



**International
Standard**

ISO 19952

Footwear — Vocabulary

Chaussures — Vocabulaire

**Second edition
2025-01**

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 216, *Footwear*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 309, *Footwear*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 19952:2005), which has been technically revised.

The main changes are as follows:

- additional terms were added, such as antimicrobial footwear, bottom wall, boxing footwear, bridge, components in contact with the skin, critical substances, drawn-up toe, extended sole spike heel, stiletto heel, etc.;
- synonyms were combined, such as box toe and toe puff, runner and through sole, built heel and stack heel etc.;
- some definitions were reviewed, such as bottom assembly, children's footwear, etc.;
- terms were updated based on industry developments, for example double sole was changed to multilayer sole;
- some unnecessary terms were deleted, such as school footwear/children's school footwear.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document defines terms and definitions used in the footwear industry, in order to facilitate communication and understanding across trade, designers, universities, manufacturers etc. in the footwear sector. This document defines each type of footwear under the current technological processes.

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Footwear — Vocabulary

1 Scope

This document defines terms used in the footwear industry.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 Footwear materials

3.1.1

abrasive

hard substance that can wear away a softer material by rubbing it

Note 1 to entry: An abrasive is usually used to prepare materials for bonding.

3.1.2

adhesive

cement

chemical compound used for bonding two surfaces together

3.1.3

backer

piece of material applied to another usually to add strength or reinforcement

3.1.4

binding

<material> narrow strip of material attached or wrapped around an edge (of a section)

3.1.5

bottom filling

bottom filler

material used to fill the void inside the lasted margin above the outsole *assembly* (3.2.2)

EXAMPLE Felt or cork.

Note 1 to entry: See [Figure 2](#), [Figure 3](#), [Figure 4](#), [Figure 5](#) and [Figure 10](#).

3.1.6

bridge

footwear support

piece of hardened paper, plastic, wood or other material to support footwear and maintain its shape during transportation and storage

Note 1 to entry: Filled-paper can also act as bridge.

3.1.7

coated fabric

textile covered with a polymer or plastic coating such as polyurethane, polyvinyl chloride (PVC) or rubber

3.1.8

coated leather

coated split leather

<material> *leather* (3.1.20) and split leather where the surface coating, applied to the outer side, does not exceed one third of the total thickness of the product but is in excess of 0,15 mm

[SOURCE: ISO 15115:2019, 3.22, modified — The preferred term “coated and coated split leather” has been changed to two preferred terms “coated leather” and “coated split leather”.]

3.1.9

coating

layer formed on the *surface* (3.6.22) of a substrate with a single or multiple application of material

3.1.10

combined material

composite material

material constituted of a combination of several different raw materials which cannot be separated mechanically

EXAMPLE Coated textile/leather (a textile/leather covered by a polymer film), complex upper (upper and lining are fully stuck by glue or other techniques and it is impossible to separate them), rubber boot upper (the sock can be fully dissolved in rubber), soling material (in injected sole footwear the insole can be fully dissolved in the sole), foam with adhesive or foam with residues of adhesive, etc.

3.1.11

double density

dual density

sole material comprising two layers of different density, from one or two polymers, solid and/or cellular in *construction* (3.2.16)

3.1.12

elastic

tape, cord or fabric containing rubber or a similar substance that allows it to stretch and return to its original shape

Note 1 to entry: Generally elastic materials are used in *upper* (3.3.65) construction in the *quarters* (3.3.48) or in the straps to hold the shoe on the foot.

3.1.13

facing stay

reinforcement (3.1.21) used to prevent *eyelets* (3.3.25) pulling through the *facer* (3.3.26)

3.1.14

foam

porous material in which the pores are all or partly intercommunicating

3.1.15

foxing

material that connects the *upper* (3.3.65) and sole to increase bendability strength

Note 1 to entry: Generally foxing is usually used in vulcanized footwear.

Note 2 to entry: See [Figure 1](#).

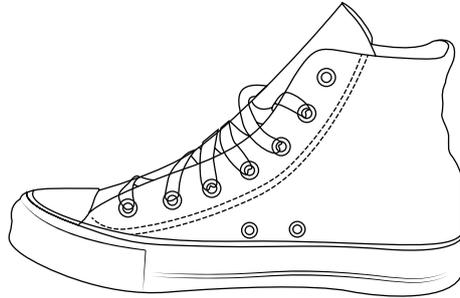


Figure 1 — Foxing

3.1.16

heel flap

Louis high heel

sole material stuck to the *heel breast* (3.3.34), where the sole continues back from the *waist* (3.6.29) down the front (breast) of the heel and extends to the *heel tip* (3.3.36)

Note 1 to entry: Such heels require a curvature at the top of the breast that blends into the waist.

3.1.17

heel grip

strip of material applied to the inside of the back part of the footwear *upper* (3.3.65) to prevent *heel* (3.3.33) slip during walking

3.1.18

heel lift

single layer of material forming part of a *built heel* (3.3.10), excluding the *top piece* (3.3.61)

3.1.19

interlining

material that is between *lining* (3.3.42) and *upper* (3.3.65)

3.1.20

leather

hide or skin with its original fibrous structure more or less intact, tanned to be imputrescible, where the hair or wool have been removed or not, whether or not the hide or skin has been split into layers or segmented either before or after tanning and where any surface coating or surface layer, however applied, is not thicker than 0,15 mm

Note 1 to entry: If the tanned hide or skin is disintegrated mechanically and/or chemically into fibrous particles, small pieces or powders, and is then, with or without the combination of a binding agent, made into sheets or other forms, such sheets or forms are not leather.

Note 2 to entry: If the grain layer has been completely removed, the term leather shall not be used without further qualification, e.g. split leather, suede leather.

Note 3 to entry: The material shall be of animal origin.

[SOURCE: ISO 15115:2019, 3.52]

3.1.21

reinforcement

material used to improve the strength and modify the stretch properties of *upper* (3.3.65) and/or lining materials or *outsole* (3.3.47) during manufacture or during wear

3.1.22

thick leather

leather (3.1.20) with a thickness greater than 2 mm

3.1.23

top facing

strip of material stitched inside a footwear *upper* (3.3.65) at the top to finish off the *lining* (3.3.42) and to reinforce the footwear

3.2 Footwear manufacturing

3.2.1

adhesion

state in which two surfaces are joined together by chemical bond or interfacial forces

Note 1 to entry: This can be via adhesive, or through a chemical reaction, i.e. thermoplastic adhesion where the soling is stuck to the rubber shoe via heating.

3.2.2

assembly

matching or bringing together the various *components* (3.3.16) of the footwear with or without the lasts

3.2.3

attached rib

ply rib

rib

wall which is perpendicular to the flat *surface* (3.6.22) of a sole or *insole* (3.3.39) and slightly inward from the edge, usually made of fabric, fixed to the insole to present a wall similar to a Goodyear insole rib

Note 1 to entry: This can be formed by cutting a channel or lip or by folding a piece of material.

Note 2 to entry: See [Figure 4](#).

3.2.4

back seam

seam (3.2.34) at the back of the *heel* (3.3.33) joining or closing the *upper* (3.3.65) together

3.2.5

beading

folding

process of folding over an edge, usually the *top line* (3.3.60)

3.2.6

binding

<process> attaching a narrow strip around an edge

3.2.7

Blake sewn

<process> *chainstitch* (3.2.13) method in which the *upper* (3.3.65) and sole are sewn together with a single stitch from the inside, resulting in a clean and seamless appearance on the exterior of the footwear

Note 1 to entry: This sewing method was invented by Blake.

Note 2 to entry: See [Figure 10](#).

3.2.8

bottom assembly

<process> bringing together all the parts of the footwear bottom

3.2.9

buffing

bringing up a shine or polishing or roughing or scouring in preparation for *adhesion* (3.2.1)

3.2.10

burnishing

treatment to add highlights, including edge treatment involving application of heat to a skive so that it assumes a quarter-round section

3.2.11

butt seam

seam (3.2.34) made by butting two edges together with no overlap, usually sewn using a zigzag stitch

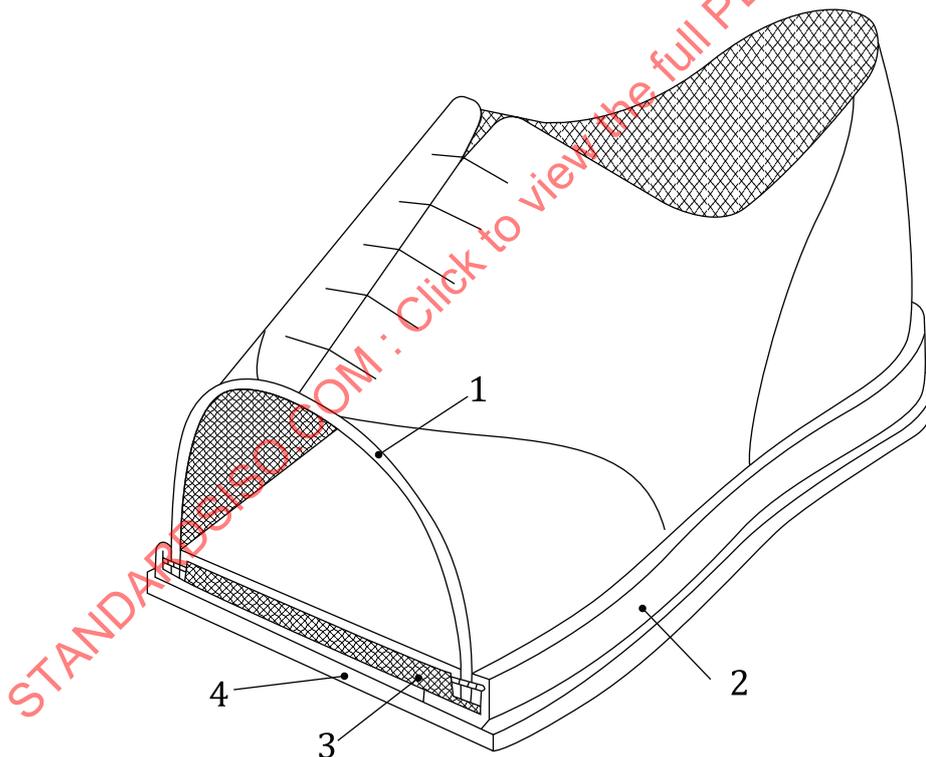
3.2.12

California

construction (3.2.16) in which the *upper* (3.3.65) is stitched to a flexible *insole* (3.3.39) or a light *sock* (3.3.31) to make a bag into which the *last* (3.6.13) is forced

Note 1 to entry: The band is then used to cover the edge of a *midsole* (3.3.43) before the *outsole* (3.3.47) is stuck on.

Note 2 to entry: See [Figure 2](#).



Key

- 1 upper
- 2 covering
- 3 bottom filling/filler
- 4 outsole

Figure 2 — California construction

3.2.13

chainstitch

stitch made by a single thread passing to and fro through a hole in the material and caught on one side by a loop formed by the previous stitch

3.2.14

cohesion

state in which the particles of a single substance are held together by the primary or secondary valence forces

3.2.15

construction

<process> particular method or process used for constructing or assembling a sole (*outsole* (3.3.47))

3.2.16

construction

<process result> manner in which the *outsole* (3.3.47) is attached to the *upper* (3.3.65)

3.2.16.1

cemented construction

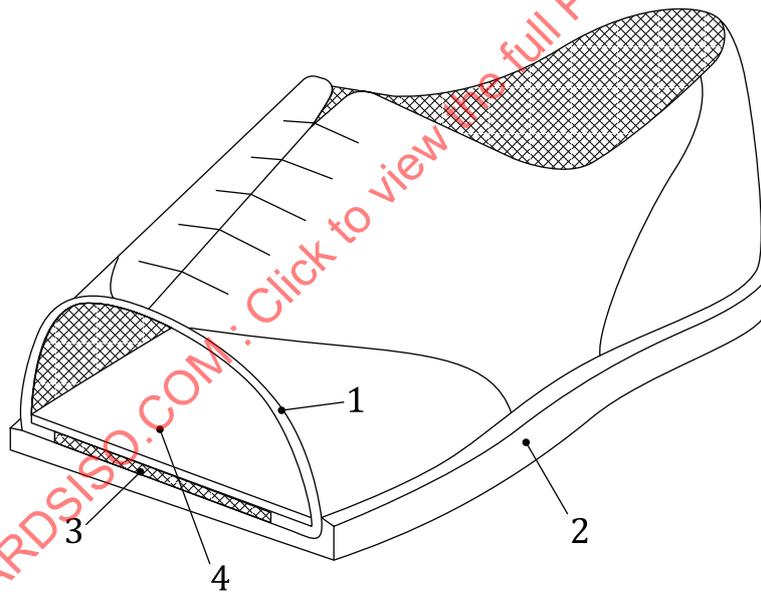
flat lasted

stuck-on sole construction

stuck-on

method of construction where the *upper* (3.3.65) is fixed or lasted to the sole using *adhesive* (3.1.2)

Note 1 to entry: See [Figure 3](#).



Key

- 1 upper
- 2 outsole
- 3 bottom filling/filler
- 4 insole

Figure 3 — Cemented construction

3.2.17

cutting area

usable area of material, for example, a hide or skin, from which *components* (3.3.16) are cut

3.2.18

direct moulding

method of having a sole/heel mould that is held against the lasted *upper* (3.3.65), making contact at the bite-line where the welt-plate touches the upper, thus enclosing a cavity within which the sole/heel is formed

3.2.18.1

injection moulding

type of *direct moulding* (3.2.18) where the sole is formed from polymer that is forced into the mould while in a molten state

3.2.18.2

direct vulcanizing dv moulded

type of *construction* (3.2.16) where uncured rubber is placed in a sole mould in contact with the lasted margin of the *upper* (3.3.65) and cured or vulcanized in situ via the application of heat and pressure

3.2.18.3

reaction moulding

type of *construction* (3.2.16) where a sole, such as a polyurethane (PUR) sole, is formed in the mould attached to the lasted upper by mixing the components of the PUR (e.g. polyol and isocyanate) immediately before they are introduced into the mould and where the components react in the mould to produce a cellular PUR outsole

3.2.19

direction of stretch

directions with the most and least stretch (modulus) respectively, usually with *leather* (3.1.20), but also with other upper materials

3.2.20

edge

3.2.20.1

edge finishing

application of inks and colorants to raw edges

3.2.20.2

edge guide

mechanical device fitted to equipment to aid following of edges, often seen on stitching machines

3.2.20.3

edge iron setter

heat treatment applied by using a tool shaped to match the edge profile and to make edges smooth

3.2.20.4

edge trimming

operation with tool to define the profile on the edge of a *component* (3.3.16) so its edge is neat and/or matches an adjacent component

Note 1 to entry: Top stitching is often known as under edge trimming.

3.2.21

finishing

<process> applying the final treatments, colourants and glosses to footwear

3.2.22

fitting

<process> matching the dimensions of the foot most accurately to a given size of foot

3.2.23

force lasting

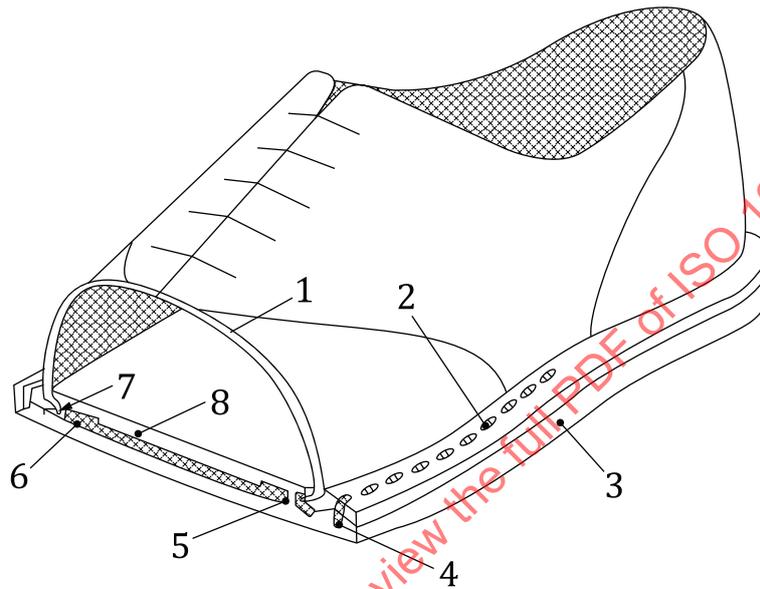
method of *lasting* (3.2.28) where the *upper* (3.3.65) is joined to the *insole* (3.3.39) or *insock* (3.3.38) and forced on to a *last* (3.6.13)

3.2.24

Goodyear welted

type of *construction* (3.2.16) in which the *welt* (3.3.70) and the *upper* (3.3.65) are sewn to the *insole rib* (3.2.3) by the *welt sewing* (3.2.48) machine or by hand, then welt is sewn to the *midsole* (3.3.43) or *outsole* (3.3.47)

Note 1 to entry: See [Figure 4](#).



Key

- 1 upper
- 2 welt
- 3 outsole
- 4 seam
- 5 rib
- 6 bottom filling/filler
- 7 welt sewing
- 8 insole

Figure 4 — Goodyear construction

3.2.25

halogenation

treatment, usually with chlorine, to improve the *bondability* (3.5.4) of materials

Note 1 to entry: Other halogens such as iodine or bromine may also be used.

3.2.26

lace hooks

<factory> small hooks inserted like *eyelets* (3.3.25) into footwear or boot *facings* (3.3.26) used for temporary closing during *lasting* (3.2.28), to prevent damage

3.2.27

lacing

drawing together, or fastening, two opposite portions of the *upper* (3.3.65) with a *lace* (3.3.40) drawn through *eyelets* (3.3.25) or around hooks

3.2.28

lasting

footwear-making operation that pulls and stretches the *upper* (3.3.65) to conform to the shape of the *last* (3.6.13)

3.2.29

lockstitch

double thread stitch that locks the threads together within the material so that breaking one stitch does not permit the *seam* (3.2.34) to come apart

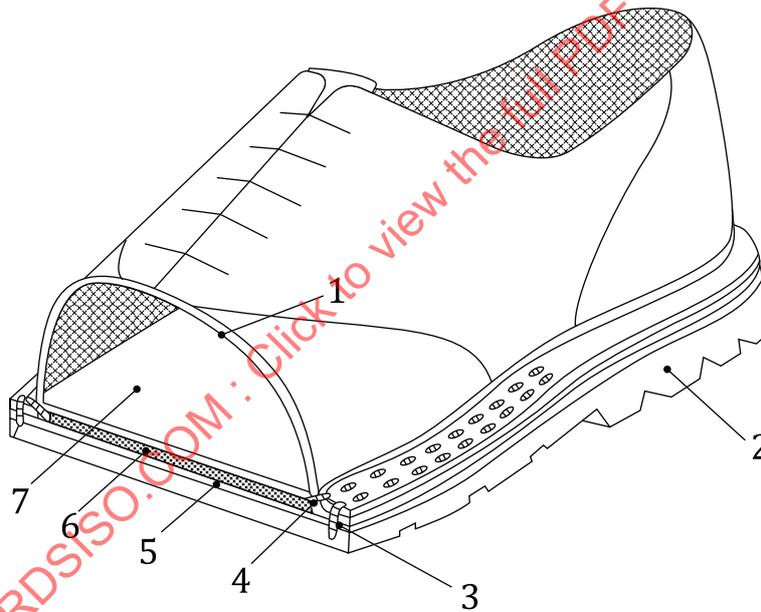
3.2.30

Norwegian construction

reversed welted

variation of the welted *construction* (3.2.16) in which the *welt* (3.3.70) (with a specifically designed cross section) is sewn vertically to the side of footwear, so that the sewing is visible, the major part of the welt below the sewing is then out-flanged and the sole stitched to this flange

Note 1 to entry: See [Figure 5](#).



Key

- 1 upper
- 2 outsole
- 3 seam
- 4 seam "with the insole"
- 5 midsole
- 6 bottom filling/filler
- 7 insole

Figure 5 — Norwegian construction

3.2.31

roughing

mechanically treating the lasted margin of the *upper* (3.3.65) in order to improve *adhesion* (3.2.1) usually by using a rotating wire brush or scouring band

3.2.32

rub

flatten any protrusion on the *upper* (3.3.65) or *lining* (3.3.42), usually applied to a raised *seam* (3.2.34)

3.2.33

saddle seam stitch

seam (3.2.34), usually with decorative purposes, formed by placing two pieces of material together facing outwards and stitching close to the edge with heavy thread to give the appearance of hand sewing

3.2.34

seam

line of stitching that joins two or more components together

3.2.35

side wall sewn

footwear *construction* (3.2.16) in which the *upper* (3.3.65) is directly stitched to the side wall running around the footwear

3.2.36

slug, verb

<process> reinforce the *top piece* (3.3.61) of a *heel* (3.3.33) by driving in a series of metal nails or slugs around the perimeter thus giving increased resistance to wear during walking

3.2.37

split, verb

cut a material into two or more layers

3.2.38

spring

toe spring

<footwear> distance between the ground level and the bottom *surface* (3.6.22) of the sole at the toe

3.2.39

stamping

imprinting information, usually using heat or pressure, onto the *sock* (3.3.31) *lining* (3.3.42) or sole

3.2.40

stitch density

number of stitches per unit length

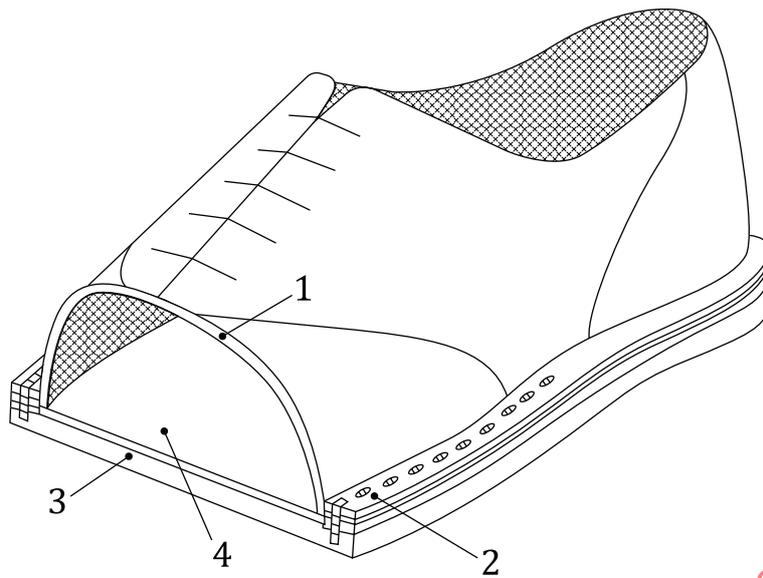
3.2.41

stitchdown

veldtschoen

basic footwear *construction* (3.2.16) where the edge of the *upper* (3.3.65) is lasted outward and stitched with a *welt* (3.3.70) directly to the *insole* (3.3.39) or sole, and the sole is attached by *stuck-on* (3.2.16.1)

Note 1 to entry: See [Figure 6](#).



Key

- 1 upper
- 2 welt
- 3 outsole
- 4 insole/runner

Figure 6 — Stitchdown (veldtschoen) construction

3.2.42

string lasted construction

construction (3.2.16) where a string around the lasting margin is used to fix the *upper* (3.3.65) at the *last* (3.6.13)

Note 1 to entry: See [Figure 7](#).

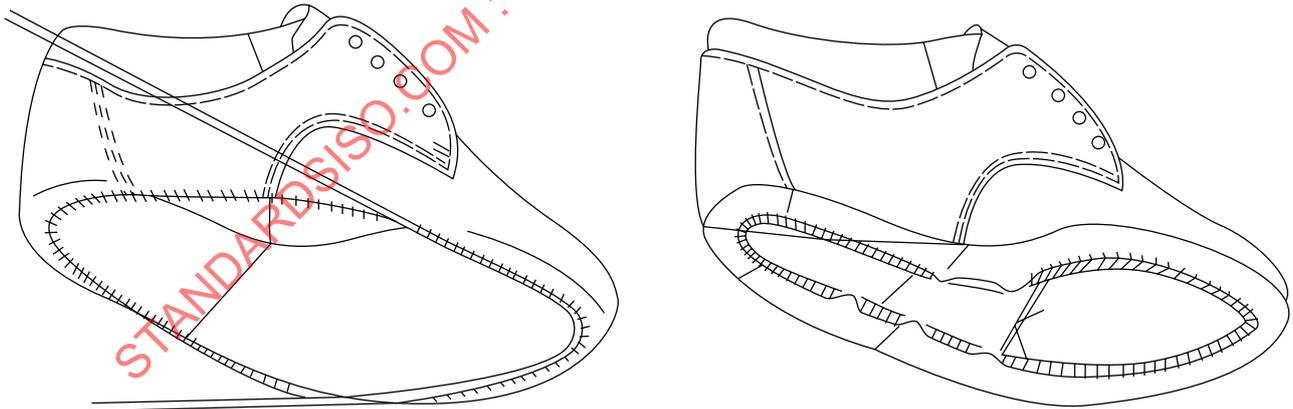


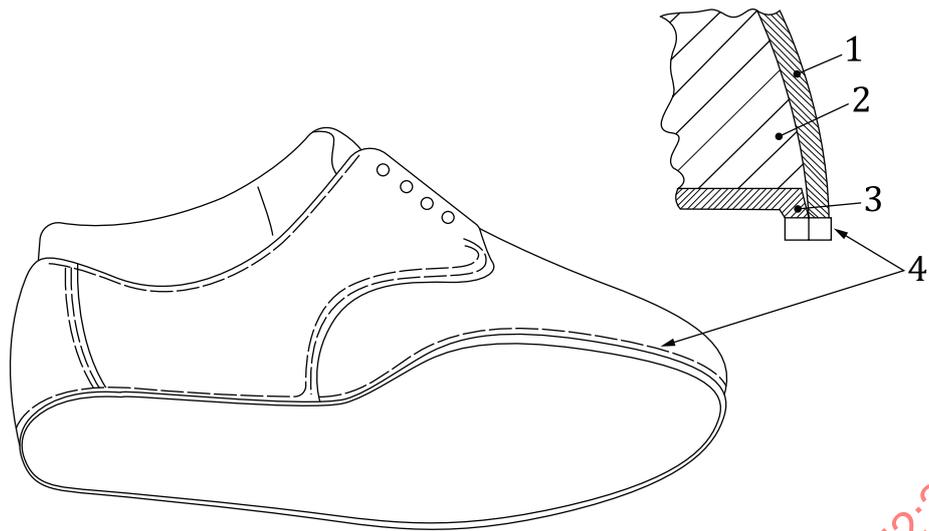
Figure 7 — String lasted construction

3.2.43

Ströbel construction

construction (3.2.16) wherein the edge of the *insole* (3.3.39) is stitched at the edge of the *upper* (3.3.65) and the ströbel stitching position is matching with the *feather edge* (3.3.27) of the *last* (3.6.13)

Note 1 to entry: See [Figure 8](#).



Key

- 1 upper
- 2 last
- 3 insole
- 4 seam stitching

Figure 8 — Ströbel construction

3.2.44

tack lasting

type of *lasting* (3.2.28) carried out on a plated *last* (3.6.13) in which the *upper* (3.3.65) is fixed by tacks not subsequently removed

3.2.45

tight to toe

correct way to cut upper components with the direction of material stretch perpendicular to the direction of greatest lasting tension

3.2.46

waist lasting

side lasting

lasting (3.2.28) process applied to the *upper* (3.3.65) from toe to *waist* (3.6.29)

3.2.47

welt beating

welt hammering

operation of lightly beating the *welt* (3.3.70) into a smooth position around the edge of the footwear prior to attaching the sole

3.2.48

welt sewing

sewing of the *welt* (3.3.70) and the *upper* (3.3.65) on to the raised lip of the *insole* (3.3.39)

Note 1 to entry: See [Figure 4](#).

3.2.49

wheeling, noun

ornamental line made across a footwear sole or around a heel rand by means of a corrugated wheel

3.2.50

whole cut

one-piece *upper* (3.3.65)

Note 1 to entry: This is distinct from one consisting of a number of joined sections.

3.2.51

wrinkle chase, noun

removal of creases in an *upper* (3.3.65) by heating or in other ways

Note 1 to entry: For *leather* (3.1.20), this is done by using heat to cause the grain surface of the leather to shrink slightly therefore eliminating fine wrinkles on the upper.

3.2.52

yield area

proportion of material used in cutting a pattern, as opposed to the waste generated

3.3 Footwear components

3.3.1

accessible components

components that can be directly reached or touched without dismantling or destroying any permanent joining of the footwear

3.3.2

accessory

indispensable visible components which have a technical function in the footwear *construction* (3.2.16)

EXAMPLE Fasteners, zipper, *laces* (3.3.40).

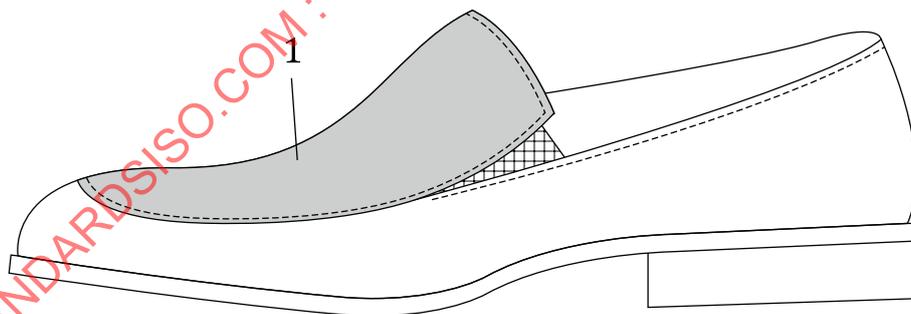
3.3.3

apron

plug

central portion on the top of the *vamp* (3.3.66)

Note 1 to entry: See [Figure 9](#).



Key

1 apron/plug

Figure 9 — Apron

3.3.4

arch support

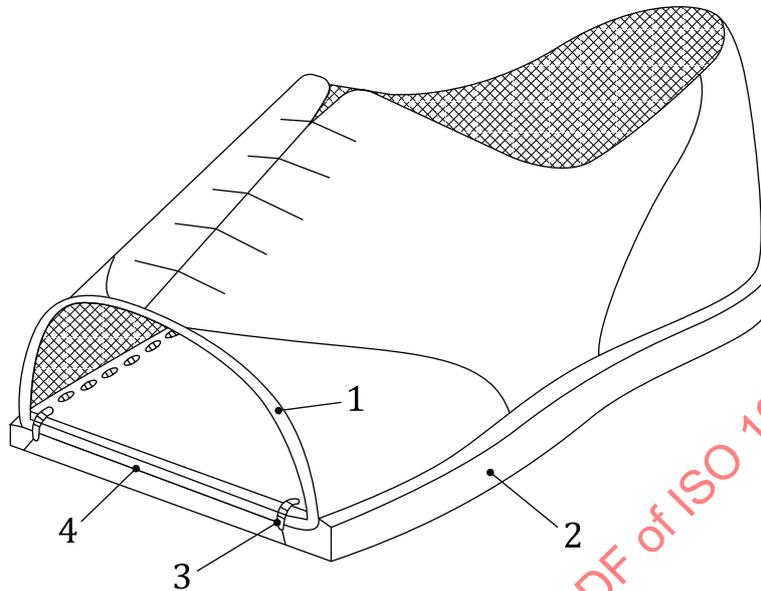
shaped piece usually of *shank* (3.3.50), wood, firm rubber or similar material fitted to the *insole* (3.3.39) in the *arch* (3.6.1) region

3.3.5

Blake sewn

<component> sole sewn on by a *chainstitch* (3.2.13), using single or double thread

Note 1 to entry: See [Figure 10](#).



Key

- 1 upper
- 2 outsole
- 3 stitch
- 4 bottom filling/filler

Figure 10 — Blake sewn

3.3.6

bottom assembly

<component> bottom parts of a footwear which can include *insole* (3.3.39), *welt* (3.3.70), *midsole* (3.3.43), *shank* (3.3.50), non-removable *insock* (3.3.38), *heel* (3.3.33) and *outsole* (3.3.47)

3.3.7

bottom unit

sole unit or complete sole with *heel* (3.3.33) attached

3.3.8

bottom wall

upright edge on the side of the sole

3.3.9

box toe

toe puff

piece of material (fabric, composite or metal) inserted as a *stiffener* (3.3.18) in the toe of a footwear between the outside and the *lining* (3.3.42) to retain the original contour of the toe of the *last* (3.6.13) in the footwear

3.3.10

built heel

stacked heel

heel (3.3.33) comprising several layers or lifts

3.3.11

cap

section covering the toe area of the *vamp* (3.3.66)

3.3.12

cleat

solid protrusion of a *tread* (3.3.62) pattern of sole

Note 1 to entry: See [Figure 11](#).

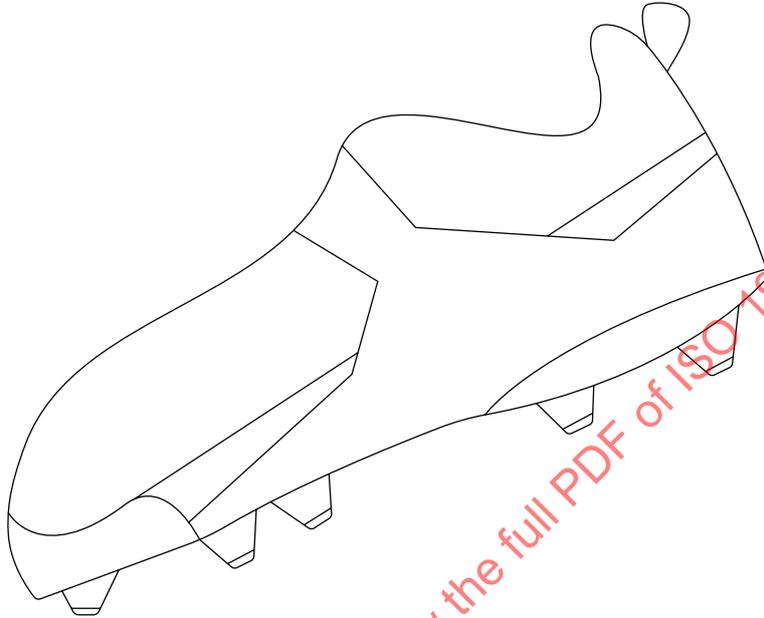


Figure 11 — Cleat

3.3.13

cleat sole

sole with a *tread* (3.3.62) pattern containing cleats

3.3.14

collar

cuff

upper (3.3.65) section which follows the *top line* (3.3.60) or top edge of the *quarters* (3.3.48)

3.3.15

complete upper assembly

finished *upper* (3.3.65), fully seamed, joined or laminated together as appropriate, comprising the centre material and any lining(s) together with all components such as interlinings, *adhesives* (3.1.2), membranes, foams or *reinforcements* (3.1.21), but excluding toe puffs and *stiffeners* (3.3.18)

Note 1 to entry: The complete upper assembly can be flat, two-dimensional or comprise lasted upper in the final footwear.

3.3.16

component

part of the footwear

EXAMPLE *Upper* (3.3.65), *outsole* (3.3.47), *lining* (3.3.42).

**3.3.17
component in contact with the skin**

component (3.3.16) closely in contact with foot or leg skin during wearing

EXAMPLE *Linings* (3.3.42), *tongues*, *insoles* (3.3.39) and *insocks* (3.3.38).

Note 1 to entry: Foot (leg) skin hose includes sock, stocking, tights, etc.

Note 2 to entry: If a footwear has no lining, the inside of the *upper* (3.3.65) should be taken as lining and regarded as component in contact with the skin.

**3.3.18
counter
stiffener**

support to give stiffness, inserted between the *lining* (3.3.42) and the *upper* (3.3.65), or outside the upper over the heel area

**3.3.19
covered heel**

heel (3.3.33) covered entirely with material

**3.3.20
D-ring**

metal or plastic piece often used for sport footwear, enabling a *lace* (3.3.40) to slide but different from an *eyelet* (3.3.25) or a *lace hook* (3.3.41)

Note 1 to entry: See [Figure 12](#).

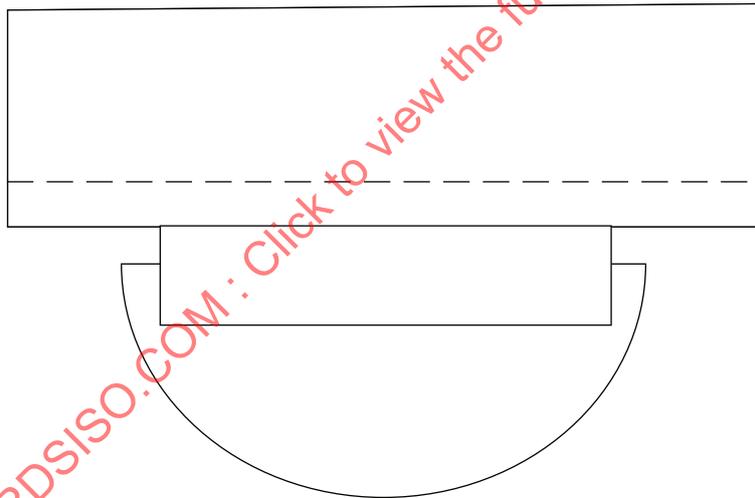


Figure 12 — D-ring

**3.3.21
decorative attachment
ornament**

component (3.3.16) with no functional property and usually designed for aesthetic purposes

Note 1 to entry: If a decorative attachment is removed, there is no function loss for the footwear.

**3.3.22
direct moulded sole**

sole made by *direct moulding* (3.2.18)

3.3.23

drawn-up toe

part of the *outsole* (3.3.47) that extends up onto the toe area at the front of the footwear, used to strengthen the bond between the sole and the *upper* (3.3.65)

3.3.24

extended sole

sole whose edge protrudes from around the *feather edge* (3.3.27)

3.3.25

eyelet

metal or plastic tube or cylinder inserted through the thickness of an *upper* (3.3.65) to take a *lace* (3.3.40) or thread

3.3.26

facer

facings

facing row

part of the *upper* (3.3.65) carrying the *eyelets* (3.3.25)

Note 1 to entry: It is usually present in rows.

3.3.27

feather edge

line that denotes the boundary between the sole and the *upper* (3.3.65)

3.3.28

fibreboard

material made from fibres, usually either *leather* (3.1.20) or cellulose, which has been reconstituted into a sheet (or board) using paper-making techniques

3.3.29

footbed

component (3.3.16) fitted onto either the *insole* (3.3.39) or the *insock* (3.3.38), or both, usually to aid either fit or comfort, or both, e.g. via contouring or shock absorption

3.3.30

forepart

front half of a *last* (3.6.13) or footwear, i.e. the toe end

3.3.31

full sock

sock

single layer of material permanently bound to the foot side of the *insole* (3.3.39)

3.3.32

half sock

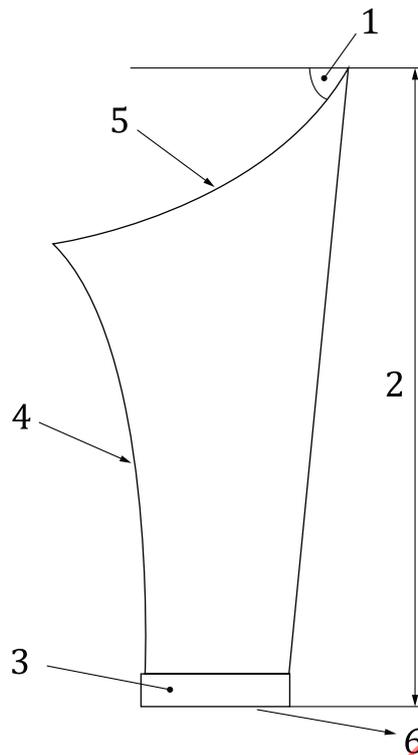
seat sock

sock (3.3.31) covering only half the visible area of the *insole* (3.3.39), usually the heel end

3.3.33

heel

<footwear> support placed under the seat of the footwear to give it its intended stance



Key

- 1 heel angle
- 2 heel height
- 3 top piece
- 4 heel breast
- 5 heel seat
- 6 heel tip

Figure 13 — Heel

3.3.34

heel breast

forward face of the *heel* (3.3.33)

Note 1 to entry: See [Figure 13](#).

3.3.35

heel seat

part of the *heel* (3.3.33) that is in contact with the *upper* (3.3.65)

Note 1 to entry: See [Figure 13](#).

3.3.36

heel tip

reinforcement (3.1.21) of metal, rubber or plastic, fixed to the bottom of a heel *top piece* (3.3.61) to give increased wear resistance at this point during walking

Note 1 to entry: See [Figure 13](#).

3.3.37

inaccessible component

component (3.3.16) hidden inside which cannot be reached or touched without dismantling or destroying some permanent joining of the footwear

3.3.38

insock

component (3.3.16), usually multilayer (removable or not), covering the *insole* (3.3.39) to improve the performance, comfort and shock absorption of the *bottom assembly* (3.3.6)

3.3.39

insole

component (3.3.16) used to form the base of the footwear to which the *upper* (3.3.65) is usually attached during *lasting* (3.2.28)

3.3.40

lace

cord or string used for drawing together two edges, usually the *quarters* (3.3.48) of a footwear

3.3.41

lace hooks

<footwear> small hooks inserted like *eyelets* (3.3.25) into footwear or boot *facings* (3.3.26) to hold the *lace* (3.3.40) for fastening

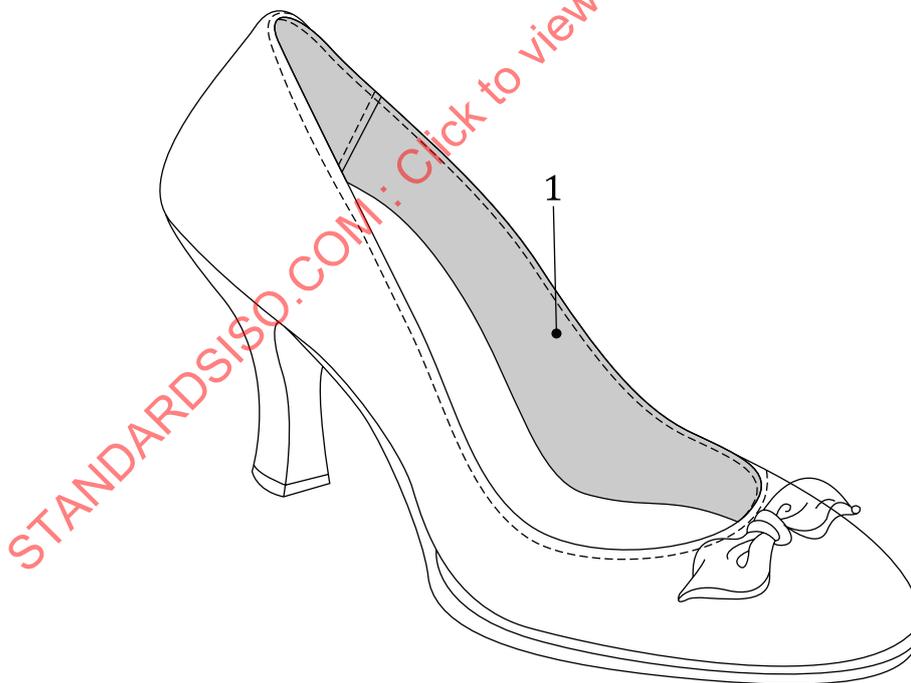
3.3.42

lining

materials that constitute the inside of the footwear and that are against the foot, leg or sock

Note 1 to entry: To aid labelling, where there are no other pieces of material attached to the *upper* (3.3.65) to form a lining, the inner face of the upper is considered as the lining. Any uncovered part of the insole is included in the calculation. Where one material constitutes at least 80 % of the surface area of the inside of the footwear, this is labelled as one of the material types listed in EU Directive 94/11/EC.^[54] Where no one material constitutes at least 80 % of the inside area of the footwear, the two main materials are described (in descending order of area).

Note 2 to entry: See [Figure 14](#).



Key

1 lining

Figure 14 — Lining

**3.3.43
midsole
runner
through sole**

layer of material, usually combination of rigid support materials and polymeric foam materials of varying Shore hardness values, inserted between the *outsole* (3.3.47) and the *insole* (3.3.39)

Note 1 to entry: See [Figure 5](#) and [Figure 28](#).

**3.3.44
multilayer sole**

sole that comprises two or more layers

**3.3.45
multiple D-ring**

plastic piece gathering several *D-rings* (3.3.20) and usually sewn on to the *upper* (3.3.65)

**3.3.46
orthotic**

moulded insert in a footwear which provides support at the *arch* (3.6.1), *heel* (3.6.9), or ball of the foot

**3.3.47
outsole**

bottom *component* (3.3.16) of the footwear, at least part of which is in contact with the ground

**3.3.48
quarter**

complete half (either inside or out) of the back area of the footwear *upper* (3.3.65) covering the side and *counter* (3.3.18)

Note 1 to entry: See [Figure 15](#).



Key

1 quarter

Figure 15 — Quarter

**3.3.49
quarter lining**

material that lines the *quarter* (3.3.48) of an *upper* (3.3.65)

**3.3.50
shank**

thin strip of material in different shape, usually wood or steel, used to stiffen or prevent excessive bending of the plantar *arch* (3.6.1)

Note 1 to entry: See [Figure 16](#).

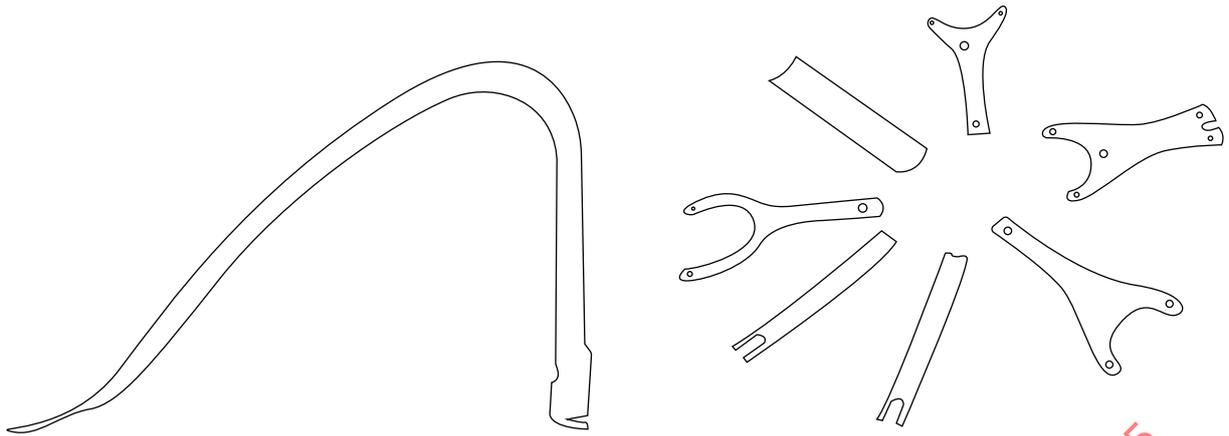


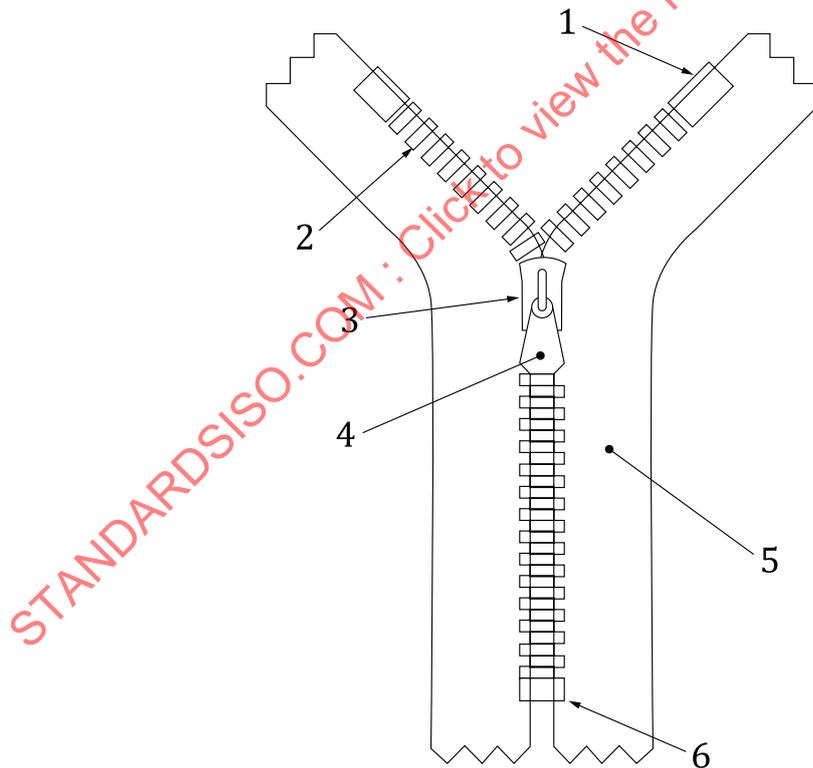
Figure 16 — Example of shanks

3.3.51
slide fastener

means of securing two flexible materials consisting of interlockable *teeth* (3.3.51.7), each attached to one of the opposing edges of two *tapes* (3.3.51.6), and a movable *slider* (3.3.51.4) that spans the interlocking teeth, which, when moved in one direction, causes the teeth of one tape to interlock with the teeth of the other tape

Note 1 to entry: When the slider is moved in the opposite direction, it causes the teeth to disengage.

Note 2 to entry: See [Figure 17](#).



Key

- | | |
|-----------|------------|
| 1 top end | 4 puller |
| 2 teeth | 5 tape |
| 3 slider | 6 end stop |

Figure 17 — Slide fastener

3.3.51.1

end stop

top stop

terminal component of the *teeth* (3.3.51.7) to prevent the *slider* (3.3.51.4) from disengaging from the teeth and *tape* (3.3.51.6)

3.3.51.2

locking device

component (3.3.16) that prevents unintended movement of the *slider* (3.3.51.4) during use or wear

3.3.51.3

puller

piece of plastic or metal attached to the *slider* (3.3.51.4) as a means of manual grip for the user to operate

3.3.51.4

slider

means of drawing the two interlocking *teeth* (3.3.51.7) together or apart as it traverses the length of the teeth

3.3.51.5

stringer

textile *tape* (3.3.51.6) with an attached row of *teeth* (3.3.51.7) designed to interact with a row attached to another tape

3.3.51.6

tape

fabric panel to support other *teeth* (3.3.51.7) of the *slide fastener* (3.3.51)

3.3.51.7

teeth

individual *components* (3.3.16) of the *slide fastener* (3.3.51) or continuous plastic spiral which interlocks with an opposing element

3.3.52

slug

<component> small pointed piece of metal, with or without a head, or a piece of metal wire cut and driven in mechanically, intended to fix together the separate layers of a *heel* (3.3.33) or various parts of the footwear bottom

3.3.53

spike heel

very high tapering *heel* (3.3.33)

3.3.54

stiletto heel

medium or high heel (35 mm or above) with a very small *top piece* (3.3.61) tapering in to a very fine point

3.3.55

Thomas heel

heel (3.3.33) manufactured with an anterior medial extension approximately 1,27 cm longer than the standard heel

Note 1 to entry: The purpose of the Thomas heel is to give added support under the sustentaculum tali and the medial longitudinal arch.

Note 2 to entry: See [Figure 18](#).

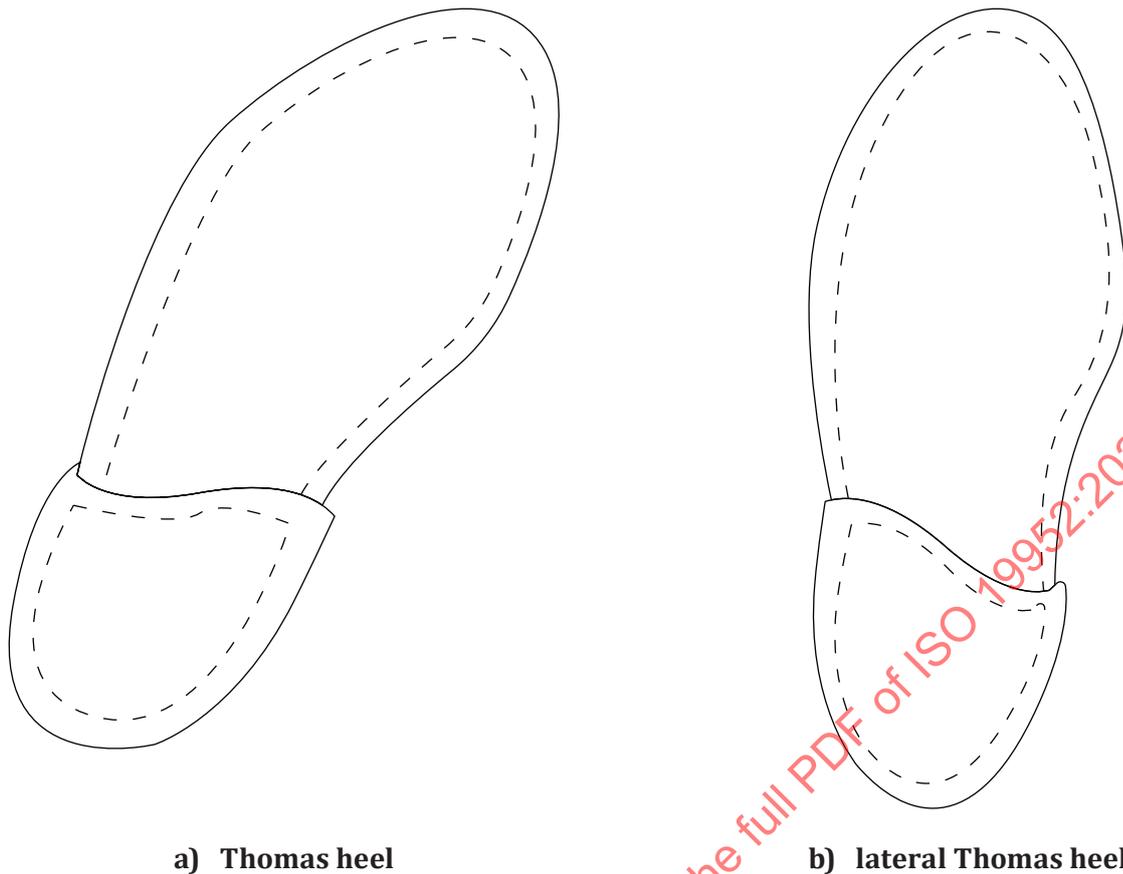


Figure 18 — Thomas heel

3.3.55.1

lateral Thomas heel

heel (3.3.33) that supports the cuboid area and rotates the foot externally, thus abducting the foot

Note 1 to entry: A wedge can be inserted if additional support is needed.

Note 2 to entry: See [Figure 18](#).

3.3.56

throat

footwear *vamp* (3.3.66) opening as the entrance for the forepart of the foot

3.3.57

toe cap

forepart (3.3.30) of the *upper* (3.3.65) which extends from the tip of the footwear to part way up the *vamp* (3.3.66)

3.3.58

tongue

part of the *upper* (3.3.65), or a section fixed to the upper, which extends from the rear edge of the *vamp* (3.3.66) and lies under the lacing as a protection for the instep

3.3.59

top lift

outermost layer in a built-up heel to which the *top piece* (3.3.61) is joined

3.3.60

top line

line that runs around the footwear at the top of the *vamp* (3.3.66) and *quarter* (3.3.48)

3.3.61

top piece

part of the *heel* (3.3.33), usually detachable, in contact with the walking surface

Note 1 to entry: See [Figure 13](#).

3.3.62

tread

weight-bearing pattern and *surface* (3.6.22) of the sole of a footwear

3.3.63

trim

item attached to the *upper* (3.3.65), including either decorative or functional attachments, or both

EXAMPLE Buttons, upper decorations.

3.3.64

unit sole

moulded sole in which *heel* (3.3.33) and sole are moulded as a single unit in predetermined sizes

3.3.65

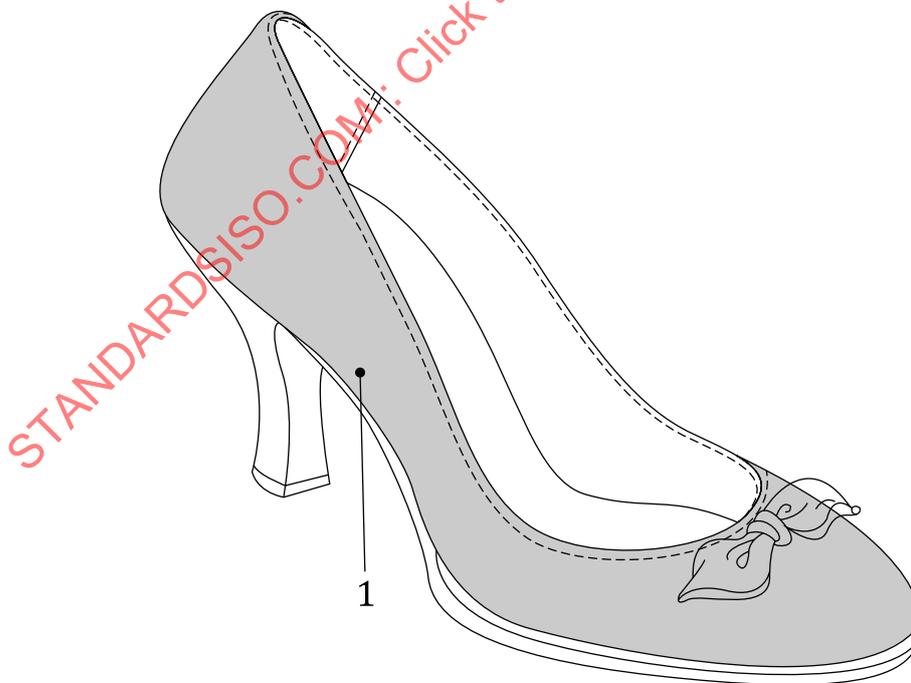
upper

materials forming the outer face of the footwear, which is attached to the *sole assembly* (3.2.2) and covers the upper dorsal surface of the foot

Note 1 to entry: In the case of *boots* (3.4.4), this also includes the outer face of the material covering the leg. Only the materials that are visible are included, no account should be taken of underlying materials.

Note 2 to entry: To aid labelling, where one material constitutes at least 80 % of the surface area, this is labelled as one of the types of material listed in EU Directive 94/11/EC.^[54] Where no one material constitutes at least 80 % of the upper area, the two main materials are described (in descending order of area). No account should be taken of accessories or purely decorative trims.

Note 3 to entry: See [Figure 19](#).



Key

1 upper

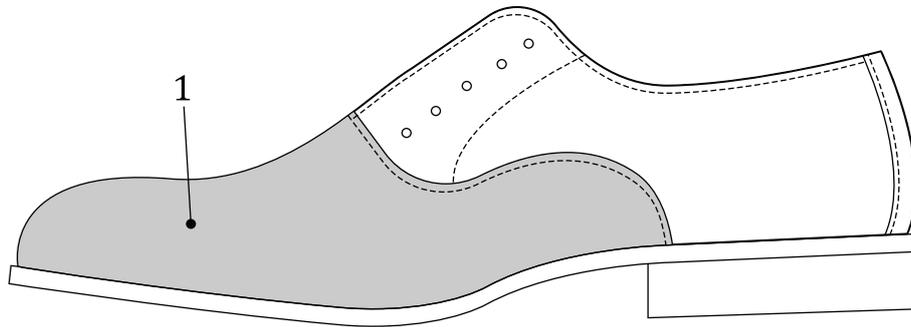
Figure 19 — Upper

3.3.66

vamp

fore section of the *upper* (3.3.65), excluding the quarters, which covers the toes and front of the foot

Note 1 to entry: See [Figure 20](#).



Key

1 vamp

Figure 20 — Vamp

3.3.67

vamp lining

piece of material which lines the *vamp* (3.3.66) of an *upper* (3.3.65)

3.3.68

vamp wing

each side of the back *vamp* (3.3.66) edges where they lie over the *quarter* (3.3.48)

3.3.69

wedge-shaped heel

solid *heel* (3.3.33) extending from the back of the footwear to the ball of the footwear making a flat treading surface along the entire length of the footwear

3.3.70

welt

flexible strip of material around the edge of the sole

Note 1 to entry: See [Figure 4](#) and [Figure 6](#).

3.3.71

wing cap

wing-shaped overlay, often perforated and with a gimped edge, applied to the *vamp* (3.3.66) for a decorative effect

3.4 Footwear type

3.4.1

ankle boot

high cut footwear

boot (3.4.4) or footwear with *upper* (3.3.65) extending to just cover the ankle (malleolus)

3.4.1.1

Balmoral

style of *ankle boot* (3.4.1) which follows the Oxford style of facing with the *vamp* (3.3.66) overlaying the *quarters* (3.3.48), in which the side curve of the vamp does not meet the feather line but extends towards the back to meet the back strap

3.4.1.2

Chelsea boot

close-fitting *ankle boot* (3.4.1) with *low heel* (3.3.33), *round toe cap* (3.3.57), *no lace* (3.3.40) and moderately shaped elastic belt (panels) on the side, that usually has a tab or loop on the back of the boot, enabling it to be pulled on

Note 1 to entry: See [Figure 21](#).

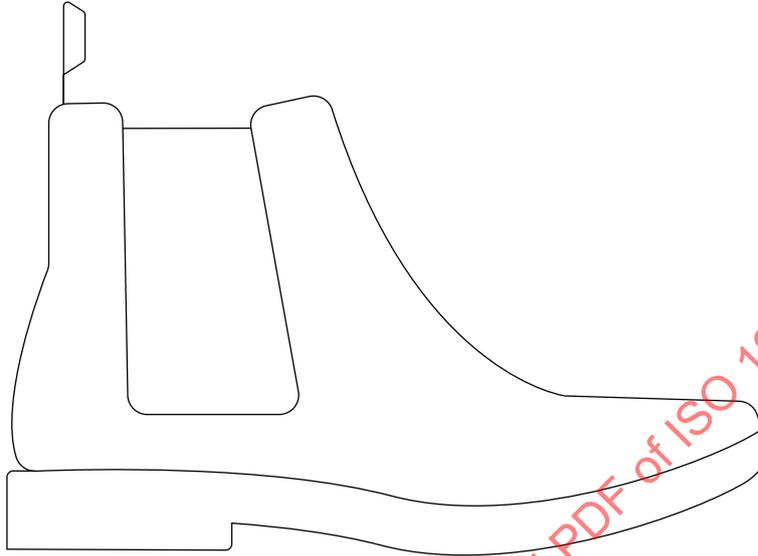


Figure 21 — Example of Chelsea boot

3.4.1.3

Chukka boot

ankle boot (3.4.1) with suede or *leather* (3.1.20) *upper* (3.3.65), *leather or rubber outsole* (3.3.47), and open-lacing with two or three pairs of *eyelets* (3.3.25)

Note 1 to entry: See [Figure 22](#).



Figure 22 — Example of Chukka boot

3.4.2

antimicrobial footwear

footwear that includes *linings* (3.3.42), *insocks* (3.3.38), *uppers* (3.3.65) and other *components* (3.3.16) made of antimicrobial materials or treated with antimicrobial agents to kill microorganisms or to inhibit their growth

3.4.3

ballet footwear

lightweight footwear designed for dancing, made of satin upper material, ribbon fasteners and no *heel* (3.3.33)

Note 1 to entry: The toe of ballet footwear may be soft or solid for specific dances.

3.4.4

boot

footwear with a leg section above the ankle

Note 1 to entry: According to the height of *upper* (3.3.65), the boot can be classified into high-tops, half-knee boot, knee-high boot, over-knees boot, etc.

3.4.5

Brogue footwear

footwear characterised by multiple-piece, sturdy *leather* (3.1.20) *uppers* (3.3.65) with decorative perforations along the visible edges of the upper parts

Note 1 to entry: The degree of perforated embellishments decoration ranges from a few details on the *toe cap* (3.3.57) to full decoration from toe to heel. According to shape and decoration of the upper parts, Brogue can be classified into full Brogue, semi Brogue, quarter Brogue and longwing Brogue.

Note 2 to entry: See [Figure 23](#).

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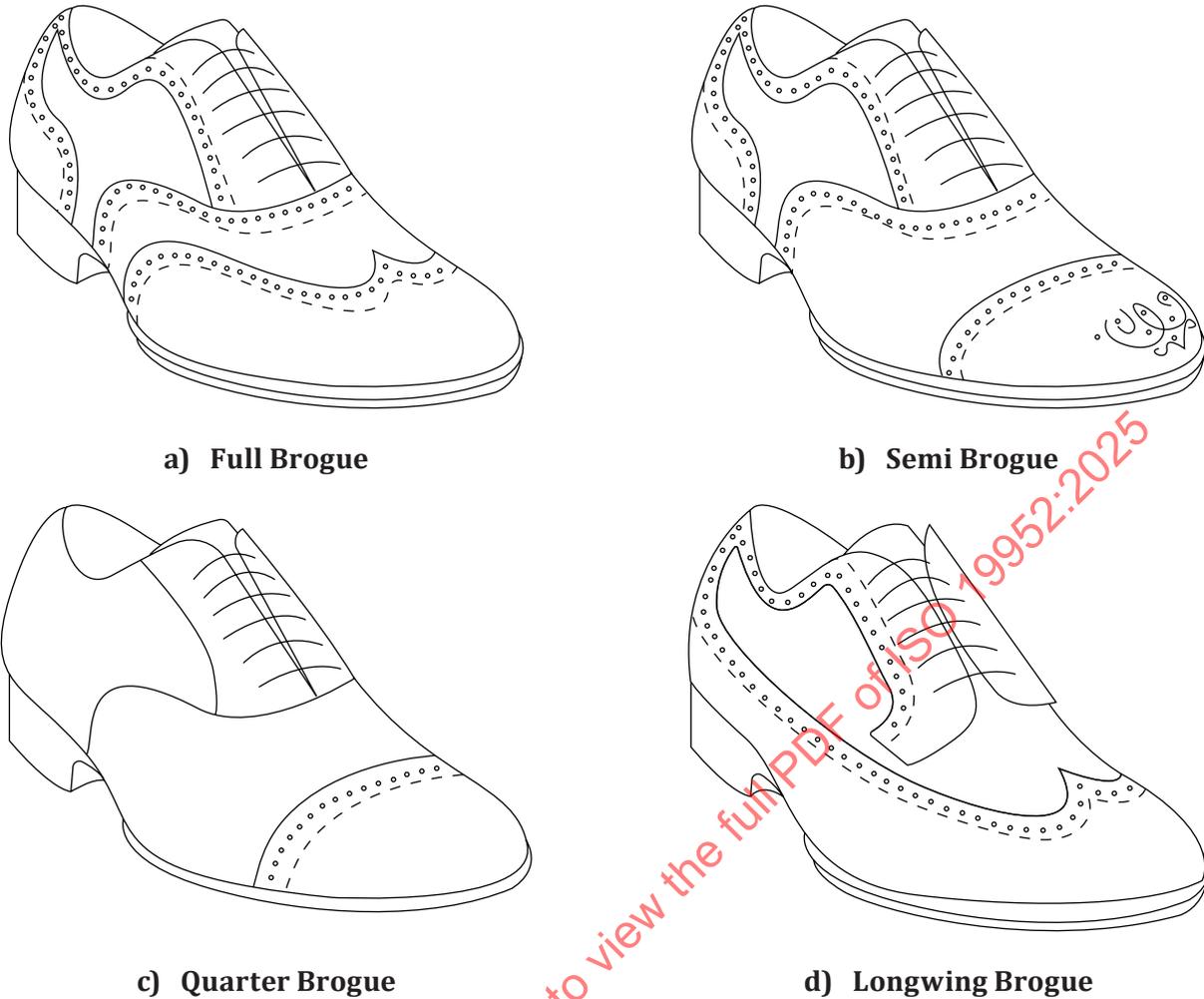


Figure 23 — Examples of Brogue footwear

3.4.5.1

full Brogue

footwear with *toe cap* (3.3.57) decorations that extend back to the middle of the footwear, creating what looks like wings, usually called *wing cap* (3.3.71)

Note 1 to entry: Full brogue footwear is also decorated along the sides of the *upper* (3.3.65) and heel piece.

3.4.5.2

semi Brogue

footwear that has decorations on the *toe cap* (3.3.57) and along the rim of the *upper* (3.3.65) and heel piece

3.4.5.3

quarter Brogue

footwear that has decorations on *toe cap* (3.3.57) rim, *upper* (3.3.65) and heel piece

3.4.5.4

longwing Brogue

footwear with *toe cap* (3.3.57) decoration that extends and wraps all the way around the heel of the footwear, and with decoration along the rim of the *upper* (3.3.65)

3.4.6

Brothel-creeper

footwear with a very heavy crepe rubber sole

3.4.7

children's footwear

footwear designed and manufactured for children aged 3 to 14 years

3.4.8

closed footwear

type of footwear in which the *upper* (3.3.65) is connected to all the perimeter of sole

3.4.9

closed-lacing footwear

footwear with the *facier* (3.3.26) attached under the *vamp* (3.3.66)

Note 1 to entry: See [Figure 24](#).

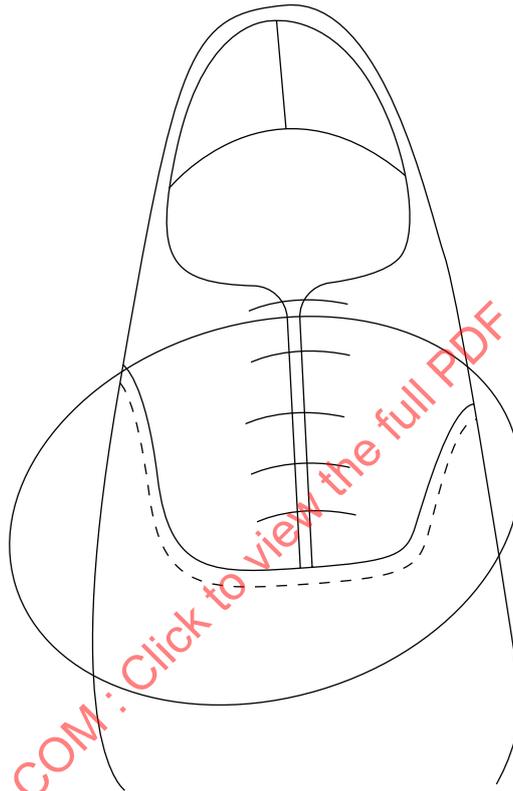


Figure 24 — Example of closed-lacing footwear

3.4.10

cold weather footwear

footwear designed and manufactured to give specific protection to the wearer during use in sub-zero temperatures and in ice or snow or on frozen underfoot surfaces

Note 1 to entry: Cold weather footwear is also suitable for specific cold environments.

3.4.11

court footwear

open footwear with a plain *top line* (3.3.60) and without fastening, as the shoe holds onto the foot by the 'clip' of the top line and the *stiffener* (3.3.18) around the heel

3.4.11.1

d'Orsay

style of court footwear in which the *top line* (3.3.60) drops down to the insole in the *waist* (3.6.29), i.e. it is open waisted

3.4.12

diabetes footwear

footwear designed for diabetic patient's foot protection

3.4.13

fashion footwear

footwear designed and manufactured for light wear in which style is prevalent

3.4.13.1

high fashion footwear

footwear with a limited design and manufacture where fashion appeal style is the most important parameter

3.4.14

footwear

shoe

article(s) made of a sole (*outsole* (3.3.47)) and an *upper* (3.3.65) in different materials designed to protect or cover the foot

Note 1 to entry: This shall be interpreted to mean all types of footwear without restriction, including *boots* (3.4.4), slippers, sandals, etc.

[SOURCE: ISO 9407:2019, 3.1]

3.4.15

general purpose footwear

footwear manufactured as suitable for formal, semi-formal, casual and other general purposes

3.4.15.1

casual footwear

footwear designed and manufactured as suitable for out-of-work leisure and spare time activities

3.4.15.1.1

boat footwear

deck footwear

top sider

type of *casual footwear* (3.4.15.1) known for its water-resistant hide, slip-resistant sole, low profile and side *lacing* (3.2.27)

Note 1 to entry: Boat footwear is considered less formal than dress footwear but more formal than Loafers.

Note 2 to entry: See [Figure 25](#).

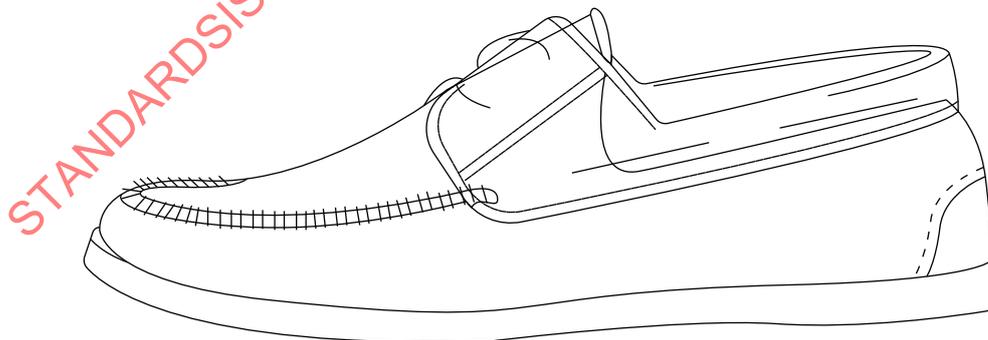


Figure 25 — Example of boat footwear

3.4.15.2

dress footwear

formal footwear

footwear worn on formal occasions, which is paired with formal attire or dress suits and is often crafted from high-quality *leather* (3.1.20) or other premium materials, with great attention paid to detail

3.4.15.2.1

Derbies

lace-up style of footwear with *facings* (3.3.26) that do not touch at the front, but overlay the *vamp* (3.3.66)

Note 1 to entry: See [Figure 26](#).



Figure 26 — Example of Derbies

3.4.15.2.2

Oxford footwear

lace-up style footwear in which the *vamp* (3.3.66) overlays the closed tab *quarters* (3.3.48)

Note 1 to entry: See [Figure 27](#).



Figure 27 — Example of Oxford footwear

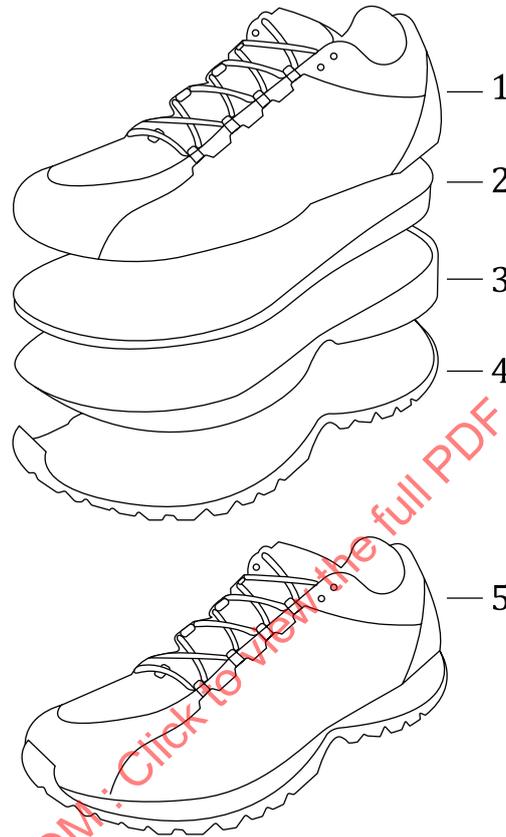
3.4.16

**general purpose sports footwear
general purpose athletic footwear**

footwear designed and manufactured as suitable for wear during a variety of non-specialist sporting activities

EXAMPLE Footwear for jogging, occasional racket sports or court games such as netball and light general training.

Note 1 to entry: See [Figure 28](#).



Key

- 1 upper
- 2 insole
- 3 midsole
- 4 outsole
- 5 general purpose sports footwear

Figure 28 — Example of general purpose sports footwear

3.4.17

galosh

type of overshoe or rubber *boot* ([3.4.4](#)) that is put on over shoes to keep them from getting muddy or wet during inclement weather

3.4.18

indoor footwear

footwear designed and manufactured as having adequate durability and comfort for wear indoors, around the house, unsuitable for use as a *town footwear* ([3.4.37](#)) and unlikely to offer protection from inclement weather or harsh wear environments

3.4.19

infant's footwear

footwear designed and manufactured to be worn or used by infants below the age of 36 months

Note 1 to entry: Footwear size less than 170 is generally regarded as infants' footwear.

3.4.20

low cut footwear

footwear where the *quarter* ([3.3.48](#)) is lower than the ankle

3.4.21

Martin boots

boots ([3.4.4](#)) which usually have thick (rubber) soles with large round top open-lacing *uppers* ([3.3.65](#))

Note 1 to entry: Martin boots were first designed by Dr. Klaus Martens and named after him.

3.4.22

Mary Jane footwear

bar footwear

strap footwear

footwear with a rounded *top line* ([3.3.60](#)) at the front and a *toe cap* ([3.3.57](#)) that covers the whole toe, and with a single strap over the instep, which is attached by buttons or buckles

3.4.23

moccasin

3.4.23.1

moccasin

<original> footwear whose *vamp* ([3.3.66](#)) completely enclosed the foot, wrapping it round from underneath

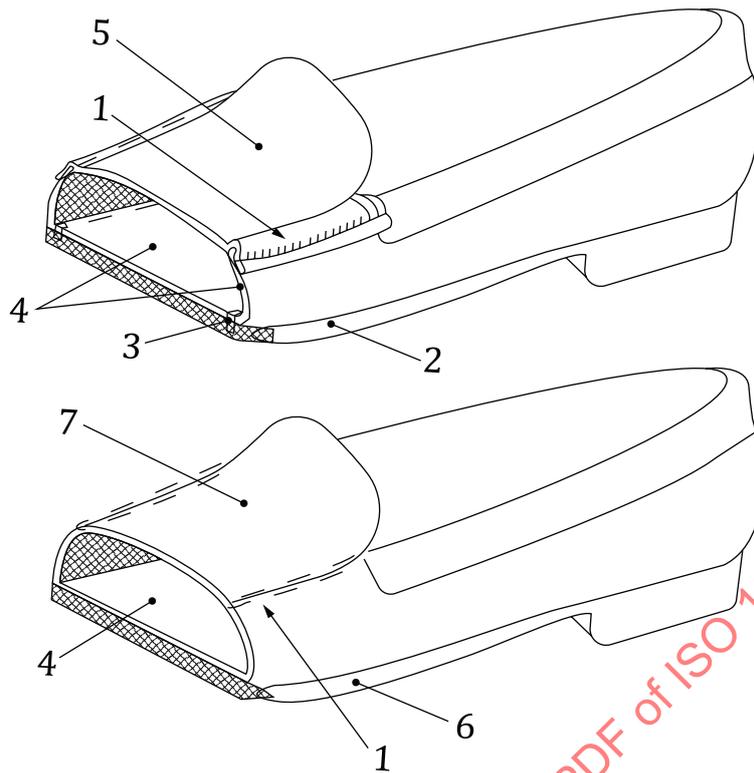
3.4.23.2

moccasin

<current> footwear with the *upper* ([3.3.65](#)) of similar appearance to that of *moccasin* ([3.4.23.1](#)), but with the *outsole* ([3.3.47](#)) stitched or stuck on

Note 1 to entry: See [Figure 29](#).

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Key

- | | |
|-----------------|------------------|
| 1 moccasin seam | 5 apron/plug |
| 2 outsole | 6 welted outsole |
| 3 seam | 7 apron/plug |
| 4 upper | |

Figure 29 — Moccasin

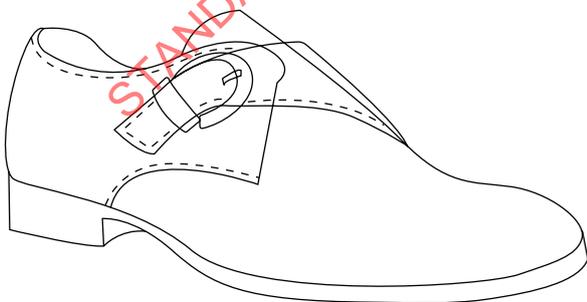
3.4.24

monk

closed footwear (3.4.8) held to the foot by a strap across the instep

Note 1 to entry: Monk can be classified into single monk and double monk based on whether single-buckle or double-buckle monk straps are used.

Note 2 to entry: See [Figure 30](#).



a) Single-buckle



b) Double-buckle

Figure 30 — Examples of monk

3.4.25

open footwear

type of footwear where the *upper* (3.3.65) is not connected to all the perimeter of the *outsole* (3.3.47)

EXAMPLE Open back, open waist, open cap.

3.4.25.1

open back footwear

footwear without a back part or *counter* (3.3.18) or whose back part consists only of a hold-on strap

3.4.25.2

slingback

footwear in which the *upper* (3.3.65) at the back consists of a strap that passes around the back of the foot at a height similar to the *top line* (3.3.60) of a conventional shoe, leaving the heel of the foot exposed

3.4.26

open-lacing footwear

footwear with the piece of lacing *eyelets* (3.3.25) attached on top of the *vamp* (3.3.66)

Note 1 to entry: See [Figure 31](#).

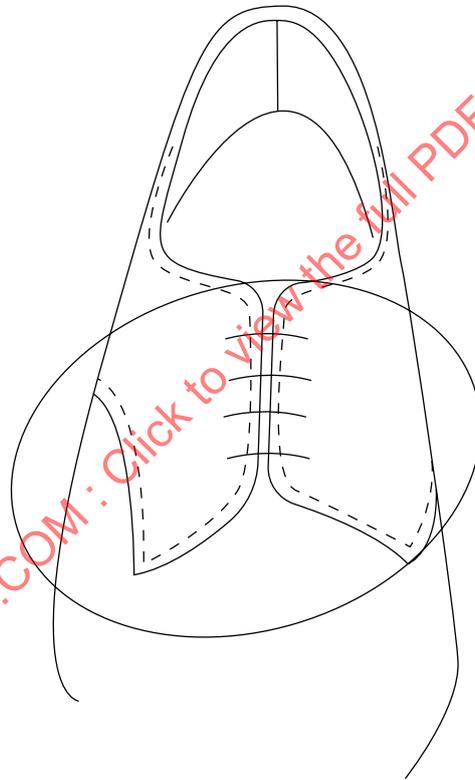


Figure 31 — Example of open-lacing footwear

3.4.27

orthopaedic footwear

prophylactic therapeutic footwear

footwear used for therapeutic management of a particular abnormality of the foot

Note 1 to entry: Orthopaedic footwear can be individually-produced or mass produced.

3.4.28

peep-toe footwear

footwear with a style of *upper* (3.3.65) in which the toe is open so that all or some of the toes are visible

3.4.29

platform footwear

footwear which has a thick sole in the *forepart* (3.3.30)

Note 1 to entry: See [Figure 35](#).

3.4.30

professional sports footwear

specialized sports footwear

footwear that is designed and manufactured according to the requirements of the respective sport

Note 1 to entry: Specialized sports footwear which is designed for a sporting activity has, or has provision for the attachment of, spikes, sprigs, stops, clips, bars or the like.

3.4.30.1

baseball footwear

footwear designed and manufactured for baseball, where the sole bottom is usually equipped with antiskid metal nail or eraser head

3.4.30.2

basketball footwear

sports footwear designed for basketball sports, where the sole bottom is generally flat, focusing on shock absorption function, and the height of the *quarter* (3.3.48) is usually above the ankle to protect it from injury

3.4.30.3

boxing footwear

footwear designed and manufactured for boxing, and provided with good elasticity and grip

3.4.31

pump

style of footwear with a low-cut front or *vamp* (3.3.66) exposing the instep, including a type of low heel court footwear, usually with a plain round *throat* (3.3.56) or *top line* (3.3.60)

3.4.32

rubber footwear

footwear in which a rubber sole is vulcanized to the *upper* (3.3.65)

Note 1 to entry: Rubber footwear is a common trade classification (as distinct from non-rubber footwear) and usually includes protective rubber footwear.

3.4.33

sandal

open toe style of footwear with a sole held on to the wearers' foot by straps, typically around the *forepart* (3.3.30) and instep

3.4.33.1

Chappal

Chupplee

type of sandal consisting of a flat or tapered sole and one or two upper straps which are attached between the toes, cross over at the *forepart* (3.3.30) and pass around the heel to be joined by a buckle

3.4.33.2

flip-flops

type of light sandal, which consist of a flat sole held loosely on the foot with a Y-shaped (usually) polymeric strap (toe post) between the big and second toe and around both sides of the foot

Note 1 to entry: See [Figure 32](#).

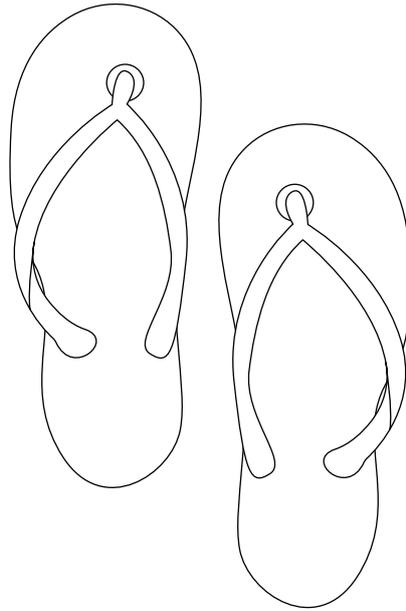


Figure 32 — Flip-flops

3.4.34

service footwear

footwear used for service purposes

EXAMPLE Footwear used by military or paramilitary, police and other security forces.

3.4.35

slipper

open type of footwear having an upper part not covering the entire foot and which do not have a back strap but may have a back support

3.4.35.1

babouche

Turkish or Moroccan slipper, often described as backless or heel-less

3.4.35.2

Grecian slipper

indoor footwear in which the *top line* (3.3.60) of the *quarter* (3.3.48) and *vamp* (3.3.66) both curves downwards to overlap on each side close to the feather line

3.4.35.3

Mules

slipper which is open around the *heel* (3.3.33)

3.4.36

slip-on footwear

footwear held to the foot without *laces* (3.3.40), buckles or other fasteners

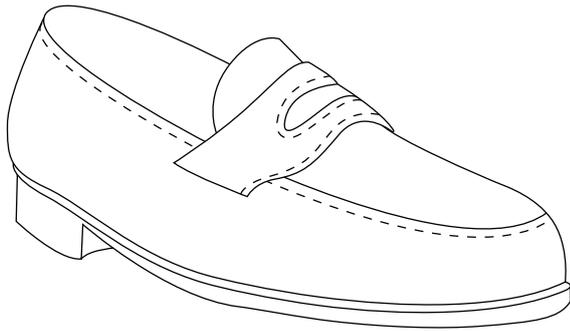
3.4.36.1

Loafer

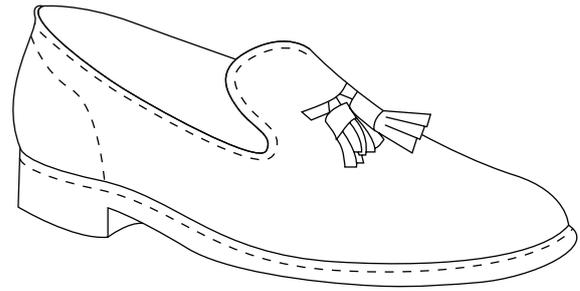
type of low slip-on footwear, typically with a saddle or a *trim* (3.3.63) on the *vamp* (3.3.66) which has an extension up the instep

Note 1 to entry: The three most common styles of leather Loafers are Horsebit, Tassel and Penny Loafer.

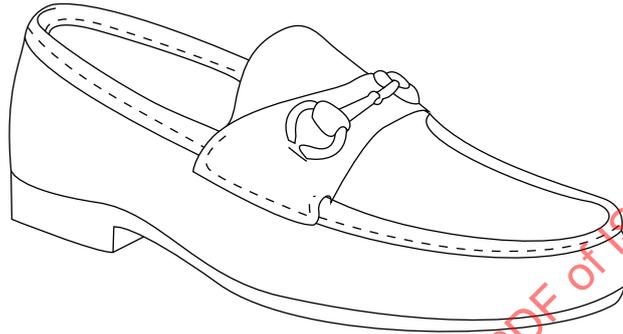
Note 2 to entry: See [Figure 33](#).



a) Penny



b) Tassel



c) Horsebit

Figure 33 — Examples of Loafers

3.4.37

town footwear

footwear designed and manufactured as suitable for everyday wear at the office, for shopping or similar wear environments

Note 1 to entry: Normally durability and comfort are more important than design or fashion content with this type of footwear.

3.4.38

trainer sneaker

footwear developed for sports activities typically featuring a fabric upper with overlaid components of *leather* (3.1.20) or synthetic material, with a flexible lightweight sole

Note 1 to entry: Trainers can be further subcategorised into many specialised trainers with features for specific sports.

3.4.39

T-bar footwear

closed, low-cut shoe with two or more straps forming one or more T shapes

EXAMPLE One or more straps across the instep passing through a perpendicular, central strap that extends from the *vamp* (3.3.66).

3.4.40

unlined footwear

footwear without a *lining* (3.3.42)

Note 1 to entry: Unlined footwear is typical of summer footwear.

3.4.41

welted footwear

footwear *construction* (3.2.16) in which the *welt* (3.3.70) is joined to the upper lining and insole lip without stitching inside the footwear

3.4.42

Wushu footwear

footwear designed and made for practice, performing or demonstration of the Wushu sport or competition, with physical requirements of durability, light-weighted, slip-resistance, shock absorption and resilience, and with design requirements of low cut, plain toe type, thick *counter* (3.3.18) area and relative thin sole

Note 1 to entry: Due to many feet movements that require highly durable and low-cut footwear, and due to movements that require light-weighted, slip-resistance, shock absorption and resilience, the counter area of Wushu footwear should be thickened to provide protection for athletes. The design of plain toe type and thin sole is for easy tapping by athletes.

3.5 Footwear performance

3.5.1

abrasion resistance

resistance to wear by mechanical action upon a surface

3.5.2

antibacterial activity

efficacy of a material or finish used to prevent or mitigate the growth of bacteria, to reduce the number of bacteria or to kill bacteria

3.5.3

antifungal activity

antimycotic activity

efficacy of a material or finish used to prevent or mitigate the growth of micro-fungi, to reduce the number of micro-fungi or to kill micro-fungi

3.5.4

bondability

aptitude of a material to be bonded to itself or to other material by applying either pressure or heat, or both, and eventually an *adhesive* (3.1.2)

3.5.5

break of leather

<performance> *surface* (3.6.22) on which wrinkles are formed when the *leather* (3.1.20) is bent, grain inward

Note 1 to entry: Adjectives commonly used to describe this characteristic are “tight”, “fine”, “loose”, “coarse”, “pipey” and “flanky”. Generally, the finer the wrinkles or grain break, the better the quality of the leather.

[SOURCE: ISO 15115:2019, 3.15, modified — “surface wrinkles formed” has been rephrased to “surface on which wrinkles are formed”.]

3.5.6

breaking strength

maximum tensile stress recorded in extending a test piece of footwear *components* (3.3.16) or materials to the breaking point

3.5.7

breathability

ability of a material to allow the passage of water vapour

3.5.8

colour fastness

ability of a footwear material or *component* (3.3.16) to maintain its colour after the action of various agents

3.5.9

colour migration

discolouration caused by movement of colour from one material to another

3.5.10

compression strength

force required to deform the test piece of footwear *components* ([3.3.16](#)) or materials in determined extent

3.5.11

corrosion resistance

propensity of a metal surface either not to change visually due to chemical attack by atmospheric pollution, or not to be altered due to the action of salt water

3.5.12

deformability

multidirectional modulus characteristics of an upper material

3.5.13

delamination resistance

3.5.13.1

delamination resistance

<upper> strength of *adhesion* ([3.2.1](#)) between a coating and its base material

3.5.13.2

delamination resistance

<insole> force per unit area required to separate the internal structure of the insole material

3.5.13.3

delamination resistance

<outsole> force required to propagate delamination of the adhesive layer or joint interface if a multilayer outsole is composed of an adhesive layer, divided by the width of the test pieces

3.5.14

dimensional stability

reduction in the distance between two reference points on a test piece before and after heating in air under specified conditions

3.5.15

durometer value

hardness, often of soling materials

3.5.16

fatigue resistance

3.5.16.1

fatigue resistance

<shanks> the resistance of a *shank* ([3.3.50](#)), under specified conditions, to repeated loading cycles

3.5.16.2

fatigue resistance

<heels> the resistance of the *heel* ([3.3.33](#)) to repeated blows, each of specified energy, delivered by a pendulum

3.5.17

fitting

<dimension> different *last* ([3.6.13](#)) measurement to fit the dimensions of the foot most accurately to a given size

3.5.18

flex resistance

resistance of a material to crack or otherwise fail at flexing creases

3.5.19

heel attachment strength

maximum force, measured under testing condition, required to detach the *heel* (3.3.33) from the sole/insole assembly (3.2.2)

Note 1 to entry: The heel attachment strength is expressed in newtons.

3.5.20

heel pin holding strength

force required to pull a standard pin out of the *heel* (3.3.33) material divided by the effective length of pin buttressing in the material

Note 1 to entry: The heel pin holding strength is expressed in N/mm.

3.5.21

high temperature behaviour

resistance of a material to elevated temperatures as measured by the effect on the tensile properties of the material

Note 1 to entry: High temperature behaviour is particularly applicable to materials used in vulcanised footwear.

3.5.22

longitudinal shear strength

maximum force per unit effective area required to separate the two tapes forming the specified closure in a shearing action under the specified conditions of test

3.5.23

longitudinal stiffness

stiffness in the longitudinal direction of *shanks* (3.3.50) as determined by measuring the deflection of the shank under specified conditions when loaded with a specified force

3.5.24

needle tear strength

quotient obtained by dividing the maximum force, occurring during tearing-out of the needle, by the thickness of the test piece

3.5.25

peel strength

force per unit effective width required to separate the two tapes forming the specified closure from an open edge under the specified conditions of test

3.5.26

penetration time

<upper> duration of flexing, in minutes, which is just sufficient to cause water to penetrate from the wetted surface (3.6.22) to the other face of the test piece

3.5.27

perspiration resistance

resistance to the action of an artificial sweat solution, measured by the change in size and appearance of the component (3.3.16) tested

3.5.28

reparability

ease with which the components (3.3.16) of a footwear can be replaced to extend the usable life of the footwear

3.5.29

resistance to damage on lasting

ability of a material to be stretched simultaneously in all directions (distended) without being damaged

3.5.30

resistance to stitch tear

force required to pull a loop of wire of specified dimensions through a test specimen of insole material

3.5.31

seam strength

breaking strength (3.5.6) of a stitched *seam* (3.2.34) as determined under specified conditions using a tensile testing machine

3.5.32

shape retention

aptitude of the material to maintain the original shape (dome) after loading the test piece several times

3.5.33

shrinkage

reduction in dimensions or volume of a test piece of footwear *components* (3.3.16) or materials, usually due to decreased moisture content

3.5.34

split tear strength

force required to propagate a cut in a test piece of footwear *components* (3.3.16) or materials by tearing

3.5.35

swelling

increase in the volume of a test piece of footwear *components* (3.3.16) or materials submerged in liquid

3.5.36

tear strength

median force required to propagate a cut in a specified test specimen

3.5.37

tensile strength

tensile stress at maximum force

3.5.38

thermal insulation

temperature difference on the inner surface of the *vamp* (3.3.66) or *insocks* (3.3.38), or both, under specific test conditions

3.5.39

top piece retention strength

maximum force required to pull off a *top piece* (3.3.61) from the *heel* (3.3.33)

Note 1 to entry: The top piece retention strength is expressed in newtons.

3.5.40

trouser tear strength

median force, required to propagate a cut in a specified trouser-shaped test piece by tearing, divided by the thickness of the test piece

3.5.41

upper-sole adhesion

force required to separate the sole-upper bonding

3.5.42

washability

resistance of a footwear or material to dimensional change or colour loss when washed in a washing machine under specified conditions

3.5.43

water absorption

gain in mass per unit area of the test piece due to water absorption during one or more specified periods of time

3.5.44

water desorption

percentage loss in mass of the test piece, expressed in terms of the mass of water absorbed

3.5.45

water penetration rate

amount of water crossing the test piece during one or more periods of time

3.5.46

water resistance

resistance of a footwear *components* ([3.3.16](#)) or material to water penetration at the given condition

3.5.47

water soluble matter

quantity of all those substances that, under certain conditions, are dissolved out of the material by water

3.5.47.1

water soluble inorganic substances

sulfated ash of water soluble substances

3.5.47.2

water soluble organic substances

difference between total *water soluble matter* ([3.5.47](#)) and *water soluble inorganic substances* ([3.5.47.1](#))

3.5.48

water vapour permeability

amount of water vapour a material will transmit through its structure expressed as mass of water transmitted per unit area of material per unit time at the given condition

3.5.49

water vapour absorption

amount of water vapour a material can absorb in a specified time expressed as mass of water per area of material

3.6 Other terms

3.6.1

arch