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SIST EN 670:1999

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EUROPEAN STANDARD

EN 670

NORME EUROPÉENNE

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Descriptors: floor coverings, linoleum, identification, composition, ash content, binder

English version

**Resilient floor coverings - Identification of linoleum
and determination of cement content and ash
residue**

Revêtements de sol résilients - Identification
du linoléum et détermination de la teneur en
ciment et du taux de cendres

Elastische Bodenbeläge - Erkennung von Linoleum
und Bestimmung des Gehaltes an Bindemittel und
anorganischen Füllstoffen

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 134 “Resilient and textile floor coverings”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by March 1998, and conflicting national standards shall be withdrawn at the latest by March 1998.

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 European Standard specifies methods for identifying linoleum and determining the cement content and inorganic filler (ash residue) in linoleum floor coverings.

2 Definitions

For the purposes of this European Standard, the following definitions apply.

2.1 ash content : The residue that remains following incineration at 500 °C for 3 h.

2.2 linoleum cement : Binder in linoleum, consisting of a mixture of linseed oil and/or other vegetable drying oils, rosin and drying oil catalysts, which is converted to a semi-elastic mass by an oxidative curing process.

3 Principles

3.1 Identification

A small test piece is saponified in a solution of potassium hydroxide in methanol to identify linoleum from other floor coverings.

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3.2 Composition

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3.2.1 Cement content

The surface layer of a test piece without the backing material is crumbled and mixed with a solution of potassium hydroxide in methanol. After intensive stirring at 20 °C to 25 °C the mixture is filtered and the residue is carefully dried. The difference between the initial mass and the mass of the residue is the defined mass of linoleum cement.

3.2.2 Inorganic filler (ash residue)

To determine the amount of inorganic filler, the surface layer of a test piece without the backing material is incinerated and the mass of the residual ash is measured.

4 Apparatus and materials

4.1 Apparatus

4.1.1 Grater

4.1.2 General laboratory apparatus, eg. beakers.

4.1.3 Porcelain crucibles.

4.1.4 Desiccator (vacuum type), containing a suitable desiccant, eg. silica gel.

4.1.5 Furnace, capable of being controlled at $500\text{ °C} \pm 10\text{ °C}$.

4.1.6 Balance, having an accuracy of 0,1 mg.

4.1.7 Laboratory sieve, with a nominal aperture size of 0,5 mm

4.1.8 Ultrasonic bath, or equivalent device.

4.1.9 Centrifuge or vacuum filter (filter type A2) and suction device, eg. a water jet pump.

4.2 Reagents

4.2.1 Methanol (methyl alcohol), analytical grade

4.2.2 Potassium hydroxide analytical grade in methanol solution with a concentration of 0,5 mol/l

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5 Sampling and preparation of specimens

5.1 Sampling

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Take a representative sample from the available material

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5.2 Preparation of specimens

Take five specimens, each of minimum area 50 cm^2 , from across the width of sample, or from individual tiles, the distance between the edge of the sample and the nearest edge of the test piece being at least 100 mm.

5.2.1 Identification testing.

Cut a square of approximately 20 mm x 20 mm from a specimen.

5.2.2. Saponification testing.

Grate the surface layer of the specimen, ensuring that the backing material is separated. Use that part which passes a 0,5 mm sieve for the saponification testing.

5.2.3 Ashing.

Cut the surface layer of the specimen into small pieces of approximately 5 mm x 5 mm, ensuring that the backing material is separated.

6 Conditioning

Condition the prepared specimens at a temperature of (23 ± 2) °C and relative humidity (50 ± 5) % for a minimum of 24 h.

7 Procedure

7.1 Identification

Saponify the test piece in excess potassium hydroxide/methanol solution without stirring. After 24 h, record whether complete disintegration of the linoleum has taken place. If disintegration has not taken place, the sample is not identified as linoleum, so discontinue the test.

7.2 Composition

7.2.1 Determination of cement content

Weigh approximately 1 g of the grated test piece, with particle size $\leq 0,5$ mm, in a tared beaker.

Add approximately 10 ml of the potassium hydroxide/methanol solution and stir for $10 \text{ min} \pm 30 \text{ s}$. Ensure that the temperature does not exceed 25 °C, because wood- and/or cork-flour may be affected.

Centrifuge or vacuum filter the mixture using filter type A2 and rinse the residue at a temperature of 40 °C. Condition the dry residue (see clause 6) for a minimum of 24 h and record its mass.

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7.2.2 Determination of inorganic filler (ash content)

Determine the tared mass of a porcelain crucible as follows. Prepare a crucible by heating in the furnace at 500 °C for at least 3 h. Allow to cool in the desiccator for at least 1 h and determine the mass of the crucible. Repeat the process of heating, cooling and weighing until the results of two consecutive weighings of the mass do not differ from each other by more than 0,5 mg, ie. the mass is virtually constant.

Weigh approximately 2 g of the crumbled specimen in the tared porcelain crucible. Heat the crucible using a Bunsen burner so that the specimen burns in a controlled manner. Place the crucible and contents in a furnace at $500 \text{ °C} \pm 10 \text{ °C}$ for at least 3 h to allow incineration to proceed to completion, ie. when no carbonaceous matter remains in the crucible.

Transfer the crucible and contents to the desiccator and allow to cool for at least 1 h. Determine the mass of the crucible and residue. Repeat the process of incineration, cooling and weighing until the results of two consecutive weighings do not differ from each other by more than 0,5 mg, ie. the mass is virtually constant.

8 Calculation and expression of results

8.1 Calculation

8.1.1 Saponification.

Calculate the linoleum cement content as a percentage by mass using the following expression:

$$\frac{m_1 - m_2}{m_1} \times 100$$

where m_1 is the initial mass of the test piece (in g);
 m_2 is the mass of the dry residue (in g).

8.1.2 Ash residue

Calculate the content of inorganic filler as a percentage by mass, using the following expression;

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$$\frac{m_3}{m_1} \times 100$$

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where m_1 is the initial mass of the test piece (in g);
 m_3 is the mass of the ash residue (in g).

8.2 Expression of results

8.2.1 Identification.

Record whether complete disintegration takes place.

8.2.2 Composition.

Express the results for linoleum cement content and inorganic filler (ash residue) as the averages of the number of test pieces used and record these to the nearest 0,5 %.