
**Footwear — Test methods for insoles —
Delamination resistance**

*Chaussures — Méthodes d'essai applicables aux premières de montage —
Résistance au délaminage*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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

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

International Standard ISO 20866 was prepared by the European Committee for Standardization (as EN 12744:1999) 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.

Annex A of this International Standard is given for information only.

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 309 "Footwear", the secretariat of which is held by AENOR.

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of an identical text or by endorsement, at the latest by March 2000, and conflicting national standards shall be withdrawn at the latest by March 2000.

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This draft standard specifies a test method for the determination of the delamination resistance of insoles, irrespective of the material.

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 into it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 12222	Footwear - Standard atmospheres for conditioning and testing of footwear and components for footwear
prEN 13400:1998	Footwear - Sampling location of components for footwear
ISO 5893	Rubber and plastic test equipment - Tensile, flexural and compression types (constant rate of traverse) - Description

3 Definitions

For the purpose of this standard the following definition applies:

delamination resistance:

The transverse force required to delaminate a unit area of the insole material.

4 Apparatus and material

The following apparatus and material shall be used:

4.1 Tensile-testing machine (Dynamometer)

The tensile-testing machine shall comply with the requirements of ISO 5893, to an accuracy corresponding to grade B, with a constant rate of traverse of 25 mm/min $\pm$ 5 mm/min.

4.2 Pairs of solid cylinders

Pairs of solid cylinders, each $38,92 \pm 0,02$ mm in diameter, with provisions for attachment to the tensile-testing machine. The end faces of the cylinders shall be at right angles to their axes. The cylinders shall fit in the tensile-testing machine so that the line of action passes through the axis of the two cylinders. One pair of cylinders is required for each test piece.

4.3 Collars

Collars, with internal diameters of $39,00 \text{ mm} \pm 0,03 \text{ mm}$, to keep the cylinders and test pieces coaxial during assembly.

4.4 Circular knife

Circular knife, to cut a circular test piece of diameter $38,0 \text{ mm} \pm 1,0 \text{ mm}$. The inner surface of the knife shall be angled outward from the cutting edge at approximately 5° to the vertical so that when the test piece is cut it passes through the knife without damage to the edge of the test piece.

4.5 Press

Press, or similar apparatus, capable of exerting a force of $5,00 \text{ kN} \pm 0,25 \text{ kN}$ on the assembly of cylinders and test piece.

4.6 Vernier calipers

Vernier calipers, capable of measuring to an accuracy of $0,1 \text{ mm}$.

4.7 Polymer adhesive

Polymer adhesive, solvent-based, chloroprene rubber type.

NOTE: Suitable adhesives are most chloroprene rubber sole-attaching adhesives and commercially available chloroprene rubber impact adhesives sold for household use.

5 Sampling and conditioning

Using the circular knife described in 4.4, cut out three test pieces of diameter $38,0 \text{ mm} \pm 1,0 \text{ mm}$, from the shoe insoles, cut insoles or from the component as supplied.

If the test pieces are taken from the shoe insoles or cut insoles, sampling must be done according to prEN 13400:1998.

Condition the test pieces according to EN 12222, for a minimum of 24 h.

If a wet test is required cut out three additional test pieces.

6 Test method

6.1 Measure the diameter of each test piece to the nearest 0,1 mm with the vernier calipers (see 4.6). Clean the end faces of the cylinders (see 4.2) to remove all traces of insole material and adhesive from previous tests and remove all traces of grease.

6.2 Assemble each pair of cylinders with one of the test pieces using the following procedure: Coat the end faces of a pair of cylinders and both surfaces of a test piece with adhesive (see 4.7), and allow to dry for 20 min. Place the collar (see 4.3) over the end of one cylinder, place the test piece in the collar and press it lightly on to the cylinder face. Insert the end face of the other cylinder into the collar and press lightly on to test piece.

Place the assembly of cylinders, test piece and collar into the press (see 4.5), exert a force of $5,00 \text{ kN} \pm 0,25 \text{ kN}$ to press the cylinders on to the test piece with the collar in position.

6.3 Remove the collars and leave the test assemblies in the conditioning atmosphere, according to EN 12222, for 24 h before proceeding further with the determination.

6.4 Fit the first test assembly into the tensile-testing machine and run the machine at a cross-head speed giving a cylinder separation speed of $25 \text{ mm/min} \pm 5 \text{ mm/min}$. Record the maximum force obtained.

6.5 Repeat the procedure for the other two test assemblies. Reject the result of any test in which the test piece shows failure of adhesion of the adhesive film either to the insole material or to a cylinder and repeat the procedure on a further test piece.

6.6 For the test specimens that are to be tested wet:

6.6.1 Follow the procedure in 6.1 to 6.3 to procedure three test assemblies

6.6.2 Soak the three test assemblies in distilled water for $(6,0 \pm 0,5)$ hours.

6.6.3 Remove each test assembly from the water, and immediately carry out the procedure described in 6.4 to 6.5

7 Expression of results

7.1 Dry test

Divide the mean of the three maximum recorded forces by the mean of the areas (one surface) of the three test pieces. Express the result, in megapascals¹, as the delamination resistance of the insole material.

7.2 Wet test

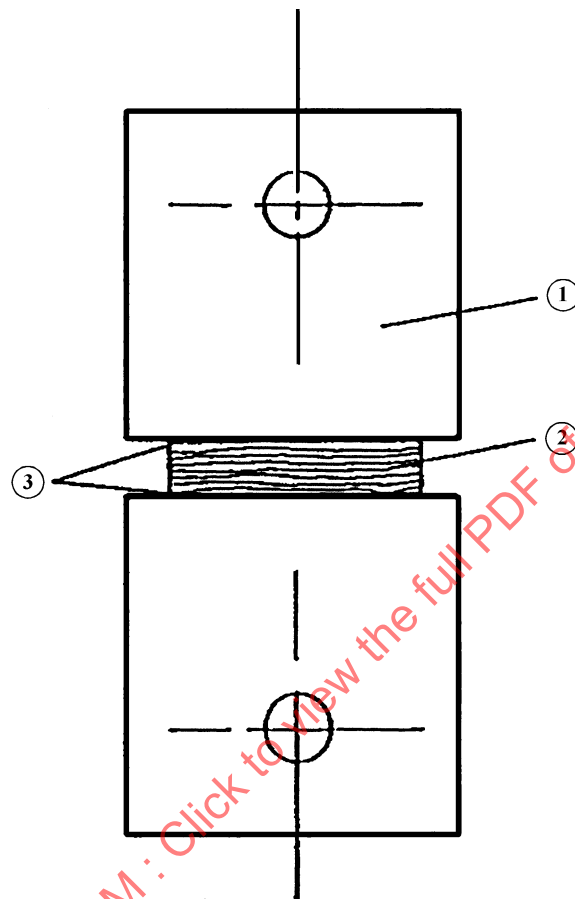
Divide the mean of the three maximum recorded forces obtained in the wet test assemblies by the mean of the areas (one surface) of the three test pieces. Express the result in megapascals¹, as the delamination resistance of the wet insole material.

8 Test report

The test report shall include the following information:

- a) the result, expressed in accordance with clause 7;
- b) the nature and full identification of the sample;
- c) a description of the sampling procedure, where relevant;
- d) reference to the method of test;
- e) details of any deviation from the standard test procedure;
- f) the date of testing.

¹ 1 megapascal (MPa) = 1 N/mm²



- 1 Specimen holder
- 2 Test specimen
- 3 Cementing assembly

Figure 1 - Device for measuring delamination resistance.