



SLOVENSKI STANDARD

SIST EN 13075-1:2003

01-januar-2003

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Bitumen and bituminous binders - Determination of breaking behaviour - Part 1:
Determination of breaking value of cationic bitumen emulsions, mineral filler method

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Bitumen und bitumenhaltige Bindemittel - Bestimmung des Brechverhaltens - Teil 1:
Bestimmung des Brechwertes kationischer Bitumenemulsionen, Verfahren mit
Feinmineralstoff

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Bitumes et liants bitumineux - Détermination du comportement a la rupture - Partie 1:
Détermination de l'indice de rupture des émulsions cationiques de bitume, méthode des
fines minérales

Ta slovenski standard je istoveten z: EN 13075-1:2002

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

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en

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ICS 75.140; 91.100.50

English version

Bitumen and bituminous binders - Determination of breaking
behaviour - Part 1: Determination of breaking value of cationic
bitumen emulsions, mineral filler method

Bitumes et liants bitumineux - Détermination du
comportement à la rupture - Partie 1: Détermination de
l'indice de rupture des émulsions cationiques de bitume,
méthode des fines minérales

Bitumen und bitumenhaltige Bindemittel - Bestimmung des
Brechverhaltens - Teil 1: Bestimmung des Brechwertes
kationischer Bitumenemulsionen, Verfahren mit
Feinmineralstoff

This European Standard was approved by CEN on 14 March 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.



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 13075-1:2002 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 January 2003, and conflicting national standards shall be withdrawn at the latest by January 2003.

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 is normative and annex B is informative.

This European Standard EN 13075 consists of the following parts under the general title *Bitumen and bituminous binders – Determination of breaking behaviour*:

Part 1 – Determination of breaking value of cationic bitumen emulsions, mineral filler method;

Part 2 – Determination of fines mixing time of cationic bitumen emulsions.

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 breaking value of cationic bitumen emulsions.

WARNING – The use of this standard may 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. 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 in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 58¹⁾, *Bitumen and bituminous binders - Sampling bituminous binders*.

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

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3 Terms and definitions

For the purposes of this European Standard, the following term and definition apply.

3.1 breaking value

dimensionless number corresponding to the amount of reference filler, in grams, needed to coagulate 100 g of bitumen emulsion

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4 Principle

A reference filler is added at a uniform rate to a specified quantity of stirred cationic bitumen emulsion. When the emulsion has broken completely, the amount of added filler is determined by weighing. The mass of filler (in grams) multiplied by 100 and divided by the amount of emulsion (in grams) is the breaking value.

NOTE The cationic or anionic nature of an emulsion can be determined with EN 1430 [1].

5 Reagents and materials

5.1 Filler, Forshammer SE filler²⁾, reference is given in annex A.

The filler shall be dried before use.

NOTE For information, the round robin test showed good correlation with Sikaisol filler (described in annex B).

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.

In case of dispute, the Forshammer SE filler shall be used.

5.2 Cleaning agents, as used conventionally in laboratories.

6 Apparatus

Usual laboratory apparatus and glassware, together with the following:

6.1 Equipment for semi-automatic procedure, as shown in Figure 1, consisting of the following:

6.1.1 Stirrer motor, with an output power of at least 25 W, and a speed of 260 r/min \pm 60 r/min.

6.1.2 Stirrer, having the dimensions given in Figures 3, 4 and 5. In Figure 3, the dimensions are given as an example.

6.1.3 Adjustable filler feeder, capable of feeding the filler at a rate of 0,3 g/s - 0,4 g/s. This equipment shall be calibrated. The calibration shall be achieved by weighing the amount of the filler poured during a period of time between 100 s and 200 s measured with an accuracy of 0,2 s.

NOTE For the manual procedure, the feeding rate, q , in grams per second, should be calculated, using the following equation:

$$q = \frac{m_f}{t}$$

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where

m_f is the mass of filler in grams;

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t is the analysis time in seconds.

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6.1.4 Metal cans, cylindrical, of approximate capacity 500 ml, height 95 mm and diameter 90 mm.

6.2 Equipment for manual procedure

6.2.1 Conical-shaped pan, capable of feeding the filler at a rate of 0,3 g/s - 0,4 g/s.

6.2.2 Enamel dish, having approximately 20 cm inside diameter and 10 cm high.

6.2.3 Nickel spatula, 20 cm long.

6.3 Equipment for both

6.3.1 Timer or stop watch, with an accuracy of 0,2 s or better over a time interval of 100 s.

6.3.2 Suitable bottles, of approximate capacity 500 ml made of a material that will not react with the emulsion, having tight fitting lids.

6.3.3 Constant temperature bath, capable of maintaining the sample in the can at 25 °C \pm 1 °C.

NOTE The bath should be equipped with a frame or device to prevent the plastic bottles from moving in the water bath.

6.3.4 Balance, having a suitable range, capable of weighing the samples in clause 8 to the nearest 0,1 g.

6.3.5 Thermometer, having a suitable range, capable of measuring the temperature to the nearest 0,1 °C.

7 Sampling

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

8 Procedure

Carry out the procedure under normal laboratory conditions (18 °C to 28 °C). However, both emulsion and filler should be used at a temperature of 25 °C ± 1 °C.

8.1 Semi-automatic procedure

Pour a portion of emulsion 250 g ± 10 g into a suitable bottle (6.3.2) and secure the lid.

Place the suitable bottle in the constant temperature bath (6.3.3) for a minimum of 1,5 h.

Weigh the metal can (6.1.4) containing the stirrer (6.1.2) to the nearest 0,1 g (m_1).

Transfer 100 g ± 1 g to the nearest 0,1 g (m_e) of the emulsion sample from the suitable bottle (6.3.2) to the weighed metal can.

Place the metal can under the stirrer motor (6.1.1) and connect the stirrer (6.1.2) to the stirrer motor.

Start the stirrer motor and the feeder simultaneously, ensuring that the stirrer blades are below the surface of the emulsion during the test.

Rotate the metal can slowly (approximately 5 r/min) by hand in the opposite direction to the stirrer in order to ensure homogeneity of mixing.

The mixture becomes thicker as the filler is added and the emulsion is considered to be broken when the mix detaches itself from the metal can. Turn off the filler feeder and the stirrer at this point.

Weigh the metal can containing the broken emulsion and the stirrer to the nearest 0,1 g (m_2).

Repeat the test with a second portion of emulsion taken from the same suitable bottle using a new metal can and stirrer.

NOTE In case of dispute, only the semi-automated apparatus is allowed.

8.2 Manual procedure

Weigh the enamel dish (6.2.2) containing the spatula (6.2.3) to the nearest 0,1 g (m_1).

Transfer 100 g ± 1 g to the nearest 0,1 g (m_e) of the emulsion sample from the suitable bottle (6.3.2) to the weighed enamel dish containing the spatula.

Place the enamel dish in the constant temperature bath (6.3.3) for a minimum of 1,5 h.

Start the filler addition and the timer simultaneously. Thoroughly mix the emulsion and the filler by stirring at a steady rate 1 r/s, using the spatula.

The mixture becomes thicker as the filler is added and the emulsion is considered to be broken when the mix detaches itself from the enamel dish. Stop the filler addition, the timer and the mix at this point.

Weigh the enamel dish containing the broken emulsion and the spatula to the nearest 0,1 g (m_2).

Repeat the test with a second portion of emulsion taken from the same suitable bottle using a new enamel dish and spatula.

9 Calculation

Calculate the breaking value, BV , for 100 g of emulsion, using the following equation:

$$BV = \frac{100 \times m_f}{m_e}$$

where

$m_f = m_2 - m_e - m_1$ is the added amount of filler in grams;

m_e is the amount of emulsion in grams.

10 Expression of results

Express the individual breaking values, and the average breaking value, to the nearest integer.

11 Precision

NOTE The precision of the method was evaluated in accordance with EN ISO 4259 [2].

11.1 Repeatability, r

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 10 % of the mean value in only one case in twenty.

NOTE In the French standard XP T 66-017:1983³⁾, the repeatability, r , is calculated from the mean taken from 3 tests (BV^*).

$$r = 0,03 \times BV^*$$

11.2 Reproducibility, R

The reproducibility for this standard is not currently available.

12 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) the procedure used (semi-automatic or manual);
- d) the feeding rate, the temperature and the rotational speed;
- e) the result of the test (see clause 10);

3) XP T 66-017, *Emulsions de bitume – Détermination de l'indice de rupture d'une émulsion cationique* (Bitumen emulsions – Determination of breaking point of a cationic emulsion).

- f) any deviation, by agreement or otherwise, from the procedure described;
- g) the date of the test.

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