BRITISH STANDARD

BS EN ISO
19954:2003

Footwear — Test methods for whole shoe — Washability in a domestic washing machine

The European Standard EN ISO 19954:2003 has the status of a British Standard

ICS 61.060

BSI
British Standards

National foreword

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The UK participation in its preparation was entrusted to Technical Committee TCI/69, Footwear and leather, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 12, an inside back cover and a back cover.

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EUROPEAN STANDARD

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EUROPÄISCHE NORM

EN ISO 19954

October 2003

ICS 61.060

English version

Footwear - Test methods for whole shoe - Washability in a domestic washing machine (ISO 19954:2003)

Chaussures - Méthodes d'essai s'appliquant à la chaussure entière - Lavabilité au lavage domestique (ISO 19954:2003)

Schuhe - Prüfverfahren für fertige Schuhe - Prüfverfahren in einer Haushaltswaschmaschine (ISO 19954:2003)

This European Standard was approved by CEN on 16 May 2003.

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Foreword

This document (EN ISO 19954:2003) has been prepared by Technical Committee CEN/TC 309 "Footwear", the secretariat of which is held by AENOR, in collaboration with Technical Committee ISO/TC 216 "Footwear".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2004 and conflicting national standards shall be withdrawn at the latest by January 2004.

Annex ZA is normative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies a test method for the evaluation of the behaviour of footwear when subjected to domestic washing. The evaluation is based upon the modification of some characteristics measured before and after washing.

This European Standard specifies a method of domestic washing adapted to all types of footwear.

2 Normative references

This European Standard incorporates by dated or undated references, 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 12222, *Footwear - Standard atmospheres for conditioning and testing of footwear and components for footwear.*

EN ISO 6330, *Textiles - Domestic washing and drying procedures for textile testing (ISO 6330:2000).*

EN ISO 17708, *Footwear - Test methods for whole shoe - Upper sole adhesion (ISO 17708:2003).*

ISO 105-A02, *Textiles - Tests for colour fastness - Part A02: Grey scale for assessing change in colour.*

ISO 105-A03, *Textiles - Tests for colour fastness - Part A03: Grey scale for assessing staining.*

3 Apparatus and material to be used

3.1 Washing machine

A washing machine complying with 3.1.1 to 3.1.4. Other equipment can be used provided that it gives identical results to the machine described in this subclause.

3.1.1 General

The washing machine used should correspond to machine type A1 as described in EN ISO 6330.

3.1.2 Washing conditions

The washing cycle should comply with the following:

- volume of water of 18 l ± 1 l;
- temperature within the range of 30 °C to 35 °C;
- a washing time of 30 min ± 2 min;
- rotation speed of the drum of 5,4 rad/s ± 0,5 rad/s (alternative movement)[1)];
- 4 g/l of detergent specified in 3.5.

3.1.3 Rinsing conditions

The rinsing cycle should comply with the following:

- volume of water of 15 l ± 1 l;
- rinsing time of 4 min ±± 1 min.

3.1.4 Wringing/Emptying conditions

3.1.4.1 Initial wringing

This cycle should comply with the following:

- 120 s ± 30 s at a rotation speed of 5,7 rad/s ± 0,5 rad/s.

3.1.4.2 Final wringing

This cycle should comply with the following:

- 6 min ± 1 min at a rotation speed of 49,5 rad/s ± 2,6 rad/s.

3.2 Textile component

It shall be a white, 100% monofibre cotton textile of 125 g/m² ± 5 g/m² cut into rectangles of (50 ± 2) cm x (50 ± 2) cm.

The textile component shall be composed of 10 such rectangles.

The textile component is used in order to simulate normal washing conditions and to minimise abrasion damage of the footwear against the drum.

3.3 Standard grey scale

The grey scales for the evaluation of colour change and colour transfer (see clause 5) shall comply with ISO 105-A02 and ISO 105-A03, respectively.

3.4 Toe spring gauge

The toe spring gauge shall be as shown in Figure 1.

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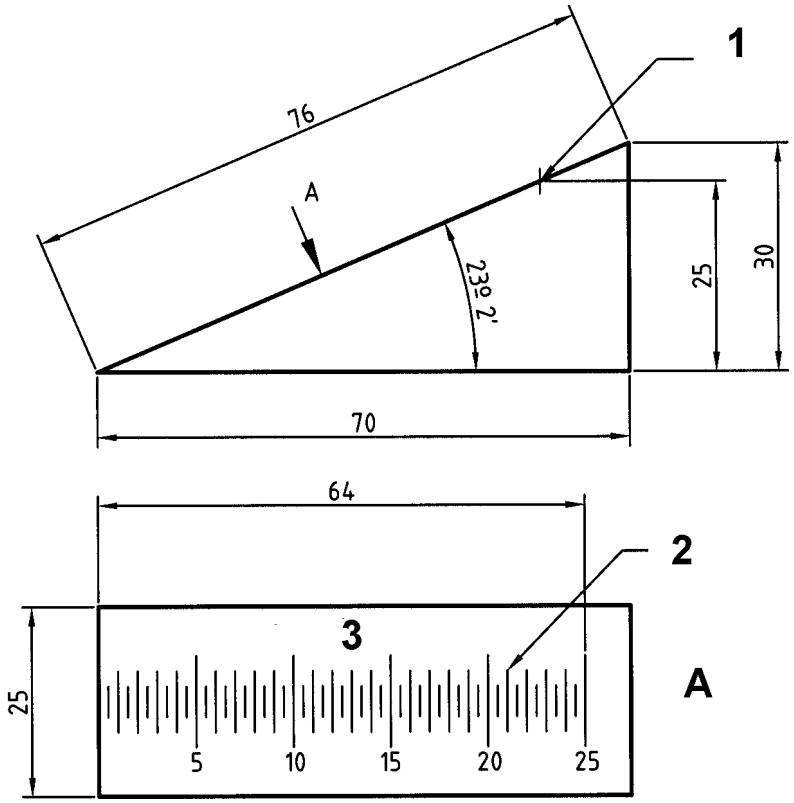
1) 1 rad ≅ 0,16 revolution.

Dimensions in millimetres



Key
1: Scale reads 25mm
2: Engrave as shown
3: Toe spring in mm
A: View on A

Figure 1 — Toe spring gauge

3.5 Detergent

The reference detergent ECE (see EN ISO 6330) shall be used.

NOTE Information on the availability of suitable detergent can be obtained from CEN/TC 309 Secretariat.

3.6 Water

Tap water can be used, under the following conditions:

- temperature of 20 °C ± 4 °C;
- pH of (7 ± 1).

4 Sampling and conditioning

4.1 The sample shall be, at least, two pairs of shoes.

Each complete item of footwear shall be considered as a test piece and at least two test pieces shall be tested.

4.2 The sample shall be conditioned according to EN 12222 for 24 h prior to the test.

5 Test method

5.1 Principle

The test pieces are examined visually. Then one of the test pieces is stored in a standard atmosphere and the other test piece, together with a reference sample of a specified textile, are washed under suitable conditions of temperature, alkalinity and detergent, so that the washing cycle is short. Then they are rinsed and dried.

After complete washing cycle, the test piece is examined in order to determine:

- upper to sole adhesion,
- any colour changes,
- miscellaneous damage, such as tearing, loss of eyelets, etc.,
- any dimensional changes which may have taken place.

5.2 Procedure

5.2.1 Initial assessment

The operator shall ensure that the visual appearance of the test pieces, for the left and right feet of the pairs, is identical.

The test piece shall be characterised by recording all of the detail (colour of material, decoration, washing instruction, etc.).

Place the test piece on a horizontal flat surface and without applying any pressure to any part of said test piece, measure the toe spring as shown in Figure 2, using the toe spring gauge (see 3.4), and record the result, in mm.

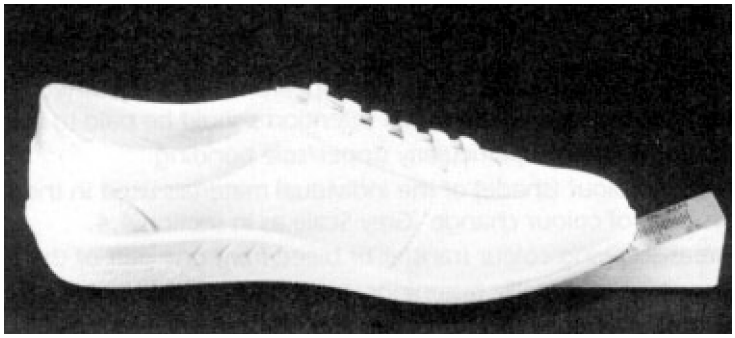


Figure 2 — Measurement of the toe spring

Finally, measure the internal length and width of the test pieces according to 5.2.3.2, and record the results, in mm, as L_1 and B_1, respectively.

5.2.2 Complete washing cycle

5.2.2.1 General

After initial assessment, the test piece corresponding to the right feet is stored in a standard atmosphere (see EN 12222), and the test piece corresponding to the left feet is submitted to the complete washing cycle.

The complete washing cycle consists of three washings and three dryings.

5.2.2.2 Washing

Put, at least, two test pieces into the drum of the washing machine (see 3.1), together with the textile component (see 3.2).

Programme the machine according to clause 3.1.

The complete washing cycle should be:

– washing (see 3.1.2);

– wringing/emptying (see 3.1.4);

– rinsing (see 3.1.3);

– emptying;

– rinsing;

– wringing/emptying;

– rinsing;

– final wringing/emptying.

At the end of the complete washing cycle, note any variation in the colour of the textile component according to ISO 105-A03. If the textile is slightly coloured, it should be replaced for the following test.

5.2.2.3 Drying

Leave the test pieces to dry freely in a standard atmosphere according to EN 12222.

NOTE Ventilation can be used to accelerate drying.

The final drying after a complete washing cycle is particularly important. It is necessary to ensure, by weighing, that the test piece is really dry, so that the difference in mass between two weightings carried out with 1 h of difference should not be greater than 1 %. The dried test piece can then be used for the following test.

5.2.3 Assessment of damages

5.2.3.1 General

Any damage caused by the complete washing cycle can be evaluated by comparing the test piece which has been tested, with the test piece corresponding to the right feet, which remains in the initial condition (see 5.2.2).

5.2.3.2 Miscellaneous damage

Note any damage of the test piece:

– cuts or tears;

– loss of accessories (decoration, eyelets, etc.);

– leaching of colour from components (from one to another).

Place the footwear on a horizontal flat surface and without applying any pressure to any part of the shoe, measure the toe spring as shown in Figure 2, using the toe spring gauge (see 3.4), and report the result, in mm.

5.2.3.3 Dimensional changes

Any deformation of the test piece is considered as a dimensional change. If the deformation is significant, verify the internal length and width of the test piece, or carry out a fitting trial, taking into account that:

– The internal length is the length between the lining in the toe area and the lining in the stiffener area. This dimension is taken along the *X* axis (see EN 13400) and on the insock (or the insole), and the measure is recorded, in mm, as L_2.

– The internal width is the length between the both sides of the lining in the footwear flexion area. This dimension is taken along the *Y* axis (EN 13400) and on the insock (or the insole), and the measure is recorded, in mm, as B_2.

The evolution of the internal length and internal width of the test piece is calculated according to clause 6.

5.2.3.4 Colour changes

Any colour change caused by washing is evaluated with the standard grey scale (see ISO 105-A02) comparing the washed and unwashed test pieces.

The final result is taken as the most severe level of colour change.

5.2.3.5 Upper to sole adhesion

The upper to sole adhesion shall be determined, on the washed and unwashed test pieces, according to EN ISO 17708, and the values obtained shall be recorded, in N/mm, as F_1 (unwashed test piece) and F_2 (washed test piece).

6 Expression of results

6.1 Calculate the change, R_1, in the internal length of each shoe tested, in mm, using the formula:

$$R_1 = L_1 - L_2$$

where

L_1 is the initial internal length of the test piece, in mm (see 5.2.1),

L_2 is the final internal length of the test piece, in mm (see 5.2.3.3).

6.2 Calculate the change, R_2, of the internal width of each shoe tested, in mm, using the formula:

$$R_2 = B_1 - B_2$$

where

B_1 is the initial internal width of the test piece, in mm (see 5.2.1),

B_2 is the final internal width of the test piece, in mm (see 5.2.3.3).

7 Test report

The test report shall include the following information:

a) reference to this standard, EN ISO 19954;

b) full description of the sample tested, including commercial styles, code, colour, nature, etc.;

c) damages observed:

- general damage, according to 5.2.3.1;
- dimensional change, according to 5.2.3.3. If necessary, quote R_1 and R_2 (see clause 6);
- any colour change, according to 5.2.3.4;

d) toe spring value before (see 5.2.1) and after (see 5.2.3.2) washing;

e) values for upper to sole adhesion, before (F_1) and after (F_2) washing, according to 5.2.3.5;

f) note, if necessary, any relevant remarks pertaining to the test (colour changes of the textile, for example);

g) any deviation from this test method and any incident which could affect the result;

h) date of testing.

Annex ZA
(normative)

List of International Standards identical to the European Standards referenced in Clause 2

European Standard	International Standard
EN 12222	ISO 18454
EN ISO 6330	ISO 6330
EN ISO 17708	ISO 17708

Bibliography

EN 13400, *Footwear - Sampling location, preparation and duration of conditioning of samples and test pieces.*

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