PRIVATE SPECIFICATION

Prepared for

SOUTH AFRICAN AIRWAYS

A STAR ALLIANCE MEMBER

Flight Deck Crew, Cabin Crew and Ground Staff, Ladies, Step–out Shoe

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1. Scope

This specification covers the requirements for the materials and construction of ladies' court shoes with a square toe and high-heel, suitable for use by the female personnel of South African Airways.

2. Definitions and Abbreviations

For the purposes of this specification, the following definitions apply:

acceptable: acceptable to South African Airways

nominal: subject to the tolerances normal to good manufacturing practice

calf leather skin from an immature bovine animal not exceeding 167 sq. dmin area, that has been suitably trimmed

3. Style

- **Construction:**
  - according to the stuck-on, flat lasted principle
  - square toe
  - high-heel
- **Upper:** full-grained, chrome-tanned calf leather
- **Lining and socking:**
  - breathable synthetic lining with anti-fungal and anti-bacterial, absorption and desorption properties
  - Full sock to be laminated to the footbed
- **Heel grip:** non-woven material
- **Toe puff:** heat- or solvent-activated; with a woven carrier
- **Heel stiffener:** heat- or solvent activated with a woven carrier
- **Footbed:**
  - Latex or Poron PU (or acceptable alternative that shall promote comfort)
  - The footbed must run the full length of the shoe.
- **Insole board:** cellulose fibreboard
- **Shank:** Steel shank
- **Shank board:** of thickness at least 2.0 mm
- **Outer sole:**
  - Thermoplastic rubber (TPR)
  - Anti-slip grip. Approximate Shore A hardness of 75-78.
- **Heel:** spray-stacked plastic (ABS) heel, 70 mm high incl. top piece.

4. Digital images

The digital images below shall serve as a guideline and depict an example of a typical court shoe, but shall not be limited to the exact design given below. Similar designs will be considered.

Figure 1 – Example of typical side view

Figure 2 – Example of a typical back view

Figure 3 – Example of a typical front view

NOTE: *Perforations are not compulsory, but to serve as an example only.*

Figure 4 – Example of a typical top view

Figure 5 – Example of typical outer sole

5. Client furnished materials

No materials shall be supplied by the South African Airways.

6. Component materials

The following materials to be supplied and used by the manufacturer.

NOTE: *All components listed in 6.2 and 6.3 shall be manufactured in the Republic of South Africa. In instances where the raw material and/or finished components are not available in the Republic of South Africa, the onus shall be on the bidder to apply for exemption certificates from DTI. Exemption certificates, where relevant, shall be submitted together with each bid.*

6.1 Last

- square-toed as shown in figures 1 to 4
- available in one generous EE fitting
- in full and half sizes from UK2 to UK10 (8.46mm grade rule)
- Heel height to be approximately 70 mm including the top-piece for a UK4 and to be graded accordingly throughout the range of sizes.

6.2 Upper materials and components

6.2.1 Upper leather

6.2.1.1 General requirements

- full-grained, chrome-tanned calf leather, 0.8 mm to 1.4 mm thickness when measured according to SANS 2589, *Leather – Physical and mechanical tests – Determination of thickness*
- soft, mellow feel
- grain to have a fine break
- well-tanned of acceptable quality
- dyed through and finished so that it does not obscure the natural grain pattern of the leather
- free from defects that affect its appearance or that might affect its serviceability (or both),
- not be pipy, loose grained, hard or bony
- well fleshed and free from flay marks

6.2.1.2 Colour

The colour to be matt black as agreed upon between SAA and the supplier (Colour 400c-12 “Jet Black” of CKS 129 to serve as a guideline)

6.2.1.3 Physical and chemical requirements for upper leather

After conditioning according to SANS 5616, *Preparation of samples (leather, elastomeric material and other footwear materials,* to comply with the requirements of table 1.

Table 1 — Physical and chemical requirements for upper leather

1	2	3
Property	**Requirement**	**SANS number (unless otherwise indicated)**
Shrinkage temperature, °C, min.	100	3380
Chromic oxide content (on a moisture-free and grease-free basis), %, min.	3,5	5398-1
Grease content (on a moisture-free basis), %	3,0 to 8,0	5618
pH value, min.	3,3	4045
Resistance to rubbing, grain side, permissible colour change, rating, min. Dry, 150 cycles ..... Wet, 50 cycles	 4 – 5 4 – 5	11640
Adhesion of finish, N, min. Dry ..... Wet	 3,5 2,0	11644
Flex endurance (flexometer) After 10 000 cycles ..... After 30 000 cycles	 Only fine cracks in the finish are permitted Neither the width nor the depth of these cracks shall have increased appreciably and there shall be no sign of the finish flaking or separating	17694
Grain strength, stretch and set at a pressure of 1,2 MPa Grain strength [a] ..... Stretch, %, min. ..... Set, %, min.	 There shall be no sign of finish cracking or grain cracking 12 4	5639
Elongation at break, %, min.	35	5636
Tensile strength, MPa, min.	15	5636
Distension, mm, min. At finish crack ..... At grain crack	 6,5 7,0	5669
Scuff resistance, permissible colour change, rating, max.	5	5884 and 5885
[a] Report any cracking of the finish or the grain before a pressure of 1,2 MPa is reached, as detailed in section 3(c) of SANS 5639.		

6.2.2 Lining and socking

6.2.2.1 General requirements

- breathable synthetic material
- at least 0.9 mm thick
- anti-fungal and anti-bacterial properties
- colour to be black or metallic grey.
- insole socks to be full socks

6.2.2.2 Performance requirements

After conditioning in accordance with SANS 5616, Preparation of samples (leather, elastomeric material and other footwear materials, shall comply with the performance requirements of table 2.

Table 2 – Lining and socking performance requirements

1	2	3
Property	**Requirement**	**SANS number (unless otherwise indicated)**
Abrasion resistance After 25 000 cycles dry ..... After 12 800 cycles wet	The wearing surface shall not develop any holes	17704
Flex endurance (flexometer) Afer 10 000 cycles	No sign of cracking	17694

6.2.3 Heel grip

6.2.3.1 General requirements

- non-woven material
- of thickness between 0,7 mm and 1,0 mm when measured according to SANS 2589, *Leather – Physical and mechanical tests – Determination of thickness*

6.2.3.2 Performance requirements

- to comply with the abrasion resistance of table 2

6.2.4 Toe-puff and heel stiffener

6.2.4.1 General requirements

Toe puff

- heat- or solvent-activated; with woven carrier
- thickness between 0,7 mm and 0,8 mm when measured according to SANS 2589, *Leather – Physical and mechanical tests – Determination of thickness*

Heel stiffener

- heat- or solvent activated with a woven carrier
- thickness between 0,8 mm and 1,0 mm when measured according to SANS 2589, *Leather – Physical and mechanical tests – Determination of thickness*
- to extend into the waist area on the inside and to the start of the waist area on the outside

6.2.4.2 Performance requirements

After conditioning in accordance with SANS 5616, Preparation of samples (leather, elastomeric material and other footwear materials, shall comply with the performance requirements of table 3.

Table 3 –Toe-puff and heel stiffener performance requirements

1	2	3	4
Property	**Requirement**		**SANS number (unless otherwise indicated)**
	Toe-puffs	Stiffeners	
First collapsing load, N, min.	30-80	80-130	20864
Resilience, %, min.	50	40	20864
Moisture resistance, %, min.	65	60	20864
Area shape retention, % min.			20864
Initial	60	60	
After 10 collapses	50	50	
Peel strength, N/cm, min.			BS 5131-1-1.2
Dry	5,0	6,0	
Wet	3,0	—	

6.2.5 Sewing thread

- to comply with the requirements of sans 1362 “sewing thread”
- ticket no. 50

6.3 Bottom materials and components

6.3.1 Inner soles

- **Latex or Poron PU footbed** (or acceptable alternative that shall promote comfort). The footbed to be at least 3mm thick and to be laminated to the sock.
- **Insole board** — cellulose fibreboard of thickness (measured according to SANS 2589) in the range of 1.50mm ±0,25 mm that complies with the requirements of table 4
- **Shank board** — the waist and seat area to be reinforced with shank board of thickness (measured according to SANS 2589) at least 2.0 mm that complies with the requirements of table 5

Table 4 – Cellulose fibreboard insole requirements

1	2	3
Property	**Requirement**	**SANS number (unless otherwise indicated)**
Water absorption, g/25 cm^2, min.	0,40	5642
pH value, min. ..... **Difference figure**, max	3,3 0,7	4045
Wet stitch tear strength, N/mm of thickness, min.	40	5633
Flex endurance, cycles, min.	3 000	5640
Wet split tear strength, N/mm of thickness, min.	0,20	5962
Tensile strength, MPa, min. Dry ..... Wet	 5,0 3,0	BS 5131-4-4.5
Moisture stability, linear change, %, max	3,0	6117

Table 5 – Requirements for shank board

1	2	3
Property	**Requirement**	**SANS number (unless otherwise indicated)**
Tensile strength, MPa, min.		BS 5131-4-4.5
Dry		
Along	49	
Across	22	
Wet		
Along	22	
Across	8,8	
Heel pin holding strength, kN, min.		BS 5131-4-4.4
Dry	1,10	
Wet	0,98	
Moisture stability, linear change, %, max	3,0	6117

6.3.2 Outer sole

- pre-moulded thermoplastic rubber (TPR)
- Shore A harness approximately 75-78
- thickness to comply with table 6
- to have an anti-slip tread pattern (example as given in figure 5)

Table 6 – Outer sole requirements

1	2	3
Property	**Requirement**	**SANS number (unless otherwise indicated)**
Thickness, mm, min.		2589
Toe area.....	3,2	
Forepart area	3,6	
Waist area	2,8	
Seat area	2,1	

6.3.3 Heel

NOTE: *The heel compound has to be black throughout and such that it will never expose another colour should scuffing occur.*

- spray-stacked plastic (ABS) heel
- attached with 6 nails
- total height 70 mm – including top piece
- when tested according to SANS 6110, *Accumulated impact strength of ladies shoe heels of height greater than 25mm* to have an accumulated impact strength exceeding 80 J

6.3.4 Heel top-piece

- acceptable pre-moulded plastics material, preferably TPU
- of thickness (measured according to SANS 2589) at least 5.0 mm
- width and length to fit the heel within a tolerance of ± 1 mm
- colour to be black
- top-piece material to comply with the requirements of table 7

Table 7 – Requirements for heel top-pieces

1	2	3
Property	**Requirement**	**SANS number (unless otherwise indicated)**
Density, g/cm^3, min.	1,2	5649
Hardness, IRH, min.	90	5650

6.3.5 Shanks

NOTE: *Non-metal shanks shall be preferred if possible (to prevent activation of metal detectors on airports), but the type of shank may not compromise the quality of the shoes.*

- made of steel compound
- fluted
- thickness at least 1.0 mm

- width at least 9.5 mm
- to extend from the joint line to a distance of at least 25 mm under the heel
- to conform to the bottom contour of the last

7. Workmanship

Court shoes to be:

- made in accordance with sound manufacturing practice with first-class workmanship throughout
- of uniform and acceptable make, colour and finish
- at least equal to the sealed sample that is acceptable to South African Airways.

Shall be free from:

- defects, that affect their appearance or may affect their serviceability (or both)
- injurious folds and wrinkles in the lining
- spots and stains that might have occurred during manufacture

Seams and stitches to be:

- smooth and uniform
- free from twists, pleats and puckers
- sufficiently extensible to avoid seam cracking and undue shrinkage in use

Ends of sewing to be:

- trimmed and loose threads removed
- back-tacked if unsecured

8. Sizes

Court shoes shall:

- be supplied in sizes UK2 – UK10 including half sizes and in one generous EE fitting

9. Constructional requirements

9.1 Upper construction

9.1.1 Pattern

- the style of the pattern to be that of a court shoe as shown in Figures 1 to 4 or similar
- upper to have seam on the inside waist area.
- vamp and quarter areas to be lined with a one piece lining
- folding to be wide enough to allow the edge stitching to pass through the folded edge

9.1.2 Attachment of upper components

- skiving to be done in a manner that will prevent the formation of ridges inside the shoe
- stitch length to be 12 to 14 stitches per 25 mm
- the top-line stitching to be one row right around the folded edge

9.1.3 Seams

- upper closing to be in accordance with sound manufacturing practice
- inside seams to be free from ridges and roughness
- no loose, ragged or uneven seams
- thread tensions on lock-stitch seams to be so balanced that the lock is located in the centre of the materials being stitched
- to be free from loose thread ends

9.1.4 Back seam

- as shown in figure 2
- be a closed seam, properly reduced or rubbed down prior to the application of the adhesive reinforcing tape with the fish tail stitched along the edge

9.1.5 Seams and stitches

- smooth and uniform
- free from twists, pleats and puckers
- sufficiently extensible to avoid seam cracking and undue shrinkage in use
- end of seams and stitching shall be trimmed and loose threads removed

9.2 Bottom construction

9.2.1 Preparation of bottom stock

9.2.2 Inner soles

- insoles and shank board to be accurately cut and moulded to the shape of the last
- shank board reinforcement in the waist and seat area to be securely stuck to the insole material
- latex or Poron PU footbed (or acceptable alternative that shall promote comfort) to be positioned correctly and laminated to the sock

9.2.3 Outer soles

- accurately cut to the correct shape
- inner side of the outer sole to be roughened

9.2.4 Heel top-piece attachment

- properly attached to the tops of the heels by means of at least two top-piece attaching pins of the correct type and length.

9.3 Lasting

9.3.1 Lasting

- toe-puffs and stiffeners of the correct size, skived and properly activated to be correctly positioned in the uppers
- stiffeners to be back-part moulded after insertion and be well stuck to both the lining and the upper
- the assembled upper to be pulled over the last and the resulting lasting overlay to be at least 13 mm
- uppers to be cement lasted in the forepart and waist and tack lasted in the seat area
- uppers to remain on the lasts long enough to allow the components to set

9.3.2 Pounding

- the lasted upper leather to be pounded to a level surface on the lasted overlay without removing an appreciable quantity of the lasted upper leather round the toe

9.3.3 Shank fitting and bottom filling

- forward end of the shank to lie flush with the inner sole joint line
- fit the contour of the shoe bottom
- securely attached to the insole

- bottom filler to be stuck in the inner sole cavity and to extend with a uniform even surface to the shank portion
- all other cavities to be filled with felt to ensure a smooth surface

9.3.4 Upper roughening

- the lasted-in margin of the upper leather to be so roughened as to raise the leather fibres adequately without impairing the strength of the leather

9.3.5 Outer-sole attachment

- the lasted margin of the upper leather to be adequately roughened
- the roughened and treated parts of the outer sole and heel units and the lasted margin of the upper to be coated with an adhesive that is compatible with the materials that are to be stuck together
- the lasted upper and sole to be stuck together using the recommendations of the adhesive manufacturer

9.3.6 Heel attachment

- each heel to be attached to the shoe by at least 6 (six) heel attaching nails
- heel attaching nails to penetrate to a depth of at least 15 mm into the heel
- nails to be driven into the heel at an angle such that they do not break through the visible surface of the heel
- force required to pull a heel off to be at least 550 N when tested in accordance with SANS 6131, *Pull off strength of ladies' shoe heels*

9.3.7 Peeling strength

- peeling strength of the attachment of an outer sole or outer sole and heel unit, determined in accordance with SANS 184, *The determination of the peeling load of direct moulded footwear*, at least 48 h after attachment, to be at least 100 N in the forepart and waist area of the shoe

9.3.8 Insole socks

- each pair of shoes to be provided with full insole socks
- correctly positioned and adequately stuck down

9.3.9 Cleaning

- uppers to be properly cleaned and polished
- entire bottom to be properly cleaned

10. Label

A swing label with care and use instructions that includes the substance of the wording in (a) to (d) to accompany each pair of shoes.

a) Be sure your shoes fit properly.

b) Clean your shoes daily. Remove all dust and dirt using a brush.
Apply a thin layer of good shoe polish to the upper leather with a brush, paying special attention around the seams. Leave for a few minutes then brush well.

c) Remove all mud and dirt from wet shoes by wiping, brushing or rubbing and dry with a cloth. Apply a layer of good shoe polish to the upper leather, especially to the seams. Place the shoes in a cool, dry, airy place until dry. Do not leave near heat as this will make the leather hard and brittle. Brush well.

d) Do not use any form of heat on your shoes. Do not bone them or use a hot iron on them.

11. Marking

The following information shall be acceptably and permanently displayed on each shoe

- size designation
- manufacturer's name or trade mark or both
- year of manufacture
- the words “Made in South Africa”

12. Packaging

With the exception of the last consignment of an order, only footwear of the same size shall be packed together in an outer container

- unless otherwise specified in the order or contract, each pair of shoes shall be packed in an individual box that will protect it from damage during normal transportation, handling and storage. The shoes must be wrapped in tissue paper.
- boxes to be packed in an acceptable bulk container
- the number of pairs of shoes in each outer container shall be not greater than 15.

13. Shoe boxes

Each shoe box on the short side to be clearly marked with

- the item number
- size and colour
- year and month of manufacture

14. Bulk containers

Each bulk container shall have a label securely attached to the outside. This label shall be visible when the containers are stacked and shall provide the information in legible and indelible markings as follows:

- manufacturer's trade name or trade mark or both
- the item number
- size and colour
- quantity
- order number
- month and year of manufacture
- the box number, e.g. "1 of 5"
- the total mass of the packed container

Additional marking

When so required, shoe box labels or bulk containers (or both) shall bear information additional to that specified above.

15. Normative references

The following referenced documents are indispensable for the application of this document. All normative documents are subject to revision and, since any reference to a normative document is deemed to be a reference to the latest edition of that document, parties to agreements based on this document are encouraged to take steps to ensure the use of the most recent editions of the normative documents indicated below. Information on currently valid national and international standards can be obtained from the South African Bureau of Standards (SABS)[1].

AATCC test method 20, *Fiber analysis: Qualitative.* Available from World Wide Web http://www.aatcc.org/Technical/Test_Methods/scopes/tm20.cfm

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.*

BS 5131-4-4.4, *Methods of test footwear and footwear materials- Part 4: Other components – Section 4.4: Heel pin holding strength of fibre-board.*

BS 5131-4-4.5, *Methods of test footwear and footwear materials- Part 4: Other components – Section 4.5: Tensile strength of fibre-board.*

SANS 184, *The determination of the peeling load of direct moulded footwear*

SANS 1362, *Sewing thread*

SANS 2589, *Leather – Physical and mechanical tests – Determination of thickness*

SANS 3380, *Leather – Physical and mechanical tests – Determination of shrinkage temperature up to* 100^{O} *C*

SANS 4045, *Leather – Chemical tests – Determination of pH*

SANS 5398-1/ISO 5398-1, *Leather – Chemical determination of chromic oxide content – Part 1: Quantification by titration*

SANS 5616, *Preparation of samples (leather, elastomeric material and other footwear materials*

SANS 5618, *Leather – Determination of matter extractable by petroleum ether.*

SANS 5633, *Determination of wet stitch tear strength (leather: leather board; fibreboard)*

SANS 5636, *Determination of (a) tensile strength, (b) percentage elongation caused by a specified force, (c) percentage elongation at break of leather*

SANS 5639, *Determination of two-dimensional extension of leather*

SANS 5640, *Determination of flex resistance (leather fibreboard and cellulose fibreboard inner soles).*

SANS 5642, *Determination of water absorption of inner soles and inner sole material.*

SANS 5649, *Determination of density of elastomeric material.*

SANS 5650, *Determination of hardness of elastomeric material.*

SANS 5669, *Measurement of distension and strength of grain of leather by the ball burst test*

[1] ***South African Bureau of Standards: Tel. +27 (0) 12 4287911 www.sabs.co.za***

SANS 5884, *Scuff damage by impact on leather*

SANS 5885, *Assessment of scuff damage to leather (viewing box method)*

SANS 5962, *Determination of wet split tear strength of inner sole and runner materials (other than leather)*

SANS 6110, *Accumulated impact strength of ladies shoe heels of height greater than 25mm*

SANS 6117, *Moisture stability of insole boards and shank boards for footwear*

SANS 6131, *Pull off strength of ladies' shoe heels*

SANS 11640, *Leather – Test for colour fastness – colour fastness to cycles of to-and-fro rubbing*

SANS 11644, *Leather – Test for adhesion of finish*

SANS 17704, *Test methods for uppers, lining and in-socks – Abrasion resistance*

SANS 17694, *Footwear – Test methods for uppers and lining – Flex resistance*

SANS 20864, *Footwear – Test methods for stiffeners and toe-puffs – Mechanical characteristics*

ANNEX A

(Normative)

Special conditions of tender

A-1 GENERAL

A-1.1 Unless otherwise stated, the South African Bureau of Standards shall be the inspecting authority.

Any applications for deviations from drawings or the specification, or any laid down process, treatment or procedures as set out in this specification, shall be made to the SA Airways and verified by the SABS. All applications must be submitted in writing.

A-1.2 The following shall have been submitted, inspected, tested and approved by the inspecting authority before bulk production is commenced:

a) three pre-production sample pairs of shoes

b) 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:

- the packaging slip or delivery note;
- where applicable the inspection certificate(s);
- a copy of the invoice containing the following information:
  - the order number
  - the financial authority number
- a full description of the consignment, i.e. Item Number, quantity, etc

HISTORY SHEET				
VERSION	DATE	AMENDMENTS/HISTORY	CHECKED	
			NAME	INIT.
1	August 2014	First release		