



AGENCE DES NORMES ET DE LA QUALITE®
STANDARDS AND QUALITY AGENCY®

www.anor.cm

PROJET DE NORME CAMEROUNAISE PNC 3017 : 2026 - CT 31

2026

CHILDREN'S SCHOOL SHOES WITH DIRECT INJECTION

Toute reproduction ou représentation intégrale ou partielle, par quelque procédé que ce soit, des pages publiées dans le présent document, faite sans l'autorisation de l'éditeur est illicite et constitue une contrefaçon. Seules sont autorisées d'une part, les reproductions strictement réservées à l'usage privé du copiste et non destinées à une utilisation collective et, d'autre part, les analyses et courtes citations justifiées par le caractère scientifique ou d'information de l'œuvre dans laquelle elles sont incorporées.

PROJET DE NORME CAMEROUNAISE

ENQUETE PUBLIQUE N° : 19

Durée de l'enquête Du 21/09/2026 Au 19/10/2026

Edition et diffusion par l'Agence des Normes et de la Qualité
B.P.: 14966 Yaoundé – CAMEROUN – Tél: 6992 257 777 / Fax.: (237) 222 22 64 96
E-mail : enquetepublique@anor.cm – www.anor.cm/enquetes-publiques

ANOR®

DN-R2/PR-01/ENR-02
16/12/2015

**Footwear — Children's school shoes with direct injection —
Specification**



Table of contents

1	Scope	1
2	Normative references	1
3	Terms and definitions	2
4	Type and method of construction	3
4.1	Type	3
4.2	Method of construction	3
5	Materials and components	3
5.1	Upper materials and components	3
5.2	Bottom materials and components	8
6	Constructional requirements	10
6.1	Upper construction	10
6.2	Closing	11
6.3	Preparation of bottom stock	12
6.4	Making	13
7	Workmanship and finish	14
7.1	General	14
7.2	Upper cleaning and polishing	14
7.3	Bottom cleaning	15
7.4	Inner sole socks	15
7.5	Freedom from defects	15
7.6	Laces	15
8	Packing and marking	15
8.1	Packing	15
8.2	Marking	15
9	Sampling and compliance with the specification	15
9.1	Sampling	16
9.2	Compliance with the specification	16
10	Inspection and methods of test	16
10.1	Inspection	16
10.2	Reduction to component parts of shoes to be tested	17
10.3	Preparation of test specimens	17
10.4	Upper leather	17
10.5	Upper components	18
	Annex A (informative) Typical shoe designs	21

Foreword

The African Organization for Standardization (ARSO) is an African intergovernmental organization established by the United Nations Economic Commission for Africa (UNECA) and the Organization of African Unity (AU) in 1977. One of the fundamental mandates of ARSO is to develop and harmonize African Standards (ARS) for the purpose of enhancing Africa's internal trading capacity, increase Africa's product and service competitiveness globally and uplift the welfare of African communities. The work of preparing African Standards is normally carried out through ARSO technical committees. Each Member State interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, Regional Economic Communities (RECs), governmental and non-governmental organizations, in liaison with ARSO, also take part in the work.

ARSO Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare ARSO Standards. Draft ARSO Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an ARSO Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ARSO shall not be held responsible for identifying any or all such patent rights.

This African Standard was prepared by the ARSO Technical Harmonization Committee Number 7 on Leather and Textile Products (ARSO/THC 07).

© African Organisation for Standardisation 2017 — All rights reserved*

ARSO Central Secretariat
International House 3rd Floor
P. O. Box 57363 — 00200 City Square
NAIROBI, KENYA

Tel. +254-20-2224561, +254-20-3311641, +254-20-3311608

E-mail: arso@arso-oran.org

Web: www.arso-oran.org

* © 2017 ARSO — All rights of exploitation reserved worldwide for African Member States' NSBs.

Copyright notice

This ARSO document is copyright-protected by ARSO. While the reproduction of this document by participants in the ARSO standards development process is permitted without prior permission from ARSO, neither this document nor any extract from it may be reproduced, stored or transmitted in any form for any other purpose without prior written permission from ARSO.

Requests for permission to reproduce this document for the purpose of selling it should be addressed as shown below or to ARSO's member body in the country of the requester:

© African Organisation for Standardisation 2017 — All rights reserved

ARSO Central Secretariat
International House 3rd Floor
P.O. Box 57363 — 00200 City Square
NAIROBI, KENYA

Tel: +254-20-2224561, +254-20-3311641, +254-20-3311608

E-mail: arso@arso-oran.org
Web: www.arso-oran.org

Reproduction for sales purposes may be subject to royalty payments or a licensing agreement. Violators may be prosecuted.

Footwear — Children's school shoes — Part 1 - Direct injection — Specification

1 Scope

This African Standard covers the requirements for children's leather school shoes made according to the direct injection-moulded principle.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12590, *Textiles — Industrial sewing threads made wholly or partly from synthetic fibres*

ISO 1833, *Textiles – Binary fibre mixtures — Quantitative chemical analysis*

ISO 2062, *Textiles — Yarns from packages — Determination of single-end breaking force and elongation at break*

ISO 2419, *Leather — Physical and mechanical tests — Sample preparation and conditioning*

ISO 3376, *Leather — Physical and mechanical tests — Determination of tensile strength and percentage extension*

ISO 3379, *Leather — Determination of distension and strength of surface (Ball burst method)*

ISO 3380, *Leather — Physical and mechanical tests — Determination of shrinkage temperature up to 100 °C*

ISO 3801, *Textiles — Woven fabrics — Determination of mass per unit length and mass per unit area*

ISO 4044, *Leather — Chemical tests — Preparation of chemical test samples*

ISO 4045, *Leather — Chemical tests — Determination of pH*

ISO 4047, *Leather — Determination of sulphated total ash and sulphated water-insoluble ash*

ISO 5084, *Textiles — Determination of thickness of textiles and textile products*

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

ISO 9073-1, *Textiles — Test methods for nonwovens — Part 1: Determination of mass per unit area*

ISO 11640, *Leather — Tests for colour fastness — Colour fastness to cycles of to-and-fro rubbing*

ISO 11644, *Leather — Test for adhesion of finish*

ISO 11646, *Leather — Measurement of area*

ISO 13934-1, *Textiles — Tensile properties of fabrics — Part 1: Determination of maximum force and elongation at maximum force using the strip method*

ISO 17070, *Leather — Chemical tests — Determination of tetrachlorophenol-, trichlorophenol-, dichlorophenol-, monochlorophenol-isomers and pentachlorophenol content*

ISO 17076-2, *Leather — Determination of abrasion resistance — Part 2: Martindale ball plate method*

ISO 17236, *Leather — Physical and mechanical tests — Determination of extension set*

ISO 17694, *Footwear — Test methods for uppers and lining — Flex resistance*

ISO 17696, *Footwear — Test methods for uppers, linings and insoles — Tear strength*

ISO 17698, *Footwear — Test methods for uppers — Delamination resistance*

ISO 20344, *Personal protective equipment — Test methods for footwear*

ISO/TR 20573, *Footwear — Performance requirements for components for footwear — Heels and top pieces*

ISO 20863, *Footwear — Test methods for stiffeners and toepuffs — Bondability*

ISO/TR 20880, *Footwear — Performance requirements for components for footwear — Outsoles*

ISO 20864, *Footwear — Test methods for stiffeners and toepuffs — Mechanical characteristics*

ISO 20875, *Footwear — Test methods for outsoles — Determination of split tear strength and delamination resistance*

ISO 20876, *Footwear — Test methods for insoles — Resistance to stitch tear*

ISO/TR 20882, *Footwear — Performance requirements for components for footwear — Lining and insoles*

ISO 22649, *Footwear — Test methods for insoles and insoles — Water absorption and desorption*

IUP 22, *Assessment of scuff damage by use of the viewing box*

IUP 23, *Measurement of scuff damage*

3 Terms and definitions

For the purposes of this specification the following definitions apply.

3.1

defective

a shoe that fails in one or more respects to comply with the relevant requirements of the specification

3.2

lot

not less than 50 and not more than 2 000 pairs of shoes of the same type, materials, style, and colour, from one manufacturer, submitted at any one time for inspection and testing

3.3

nominal

subject to the tolerances normal to good manufacturing practice

3.4

shoe

a footwear having an outer covering for the entire feet not coming much above the ankle. It is built up or assembled on a last or appropriate mould to the required shape, size and fitting. The upper part of the shoe consists of number of components such as vamp, quarters, counter, etc. and the same are aligned and assembled together by various methods. The bottom part of the shoe consists of number of components, such as insole, sole heel, etc. and the same are aligned and assembled together by various methods. The assembled upper part and bottom parts are attached to each other by various methods

4 Type and method of construction

4.1 Type

The shoes shall have side leather uppers, quarter linings, vamps that are lined or unlined (as specified by the purchaser), and outer soles and heels that comply with the requirements of 5.2.2. They shall be of one of the following types, as specified by the purchaser:

- a) **Type 1.** Lace-up type.
- b) **Type 2.** One bar type, with or without a T-bar (as specified by the purchaser).
- c) **Type 3.** Upper styles that are technically suitable for approval by the authority administering this standard.

4.2 Method of construction

4.2.1 General

The method of construction shall be in accordance with the direct injection-moulded principle and shall be such that an insole and an outsole as detailed in 5.2 are used.

The shoes shall be of one of the following classes, as specified by the purchaser:

- a) **Class A.** Tack-lasting or cement-lasting or a combination of the two.
- b) **Class B.** Force-lasting.

4.2.2 Lasts

The lasts used shall be of an acceptable type, and the size(s) shall be as specified by the purchaser.

5 Materials and components

5.1 Upper materials and components

5.1.1 Upper leather

5.1.1.1 General

The upper leather (including tongues) shall be well-tanned bovine leather of acceptable quality. It shall be free from defects that affect its appearance or might affect its serviceability (or both), shall not be pipy, loose grained, hard or bony, and shall be well-fleshed and free from flay marks.

The leather shall be dyed to the required colour on the grain side before finishing and the colour shall be an acceptable match to that specified by the purchaser. The leather may have a lightly printed finish.

The leather may be

- a) coated leather; or
- b) split leather and the split may be finished as coated leather or as laminated leather.

5.1.1.2 Physical and chemical requirements for upper leather

Upper leather shall, when tested in accordance with the relevant methods given in 10.4, comply with the requirements given in column 2 of Table 1.

Table 1 — Physical and chemical requirements for upper leather

1	2	3
Property	Requirement	Subsection
Shrinkage temperature, °C, min.		10.4.1
Inorganic tanned leather	100	
Organic tanned leather	75	
Grease content (on a moisture-free basis), %	3.0 – 8.0	10.4.2
Chromic oxide content* (on a moisture-free and grease-free basis), %, min.	3.5	10.4.3
pH value, min.	3.3	10.4.4
Sulphated ash of water-soluble matter (on a moisture-free and grease-free basis), %, max.	2.0	10.4.5
Resistance to rubbing, after 50 rubs wet and 50 rubs dry:		10.4.6
Grain side		
Permissible colour change, rating, min.	4	
Flesh side		
Permissible colour transfer, rating, min.	4	
Adhesion of finish, N, min.	5	10.4.7
Slit tear strength, N, min.		10.4.8
Nominal thickness ≥ 1.2 mm < 1.4 mm	48	
Nominal thickness ≥ 1.4 mm < 1.6 mm	70	
Nominal thickness ≥ 1.6 mm < 1.8 mm	80	
Nominal thickness ≥ 1.8 mm	108	
Flex endurance		10.4.9
After 10 000 cycles	Only fine cracks in the finish are permitted	
After 20 000 cycles	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	
After 100 000 cycles	There shall be no cracking of the grain leather, no formation of coarse grain folds, and no powdering of the fibres of the leather	
Grain strength, stretch and set at a pressure of 1.2 MPa		10.4.10
Grain strength ⁺	There shall be no sign of finish cracking or grain cracking	
Stretch, %, min.	12	
Set, %, min.	4	
Distension, mm, min.		10.4.11
At finish crack	6.0	
At grain crack	7.0	
Tensile strength, N/mm ² min.	15	10.4.12
Elongation at break, %, min.	35	10.4.13
Scuff resistance, permissible colour change, rating, max.		10.4.14
	5	
* Only applicable when chrome-tanned leather is used.		
+ Report any cracking of the finish or the grain before a pressure of 1.2 MPa is reached according to ISO 17236.		

5.1.2 Lining materials

5.1.2.1 Quarter linings

Quarter linings shall be of leather, a non-woven fabric, or a coated fabric and shall comply with the requirements given in (a), (b), or (c) below, as relevant.

- a) **Leather quarter linings.** The leather shall be well-tanned leather of acceptable type and quality. When tested in accordance with 10.5.1, the finish on the grain (or, when relevant, the suede or grain-split) side of the leather shall be fast to both wet and dry rubbing. The thickness of the leather used shall be not less than 0.8 mm and not more than 1.2 mm for sizes 150 mm – 205 mm, and not less than 1.0 mm and not more than 1.5 mm for sizes 210 and upwards.
- b) **Non-woven fabric.** A non-woven fabric shall consist of polyester or nylon fibres, or a mixture of both. It shall have a thickness of not less than 0.8 mm and not more than 1.5 mm and, when tested in accordance with
 - 1) 10.5.2, its bursting strength when dry shall be at least 800 kPa;
 - 2) 10.5.3, its mass per unit area shall be at least 250 g/m²;
 - 3) 10.5.4, its tearing strength shall be at least 30 N;
 - 4) 10.5.5, its water vapour permeability shall exceed 10.0 mg/cm².h;
 - 5) 10.5.6, its loss on abrasion shall not exceed 5 %; and
 - 6) 10.5.7, its flex endurance shall be at least 30 000 cycles.
- c) **Coated fabrics.** Coated fabrics linings shall comply with ISO/TR 20882.

5.1.2.2 Bar linings

Bar linings of a type 2 shoe shall be of the same material as the quarter linings.

5.1.2.3 Vamp linings

Vamp linings shall be of leather, a woven fabric, or a non-woven fabric, and shall comply with the requirements given in (a), (b) or (c) below, as relevant.

- a) **Leather vamp linings.** Leather vamp linings shall be of an acceptable quality well-tanned grain sheep, goat, or side leather, or pigskin, and shall have a thickness of not less than 1.0 mm and not more than 1.5 mm.
- b) **Woven fabric vamp linings.** Woven fabric vamp linings shall comply with the relevant requirements of ISO/TR 20882 (see also 9.5.21) and, when tested in accordance with 9.5.18, shall have an abrasion resistance of at least 30 000 cycles. For sizes 150 – 205 they shall be of a drill (bleached or unbleached) of mass per unit area at least 205 g/m² or a raised fabric of mass per unit area at least 220 g/m², and for sizes 210 and upwards of unbleached duck of mass at least 270 g/m² or a combined fabric of total mass per unit area at least 410 g/m².
- c) **Non-woven fabric vamp linings.** Non-woven fabric vamp linings shall comply with the relevant requirements given in ISO/TR 20882.

5.1.2.4 Tongue linings

Tongue linings shall be of leather, or felt, or a woven fabric, or a non-woven fabric, and shall comply with the requirements given in (a), (b), (c) or (d) below, as relevant.

- a) **Leather.** Leather tongue linings shall be of acceptable quality well-tanned leather.
- b) **Felt.** Felt tongue linings shall be of a felt that, when tested in accordance with 10.5.8, complies with the requirements given in column 2 of Table 2.
- c) **Non-woven fabric.** Non-woven fabric tongue linings shall comply with the requirements given in 5.1.2.1 (b) or 5.1.2.3 (c).
- d) **Woven fabric.** Woven fabric tongue linings shall comply with the appropriate requirements given in 5.1.2.3 (b).

Table 2 — Requirements for felt tongue linings

1	2
Property	Requirement
Fibre composition, %	
Wool	50 ±
Other fibres	50 ±
Mass per unit area (free from non-fibrous material), g/m ² , min.	190
Non-fibrous material content, %, max.	2.0
Thickness (mean), mm	1.1 ± 0.2

5.1.3 Thicknesses of upper leather

The thicknesses of upper leather shall conform to the appropriate values given in table 3.

Table 3 — Thicknesses of upper leather

1	2	3	4	5
	Thickness mm			
Component	Sizes 150 – 205		Sizes 210 and upwards	
	Min.	Max.	Min.	Max.
Vamps	1.2	1.6	1.6	2.0
Toe-caps (when used)	1.2	1.6	1.6	2.0
Quarters	1.2	1.6	1.6	2.0
Mudguards and aprons (when used)	1.2	1.6	1.6	2.0
Back straps and stays	1.2	1.4	1.4	1.6
Tongues (type 1)	1.2	1.4	1.4	1.6
Bars (type 2)		1.6	1.6	2.0

5.1.4 Toe-puffs

5.1.4.1 Toe-puffs shall be so cut and skived as to fit the size and shape of the last. Toe-puff material, when tested in accordance with 9.5.9, shall comply with the requirements given in Table 4.

5.1.4.2 Toe-puffs for children's shoes and girls' and maids' shoes with unlined vamps, may be of an acceptable thermoplastic printed type having a thickness at the crown of the toe of at least 0.5 mm. Such toe-puffs shall be of adequate strength and resilience to ensure that the shape of the toe-end of the shoe is retained during wear.

5.1.5 Stiffeners

Stiffeners shall be so cut and skived as to fit the size and shape of the last. They shall be of moulded board, or the thermoplastic or the thermo-adhesive-coated board type, and shall be of a material that complies with the appropriate of the following requirements:

- a) **Moulded board stiffeners.** Moulded board stiffener material shall have a thickness at the unskived sections of at least 1.8 mm for sizes 150 – 205, and at least 2.1 mm for sizes 210 and upwards and, when tested in accordance with
 - 1) 10.5.2, shall have a bursting strength such that the pressure required to burst the material when dry is at least 2.5 MPa, and when wet at least 2.1 MPa; and

- 2) 10.5.10, shall not absorb more than 15 % (m/m) of water.
- b) **Thermoplastic stiffeners.** Thermoplastic stiffener material, when tested in accordance with 10.5.9, shall comply with the requirements given in Table 4.

Table 4 — Requirements for toe-puffs and stiffeners

1	2	3	4
Property	Requirement		
	Toe-puffs	Stiffeners	Method of test
First collapsing load, N, min.	30	30	ISO 20864
Resilience, %, min.	50	50	
Moisture resistance, %, min.	60	60	
Area shape retention, %, min.			
Initial	60	70	ISO 20864
After 10 collapses	50	60	
Peel strength, N/cm			
Dry	5	6	ISO 17698
Wet	3	—	

- c) **Thermo-adhesive-coated board stiffeners.** Thermo-adhesive-coated board stiffener material shall be thermo-adhesive-coated on both sides, and shall have a thickness and a dry bursting strength as specified in (a) above.

5.1.6 Eyelets and buckles

5.1.6.1 Eyelets

Type 1 (lace-up type) shoes shall be fitted with eyelets of the visible- or the invisible-setting type, and shall be of an intrinsically corrosion-resistant metal. The visible-setting type shall have celluloid or japanned rims; the invisible-setting type shall be nickel-plated. The diameter of the eyelets, measured across the inside of the barrel, shall be not less than 3 mm. The length of the barrels shall be such as to ensure proper clinching on the facings.

5.1.6.2 Buckles

Buckles shall be of an acceptable type and shall be of an intrinsically corrosion-resistant metal.

5.1.7 Threads

The threads used for attaching the various upper components (see 6.2.4) shall comply with the requirements of EN 12590.

5.1.8 Top-edge tapes

When edges are folded, the tape used shall be of nylon, polyester, or a mixture of cotton and polyester. The tape shall have a nominal thickness of 0.2 mm and, when tested in accordance with:

- a) 10.5.15, a width of not less than 1.6 mm, and not more than 2.6 mm;
- b) 10.5.16, its mass/100 m shall be at least 209 g; and
- c) 10.5.17, its breaking strength shall be at least 135 N, and the extension at break shall be in the range 17 – 27 %.

5.2 Bottom materials and components

5.2.1 Insole

5.2.1.1 Class A shoes

Insole shall be of acceptable inner sole material of thickness $1.75 \text{ mm} \pm 0.25 \text{ mm}$ for sizes 150 mm – 205 mm; $2.25 \text{ mm} \pm 0.25 \text{ mm}$ for sizes 210 mm – 240 mm; and $2.75 \text{ mm} \pm 0.25 \text{ mm}$ for all larger sizes. When combined-strip-type inner soles are used, the waist and seat area shall be of fibreboard of acceptable quality and of thickness at least 2.0 mm. The inner sole material, when tested in accordance with

- a) 10.5.10, shall have a water absorption rate of at least $1 \text{ g}/25 \text{ cm}^2$;
- b) 10.5.11, shall have a pH value of at least 3.3;
- c) 10.5.12, shall have a wet stitch tear strength of at least 50 N/mm of thickness;
- d) 10.5.13, shall have a flex endurance of at least 5 000 flexes; and
- e) 10.5.19, shall have wet split tear strength of at least 0.3 N/mm of width.

5.2.1.2 Class B shoes

Insole shall be of an acceptable non-woven material of thickness at least 2.0 mm and that complies with the requirements of 5.2.1.1(a) to (e).

5.2.2 Outsole and heels

5.2.2.1 General

Unless otherwise acceptable, the material of the injection-moulded outsole and heels shall comply with the relevant requirements of ISO/TR 20573 and ISO/TR 20880 and shall be one of the following, as specified by the purchaser:

- a) Type P1 (soft PVC material);
- b) Type P3 (non-migratory plasticized PVC material);
- c) Type E1 (reaction-moulded expanded polyurethane material (industrial footwear)); or
- d) Type E2 (reaction-moulded expanded polyurethane material (commercial footwear)).

5.2.2.2 Thicknesses of outsole and heels

- a) **Outer soles.** The thickness of outsole shall conform to the appropriate values given in Table 5.

Table 5 — Thicknesses of outsole

1	2	3
Sizes	Thickness* (mm, min.)	
	Forepart area (including cleats)	
150 – 205	5	4
210 – 240	6	4
245 and upwards	8	4

*In the case of the forepart area, measured at the inside edges of the lasted overlay of the upper and across the centre of the forepart. In the case of the waist area, measured at the shank position.

- b) **Heel area (all sizes).** The thickness of the heel (including the cleats) shall be in accordance with the pitch of the last used.

5.2.3 Heel filler pieces (when used)

5.2.3.1 Material

Heel filler pieces shall be of fibreboard, or a plastics material, or wood, of (in all cases) acceptable quality.

5.2.3.2 Thickness

The thickness of heel filler pieces shall be determined by the thickness of the heel and the thickness of the direct injection-moulded material covering the top of the heel filler piece which shall be at least 5.0 mm for sizes 150 – 205, at least 6.0 mm for sizes 210 – 240, and at least 8.0 mm for all larger sizes.

5.2.3.3 Size

The size of a heel filler piece shall be such as to allow for a clearance of at least 8 mm between the heel filler piece and

- a) the edges of the lasted seat of the upper, and
- b) the breast line of the heel.

5.2.4 Shanks

5.2.4.1 General

Shanks shall extend from the joint line to a distance of at least 13 mm under the heel, measured from the breast line towards the rear of the heel. The shanks shall conform to the bottom contours of the last. Where the sole is a wedge heel design, the shank may be omitted, provided that the wedge heel has a built-in reinforcement bar.

5.2.4.2 Types of shanks

Shanks shall be of steel, wood, or a plastics material.

NOTE 1 Unless the type of shank material is specified by the purchaser, the choice of the type to be used shall be at the discretion of the supplier.

NOTE 2 Unless specified by the purchaser, the use of shanks in shoes of sizes 150 – 205 shall be at the discretion of the supplier.

5.2.4.3 Steel shanks

- a) **Thickness.** Steel shanks shall be of flat or fluted steel of thickness at least 1.0 mm.
- b) **Width of shanks.** The shanks shall have a width of at least 7 mm for sizes 150 – 240, and at least 9 mm for all larger sizes.

5.2.4.4 Wood shanks

- a) **Material:** The species of wood used shall be birch or any other species that will give a performance not lower than that given by birch. The wood shall be free from both inherent and seasoning defects.
- b) **Width and thickness.** The width and thickness of wood shanks shall be as follows:

Width (at the narrowest cross-section): At least 10 mm for sizes 150 – 205 and at least 12 mm for all larger sizes.

Thickness (at the unbevelled section): At least 3 mm.

5.2.4.5 Plastics shanks

The material used shall be of acceptable quality, and the width and thickness of the shanks shall be as specified for wood shanks (see 5.2.4.4(b)).

6 Constructional requirements

6.1 Upper construction

6.1.1 Style

The style shall be appropriate to the type of shoe specified by the purchaser. Type 1 shall have a toe-cap, or a plain vamp, or a vamp that incorporates an apron or mudguard, or a vamp that has a stitched or perforated design, as specified by the purchaser. When a toe-cap is used, the vamp may be joined. The vamp of Type 2 shoes shall be plain or shall have ornamental stitching or cut-outs, as specified by the purchaser. A T-bar may be integral with (i.e. cut in one piece with) the vamp or it may be joined to it. The bar of a one-bar shoe shall be integral with (i.e. cut in one piece with) the inside quarter or it may be joined to it.

Type 3 shoes shall be in accordance with the style approval documentation held by the authority administering this standard.

6.1.2 Quarters

Gibson-style quarters shall be cut low at the tab facing. The exposed edges of quarters shall be folded, burnished, bagged or raw-edge stained.

6.1.3 Vamps

The vamps of Oxford-style and Type 2 shoes shall have raw-edge stained, folded, or burnished top edges. The vamp of a Gibson-style shoe shall be integral with (i.e. cut in one piece with) the tongue or it may be joined to it.

6.1.4 Toe-caps

Toe-caps shall have raw-edged stained, folded, burnished, or gimped top edges.

6.1.5 Aprons

The exposed edges of aprons shall be folded, raw-edge stained, burnished, or gimped.

6.1.6 Tongues

Tongues shall be wide enough to protect the instep of the wearer from the effects of lacing. When tongues are joined they shall, on Gibson-style shoes, be underlaid to the vamp.

6.1.7 Tongue linings

Tongue linings (when used) shall be of such shape as to leave a margin at the sides and top of not less than 4 mm and not more than 9 mm between the edges of the tongue and tongue lining. When a leather lining is used, the sides shall be skived to give a smooth edge. When a woven fabric lining is used, the lining shall be folded at the top and side edges. A tongue lining (other than of felt) on Gibson-style shoes shall be either integral with (i.e. cut in one piece with) the relevant vamp lining or joined to it.

6.1.8 Quarter linings

Quarter linings shall not have a full seam at the centre of the back.

6.1.9 Bar linings

Bars shall be fully lined.

6.1.10 Back seam construction

When the quarters are joined at the back, the construction of the back seam shall be one of the following types, as specified by the purchaser:

The seam shall be adequately reinforced at the top with an acceptable quality reinforcing tape or shall have a leather or acceptable fabric-supported PVC stayed top (or an overlapping inside or outside quarter) or shall have a back strap. Back straps shall, in all cases, have a width of at least 10 mm, and shall be folded over at the top edge. Stays shall have a height of not less than 2 mm and not more than 4 mm, and a width (on the completed upper) of at least 9 mm. Reinforcing tape used at the top of the back seam shall extend over and at least 9 mm on each side of the back seam and shall have a height of at least 10 mm on the flesh side of the finished upper. Overlapping on inside and outside quarters shall extend at least 13 mm beyond the back seam and shall be not less than 10 mm and not more than 15 mm deep at the widest point.

6.2 Closing

6.2.1 Skiving

Skiving shall be done in a manner that will ensure adequate seam strength and prevent the formation of hard ridges.

In the case of class B shoes, the margin round the feather edge shall be suitably skived or roughened to remove the grain surface of the leather.

6.2.2 Folding

Folding shall be wide enough to allow the edge stitching to pass through the folded edge.

6.2.3 Top-edge taping

The top-edge taping shall be correctly positioned in the folded edges along the top line, and the edge stitching shall pass through the top-edge tape.

6.2.4 Seams

All inside upper seams shall be free from ridges and roughness. There shall be no loose, ragged, or uneven seams, and all loose thread ends shall be removed. When quarters are joined at the back, they shall be joined with a closed seam or with a double chain stitch seam or, when a back strap is used, with a zig-zag seam. When a back strap is not used, the back seam on an upper shall be covered, on the inside of the shoe, with an adhesive tape of acceptable quality. On Gibson-style shoes the front ends of the quarter linings may be joined to the unlined vamp or the vamp lining (as relevant) with a stuck-on seam made with a suitable adhesive that will produce a bond between the quarter lining and the vamp/vamp lining that will remain intact during normal use of the shoes.

The suggested requirements for the attachment of various upper components are as detailed in table 6 (see also 5.1.7) and shall form the basis for approval of the manner in which the upper components of type 3 shoes are attached.

6.2.5 Eyeletting (lace-up styles)

The eyelets shall be securely fastened on the facings of the shoes, shall be evenly spaced, and shall have a smooth setting. Unless the number of eyelets per shoe is specified by the purchaser, it may vary (at the discretion of the manufacturer) according to the design and size of shoe.

6.2.6 Lacing of closed uppers (lace-up styles)

After eyeleting, the machine lacing shall provide for an opening, at the top of the facing, of 3 mm before lasting, with a tolerance not exceeding +3 mm after lasting in the case of Oxford-style shoes, and 4 mm before lasting with a tolerance not exceeding +3 mm after lasting in the case of Gibson-style shoes.

6.3 Preparation of bottom stock

All inner soles shall be accurately cut to the required last shape. Where combined-strip-type inner soles are used, the fibreboard portion in the waist and seat area shall be securely stuck to the inner sole material.

Table 6 — Stitching of uppers

1	2	3	4	5
Seam	Number of rows of stitches	Nominal linear density* (top and shuttle)		Number of stitches per 25 mm
		Cotton threads	Polyester-and-cotton and core-spun synthetic threads	
Back seam: Method 1 Method 2	1 row, closed or zig-zagged 1 row, closed	R140 tex/3/3	R72 tex/2 or R76 tex/3 or R84 tex/3	12 – 14
Back strap or stay: Method 1 Method 2	1 row along edge 1 row along edge of overlap	R95 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	12 – 14
Decorative stitching (when required)	As specified by the purchaser	R95 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	12 – 14, or as specified by the purchaser
Facing (when required)	1 row, or as specified by the purchaser	R95 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	12 – 14, or as specified by the purchaser
Toe-cap (when required)	1 row along edge and 1 row 3 mm away from edge row, or as specified by the purchaser	R140 tex/3/3	R72 tex/2 or R76 tex/3 or R84 tex/3	12 – 14
Vamps (Oxford-style and type 2 shoes)	1 row along edge and 1 row 3 mm away from edge row	R140 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	12 – 14
Edge row	1 row along edge	R95 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	12 – 14
Aprons and mudguards (when required)	As specified by the purchaser	R95 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	12 – 14
Bars (type 2 shoes)	1 row along edge	R95 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	12 – 14
Side seams (Gibson-style shoes)	1 row along edge and 1 row 3 mm away from edge row, or as specified by the purchaser	R140 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	12 – 14
Tongue to vamp (type 1 shoes)	2 close rows, or as specified by the purchaser	R95 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	10 – 14
Stay rows (type 1 shoes): Oxford style [†]	–	R95 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	–

Table 6 — Stitching of uppers (concluded)

1	2	3	4	5
Seam	Number of rows of stitches	Nominal linear density* (top and shuttle)		Number of stitches per 25 mm
		Cotton threads	Polyester-and-cotton core-spun and synthetic threads	
Stay rows (type 1 shoes): Gibson style	2 close rows not less than 3 mm and not more than 6 mm above and parallel to top row of side seam, running through to the corner of the quarter	R95 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	10 – 14
Bar linings (type 2 shoes)	1 row along edge	R95 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	10 – 14
Tongue linings (when required)	1 row along edge of lining	R95 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	10 – 14
Quarter linings (overlapping seams)	1 row along edge	R95 tex/3/3	R60 tex/3 or R52 tex/3 or R44 tex/3	10 – 14
Buckle attachment [#]	–	R140 tex/3/3	R72 tex/2 or R76 tex/3 or R84 tex/3	–
* The common ticket references corresponding to the specified nominal linear densities are as follows: R140 tex/3/3 Cotton, ticket No. 40, 9-cord R95 tex/3/3 Cotton, ticket No. 60, 9-cord R72 tex/2 – Metric ticket No. 36, polyester-and-cotton core-spun R60 tex/3 – Metric ticket No. 50, polyester-and-cotton core-spun R76 tex/3 – Metric ticket No. 40, polyamide (continuous multifilament) R52 tex/3 – Metric ticket No. 60, polyamide (continuous multifilament) R84 tex/3 – Ticket No. 36, polyester R44 tex/3 – Ticket No. 70, polyester + So stitched, not more than 4 mm from centre top of vamp, as to catch both quarters through the tongue. # By a special buckle-attachment machine, or as specified by the purchaser.				

6.4 Making

6.4.1 Class A (see 4.2.1)

6.4.1.1 Lasting

The toe-puffs and stiffeners shall be positioned in the upper, moulded board stiffeners having been pasted on both sides before insertion and thermoplastic and thermo-adhesive-coated board stiffeners being correctly back-part moulded after insertion. The uppers (including quarter linings and, when relevant, the vamp linings) shall be properly drafted, and the seats shall be so assembled as to provide for an overlay of width not less than 13 mm and not more than 16 mm on the inner sole. The lasted overlay of the upper leather shall have a smooth level surface.

6.4.1.2 Pounding

When necessary, the lasted overlay of the upper leather shall be pounded to a level surface without the removal of any appreciable quantity of the lasted upper around the toe. The pounder rollers shall be free from grease and oil before pounding is commenced.

6.4.1.3 Upper roughening

The lasted overlay of the upper leather shall be so roughened as to raise the leather fibres adequately without impairing the strength of the leather.

6.4.2 Class B (see 4.2.1)

6.4.2.1 Preparation of the upper for lasting

Toe-puffs and stiffeners of the correct size and that are properly activated shall be accurately positioned in the uppers. They shall be pre-formed and well stuck on both sides to the upper and the lining. Inner soles shall be stitched to the lasting edge of the upper through the lining and the outside.

6.4.2.2 Lasting

The upper shall be force-lasting onto the last and correctly positioned. The upper closure system shall be tightly fastened.

6.4.2.3 Roughening

The upper shall be adequately roughened to the nip line of the injection moulds, care being taken to ensure that the stitching on the inner sole is not broken.

NOTE Where polyurethane coated leather uppers are being injected with polyurethane and it has proved to be practical, the roughening operation may be omitted.

6.4.3 Shank fitting

The forward end of the shank (if fitted) shall be flush with the inner sole at the joint line, and the shank shall fit the contour of the shoe bottom properly and shall be securely fastened. When wooden shanks are used, they shall be adequately dry before sole and heel attachment.

6.4.4 Heel filler piece attachment

A heel filler piece (when used) shall be so positioned on the lasted seat of the upper as to provide for clearances as specified in 5.2.3.3. The heel filler piece shall be securely attached to the lasted seat of the upper. All heel filler pieces shall be adequately dry before outer sole and heel attachment.

6.4.5 Outsole and heel attachment

6.4.5.1 Application of adhesive and moulding

When appropriate the roughened lasted-in margin of the upper leather shall be coated with an adhesive that is compatible with the material used for the bottoms, and the adhesive shall be allowed to dry for the period specified by the manufacturer of the adhesive. The lasted upper shall then be correctly positioned on the outsole-and-heel mould in the injection-moulding machine, and the outsole and heel of the required thicknesses (see 5.2.2.2) injection-moulded directly onto the bottom of the lasted shoe.

6.4.5.2 Peeling strength

The peeling strength of the attachment of an outer sole and heel, determined in accordance with 10.5.14 at least 48 h after injection-moulding, shall be at least 225 N in the forepart area of the shoe, and at least 90 N at a position 13 mm from the back of the heel seat area.

7 Workmanship and finish

7.1 General

Workmanship and finish shall be in accordance with sound and acceptable trade practice.

7.2 Upper cleaning and polishing

The upper leather shall be properly washed, ironed, and dressed or polished.

7.3 Bottom cleaning

The entire bottom shall be properly cleaned, and all surplus flash shall be trimmed off completely and neatly.

7.4 Inner sole socks

Each pair of shoes shall be provided with full socks in the case of tack-lasted or force-lasted shoes and full-length or part-length socks in the case of cement-lasted shoes. Socks shall be of acceptable chrome-tanned leather or of any other acceptable material. The upper side of inner sole socks shall, when tested in accordance with 10.5.1, be fast to both wet and dry rubbing.

7.5 Freedom from defects

Inner soles and linings shall be free from unevenness and protruding grindery. There shall be no cracks on the upper along the nip line. The entire bottom of a shoe shall be free from cracks, air bubbles, cavities, and any other defect that may affect the appearance or serviceability of the shoe.

7.6 Laces

Each pair of lace-up shoes shall be provided with one pair of laces of acceptable material and length.

8 Packing and marking

8.1 Packing

Each pair of shoes shall be individually packed in a suitable box that is capable of protecting the shoes from damage during normal transportation and storage.

8.2 Marking

8.2.1 Shoes

The following information shall be adequately displayed on each shoe:

- a) the size of the shoe;
- b) the manufacturer's name or trade mark, or both;
- c) any further information specified by the purchaser.

NOTE All the information may be given on, or may be split up among, the waist of the inner sole, the inner sole sock, the quarter lining, or the outer surface of the outer sole of the shoe.

8.2.2 Boxes

Each box shall bear the following information given in neat and legible marking at a position that is visible when the boxes are stacked.

- a) the manufacturer's name or trade mark, or both;
- b) the size of the shoes;
- c) any further information required by the purchaser.

9 Sampling and compliance with the specification

NOTE This section applies to the sampling for inspection and testing before acceptance or rejection of single lots (consignments) in cases where no information about the implementation of quality control or testing during manufacture is available to help in assessing the quality of the lot. It is also used as the procedure for adjudicating in cases of dispute.

9.1 Sampling

The following sampling procedure shall be applied in determining whether a lot complies with the relevant requirements of the specification. The samples so drawn shall be deemed to represent the lot for the respective properties.

9.1.1 Sample for inspection

After checking the lot for compliance with 8.1 and 8.2.2 draw from it at random the number of pairs of shoes shown in column 2 of table 7 relative to the appropriate lot size in column 1.

Table 7 — Sample sizes

1	2	3
Lot size (pairs)	Sample size (pairs)	Acceptable failure number
50 – 90	8	0
91 – 150	13	0
151 – 280	20	1
281 – 500	32	1
501 – 1200	50	2
1201 - 2000	80	3

9.1.2 Sample for testing

a) Shoes

- 1) From the lot (or from the sample taken in accordance with 9.1.1) take at random a first sample of three shoes.
- 2) If, on testing, only one defective is found in the first sample, take (as in (1) above) a second sample of a further four shoes.

b) Components and materials

Use a sample (of size large enough for the relevant tests) of each of the following components and materials used in the shoes in the lot:

Upper leather, lining materials, toe-puff material, stiffener material, inner sole material, heel and outer sole material, threads, and top-edge tape.

9.2 Compliance with the specification

The lot shall be deemed to comply with the specification if

- a) on inspection of the sample taken in accordance with 9.1.1, the number of defectives found does not exceed the relevant acceptance number shown in column 3 of Table 7;
- b) on testing of the sample(s) taken in accordance with 9.1.2 (a), no defective is found in the first sample or, when relevant, no defective is found in the second sample; and
- c) on testing of the samples used in terms of 9.1.2 (b), no defective is found.

10 Inspection and methods of test

10.1 Inspection

Visually examine each shoe taken in accordance with 9.1.1 for compliance with 8.2.1 and all the relevant requirements of sections 4, 5, 6 and 7 compliance with which is not assessed by the tests given in 10.4 and 10.5 (inclusive).

10.2 Reduction to component parts of shoes to be tested

Before dismantling, test the shoes in accordance with 10.5.14, then, without damaging the components to be tested, remove the inner soles, stiffeners, and entire toe portions from the shoes which constitute the relevant sample taken in accordance with 9.1.2 (a).

10.3 Preparation of test specimens

Use ISO 2419 for physical and ISO 4044 for chemical conditioning.

10.4 Upper leather

10.4.1 Shrinkage temperature

Use ISO 3380

10.4.2 Grease content

Use ISO 17070 and express the result on a moisture-free basis.

10.4.3 Chromic oxide content

Use ISO 5398-1, but express the results on a moisture-free and extractable-matter free basis.

10.4.4 pH value

Use ISO 4045.

10.4.5 Sulphated ash content

Use ISO 4047, but express the results on a moisture-free and grease-free basis.

10.4.6 Resistance to wet and dry rubbing

Use ISO 11640.

10.4.7 Adhesion of finish

Use ISO 11644.

10.4.8 Slit tear strength

Use ISO 17696.

10.4.9 Flex endurance

Use ISO 17694.

10.4.10 Grain strength, stretch and set

Use ISO 17236 and a maximum pressure of 1.2 MPa.

10.4.11 Distension

Use ISO 3379 and report the distension at finish crack and at grain crack, terminating the test after grain crack has occurred.

10.4.12 Tensile strength

Use ISO 3376.

10.4.13 Elongation at break

Use ISO 3376.

10.4.14 Scuff resistance

Use IUP 22 and IUP 23.

10.5 Upper components

10.5.1 Resistance to wet and dry rubbing (leather quarter and bar linings, and inner sole socks)

Use ISO 11640.

10.5.2 Bursting strength (stiffener materials, non-woven fabric linings, and inner sole socks)

Use ISO 20863.

10.5.3 Mass per unit area (non-woven fabric linings, inner sole socks and stiffener materials)

Use ISO 3801 and ISO 9073-1 as appropriate.

10.5.4 Tearing strength (non-woven fabric linings and inner sole socks)

Use ISO 17696.

10.5.5 Water vapour permeability (non-woven fabric linings and inner sole socks)

Use ISO 20344.

10.5.6 Loss on abrasion (non-woven fabric linings and inner sole socks)

Use ISO 17076-2 and an applied force of 7.8 N, but weigh each of the four specimens before testing, submit them to 3 200 uninterrupted cycles, remove abraded matter by vacuuming the abraded areas before removing the specimens from the holders, recondition them, re-weigh and express the result as the average percentage loss, in mass, of the specimens.

10.5.7 Flex endurance (non-woven fabric linings and inner sole socks)

Use ISO 17694.

10.5.8 Properties of felt (felt tongue linings)

10.5.8.1 Composition

Use ISO 1833.

10.5.8.2 Mass per unit area

Use ISO 3801 and ISO 9073-1 as appropriate.

10.5.8.3 Non-fibrous material content

Use ISO/TR 20882.

10.5.8.4 Thickness

Use ISO 5084, with an applied pressure of 4.3 kPa.

10.5.9 Properties of toe-puffs and thermoplastic stiffeners

10.5.9.1 First collapsing load, resilience and moisture resistance

Use ISO 20864 and report the first collapsing load and the percentage resilience. Calculate the percentage moisture resistance, using the formula

$$\frac{L_w}{L_d} \times 100$$

where

L_w is the first collapsing load (wet);

L_d is the first collapsing load (dry).

10.5.9.2 Area shape retention

Use ISO 20864.

10.5.9.3 Peel strength

Use the method given in ISO 17698.

10.5.10 Water absorption (inner sole and moulded board stiffener materials)

Use ISO 22649.

10.5.11 pH value (inner sole materials)

Use ISO 4045.

10.5.12 Wet stitch tear strength (inner sole materials)

Use ISO 20876.

10.5.13 Flex endurance (inner sole materials)

Use ISO 17694 to test specimens cut from a test sample that has been subjected for a period of 2 min to a pressure of 1.0 MPa in a suitable hydraulic press whose base and top plates are maintained at temperatures of $65 \pm 2^\circ\text{C}$ and $150 \pm 2^\circ\text{C}$ respectively.

10.5.14 Peeling strength (outer sole and heel)

Use ISO 17698.

10.5.15 Width (top-edge tapes)

Use ISO 11646.

10.5.16 Mass per 100 m (top-edge tapes)

Use ISO 3801 and ISO 9073-1 as appropriate.

10.5.17 Breaking strength and extension at break (top-edge tapes)

Use ISO 13934-1.

ARS 1558:2017(E)

10.5.18 Abrasion resistance (woven fabric vamp and tongue linings)

Use ISO 17076-2, using an applied force of 7.8 N.

10.5.19 Determination of wet split tear strength (inner sole materials)

Use ISO 17696.

10.5.20 Breaking strength (threads)

Use ISO 2062.

10.5.21 Properties of woven fabric linings and outer sole and heel materials

Use the relevant methods given or referred to in ISO/TR 20882, ISO/TR 20573 and ISO/TR 20880, respectively.

Annex A
(informative)

Typical shoe designs



ENQUÊTE PUBLIQUE N° 19

ENQUETE PUBLIQUE N° 19