INTERNATIONAL STANDARD

ISO 20869

Second edition
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Footwear — Test method for outsoles, insoles, linings and insocks — Water soluble content

Chaussures — Méthode d'essai applicable aux premières de montage, aux doublures, aux premières de propreté et aux semelles d'usure — Détermination des substances solubles dans l'eau

Reference number
ISO 20869:2010(E)

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Foreword

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

ISO 20869 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 309, *Footwear*, in collaboration with Technical Committee ISO/TC 216, *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 20869:2001) which has been technically revised.

Footwear — Test method for outsoles, insoles, linings and insocks — Water soluble content

1 Scope

This International Standard specifies a method for the determination of the water soluble contents for outsoles, insoles, lining and insocks.

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.

ISO 17709, *Footwear — Sampling location, preparation and duration of conditioning of samples and test pieces*

ISO 18454, *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
water soluble matter
quantity of all those substances that, under certain conditions, are dissolved out of the material by water

3.2
water soluble inorganic substances
sulfated ash of water soluble substances

3.3
water soluble organic substances
difference between total water solubles and sulfated ash of water solubles

4 Apparatus

The following apparatus and material shall be used:

4.1 **650 ml to 750 ml flask**, with a wide neck and close-fitting glass or rubber stopper.

4.2 **Fluted filter**, 185 mm in diameter.

4.3 **500 ml measuring vessel**.

4.4 50 ml delivery pipette.

4.5 Quartz, platinum or porcelain evaporating basin, with flat bottom, to hold 50 ml, and suitable desiccators.

4.6 Funnel and 300 ml Erlenmeyer flask.

4.7 Appropriate shaker apparatus, capable of (50 ± 10) rpm (0,867 ± 0,167)$^{-s}$.

4.8 Thermometer.

4.9 Laboratory balance, with a sensitivity of 0,1 mg.

4.10 Analytical balance.

4.11 Suitable oven, set to (102 ± 2) °C.

4.12 Water bath.

4.13 Muffle oven, set to (690 ± 10) °C.

5 Reagents

5.1 Distilled water.

5.2 1 mol/l sulfuric acid.

6 Sampling

Test specimens shall be taken in accordance with ISO 17709.

The material shall be ground and extracted with dichloromethane using a soxhlet apparatus for a minimum of 30 refluxes of solvent. Condition the material for 24 h in accordance with ISO 18454. A minimum of two test pieces is necessary.

7 Test method

7.1 Shaking in water

Shake mechanically at (50 ± 10) rpm for 2 h, 10 g of conditioned ground and dichloromethane extracted material with 500 ml distilled water at (23 ± 2) °C in a wide-necked flask (4.1).

7.2 Filtrate

Filter the contents of the flask through a fluted filter until clear. Discard the first 50 ml of the filtrate. Determine the soluble organic and inorganic substances in a further 50 ml of the subsequent filtrate.

7.3 Total water solubles

Evaporate on the water bath (4.12) until dry, exactly 50 ml of the filtrate in a previously weighed dish heated at (690 ± 10) °C, drying at (102 ± 2) °C for approximately 2 h; cool in the desiccator; and weigh quickly. Only one dish at a time shall be put into a small desiccator and at most two into a large desiccator. Repeat drying until the reduction in mass amounts to less than 2 mg, but not for more than 8 h.

7.4 Sulfated ash of water solubles

Thoroughly wet the residue obtained in accordance with 7.3 in the dish with a few drops of 1 mol/l sulfuric acid (5.2), fume over a low flame until no sulfuric acid vapour is visible. Heat until red hot. Transfer to the muffle oven (4.13) at (690 ± 10) °C for 15 min. Cool in the desiccator and weigh as quickly as possible. Repeat the addition of acid, heating, cooling and weighing until the mass of the residue is constant.

NOTE If the mass of water soluble inorganic matter is likely to be less than 2,0 %, a 100 ml or 200 ml aliquot portion should be used.

8 Expression of results

8.1 The total water solubles, m_{ws}, in per cent, is given by Equation (1)

$$m_{ws} = \frac{r_d \times 10 \times 100}{m_c} \quad (1)$$

where

r_d is the mass of dry residue, in grams;

m_c is the original mass of the component, in grams.

8.2 Sulfated ash of water solubles, m_{saws}, in per cent, is given by Equation (2)

$$m_{saws} = \frac{r_{si} \times 10 \times 100}{m_c} \quad (2)$$

where r_{si} is the mass of sulfated residue from ignition, in grams.

8.3 Water soluble organic substances are the difference between the total water soluble substances and the water soluble inorganic substances.

The result is the average of the two values obtained for each test piece.

All values are calculated on the basis of fat free conditional samples.

9 Test report

The test report shall include, at least, the following information:

a) a reference to this International Standard, i.e. ISO 20869:2010;

b) results, expressed in accordance with Clause 8, rounded up or down to one decimal place;

c) full identification of the sample;

d) reference to this method of test;

e) date of testing.

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