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Footwear — Test methods for accessories: shoe laces — Abrasion resistance

Chaussures — Méthodes d'essai pour accessoires: lacets et œillets — Résistance à l'abrasion

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Foreword

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ISO 22774 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 216, *Footwear*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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

Annex ZA provides a list of corresponding International and European Standards for which equivalents are not given in the text.

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Foreword

This document (EN ISO 22774:2004) has been prepared by 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of an identical text or by endorsement, at the latest by June 2005, and conflicting national standards shall be withdrawn at the latest by June 2005.

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

1 Scope

This document specifies three test methods for determining the abrasion resistance of a shoe lace to repeated rubbing:

— Method 1: lace to lace abrasion;

— Method 2: lace to standard eyelet abrasion;

— Method 3: lace to eyelet (from footwear) abrasion.

2 Normative references

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

EN 12222, *Footwear — Standard atmospheres for conditioning and testing of footwear and components for footwear*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
abrasion resistance of shoe laces
ability of the shoe lace to resist to repeated rubbing against either a similar shoe lace or a lace carrier

3.2
number of cycles to failure
arithmetic mean of the number of cycles to failure for the test specimens submitted to test

3.3
type of failure
expressed as failure of the shorter lace or failure of the longer lace, together with a description of the respective amount of wear in the covering and core of each lace

4 Principle

A shoe lace is threaded through a loop formed by:

- a piece of similar lace held open by a spacer (Method 1);

- a lace carrier (Methods 2 and 3).

The shoe lace is bent through a fixed acute angle at the point of contact with the loop. It is then held under a standard tension while it is repeatedly drawn back and forth through the loop until it fails.

5 Apparatus and materials

5.1 General

5.1.1 A test machine with one or more test stations, see Figure 1, each having:

NOTE Test machines with less than six stations are also acceptable to conduct this test. In which case the test should be repeated until six test specimens have been tested (see 8.1.6).

5.1.2 A moveable clamp which has a means of firmly holding:

- both ends of a piece of shoe lace (Method 1);
- one end of the metal strip (see 5.1.8) (Methods 2 and 3).

5.1.3 A stationary clamp which is mounted in the same horizontal plane as the moveable clamp (5.1.1) and is capable of holding one end of a shoe lace. The stationary clamp should be 280 mm ± 50 mm from the moveable clamp (5.1.2) when the clamps are at their minimum separation, this distance will subsequently be referred to as D.

5.1.4 A tensioning device with a method of holding the end of a piece of shoe lace at a point 35 mm ± 5 mm to one side of, and in the same horizontal plane as, the stationary clamp (5.1.3) and applying a tensioning force of 2,45 N ± 0,03 N, see Figure 1. This can be achieved by passing the shoe lace over a pulley and suspending a mass of 250 g ± 3 g from the lower end of the vertical portion of the lace.

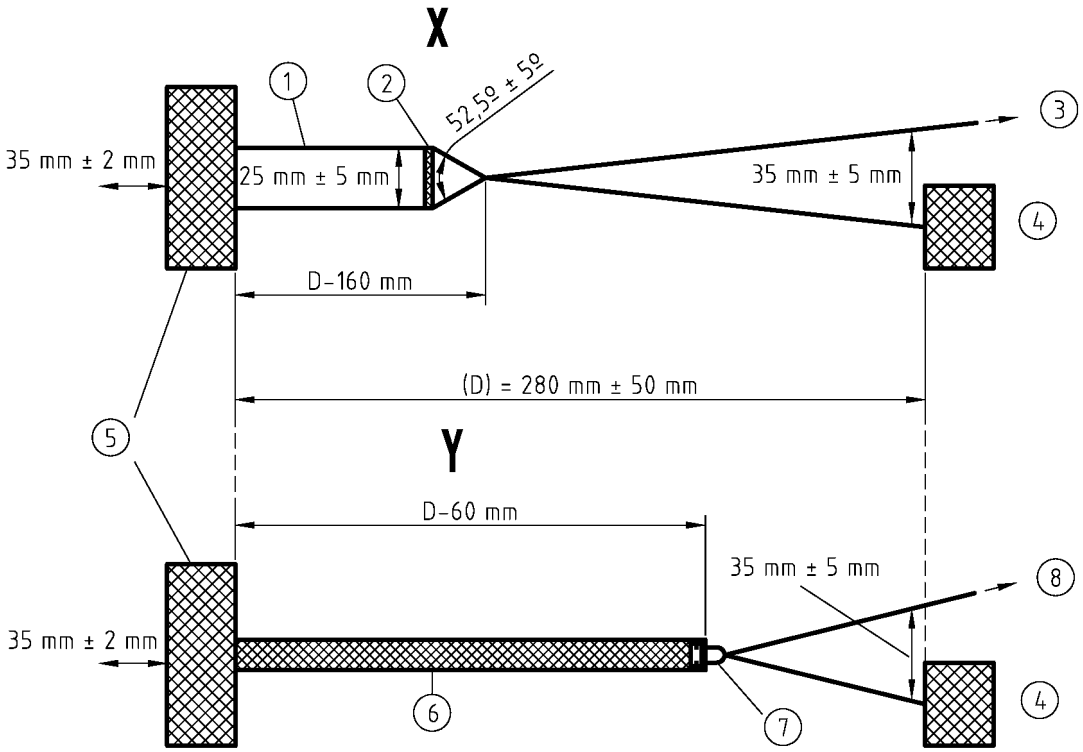
5.1.5 A means of moving the moveable clamp (5.1.2) with a simple harmonic reciprocating motion through a distance of 35 mm ± 2 mm and back to the original starting position at a rate of 60 cycles per minute ± 6 cycles per minute.

5.1.6 A means of counting the number of abrasion cycles up to failure of the lace or lace carrier.

5.1.7 For Method 1:

- a rigid spacer device of width 25 mm ± 5 mm. This is used to hold the two legs of the loop of lace which is clamped in the moveable clamp (5.1.2) apart (see Figure 1), so that when it is under tension the end of the loop forms an isosceles triangle with the spacer as its base and the two parts of the lace are at an angle of 52,5° ± 5,0°;
- a template with an angle of 52,5° marked on it, for setting the position of the spacer device.

5.1.8 For Method 2, a metal strip of width approximately 25 mm, thickness approximately 1 mm and length approximately *D* – 60 mm. One end of the strip should fit into the moveable clamp (5.1.2) and the other end should be capable of holding the test lace carrier.



X = Method 1: Lace – lace abrasion
Y = Methods 2 and 3: Lace – carrier abrasion

1 Lace loop
2 Spacer
3 Force (2,45 N ± 0,03 N)
4 Stationary clamp
5 Moveable clamp
6 Metal strip
7 Lace carrier
8 Force (2,45 N ± 0,03 N)

Figure 1 — Plan view of abrasion geometry

5.2 Standard eyelets, with the following characteristics (method 2):

— Construction: Visible (standard/flat) type;

— Material type: brass;

— Nominal internal barrel diameter: 4,5 mm;

— Nominal overall length: 5,5 mm;

5.3 Six test lace carriers (for methods 2 and 3)

5.3.1 Method 2

Mounting board: rigid fibreboard 3,0 mm ± 0,5 mm thick. Eyelet is clenched in drilled hole 5,0 mm ± 0,2 mm diameter (board with eyelet cut to size to fit mounting in machine) and fixed to the metal strip (see Figure 1).