
**Footwear — Sampling location,
preparation and duration of conditioning
of samples and test pieces**

*Chaussures — Localisation de l'échantillonnage, préparation et durée
de conditionnement des échantillons et éprouvettes*



Reference number
ISO 17709:2004(E)

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Published in Switzerland

Foreword

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ISO 17709 was prepared by the European Committee for Standardization as EN 13400:2001. This International Standard includes corrigendum EN 13400:2001/AC:2003 and was adopted under a special "fast-track procedure" by Technical Committee ISO/TC 216, *Footwear*, in parallel with its approval by the ISO member bodies.

Throughout the text of this document, read "...this European Standard..." to mean "...this International Standard...".

Introduction

CEN/TC 309 has established European Standards on test methods to determine the properties of components for or from footwear. To use correctly these standards, the sampling location is clearly defined.

The test methods need sample taking on the shoe or on the shoe component. It is necessary:

- to integrate in standards realistic and compatible sample size with footwear;
- to define footwear axis to have a system of reference for sampling;
- to have a conditioning time (see EN 12222) before the analysis beginning.

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1 Scope

This European Standard specifies the sampling location, preparation and duration of conditioning of samples and test pieces for footwear components and footwear, to carry out the test methods needed to determine the suitable properties for the end use.

These are the general conditions unless otherwise stated in the corresponding test method.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 1392, *Adhesives for leather and footwear materials - Solvent-based and dispersion adhesives - Test methods for measuring the bond strength under specified conditions.*

EN 12743, *Footwear - Test methods for outsoles - Compression energy.*

EN 12744, *Footwear - Test methods for insoles - Delamination resistance.*

EN 12745, *Footwear - Test methods for insoles - Heel pin holding strength.*

EN 12746, *Footwear - Test methods for insoles and insocks - Water absorption and desorption.*

EN 12747, *Footwear - Test methods for insoles - Abrasion resistance.*

EN 12748, *Footwear - Test methods for outsoles, insoles, lining and insocks - Water soluble content.*

EN 12770, *Footwear - Test methods for outsoles - Abrasion resistance.*

EN 12771, *Footwear - Test methods for outsoles - Tear strength.*

EN 12772, *Footwear - Test methods for outsoles - Dimensional stability.*

EN 12773, *Footwear - Test methods for outsoles - Needle tear strength.*

EN 12774, *Footwear - Test methods for outsoles - Determination of split tear strength and delamination resistance.*

EN 12782, *Footwear - Test methods for insoles - Resistance to stitch tear.*

EN 12800, *Footwear - Test methods for insoles - Dimensional stability.*

EN 12801, *Footwear - Test methods for insoles, lining and insocks - Perspiration resistance.*

EN 12803, *Footwear - Test methods for outsoles - Tensile strength and elongation.*

EN 12826, *Footwear - Test methods for lining and insocks - Static friction.*

EN 13511, *Footwear - Test methods for uppers — Resistance to damage on lasting.*

EN 13512, *Footwear - Test methods for uppers and lining - Flex resistance.*

EN 13513, *Footwear - Test methods for uppers – Deformability.*

EN 13514, *Footwear - Test methods for uppers - Delamination resistance.*

prEN 13515, *Footwear - Test methods for uppers and lining - Water vapour permeability and absorption.*

prEN 13516, *Footwear - Test methods for uppers, lining and insoles - Colour fastness.*

EN 13517, *Footwear - Test methods for uppers, lining and insoles - Colour migration.*

prEN 13518, *Footwear - Test methods for uppers - Water resistance.*

EN 13519, *Footwear - Test methods for uppers - High temperature behaviour.*

prEN 13520, *Footwear - Test methods for uppers, lining and insoles - Abrasion resistance.*

EN 13521, *Footwear - Test methods for uppers, lining and insoles - Thermal insulation.*

prEN 13522, *Footwear - Test methods for uppers - Tensile strength and elongation.*

EN 13571, *Footwear - Test methods for uppers, lining and insoles - Tear strength.*

EN 13572, *Footwear - Test methods for uppers, lining and insoles - Seam strength.*

prEN ISO 5404, *Leather - Physical and mechanical tests - Determination of water resistance of heavy leather.*

prEN ISO 17707, *Footwear - Test methods for outsoles - Flex resistance (ISO/DIS 17707:2000).*

3 Terms and definitions

None.

4 Definition of the reference system

4.1 Location of X axis (see Figure 1)

Determine the locating axis by placing the footwear on an horizontal surface and against a vertical plane so that it touches the edge of the sole at points A and B on the inner side of the footwear. Construct two further vertical planes at right angles to the first vertical plane so that they meet the sole at points M and N, the toe point and the heel point respectively.

Draw a line through M and N.

This constitutes the locating axis, X.

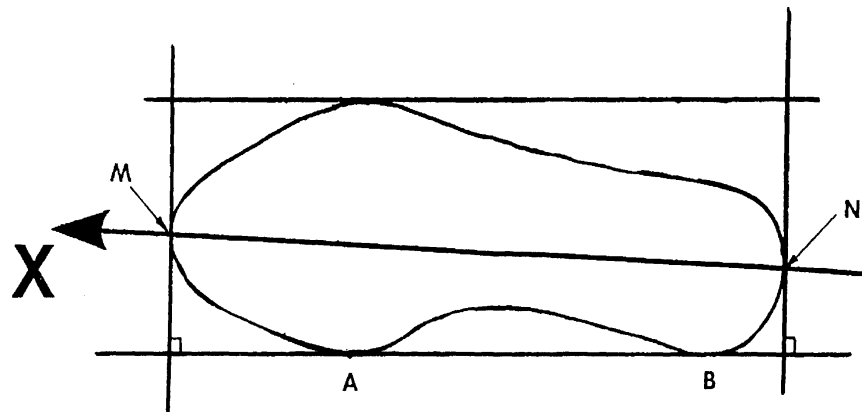


Figure 1 — Location of X axis

4.2 Location of Y axis (see Figure 2)

Draw a parallel to AB that touches the edge of the sole at point K. Draw a line through A and K.

This constitutes the locating axis, Y.

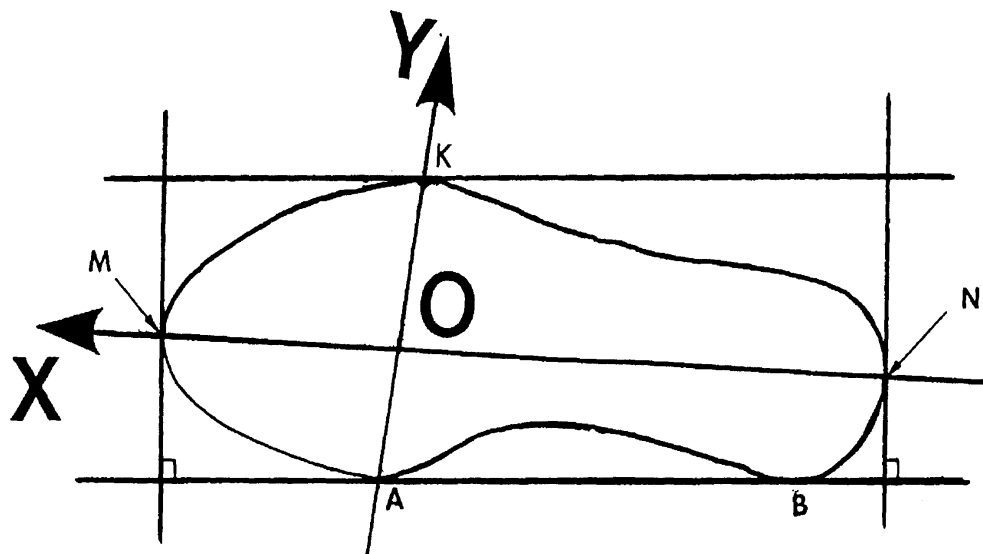


Figure 2 — Location of Y axis

The zero point is given as the intersection of X axis and Y axis.

5 Sampling location

5.1 Sampling of uppers, outsoles, insoles, insocks and linings

Shapes, dimensions, number, location and duration of conditioning for the test specimens are given in Tables 1 to 5.

5.2 Sampling of shanks, toe puff and stiffeners

The test specimen is the component itself.

Table 1 — Sampling location for uppers

Property	Test method	Test piece shape	Dimensions mm	Number of test pieces	Conditioning time h	Position	Remarks
Lastability	EN 13511	circular	$\approx \varnothing 34$	3	24		The central free area of the sample is $(25 \pm 0,5)$ mm. 34 mm are taken to have a sufficient size to clamp the sample
Flex resistance	EN 13512	rectangular	$(70 \pm 1) \times (45 \pm 1)$	4 to 8	24	parallel and 90° to the X axis	The sample number depends on the material type (see EN 13512)
Deformability	EN 13513	circular	$\approx \varnothing 34$	3	24		The central free area of the sample is $(25 \pm 0,5)$ mm. 34 mm are taken to have a sufficient size to clamp the sample
Tear strength	EN 13571	rectangular	length min. 55 width min. 25	6	24	3 test specimens CAL and 3 test specimens PAL	
Seam strength	EN 13572 Method A and B	A : T shape B1 : rectangular B2 : square	$(75 \pm 1) \times (65 \pm 1)$ minimum 80 x 50 50 x 50	6 3 minimum 12	24	A: 3 test specimens CAL and 3 test specimens PAL B2: 3 seamed test specimens for each direction of the test	B : test specimens cut from the upper B2: test specimens taken from upper material and prepared by making up seam
Delamination resistance	EN 13514	rectangular	$(70 \pm 1) \times (50 \pm 1)$	6	24	2 test specimens CAL 4 test specimens PAL	2 test specimens with longer edges CAL 4 test specimens with longer edges PAL
Water vapour permeability	prEN 13515	circular	$\approx \varnothing 38$	3	24		The tested surface has a diameter (30 ± 1) mm, known to the nearest 0,1 mm Preparation with the bally flexometer
Water vapour absorption		circular	$\varnothing (45 \pm 5)$	2			The tested surface has to be known to the nearest 0,1 mm
Colour fastness	prEN 13516 (Methods A , B and C)	A rectangular B circular C rectangular	100 x 25 $\approx \varnothing 60$ $(110 \pm 10) \times (55 \pm 5)$	2 2 1	24		The minimum number of test specimens for each version of the test
Colour migration	EN 13517	darker: rectangular lighter: rectangular	$(50 \pm 2) \times (40 \pm 2)$ $(60 \pm 2) \times (50 \pm 2)$	1 1	24		Test possible with adhesive
Water resistance	prEN 13518	rectangular	$(75 \pm 2) \times (60 \pm 1)$	2	24	1 test specimen CAL and 1 test specimen PAL	
High temperature resistance	EN 13519	rectangular	$(160 \pm 10) \times (35 \pm 2)$ $(160 \pm 10) \times (25 \pm 0,5)$	6	72	3 test specimens CAL and 3 test specimens PAL	Material which can be frayed Material which cannot be frayed

Property	Test method	Test piece shape	Dimensions mm	Number of test pieces	Conditioning time h	Position	Remarks
Bondability	EN 1392	rectangular	$(100 \pm 2) \times (30 \pm 0,5)$	3	24		
Abrasion resistance	prEN 13520	circular	$\approx \varnothing 35$	2	24		The central free area of the sample is (645 ± 5) mm ² Take a sufficient size to clamp the sample
Thermal insulation	EN 13521	circular	$\varnothing 75$	2	24		The sample has the same dimension as block B1 to the nearest 0,2 mm
Tensile strength and elongation	EN 13522	rectangular	$(160 \pm 10) \times (35 \pm 2)$ $(160 \pm 10) \times (25 \pm 0,5)$	6	24	3 test pieces CAL and 3 test pieces PAL	Material which can be frayed Material which cannot be frayed
NOTE CAL: parallel to X axis; PAL: perpendicular to X axis							

Table 2 — Sampling location for outsoles

Property	Test method	Test piece shape	Dimensions mm	Number of test pieces	Conditioning time h	Position	Remarks
Flex resistance	prEN ISO 17707	outsole		3	24		3 samples , if possible covering the full size range test specimen : Outsole is fitted with insole
Bondability	EN 1392	rectangular	$(100 \pm 2) \times (30 \pm 0,5)$	3	24		
Abrasion resistance	EN 12770	circular	$\varnothing 16 \pm 0,2$	3	24		In the flexion zone and in the heel zone because these two parts are the most solicited.
Tear strength	EN 12771	Leather: rectangular other: rectangular	100 minimum x 40 100 minimum x 15	3	24	PAL	
Dimensional stability	EN 12772	normal: rectangular short: rectangular	$(150 \pm 35) \times (25 \pm 5)$ $(75 \pm 10) \times (25 \pm 5)$	3 3	24	CAL	Measurement length normal: (100 ± 5) mm Measurement length short: (50 ± 5) mm
Seam strength	EN 12773	rectangular	$(50 \pm 1) \times (20 \pm 1)$	3	24	CAL	
Delamination resistance	EN 12774	rectangular	75 minimum x $(25 \pm 0,2)$	3	24	CAL	
Water resistance	prEN ISO 5404	rectangular	$(110 \pm 1) \times (40 \pm 1)$	2	24	CAL (in the flexion zone)	
Energy absorption	EN 12743	outsole		2 by size	24	CAL (heel region)	Test specimen: Outsole is fitted with insole
Tensile strength and elongation	EN 12803	Dum-bell	type 1: $115 \times (25 \pm 1)$ type 2: $75 \times (12,5 \pm 1)$	3	24	CAL (in the flexion zone)	See Figure 2 of EN 12803:2001
Water soluble contents	EN 12748	no particularity		2	24	no particular location	10 g of material

NOTE CAL: parallel to X axis; PAL: perpendicular to X axis.

Table 3 — Sampling location for insoles

Property	Test method	Test piece shape	Dimensions mm	Number of test pieces	Conditioning time h	Position	Remarks
Delamination resistance	EN 12744	circular	$\varnothing 38 \pm 1$	3	24	C _x	
Heel pin holding strength	EN 12745	rectangular	80 x 20	1	24	CAL	2 samples if test in wet condition
Water absorption and desorption	EN 12746	square	$(50 \pm 1) \times (50 \pm 1)$	2	24	--	
Abrasion resistance	EN 12747	rectangular	120 x 20	3	24	CAL	
Resistance to stitch tear	EN 12782	rectangular	75 x 25	1	24	CAL	
Dimensional stability	EN 12800	square or rectangular	$(60 \pm 20) \times (60 \pm 20)$	2	24	CAL	
Perspiration resistance	EN 12801	square or rectangular	$(60 \pm 20) \times (60 \pm 20)$	2	24	CAL	
Water soluble content	EN 12748	no particularity		2	24	no particular location	10 g of material
NOTE CAL: parallel to X axis; C _x : centred on X axis.							

Not for Resale

Table 4 — Sampling location for insocks

Property	Test method	Test piece shape	Dimensions mm	Number of test pieces	Conditioning time h	Position	Remarks
Water absorption and desorption	EN 12746	square	$(50 \pm 1) \times (50 \pm 1)$	2	24	CAL	
Perspiration resistance	EN 12801	square or rectangular	$(60 \pm 20) \times (60 \pm 20)$	2	24	CAL	
Static friction	EN 12826	rectangular rectangular	250 x 100 120 x 50	2 6	24	CAL	Testing specimens taken from the component as supplied
Water soluble contents	EN 12748	no particularity		2	24	no particular location	10 g of material
Tear strength	EN 13571	rectangular	length min. 55 width min. 25	6	24	3 test specimens CAL and 3 test specimens PAL	
Seam strength	EN 13572	T shape	$(75 \pm 1) \times (65 \pm 1)$	6	24	3 test specimens CAL and 3 test specimens PAL	
Colour fastness	prEN 13516 (Methods A and B)	A rectangular B circular	100 x 25 $\varnothing 60$	2 2	24		
Abrasion resistance	prEN 13520	circular	$\approx \varnothing 35$	2	24		The central free area of the sample is (645 ± 5) mm ² Take a sufficient size to clamp the sample

NOTE CAL: parallel to X axis; PAL: perpendicular to X axis

Table 5 — Sampling location for linings

Property	Test method	Test piece shape	Dimensions mm	Number of test pieces	Conditioning time h	Position	Remarks
Perspiration resistance	EN 12801	square or rectangular	(60 ± 20) x (60 ± 20)	2	24	CAL	
Static friction	EN 12826	rectangular rectangular	250 x 100 120 x 50	2 6	24	CAL	Testing pieces taken from the component as supplied
Water soluble contents	EN 12748	no particularity		2	24	no particular location	10 g of material
Abrasion resistance	prEN 13520	circular	≈ Ø 35	2	24		The central free area of the sample is (645 ± 5) mm ² Take a sufficient size to clamp the sample
Thermal insulation	EN 13521	circular	Ø 75	2	24		The sample has the same dimension as block B1 To the nearest 0,2 mm
Colour fastness	prEN 13516 (Methods A and B)	A rectangular B circular	100 x 25 Ø 60	2 2	24		
Flex resistance	EN 13512	rectangular	(70 ± 1) x (45 ± 1)	4 to 8	24	parallel and 90° to the X axis	The sample number depends on the material type (see EN 13512)
Tear strength	EN 13571	rectangular	length min. 55 width min. 25	6	24	3 test test specimens CAL and 3 test test specimens PAL	
Seam strength	EN 13572	A: T shape B1: rectangular B2: square	(75 ± 1) x (65 ± 1) (90 ± 10) x (50 ± 2) (50 ± 2) x (50 ± 2)	6 3 12	24	A:3 test test specimens CAL and 3 test test specimens PAL B2: 3 seamed test test specimens for each direction of the test	B1: test pieces cut from the lining B2: test pieces taken from lining material and prepared by making up seam
Water vapour permeability	prEN 13515	circular	≈ Ø 38	3	24		The tested surface has a diameter (30 ± 1) mm, known to the nearest 0,1 mm Preparation with bally flexometer
Water vapour absorption		circular	Ø (45 ± 5)	2			

NOTE CAL: parallel to X axis; PAL: perpendicular to X axis

Bibliography

- [1] EN 344:1992, *Requirements and test methods, for safety, protective and occupational footwear for professional use.*
- [2] ISO 2418:1972, *Leather - Laboratory samples - Location and identification.*
- [3] EN 12222, *Footwear - Standard atmospheres for conditioning and testing of footwear and components for footwear.*

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