



**SLOVENSKI STANDARD**  
**SIST EN 12849:2003**

**01-januar-2003**

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Bitumen and bituminous binders - Determination of penetration power of bitumen emulsions

Bitumen und bitumenhaltige Bindemittel - Bestimmung der Eindringfähigkeit von Bitumenemulsionen

**iTeh STANDARD PREVIEW**  
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Bitumes et liants bitumineux - Détermination du pouvoir de pénétration des émulsions de bitume

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**Ta slovenski standard je istoveten z: EN 12849:2002**

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**ICS:**

75.140	Voski, bitumni in drugi naftni proizvodi	Waxes, bituminous materials and other petroleum products
91.100.50	Veziva. Tesnilni materiali	Binders. Sealing materials

**SIST EN 12849:2003**

**en**

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EUROPEAN STANDARD

**EN 12849**

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2002

ICS 75.140; 91.100.50

English version

**Bitumen and bituminous binders - Determination of penetration  
power of bitumen emulsions**Bitumes et liants bitumineux - Détermination du pouvoir de  
pénétration des émulsions de bitumeBitumen und bitumenhaltige Bindemittel - Bestimmung der  
Eindringfähigkeit von Bitumenemulsionen

This European Standard was approved by CEN on 15 February 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

## Foreword

This document EN 12849:2002 has been prepared by Technical Committee CEN/TC 336 "Bituminous binders", the secretariat of which is held by AFNOR.

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 November 2002, and conflicting national standards shall be withdrawn at the latest by November 2002.

This European Standard is part of a package including 14 standards: EN 1428, EN 1429, EN 1430, EN 1431, EN 12846, EN 12847, EN 12848, EN 12849, EN 12850, EN 13074, EN 13075-1, EN 13075-2, EN 13614 and EN 13808.

Annex A forms a normative part of this document.

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, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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## 1 Scope

This European Standard specifies a method for the determination of the penetration power of bitumen emulsions.

This test method is applicable to low-viscosity bitumen emulsions.

**WARNING – The use of this standard can involve hazardous materials, operations and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.**

## 2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. The 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 58<sup>1)</sup>, *Bitumen and bituminous binders - Sampling bituminous binders*.

EN 12594, *Bitumen and bituminous binders - Preparation of test samples*.

EN ISO 4259, *Petroleum products - Determination and application of precision data in relation to methods of test (ISO 4259:1992/Cor 1:1993)*.

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## 3 Terms and definitions

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

### 3.1

#### penetration power

ability of a bitumen emulsion to penetrate into Forshammer SE<sup>2)</sup> filler

### 3.2

#### penetration time

time, in minutes, required for a specified quantity of bitumen emulsion to penetrate into a defined quantity of Forshammer SE filler

## 4 Principle

A specified quantity of the emulsion to be tested is poured onto a Forshammer SE filler, and the time required for the emulsion to penetrate into the filler is measured.

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1) In course of revision.

2) This information is given for the convenience of users of this European Standard and does not constitute an endorsement by CEN of the product name. Equivalent products may be used if they can be shown to lead to the same results, or if a correlation between the products has been established.

**EN 12849:2002 (E)****5 Reagents and materials**

For the filler, use the filler Forshammer SE having the characteristics given in annex A.

**6 Apparatus**

Usual laboratory apparatus and glassware, together with the following:

**6.1 Test apparatus**, as shown in Figure 1, consisting of a glass tube with fused-on glass filter disc with pore size between 160 µm and 250 µm.

A vent, below the glass filter disc, provides pressure compensation when the test apparatus is charged. The vent shall be cut perpendicular to the vertical axis, with its edges slightly fused.

NOTE The vent can be dispensed with if, during the test procedure, the test apparatus is supported.

**6.2 Balance**, capable of weighing 100 g, with an accuracy of  $\pm 0,1$  g.

**6.3 Oven**, capable of being maintained at  $110\text{ °C} \pm 5\text{ °C}$ .

**6.4 Wooden board**, 200 mm x 200 mm x 10 mm in size.

**6.5 Stopwatch**, graduated in divisions of 1 s or less.

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**7 Sampling**

The material under test shall be sampled in accordance with EN 58 and prepared in accordance with EN 12594.

The test shall be carried out on two test portions of the sample, each weighing  $10,0\text{ g} \pm 0,1\text{ g}$  (see clause 9).

**8 Procedure****8.1 General**

Carry out the procedure under normal laboratory conditions.

NOTE "Normal laboratory conditions" mean that the range of temperature is  $18\text{ °C}$  to  $28\text{ °C}$ .

**8.2 Test**

Dry the quantities of filler, required for the test, in the oven (6.3) at a temperature of  $110\text{ °C} \pm 5\text{ °C}$  for  $1\text{ h} \pm 2\text{ min}$  and cool to ambient temperature in a dessiccator.

For each test portion, mix intimately  $100,0\text{ g} \pm 0,2\text{ g}$  of filler and transfer via a funnel to the upper part of the test apparatus (6.1), lifting the funnel with increasing filling height. Level the surface of the filler mixture in the apparatus by knocking the lower edge of the test apparatus three times on the wooden board (6.4).

Place the apparatus on the balance (6.2).

Pour  $10,0\text{ g} \pm 0,1\text{ g}$  of the emulsion to be tested along a glass rod onto the centre of the filler mixture. Pour the entire quantity of emulsion within  $10\text{ s} \pm 1\text{ s}$ . Start measuring the time immediately after pouring the emulsion.

Cover the test apparatus using a watch glass.

Determine the time for the emulsion to completely penetrate into the filler mixture, i.e. when the structure of the filler at its upper surface can be clearly recognised. If penetration of the filler mixture is not completed within 20 min, discontinue the test.

Repeat the test procedure using new quantities of filler and emulsion.

If the results for both sample portions differ by more than 3 min, repeat the procedure for a third sample portion. The two values nearest to each other are used to calculate the mean penetration time.

## 9 Expression of results

Express the result, as the mean penetration time in minutes, rounded to the nearest 1 min, taking EN ISO 4259 into account when rounding the last significant figure.

## 10 Precision

### 10.1 Repeatability

The difference between two successive test results, obtained by the same operator with the same apparatus under constant operating conditions on identical test material would, in the long run, in the normal and correct operation of the test method, exceed 3 min in only one case in twenty.

### 10.2 Reproducibility

The difference between two single and independent results obtained by different operators working in different laboratories on identical test material would, in the long run, in the normal and correct operation of the test method, exceed 6 min in only one case in twenty (provided that both results have been determined within two weeks).

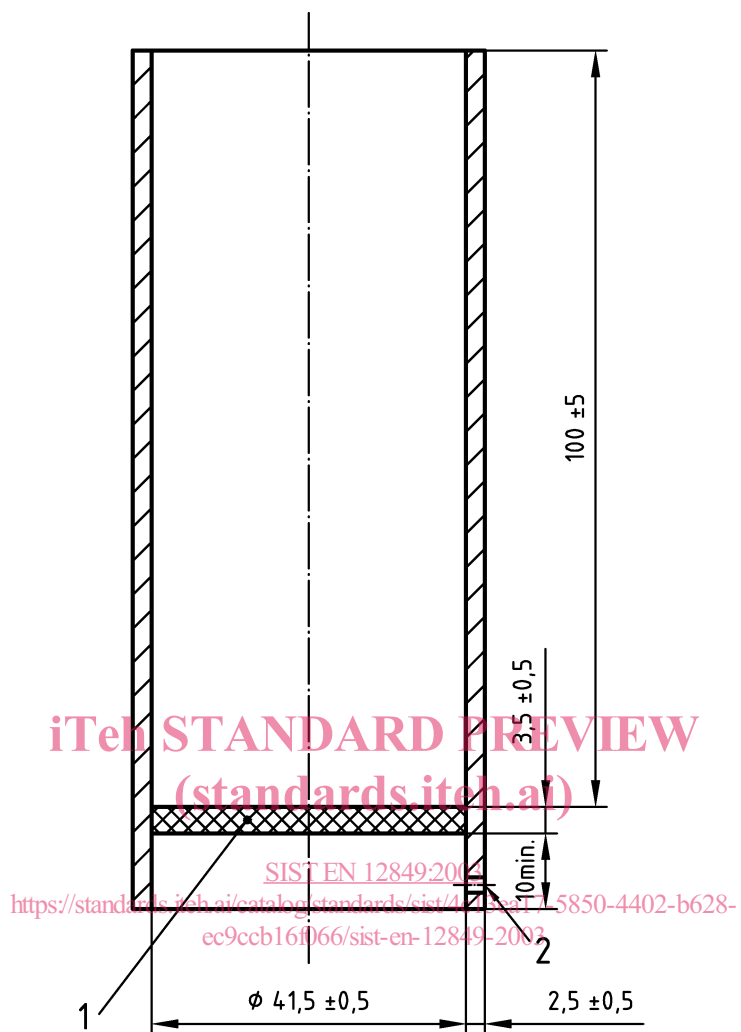
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NOTE The source of precision data is DIN 52046 [1].

## 11 Test report

The test report shall contain at least the following information:

- a) the type and complete identification of the sample under test;
- b) a reference to this European Standard;
- c) a reference to the type of apparatus used;
- d) the result of the test (see clause 9);
- e) any deviation, by agreement or otherwise, from the procedure specified;
- f) the date of sampling, the date of sample preparation and the date of the test.

**Key**

- 1 Glassfilterdisc
- 2 Vent

**Figure 1 — Test apparatus**



## Annex A (normative)

### Characteristics of the filler Forshammer SE

The filler Forshammer SE is a mixture of:

- 65 % Feldspar;
- 30 % Quartz;
- 5 % Mica.

The gradation is:

- 91,2 % passing 0,5 mm sieve;
- 56,6 % passing 0,25 mm sieve;
- 23,9 % passing 0,125 mm sieve;
- 7,7 % passing 0,064 mm sieve;
- 3 % passing 0,032 mm sieve;
- 1,7 % passing 0,016 mm sieve.

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To secure a supply of identical filler, one batch of filler Forshammer SE is stored for at least ten years for the purpose of this test method. The filler is available from the Swedish Research Laboratory, S-581 95, Linköping, Sweden.