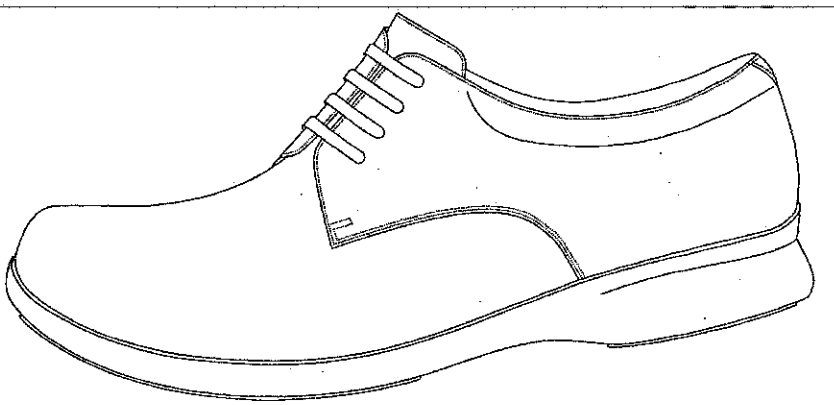
PRODUCT SPECIFICATION

Prepared for the

SOUTH AFRICAN ARMY

Shoes, Women, Ceremonial Dress



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1. Scope

This specification covers the performance, design, manufacture, test and acceptance requirements of Ceremonial Dress Shoes for use by female personnel of the South African Army.

The following requirements will be specified in tender invitations and in each order or contract:

- The size(s) and fitting(s) see 8.2 and table 7
- The packing, if other than a specified (see 11.1)

Special conditions of tender (that cover the conditions of acceptance of the shoes) are given in Annex A. Annex A forms an integral part of this specification

2. Definitions and Abbreviations

For the purpose of this specification, the following definitions shall apply:

acceptable: acceptable to the SA Army and/or the Procurement Authority
batch: A quantity of shoes manufactured at one time, covered by one work ticket and recorded on the product for traceability
defective: A pair of shoes that an inspection is judged to have a major fault that is likely to cause shoes to fail in wear, or a pair of shoes that is unsightly to the extent that it is unsuitable for issue.
heel height: The height, in millimetres, of the heel on a finished shoe, measured along a vertical line at the center of the back of the heel
inorganic tanned leather: Leather tanned with an inorganic tanning agent (or agents) and that may have been retanned with an organic tanning agent (or agents)
TPU: Thermo Polyurethane
FIFO: first in, first out (stock issuing approach)
lot: A consignment of finished shoes presented for inspection at one time, intended despatch to one destination
nominal: subject to the tolerances normal to good manufacturing practice
NSN: National Stock Number
product: Shoes Ceremonial Dress are general purpose footwear for use by personnel on base and off duty.
roughened: Descriptive of a material that has had its original surface removed using a sharp wire brush or an abrasive paper with a grit that avoids burning the surface of the material, and in the case of leather, has had its entire grain surface (when relevant) removed and the fibres raised without impairing the strength of the leather.
SANS: South African National Standard

3. Applicable Documents

The following documents contain provisions which, through reference in this text, constitute provisions of this specification. All documents are subject to revision and, since any reference to a document is deemed to be a reference to the latest edition of that document, parties to agreements based on this specification are encouraged to take steps to ensure the use of the most recent editions of the documents indicated below. Information on currently valid national, international and CKS documents may be obtained from the South African Bureau of Standards*.

BS 5131-1-1.2, *Methods of test for footwear and footwear materials – Part 1: Adhesives – Section 1.2: Resistance of adhesive joints to peeling.*
05181-100-296, *Corrugated Board Boxes for Clothing and Footwear.*
SANS 770, *Footwear Laces.*
SANS 1362, *Sewing Threads.*
SANS 1437, *Footwear soling material and footwear sole and heel components of rubber and plastics.*
SANS 579, *Textiles, Mass per unit area of conditioned textile fabric.*
SANS 5488, *Width of ribbons and other narrow fabrics*
SANS 5616, *Preparation of samples (leather, elastomeric material and other footwear materials).*
SANS 5626, *Leather or footwear components – pH value and difference figure of an aqueous extract.*
SANS 5635, *Shrinkage temperature of leather.*
SANS 5636, *Determination of (a) tensile strength, (b) percentage elongation caused by a specified force, (c) percentage elongation at break of leather.*
SANS 5640, *Determination of flex resistance (leather fibreboard and cellulose fibreboard inner soles).*
SANS 5642, *Determination of water absorption of inner soles an inner sole.*
SANS 5646, *Determination of bond strength of rib attachment (stuck-on rib inner soles)*
SANS 5647, *Leather, footwear upper and lining materials – Flex endurance.*
SANS 5649, *Determination of density of elastomeric material.*
SANS 5650, *Determination of hardness of elastomeric material.*
SANS 5962, *Determination of wet split tear strength of inner sole and runner materials (other than leather).*
SANS 5111, *Accumulated impact strength of steel shanks.*
SANS 51112, *Bending modules of steel shanks for footwear.*
SANS 51113, *Resilience of steel shanks for footwear.*
SANS 51117, *Moisture stability of insole boards and shank boards for footwear.*
SANS 51191, *Leather – Adhesion of finish*
SANS 6212, *Leather and fiberboard, measurement of thickness.*
SANS 51213, *Leather boards or fiberboards – Collapsing load of molded shapes.*
SANS 51214, *Footwear materials – Collapsing load of domed shapes.*
SANS 51215, *Abrasion resistance of footwear components (Martindale)*
SANS 51233, *Footwear – Toe-puff and stiffener material – shape retention.*

Standards South Africa: Tel. +27 (0) 12 4287911

4. Style

The style of the womens ceremonial dress shoes is as follows:

- medium height of molded TPU unit sole & Heel, semi round toe,
- Gibson upper with plain vamp and closed fishtail back-seam.
- the top-line shall be folded with one row of top-line stitching.
- lining and socking material shall be of leather. The lining shall be folded over top line closed cell foam.
- soling shall be a black Thermo Polyurethane pre molded sole and heel unit of acceptable design and fit.

5. Illustrations

Illustrations are not to scale and are for guidance only.

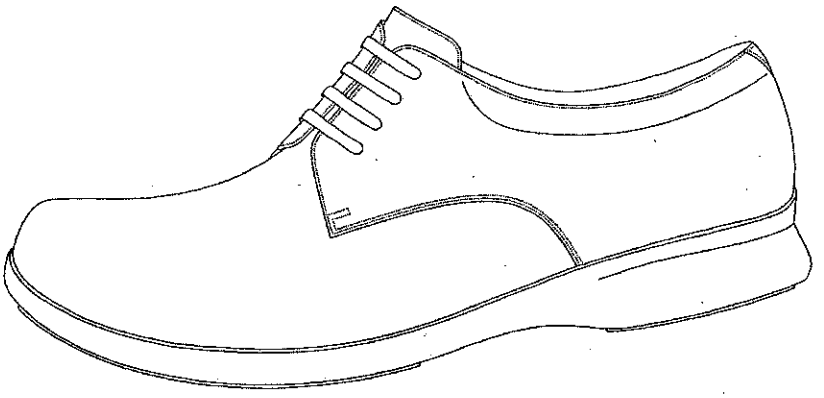

Figure 1 – Side view of Shoe

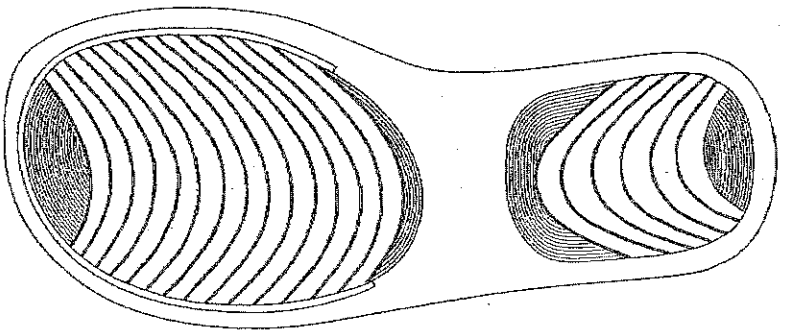

Figure 2 – Tread pattern of shoe

6. Client Furnished Materials

No materials will be supplied by the South African Army.

7. Component Materials

7.1 Upper material and components

7.1.1 Upper Leather

The leather used for the uppers shall:

- be of genuine patent leather.
- be free from defects that affect its appearance or can affect its serviceability (or both), shall not be pipy, loose grained, hard or bony and shall be well fleshed and free from flay marks.

7.1.1.1 Colour

The colour of the leather shall be Black. A match colour No:340C "Jet Black" of CKS 129

7.1.1.2 Physical and chemical requirements for genuine patent leather

When tested in accordance with the relevant methods given in column 3 of table 1, genuine patent leather shall comply with the requirements given in column 2 of table 1

Table 1 - Physical and chemical requirements for genuine patent leather

1 Property	2 Requirement	3 Test method
Shrinkage temperature, °C, min.....	100	SANS method 5635
Extractable matter content (on a moisture-free basis), %.....	3,0 – 8,0	SANS method 5617[1] SANS method 5618
pH value ..... Difference between pH values, max	3,3 0,7	SANS method 626[2]
Sulphated ash of water-soluble matter (on a moisture-free and extractable-matter free basis), % max.....	1,7	SANS method 5620
Resistance to wet rubbing, grain side Permissible colour change, rating min.....	4	SANS method 51080
Adhesion of finish, N, min. Dry..... Wet.....	3,5 2,0	SANS method 51191
Flex endurance (flexometer) After 10 000 cycles	Only fine cracks in the finish are permitted	SANS method 5647
After 30 000 cycles	Neither the width nor the depth of these cracks shall have increased appreciably and there shall be no sign of flaking or separating of the finish	
Tensile strength, MPa, min,.....	10	SANS method 5636
Distension, mm, min At finish crack ..... At grain crack	6,5 7,0	SANS method 5689[3]

1) Use SANS method 618, but express the results on a volatile matter-free basis, using SANS method 5617 to determine the volatile percentage.
2) Record the first pH value and also the difference between the two measured pH values.
3) Report the distension at finish crack and at grain crack

Note: Colour difference has been defined by referring to the international geometric Grey Scale for the assessment of change in colour. It is accepted that this is not a perfect method. The SABS uses a readily available colour difference meter and will, on request, give the values that are used in work on that instrument. It would be preferable to carry out inter-laboratory tests to obtain a correlation between the results given by the different instruments in use.

7.1.2 Lining Material

7.1.2.1 Vamp and quarter lining material

Vamp and quarter lining shall be of a natural color chrome tanned syntanned – retanned grain side leather that complies with the requirements of CKS 189 with the exception of perspiration resistance.

7.1.3 Toe Puffs and Stiffeners

When tested in accordance with the relevant methods given in Column 4 of table 2, toe puffs and stiffeners shall comply with the requirements given in columns 2 and 3 of table 2 respectively.

Toe puffs shall be thin enough to avoid a print-through effect on the finished shoe

Table 2 – Requirements for toe-puffs and stiffeners

1	2	3	4
Property	Requirement		Test method
	Toe-puffs	Stiffeners	
First collapsing load, N, min.....	30-80	80-130	SANS 51213[1]
Resilience, %, min.....	50	40	SANS 51214[1]
Moisture resistance, %, in.....	65	60	SANS method
Area shape retention Initial, %.....	60	70	SANS 51233
After 10 collapses, %, min	50	60	
Peel strength, N/cm, min.....			BS 5131-1-1-2
Dry.....	5,0	6,0	
Wet.....	3,0	-	

[1)] Report the first collapsing load and the percentage resilience. Calculate the percentage resistance using formula.

7.1.4 Laces

The laces shall:

- be nylon laces of length at least 660 mm.
- have fused ends and shall comply with the relevant requirements for type L2 of SABS 770.
- be of a colour that is a match to the upper leather.

7.1.5 Threads

The threads used for attaching the various upper components shall:

- comply with the requirements of SANS 1362
- be a polyester-and-cotton core-spun thread, ticket No: 50. except for the vamping and stay rows, and be ticket No: 36

The seam used for stitching the forepart of the sole and heel unit shall be a lock stitch seam, with a top thread of 100% Polyester braid of 1.0mm in diameter, and a bobbin thread of polycotton tex 600 5 ply

7.2 Bottom Materials and Components

7.2.1 Inner soles

The innersole shall:

- be of cellulose fibreboard with a minimum thickness of 1,75mm +- 0,25mm
- comply with the requirements given in column 2 of table 3 when tested in accordance with the relevant methods given in column 3 of table 3

Table 3 - Requirements of cellulose fibreboard inner sole and foam

1	2	3
Property	**Requirement**	**Test method**
Cellulose fiberboard Water absorption, g/25 cm2, min.....	0,40	SANS method 5642
pH value, min.....	3,3	SANS method 5626[1)]
Difference figure, max.....	0,7	
Wet stitch tear strength, N/mm of thickness, min.....	40	SANS method 5633
Flex endurance, cycles, min	3 000	SANS method 640
Wet split tear strength, N/mm of thickness, min.....	0,20	SANS method 5962

[1)] Record the first pH value and also the difference between the two measured pH values

7.2.2 Outer soles

The outer soles shall:

- be a pre moulded Thermo Polyurethane sole & heel unit (see figure 2)
- be Black
  - of thickness which complies with the requirements given in column 2 of table 4, when tested in accordance with the relevant methods given in column 3 of table 4

Table 4 - Requirements of Sole

1	2	3
Property	**Requirement**	**Test method**
Thickness mm, min....+- 0.20.....	5.0	SANS method 6212
Toe area.....	3.6	
Forepart area between cleats.....	5.0	
Including cleats.....	SOLID	
Heel strike area.....		
Shore A Hardness.....	7.5	

7.2.3 Shanks

Shanks shall be made of steel, of thickness at least 1,0 mm, and of width at least 9.0 mm. When tested in accordance with the relevant methods given in column 3 of table 5, shanks shall comply with the requirements given in column 2 of table 5.

Table 5 - Requirements for steel shanks

1 Property	2 Requirement	3 Test method
Accumulated impact strength, J, min.....	40	SANS method 51111
Bending modulus, N, min.....	700	SANS method 51112
Resilience, %, min.....	80	SANS method 51113

7.2.4 Bottom filler

The bottom filler shall:

- be a felt of thickness 3,0mm +- 0,3mm and
- comply with the requirements given in column 2 of table 6 when tested in accordance with the relevant methods given column 3 of table 6

Table 6 - Requirements for felt bottom filler

1 Property	2 Requirement	3 Test method
Mass per unit area (free from non-fibrous material, g/m^2, min	490	SANS 579
Non-fibrous material content, &, max.....	3.4	SANS 5113

7.2.5 Inner sole socks

Inner sole socks shall be a full socks of the material specified in 7.1.2.1 and shall have been laminated to a close cell foam material on substance 2.5mm ±0.50mm

8. Construction

8.1 General

The general construction requirements are the following:

- the method of construction shall be according to the stuck-on principle and shall be such that the upper is flat lasted and the inner sole as detailed in 7.2.1 and the sole as detailed in 7.2.2 respectively, are used.

8.2 Lasts

The last shall have a semi round toe as shown in figure 1.

They shall be available in wide fitting, and in sizes 210 (2) to 280 (10).

8.3 Upper Construction

The upper shall be a ceremonial Gibson style (see figure 1) with:

- one piece vamp & tongue.
- the top line folded.
- the quarter lining folded over close cell foam.
- all stitching having 12 to 14 stitches per 25 mm
- the back seam as a closed seam, and taped with the fish tail

8.4 Closing

8.4.1 Skiving

Skiving shall be done in a manner that will prevent the formation of ridges inside the shoe.

8.4.2 Folding

Folding shall be wide enough to allow the edge stitching to pass through the folded edge. Slashes shall not extend further than the stitching line.

8.4.3 Seams

The seams shall comply with the following requirements:

- all upper seams shall be free from ridges and roughness.
- there shall be no loose, ragged or uneven seams and all loose thread ends shall have been removed.
- all seams shall be lock-stitch seams.
- thread tensions shall be so balanced that the lock is located in the centre of the materials being stitched.
- the back seam shall be properly reduced or rubbed down prior to the application of the adhesive reinforcing tape

8.4.4 Eyelets

The shoes shall be fitted with four pairs of invisible-setting eyelets and shall be evenly spaced

8.5 Preparation of bottom stock

8.5.1 Inner soles

The inner soles shall be accurately cut to the correct shape of the last

8.6 Making

8.6.1 Lasting

Toe-puffs and stiffeners of the correct size and properly activated shall be correctly positioned in the uppers.

Stiffeners shall be back-part molded after insertion and shall be well stuck to both the lining and the upper.

The seats shall be assembled in such a manner and the upper so pulled over the last as to provide an even lasted margin of at least 13 mm.

Cement lasting shall be used for the forepart and waist.

Tack lasting shall be used for the seat areas.

8.6.2 Pounding

The lasting margin shall be pounded to a smooth level surface, without the removal of any appreciable quantity of lasted upper.

8.6.3 Shank fitting and bottom filling

The shank fitting and bottom filling shall be done as follows:

- the forward end of the shank shall be flush with the inner sole at the joint line
- shanks shall be flush with the waist of the inner soles and shall fit the contour of the shoe bottom.
- the shank shall be securely attached to the inner sole.
- the felt bottom filler (see 7.2.4) shall be applied carefully and pressed firmly into the inner sole cavity, and shall extend with a uniform even surface to the shank portion.
- cavities at the heel and the shank portion shall be filled with a strip of the felt bottom filler and the strip shall extend over the steel shank.

8.6.4 Outer sole attachment

- the lasted overlay of the upper leather shall be roughened.
- the roughened portions of the outer soles and of the lasted overlay of the upper shall be coated with an adhesive that is compatible with the materials that are to be stuck together.
- when this adhesive has dried, the lasted upper and the sole shall be stuck together, using a stuck on press, and using time and temperature for activation of the adhesive and the pressure recommended by the adhesive manufacturer

8.6.5 Outer sole stitching

The requirements for the outer sole stitching are as follows:

- the forepart of the sole and heel unit shall be lock stitched from just beyond both inside and outside joint positions with an average of four stitches per 25mm

9. Workmanship and finish

9.1 General

Workmanship and finish shall be of a standard at least equal to that of the pre-production samples. (See annex A.2)

9.2 Inner sole socks

Each pair of shoes shall have full socks laminated to a close cell foam as specified in 7.2.5.

9.3 Upper cleaning and polishing

The upper leather shall be properly cleaned and polished.

9.4 Freedom from defects

Inner soles and linings shall be free from protruding grindery, roughness and pleats.

9.5 Laces

Laces shall be of the correct length and colour that is an acceptable match to the colour of the upper leather, and shall have fused ends.

10. National Stock Numbers

The shoes shall:

- be available wide fitting only and in the size range 210 to 280
- the National Stock Numbers for the different sizes are as follows

Table 7 – National Stock Numbers

1 National Stock Number	2 Size

11. Packaging and marking

11.1 Packing

The packaging shall comply with the following requirements:

- the shoes shall be delivered in commercially clean and dry condition.
- each pair of shoes shall be packed in an individual shoe box that will protect it from damage during normal transportation, handling and storage.
- the boxes shall be packed in a corrugated board bulk container that complies with the requirements of specification 05181-100-209, "Corrugated Board Boxes for Clothing and Footwear", which is then labelled and sealed.
- only shoes of the same size shall be packed together in a bulk container. Shoes of different sizes may be packed together to accommodate the last part of an order or contract.
- the number of pairs in each bulk container shall be as follows:
  - Sizes 210(2)–245(6): 25 per box and
  - Sizes 250(6 ½)-and larger: 22 per box.

11.2. Marking

11.2.1 Shoes

Each shoe shall bear the following information, neatly and legibly impressed on the waist of the inner sole by means of steel stamps

- the manufacturer's name or trade mark;
- the size and fitting;
- the year of manufacture; and
- the National Stock number (NSN).

11.2.2 Shoe Boxes

Shoe boxes shall bear the following information written in black, clearly and indelibly marked on the short end of the shoe box:

- the description; the size of the shoe;
- the fitting number;
- the manufacturer's name, trade name or trade mark;
- the relevant NSN number; ticket/batch number; and
- any further information specified by the purchaser.

11.2.3 Bulk containers

In addition to the address for delivery, each bulk container shall be labelled with additional information on the four sides of the lids (outer component). The information shall be written or printed in legible and indelible block letters and the label shall be of a minimum A4-paper size, and shall contain the following:

- the manufacturer's name or trade mark or both;
- the description;
- the size and fitting;

- the National Stock Number (NSN);
- the quantity;
- the order number;
- the year of manufacture;
- the gross mass;
- the inspection authority inspection stamp

11.3 Care-labelling

A swing label with care and use instructions that shall contain the substance of the wording listed below and shall be attached through the eyelet of one shoe of each pair of shoes:

- Be sure your shoes fit properly.
- Clean your shoes daily.
- Remove all dust and dirt using a brush or wet newspaper.
- Do not leave near heat as this will make the leather hard and brittle.
- Do not use any form of heat on your shoes.

12. Test Methods

12.1 Conditioning of test specimens and test conditions

Use SANS method 5616 to condition samples and prepare them for testing. All physical tests and measurements shall be carried out under these conditions unless otherwise specified in the relevant test method.

12.2 Test Methods

Use the test methods as prescribed in tables 1 to 6.

ANNEXURE A

(Normative)

SPECIAL CONDITIONS OF TENDER

A-1 GENERAL

A-1.1 Unless otherwise stated, the South African Army (or an organization appointed by it), shall be the inspecting authority.

A-1.2 Three pre-production sample shoes shall have been inspected, tested and approved by the inspecting authority before bulk production is commenced. Each one of these samples shall be accompanied by a trim chart containing a sample of each component material and the relevant certificates. It shall be the duty of the manufacturer to give adequate notice to the inspecting authority of the availability of these samples.

A-1.3 The shoes shall be subject to inspection during the course of manufacture. The inspector shall, during normal working hours, be given all reasonable facilities for carrying out his duties and shall have the right of entry into the contractor's factory and the factory or works of any subcontractor where work on shoes supplied to this specification may be in progress.

A-1.4 The contractor shall inspect the finished shoes for compliance with the specification before submitting them to the inspecting authority for final inspection.

A-1.5 Before acceptance, the shoes shall have been inspected and tested by the inspecting authority and found to comply with the requirements of the specification.

A-2 DOCUMENTATION

One container of each consignment shall be marked "DOCUMENTS" and in addition to the shoes, shall contain the following:

a) The packaging slip or delivery note;
b) Where applicable the inspection certificate(s); and
c) A copy of the invoice containing the following information:

- the order number;
- the financial authority number; and
- a full description of the consignment, i.e. national stock number, quantity, etc.