

SLOVENSKI STANDARD
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Bitumen and bituminous binders - Determination of breaking behaviour - Part 2:
Determination of fines mixing time of cationic bituminous emulsions

Bitumen und bitumenhaltige Bindemittel - Bestimmung des Brechverhaltens - Teil 2:
Bestimmung der Mischzeit von Feinanteilen in kationischen Bitumenemulsionen

Bitume et liants bitumineux - Détermination du comportement à la rupture - Partie 2 :
Détermination de la durée de miscibilité des fines dans les émulsions cationiques de
bitume

Ta slovenski standard je istoveten z: EN 13075-2:2009

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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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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ICS 75.140; 91.100.50

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English Version

**Bitumen and bituminous binders - Determination of breaking
behaviour - Part 2: Determination of fines mixing time of cationic
bituminous emulsions**

Bitume et liants bitumineux - Détermination du
comportement à la rupture - Partie 2 : Détermination de la
durée de miscibilité des fines dans les émulsions
cationiques de bitume

Bitumen und bitumenhaltige Bindemittel - Bestimmung des
Brechverhaltens - Teil 2: Bestimmung der Mischzeit von
Feinanteilen in kationischen Bitumenemulsionen

This European Standard was approved by CEN on 10 February 2009.

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 CEN 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 CEN Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 13075-2:2009) 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 September 2009, and conflicting national standards shall be withdrawn at the latest by September 2009.

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

This document supersedes EN 13075-2:2002.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s).

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 bituminous emulsions, mineral filler method;

Part 2 – Determination of fines mixing time of cationic bituminous 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, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

EN 13075-2:2009 (E)**1 Scope**

This European Standard specifies a method for the determination of the fines mixing time of diluted cationic bituminous emulsions, under standardized conditions.

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

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.

EN 58, *Bitumen and bituminous binders – Sampling bituminous binders*

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

EN ISO 3696, *Water for analytical laboratory use – Specification and test methods (ISO 3696:1987)*

3 Terms and definitions

For the purposes of this document, the following term and definition applies

3.1
finer mixing time
time in seconds for the mixability of a mixture of mineral filler and bitumen emulsion without noticeable breaking effect under the conditions specified in this standard

4 Principle

A specified quantity of filler is added at a uniform rate, with stirring, to a specified quantity of bitumen emulsion diluted with water. Stirring is continued until the mixture becomes pasty and forms lumps which do not adhere to the walls of the pan. This, combined with a noticeable increase in stirring power indicates the end of mixability. The time to reach this point (breaking status) is the finer mixing time.

5 Reagents and materials

Use only reagents of recognized analytical grade and water conforming to grade 3 of EN ISO 3696.

5.1 Reference filler

The Sikaisol filler¹ (characteristics are given in Annex A) shall be used as the reference filler.

Other filler such as the Forshammer filler may be used as an alternative to the Sikaisol filler. In the event of dispute, the Sikaisol filler shall be used.

5.2 Cleaning agents, as used conventionally in laboratories.

¹ 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.

6 Apparatus

Usual laboratory apparatus and glassware, together with the following.

- 6.1 Oven**, capable of being maintained at $(110 \pm 5) ^\circ\text{C}$.
 - 6.2 Conical shaped funnel** of suitable volume, capable of feeding the filler at a rate of 10 g per 5 s.
 - 6.3 Spatula**, nickel or stainless steel, 20 cm long.
 - 6.4 Spatula**, spoon shaped for adding filler.
 - 6.5 Stop watch**, with an accuracy of 0,2 s or better over a time interval of 500 s.
 - 6.6 Bottles**, of approximate capacity 500 ml made of a material that will not react with the emulsion, having tight fitting lids, for storing emulsion samples and water.
 - 6.7 Constant temperature bath and/or climatic chamber**, capable of a temperature of $(25 \pm 1) ^\circ\text{C}$.
- NOTE If the bath is used to condition the emulsion sample bottles, it should be equipped with a frame or device to prevent the bottles from moving in the water bath.
- 6.8 Balance**, capable of weighing up to 1 000 g with an accuracy of 0,1 g or better.
 - 6.9 Enamelled or stainless steel dish**, of suitable volume, capable of containing 150 g of diluted emulsion and 150 g of filler.
 - 6.10 Thermometer**, having a suitable range, capable of measuring the temperature to the nearest 0,2 $^\circ\text{C}$.

7 Sampling

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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 ($18 ^\circ\text{C}$ to $28 ^\circ\text{C}$).

Dry the quantities of filler, required for the test, in the oven (6.1) at a temperature of $(110 \pm 5) ^\circ\text{C}$ until constant mass is reached and let it cool to ambient temperature in a dessiccator.

Pour a portion of emulsion (250 ± 10) g and water (150 ± 10) g into bottles (6.6) and secure the lid. Place the required quantity of filler in a closed container. Place the bottles with the emulsion and the water and the container with the filler in the constant temperature bath or climatic chamber (6.7) for a minimum of 1,5 h.

Transfer ($100 \pm 0,5$) g of the emulsion in the dish (6.9) then add ($50 \pm 0,5$) g of water while agitating with the spatula (6.3).

Transfer (150 ± 1) g of filler in the conical shaped funnel (6.2).

Start the stop watch (6.5), and while mixing with the spatula (6.3) at constant rate of 1 r/s, add filler contained in the conical shaped funnel (6.2) to the diluted emulsion, by portions of 10 g per 5 s, so that within the 75 s, the overall (150 ± 1) g filler is poured.

Continue mixing and measure the time until the emulsion breaks (see Clause 4).

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If the bitumen emulsion does not break within 300 s, the test procedure shall be stopped, and the result of the test "> 300 s" shall be reported.

NOTE It may happen that lumps form as soon as the filler contacts the diluted emulsion, but the body of the emulsion neither breaks nor reaches the "pasty" stage within 300s.. In such cases, the emulsion is deemed to have not broken. The test procedure shall be stopped and the result of the test "> 300 s – formation of lumps" shall be reported.

Repeat the test with a new test portion taken from the same laboratory sample using clean apparatus.

9 Expression of results

Express the individual mixing time values (in seconds) to the nearest integer.

Express the result as the arithmetic mean of the two individual results of mixing time, to the nearest integer.

10 Precision

NOTE A European round robin test has not been carried out. The precision data given are based on data obtained by long term experience in Germany and calculated according to ISO 5725 [1]. They are considered valid until the results of a European round robin test become available.

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 10 % of the average value 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 20 % of the average value in only one case in twenty.

11 Test report

The test report shall contain at least the following information:

- a) type and complete identification of the sample under test;
- b) reference to this European Standard;
- c) reference to the used filler;
- d) result of the test and individual mixing time values (see Clause 8 and Clause 9);
- e) any deviation, by agreement or otherwise, from the procedure described;
- f) date of the test.

Annex A (normative)

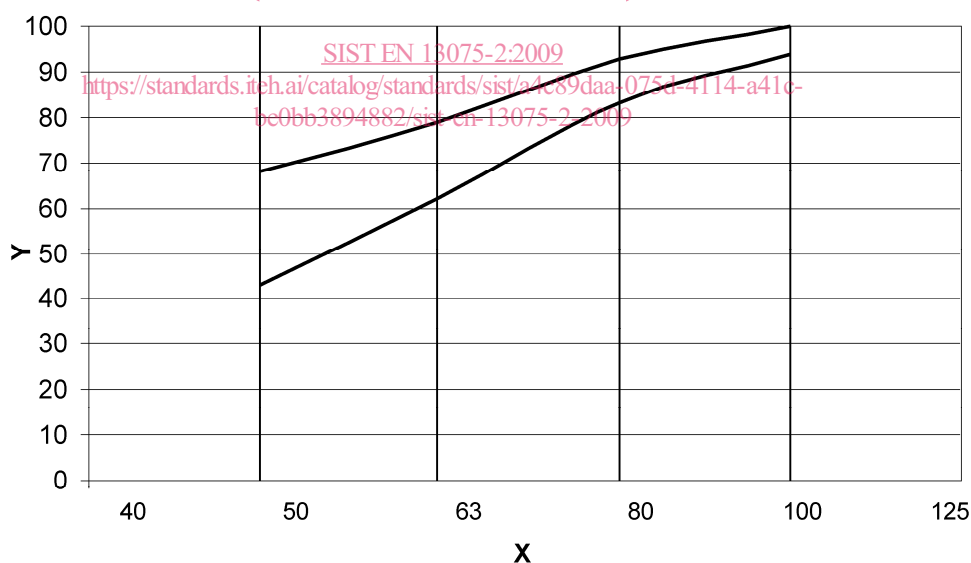
Characteristics of the Sikaisol filler

The Sikaisol filler shall have at least the following properties:

- Natural fine silica, uncrushed;
- SiO₂ content greater than 98 %;
- Density of (2 650 ± 20) kg/m³;
- Particle size distribution, as % passing:
 - 0,100 mm from 94 % to 100 %;
 - 0,080 mm from 83 % to 93 %;
 - 0,063 mm from 62 % to 79 %;
 - 0,050 mm from 43 % to 68 %.

The Sikaisol Birec filler is available from SIFRACO, Quartier les Merles, F 26730 HOSTUN, Tel.: +33 4 75 05 81 00 - FAX: 33 4 75 48 85 57 – commercial.hostun@sifraco.com.²

NOTE On the basis of current known figures, the current stock of Sikaisol filler enables to consider deliveries for a period of time extending 15 years. A statement will be presented by Sika each year in order to react when stock will only be able to supply for 5 years.



Key

X Sieves, μm

Y % passing, in weight

Figure A.1 — Gradation limits of the Sikaisol filler

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.