Stiffeners of Thermo plastic material shall be used for Toe Puff and Counter with minimum thickness **1.7–1.9 mm** respectively. The thermal impregnation is to be of thermoplastic EVA Resin. The physical and chemical properties are to be as Appendix 'B'.
(f)	**Eyelets**	**8 nos.** Black Anodised Aluminium Eyelets as per IS: 5041-1978 of size no. **7.5 + 0.5 mm** collar diameter to be fitted on each face.
(j)	**Laces**	Each pair of footwear shall be provided laced with a pair of Nylon BlackTubular Laces of **min 130 cm** long.

(h)	**Insock**	Removable full insock with anatomically moulded arch support
(g)	**Insole**	Insole will be non-woven polyester fabric in Grey/Black or Two-Toned with thickness of **2 – 2.5 mm**.
(k)	**Midsole**	Directly moulded Polyether based PU.
(l)	**Outsole**	Directly moulded PU with cleated design having distinct heel. Flat/Wedge Type sole design will not be accepted. Diagram of tread design at Appendix 'A' is for illustrative purposes only.
(m)	**Stitching Thread**	TKT No.40/60 2-Ply 100 % Polyester/Nylon. The thread should have a min. breaking strength of **100 N** when tested in accordance with **BS EN ISO 2062.**

CONSTRUCTION

14. The Boot Ankle Black shall be manufactured as per standard manufacturing techniques, some aspects of which is described in the succeeding paragraphs.

Upper Design

15. The components of the upper leather portion of the footwear are to be made from the respective upper material as indicated at Table 2 above. Care must be taken in cutting the leather to ensure that the tightness of the leather is in heel to toe direction. All upper components shall be fitted and closed in the best commercial practice. All edges of the upper components will be properly skived to ensure innocuous appearance.

16. The tongue shall be full bellows with cushion & lining and stitched with the vamp using parallel row of stitches (**4-5 mm** wide) and so fitted that wrinkles do not occur where it is joined to the vamp. The joining of quarter and vamp shall be done with two rows of stitches (**4-5 mm** wide). The end tab of the quarter shall be reinforced with paralle l(**4-5 mm** wide) row of stitching placed midway between the face stitching and the quarter and vamp joining stitching, in the manner illustrated in the drawing. The length of tab stitches shall be between **12 to 15 mm**. The distance between the two rows of stitching at the facing of the quarters shall not exceed **2 cm**, the first row of stitches being **3-4 mm** from the edge of the quarter. The number of stitches shall be **30-40 per/dm.**

17. The toe and counter is to be adhered to the upper and their edges have to be fixed with two rows of stitches, **3-4 mm** apart and **3-4 mm** from the edge, after proper skiving of the edges. Counter stiffener is to be correctly positioned and aligned prior to moulding. The depth of Toe shall be **55 ± 2 mm** for size 8 with increase or decrease of **2 mm** per size. The Back Strap, with width of **25 ± 2 mm,** has to end with a Jug Loop and affixed with stitching pattern as shown in the illustration.

18. All upper components and lining are to be firmly adhered together using flexible adhesive with the foam insert between them. Care should be taken to ensure that no air pockets are formed/remain between the layers. The boot is to be constructed such that it is not possible to remove the insole without damaging the footwear. Care shall be taken to maintain the space and uniform tension of the stitching at all places. All seams and stitches shall be properly hammered off and set.

Eyelets

19. The Eyelets should be affixed **15 mm (centred)** from the edge of the eyelet facing. The bottom Eyelet has to be affixed **15 mm** from the edge of the face and eyelet should be fixed **20 mm** from the top edge of the face/collar. The remaining eyelets should be fixed equidistant between the two. **The eyelets are to be of male-female type or with washers on the inside and riveted so as to result in the edges on the inside being smooth and innocuous to feel.**

PU-PU Sole

20. The sole complex has to be of the bucket/cup type of construction wherein there should be no flare in the sole along the feather line. The PU and the PU outsole has to be in **Jet Black Colour**. The tread design is to have the cleat design with channels open to the sides.

21. The physical dimensions of the sole complex are to be maintained in accordance with clause 5.8.1.1 to 5.8.3 of ISO:20345-2011. For guidance, the following dimensions may be adopted:-

Table 3 : Dimensions of PU-PU Sole

S.No.	Description	Thickness (Min)
1.	Thickness of PU outsole	1.5 mm
2.	Cleat height	2.5 mm
3.	Thickness of composite sole when measured from outside with side wall in accordance with applicable IS/ISO specs:-	**Thickness (Approx)**
	(a) At Forepart	20 mm
	(b) At Waist	16 mm
	(c) At Heel	35 mm
Note : Considering the nature of the item, the above dimensions have been provided for guidance only. *However, during technical evaluation of tender samples preference will be accorded to products that are closest to the indicated values.*		

TESTS OF COMPLETE FOOTWEAR

22. The specific requirements to be met by the complete boot would be as laid down at the following table when read in conjunction with the referred clauses of the ISO against each:-

Table 4 : Complete Footwear Compliance

Sl.No.	Component	Requirement
(a)	Mass of Whole Footwear	One pair of finished boots of Size 8 should weigh **1100 gms ± 50 gms** with an increase or decrease of **50 gms** for each bigger/smaller size respectively.
(b)	Height of Upper	The Height of Upper of the boot shall be **155 ± 2.0 mm**, for Size 8 with an increase or decrease by **3.0 mm** for each bigger and smaller size, when measured as per **Clause 5.2.2 of ISO:20345-2011**. The height of upper of each pair shall be equal.
(c)	Upper/ Outsole and Sole Interlayer Bond Strengths	Clause 5.3.1.2 and Clause 5.8.6 of ISO:20345-2011
(g)	Antistatic Footwear	Clause 6.2.2.2 of ISO:20345-2011
(h)	Resistance to Harsh Environments – Heat and Cold Insulation	Clause 6.2.3.1 and 6.2.3.2 respectively of ISO:20345-2011

(j)	Energy Absorption of Seat Region		Clause 6.2.4 of ISO:20345-2011
(k)	Full Shoe Flexing		(i) No Damage to any part of the Shoe upto 3 Lakh Cycles as per SATRA TM 92. (ii) Test is to be repeated for 1 Lakh Cycles after conditioning at 95% RH for 168 Hours) and no damage to any part is to be observed.
(l)	Tests for Sole Complex		
	(i)	Slip Resistance	Clause 5.3.5.2 of ISO:20345-2011
	(ii)	Hydrolysis Test	Clause 5.8.5 of ISO:20345-2011
	(iii)	Cleated Outsole	Clause 5.8.1 of ISO:20345-2011
	(iv)	Water Resistance	Clause 6.2.5 of ISO:20345-2011

Workmanship And Finish

23. The Boot Ankle Black shall be free from manufacturing defects, any chemical damage and the workmanship and finish throughout shall be of the best quality. The store manufactured shall be delivered in dry and clean condition.

24. The patterns of the quarters, vamp, lining, toe cap and toe puff etc. shall be so designed and shall be correctly fitted in such a way that these do not form excessive pleats at toe and counter regions during lasting. The sole and heel flashes shall be neatly trimmed smooth. There should be no blowholes or shrinkage or warpage in any part of the sole.

25. In appearance, the general workmanship, feel, finish and shade of the Boots shall conform to the standard pattern held in the custody of AHSP.

MARKING

26. On each boot, at the waist of the outer sole, the following shall be clearly and permanently marked, e.g. by embossing or branding:-

(a) Size
(b) Name/Trade Mark of Manufacturer
(c) Month & Year of Manufacture
(d) Country of Manufacture
(e) Number and Edition of Standards
(f) Symbol Markings of 'A', 'HI', 'E', 'CI', 'HR' and 'NS'. The above markings could also be included through the use of applicable pictograms.

27. In addition a Taffeta Label with woven markings as at Sl(a) to (d) is required to be stitched at the base of the tongue on the inner side on top of the lining material. Further, each pair of the footwear is to be supplied with a leaflet containing the following information as indicated at Clause 8.1 of ISO:20345-2011:-

(a) Name and full address of the manufacturer and of his authorised representatives in India.
(b) Explanation of the Symbol markings/pictograms marked on the sole.
(c) Instructions for safe use, storage and maintenance, including maximum periods between maintenance check and procedures.
(d) Instructions for cleaning and/or decontamination

QUALITY ASSURANCE

28. The Boot Ankle Black shall be manufactured only by Manufacturers who have their manufacturing/production facilities certified under relevant Quality Management Systems (QMS). The QMS has to be as per certified by authorised agency and should be valid and in-date. The purchaser may seek **supply chain certification** of the raw materials used in the manufacture of the stores against any specific order referring to this specification.

29. The stores shall conform to the requirements when tested in accordance with the method mentioned against each in the specification. Pilot samples shall be forwarded to AHSP from bulk supplies to check/monitor the quality of store whenever required. If stipulated in the contract, the manufacturer shall submit prescribed numbers as advance sample at AHSP for clearance by the Inspection Authority before commencement of Bulk Production.

30. Manufacturers/ Contractors must satisfy themselves first by carrying out thorough pre-inspection of each lot/ batch that the stores manufactured are in accordance with the contract and fully conform to the specification, before tendering to QA officer nominated under the terms of contract. It is mandatory of the manufacturers to give Certificate of Conformity from respective OEM's of the raw materials, wherever desired by AHSP, used in the construction of the boot. The AHSP reserves the right to test such items and also check with the OEM to determine the validity of the certification.

31. A declaration by the Contractor that necessary pre-inspection/ tests have been carried out on the stores tendered and the same are fit for inspection and test shall be rendered along with the challan. The declaration shall include the method followed in pre-inspection showing features checked / tested and the test reports be submitted along with challan.

SAMPLING AND CRITERIA FOR CONFORMITY

32. The Boot Ankle Black pairs of the same description nomenclature and of the same batch belonging to one size and fitting or a set of sizes and fittings offered against one challan shall constitute a lot. **The lot size shall not exceed 10 (Ten) thousand pairs.**

33. In all cases samples shall be drawn using technique of random sampling as per **IS: 4905**. The sampling officer shall first draw the samples for visual, dimensional, and construction parameters and for compliance to approved sample as per Column 3 & 4 of the Table-6 appended below.

34. If found satisfactory on examination as above, the officer may draw (out of it) and send samples for lab testing as per Column 5 & 6 of Table-6. The samples so drawn shall be subject to testing. If found satisfactory, the lot shall be accepted and inspection report shall be prepared.

Table-5: Sampling Plan

S. No.	Lot Size in Pairs	For Visual, Dimensional, Constructional Parameters and compliance to approved sample		For Laboratory Testing for Physical and Chemical Parameters	
		Number of samples to be drawn	Permissible no. of non-conforming samples	Number of samples to be drawn	Permissible no. of non-conforming samples
(1)	(2)	(3)	(4)	(5)	(6)
(a)	Up to 2500	50	5	3	0
(b)	2501 to 5000	90	8	5	0
(c)	5001 to 8000	150	14	7	1
(d)	8001 to 10000	200	20	10	1

PACKING

35. Each pair of Boots shall be wrapped in tissue paper and shall be packed in a 3-Ply corrugated box that will form a unit pack. A paper label with Nomenclature, Manufacturer's name/ Trade mark, Size and Month and Year of Manufacture shall be securely pasted on front of the unit box, which shall be clearly readable.

36. Suitable number of unit packs shall further be packed in one 7-Ply corrugated carton strong enough to withstand transit hazards and to the satisfaction of inspecting officer.

37. The Carton, thereafter shall be sealed with adhesive tapes and tape bound with polypropylene tapes. Each package shall be legibly marked with:-

(a) Nomenclature of the store.
(b) Quantity packed in the package.
(c) Lot and serial No. of the package.
(d) Month and year of manufacturer.
(e) Gross mass of the package in kg.
(f) Name and address of the consignee.
(g) Name and recognized trade mark of the supplier.

WARRANTY

38. Except as otherwise provided in the invitation to the tender, contractor/supplier shall declare that the footwear supplied to the purchaser against this specification is of best quality and workmanship and new in all respect and is strictly in accordance with the laid down specifications.

39. The contractor/supplier shall guarantee that the footwear would continue to conform to the aforesaid description and quality, including all physical and chemical parameters for all parts of the footwear, for a period of **twelve months** from the date of delivery of the footwear to the purchaser or **fifteen months** from the date of despatch from the supplier's premises, whichever is earlier and notwithstanding the fact that the purchaser (Inspector) may have inspected and /or approved the consignments.

40. If during the aforesaid period of 12/15 months the said consignment is discovered not conforming to the description and quality aforesaid or not giving

satisfactory performance or have deteriorated and the decision of the purchaser in the behalf shall be final and binding on the contractor/supplier to rectify/replace by acceptable goods or such portion or portions thereof as is found to be defective by the purchaser within a reasonable period not exceeding three months or as decided by the purchaser.

41. In such an event the warranty period shall apply to the footwear replaced from the date of replacement or otherwise the contractor/supplier shall pay the purchaser, such compensation as determined by the purchaser as may arise by reason of breach of the warranty contained herein.

Suggestion for Improvement

42. Any suggestion for improvement of this document may be forwarded to:-

The Principal Director of Clothing & Victualling
Integrated Headquarters of Ministry of Defence (Navy)
Sena Bhawan, DHQ Post, New Delhi - 110 011

Appendix – "A"

Diagram - 1: Inner Side Of Boot Ankle Black

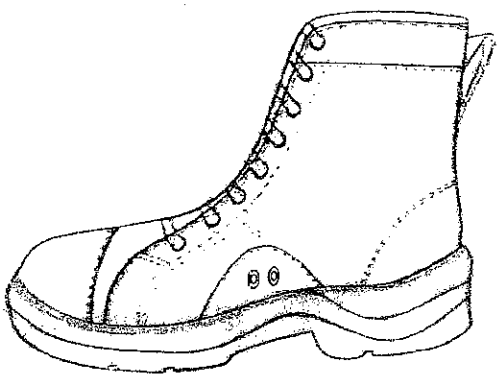


Diagram - 2: Outer Side Of Boot Ankle Black

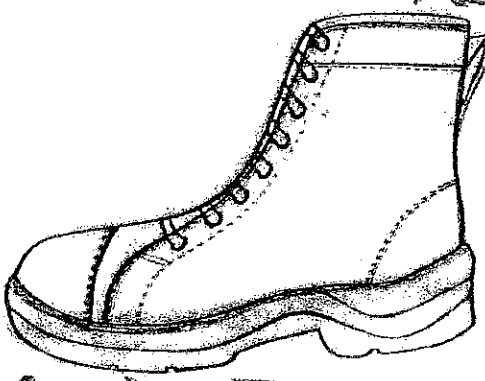
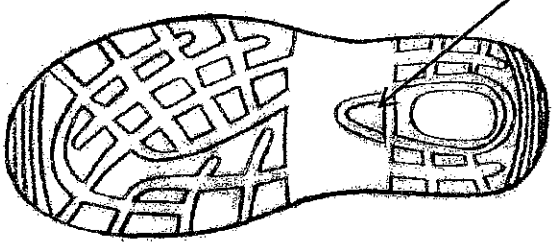


Diagram - 3: Illustrative Tread Design For Outsole



Appendix – "B"

ACCEPTANCE CRITERIA FOR PHYSICAL AND CHEMICAL PROPERTIES

Table-1: Leather Components

S.No.	Parameter	Requirement	Test Method
(a)	**Vamp and Quarters (Including Collar)**		
	Thickness	1.4 ± 1	ISO: 2589/SATRA TM 1
	Tear Strength (Min)	120 N	Clause 5.4.3 of ISO:20345-2011
	Water Vapour Permeability And Water Vapour Coefficient	Permeability ≥ 0.8 mg/(cm^2.h) & Coefficient ≥ 15 mg/cm^2	Clause 5.4.6 of ISO:20345-2011
	pH Value	≥ 3.5	Clause 5.4.7 of ISO:20345-2011
	Flexing Resistance	No damage after 100,000 cycles	ISO 5402
	Tensile Strength	17 N/mm^2	ISO 3376
	Lastometer Tests:- (a) Distension at Grain Crack (b) Load at Grain Crack	(a) 7 mm (b) 245 N	ISO 3379
	Adhesion of Finish	Min 2 N/mm	ISO 11644
	Break Pipiness Test	Min 3-4	SATRA TM 36
(b)	**Tongue & Collar**		
	Thickness	3.0 ± 1	ISO: 2589/SATRA TM 1
	Tear Strength (Min)	36 N	Clause 5.6.1 of ISO:20345-2011
	pH Value	≥ 3.5	Clause 5.6.2 of ISO:20345-2011
(c)	**Toe Piece, Counter and Back Strap with Jug Loop**		
	Thickness	1.2 ± 1	ISO: 2589/SATRA TM 1
	Tear Strength (Min)	120 N	Clause 5.4.3 of ISO:20345-2011
	Water Vapour Permeability And Water Vapour Coefficient	Permeability ≥ 0.8 mg/(cm^2.h) & Coefficient ≥ 15 mg/cm^2	Clause 5.4.6 of ISO:20345-2011
	pH Value	≥ 3.5	Clause 5.4.7 of ISO:20345-2011
	Scruff Resistance	Rating 3 (min.)	SATRA TM 140
(d)	**Counter Lining**		
	Thickness	1.0 ± 1	
	Tear Strength (Min)	30 N	Clause 5.5.1 of ISO:20345-2011
	Abrasion Resistance	51,200 Cycles (dry) 25,600 Cycles (wet)	Clause 5.5.2 of ISO:20345-2011
	Water Vapour Permeability And Water Vapour Coefficient	Permeability ≥ 2 mg/(cm^2.h) & Coefficient ≥ 20 mg/cm^2	Clause 5.5.3 of ISO:20345-2011
	pH Value	≥ 3.5	Clause 5.5.4 of ISO:20345-2011

Note :

(i) All upper leather components have to be in adherence to IS:5677.

(ii) The leather shall be suitably fat-liquored. Mineral types of fat liquors or oils shall not be used.

Table-2 : Non-Woven Lining Material

Sl.No.	Parameter	Requirement	Test Method
(a)	Blend Composition	Nylon: 100%	IS: 11195
(b)	Weave	Non Woven	Visual
(c)	Thickness	0.7 mm (min.)	SATRA TM 27
(d)	Mass (gm / m^2)	150 ± 25	IS: 1964
(e)	Tear Strength in N, Min	15	Clause 5.5.1 of ISO:20345-2011
(f)	Mullen Burst in Kg / cm^2	4(min)	IS:7016 Part-6/ IS:1966 Part-1
(g)	Abrasion Martindale, Min	25,600 Cycles (dry) 12,800 Cycles (wet)	Clause 4.5.3 of ISO:20345-2011
(h)	Colour Fastness a. Light b. Washing c. Perspiration	 4 or better 4 or better 4 or better	 IS: 2454 IS: 984 / IS:764 IS: 971
(j)	Anti-Microbial Properties for Staphylococcus Aureus (AATCC 6538) and Klebsiella Pneumonia (AATCC 4352)	90% Reduction of both bacteria.	AATCC 100-2004 (Using Nutrient Agar)
(k)	Anti-Fungal Properties for Trichophyton Mentagrophytes	Grade 0 or 1 Growth after 07 Days	AATCC 30
(l)	Water Vapour Permeability And Water Vapour Coefficient	Permeability ≥ 2 mg/(cm^2.h) & Coefficient ≥ 30 mg/cm^2	Clause 4.5.4 of ISO:20345-2011

Table 3 : Black Anodised Aluminium Eyelets

Sl.No.	Parameter	Requirement	Test Method
1.	Breaking Strength	Min 250 N	SATRA TM 149
2.	Peeling Strength	Min 250 N	SATRA TM 150
3.	Atmospheric Sulphide Tarnishing & Salt Water Corrosion	Min Grade 4	SATRA TM 310

Table-4 : Laces

Sl.No.	Parameter	Requirement	Test Method
(a)	Material & Construction	100% Nylon	IS:11195
(b)	Breaking Strength	Min 500 N	SATRA TM 94 or BS 5131-Sec 3
(c)	Abrasion Resistance (Against itself and Against D-Ring)	10,000 Cycles	SATRA TM 154
(d)	Ability To Retain Knots	Pass	SATRA TM 195

Table-5: Insock

S.No.	Parameter	Requirement	Test Method
(a)	Composition	100% Virgin PU with density of **0.4 ± 0.05 gm/c**	IS: 11195
(b)	Thickness	**Min 2 mm** at forepart and **min 5**	Clause 5.7.1 of

(c)	Top Wearing Surface	mm at heelpart 100 % non-woven Polyamide	ISO:20345-2011 IS: 11195
(d)	Anti-Microbial and Anti-Fungal Properties	As provided at Table 2 above.	
(e)	Abrasion Resistance	Clause 5.7.4.2 of ISO:20345-2011	

Table-6: Insole

S.No.	Parameter	Requirement/Norm	Test Method
(a)	Blend Composition	100% Polyester with HDPE Coating on one side	IS: 11195
(b)	Antistatic Value	Clause 4.3.4.2 of IS:15298 Pt I	
(c)	Water Absorption And Desorption	Clause 4.7.3 of IS 15298 Pt I	
(d)	Abrasion Resistance	Clause 4.3.4.2 of IS:15298 Pt I	
(e)	pH Value	Clause 4.7.2 of IS:15298 Pt I	

Table 7 :Polyether Based PU Mid Sole

Sl.No.	Parameter	Requirement / Norm	Test Method
(a)	Hardness	40 to 50 Shore 'A'	SATRA TM 205
(b)	Moulded Density	430 to 500 Kg / m^3	SATRA TM 134
(c)	Tear Strength	Min 4.0 N/mm	SATRA TM 218
Note: Only Basic test for Midsole since it is un-exposed part of the sole complex.			

Table 8 : Polyether Based PU Out Sole

Sl.No.	Parameter	Requirement	Test Method
1.	Hardness	90 ± 5 Shore 'A'	SATRA TM 205
2.	Moulded Density	900-950 Kg / m^3	SATRA TM 134
3.	Tear strength	≥ 8 kN/m	Clause 5.8.2of ISO:20345-2011
4.	Abrasion Resistance	≤ 150 mm³	Clause 5.8.3 of ISO:20345-2011
5.	Flexing Resistance	Cut growth ≤ 3 mm before 30,000 flexes	Clause 5.8.4 of ISO:20345-2011
6	Flexing Resistance upto 1,00,000 cycles	Cut growth not more than 0.03 mm/1000 cycles at –5°C and at –18° shall	Ross Flex Test
7	Upper/ Outsole and Sole Interlayer Bond Strengths (Whole boot flexing for 1,00,000 cycles).	The footwear shall be placed in RH of 100% at a temperature of 70° C for 5 days.	Clause 5.3.1.2 and Clause 5.8.6 of ISO:20345-2011.

Table9: Tests For Chemical Substances

S.No	Material	Test	Norm	Test Method
(a)	All Leather & Lining including insole/ insocks	Azo Free dyes	SG Criteria	ISO 17234, ISO 14362
		Chlorinated Phenols (PCP/TCP/TeCP/OPP)	SG Criteria	ISO 17070
		Cr-6	SG Criteria	ISO 17075
		Heavy Metals extractable	SG Criteria	ISO 105 EO4/1CP
		Formaldehyde	SG Criteria	ISO 17226
(b)	Polyester, Laces	Azo Free Dyes	SG Criteria	ISO 17234 ISO 14362
		Chlorinated Phenols (PCP/TCP/TeCP/OPP)	SG Criteria	ISO 17070
		Dispersed dyes	SG Criteria	DIN 54231

		allergenic & carcinogenic		
		Formaldehyde	SG Criteria	ISO 17226
(c)	Sole Complex	Phthalte	SG Criteria	Solvent Extraction/GCMS
		Organotins Compounds (TBT/DBT/MBT)	SG Criteria	ISO 17353
		Lead	SG Criteria	EN 1122
		Cadmium	SG Criteria	EN 1122
(d)	Eyelets	Nickel free	SG Criteria	DIN EN 12471

Table-10 : Tests For Thermoplastic Toe Puff and Counter Stiffner

Sl.No.	Parameter	Requirement / Norm	Test Method
(a)	Thickness (extracted from boot)	1.60 mm – 1.80mm	
(b)	Peel strength[1] (N/mm)	Min 0.5	SATRA TM 401
(c)	Shape retention of toe caps of finished footwear :- (a) After First Collapse (b) After Vth Collapse (c) After 2 hrs recovery	 (a)18% (b)21% (c)21%	SATRA TM 186

Note :
1. Best Results are achieved after bonding to upper at 180 °C and 200 kPa

Table-11 : Tests For PU Foam Padding

Sl.No.	Parameter	Requirement / Norm	Test Method
(a)	Material	Polyurethane Foam	IS: 7888-1976
(b)	Density, Min	24 Kg/m^3	
(c)	Compression set (50% deflection for 2 hrs at 70 ± 2° C)	28±2	
(d)	Thickness	As Indicated at Table 2	

Note: These tests are not to be carried out from extracted material