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 A YhcXU`hYcfc`dg_Y`XYgh`UW`Y`

Bitumen and bituminous binders - Determination of water content in bitumen emulsions -
 Azeotropic distillation method

Bitumen und bitumenhaltige Bindemittel - Bestimmung des Wassergehaltes von
 Bitumenemulsionen - Azeotropisches Destillationsverfahren

Bitumes et liants bitumineux - Détermination de la teneur en eau dans les émulsions de
 bitume - Méthode de distillation azéotrope

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Ta slovenski standard je istoveten z: EN 1428:1999

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 1428:2000

en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1428

October 1999

ICS 75.140; 91.100.50

English version

Bitumen and bituminous binders - Determination of water
content in bitumen emulsions - Azeotropic distillation method

Bitumes et liants bitumineux - Détermination de la teneur
en eau dans les émulsions de bitume - Méthode de
distillation azéotrope

Bitumen und bitumenhaltige Bindemittel - Bestimmung des
Wassergehaltes von Bitumenemulsionen - Azeotropisches
Destillationsverfahren

This European Standard was approved by CEN on 5 September 1999.

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 Central Secretariat 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 Central Secretariat 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, 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

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

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 19 "Petroleum products, lubricants and related products", the secretariat of which is held by NNI.

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 April 2000, and conflicting national standards shall be withdrawn at the latest by June 2002.

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.

This draft is part of a package including 15 standards : EN(WI 00019104), 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 13614-1, EN 13614-2.

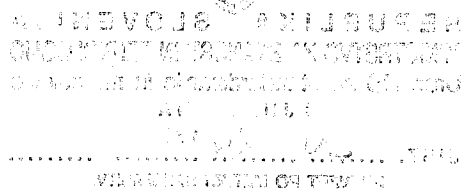
In this standard, annex A is normative and annex B is informative.

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1 Scope

This European Standard specifies a method for the determination of the water content in bitumen emulsions by means of distillation.

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. 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 incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 58, *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)*

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3 Definition

For the purposes of this standard, the following definition applies :

3.1

water content

percentage by mass of water determined in accordance with the method specified in this standard.

4 Principle

The water contained in a bitumen emulsion is distilled over by means of a carrier vapour from a water immiscible solvent-carrier liquid.

Condensed solvent-carrier liquid and water are separated continuously in a graduated receiver ; the water settles in the graduated section of the receiver and the condensed solvent-carrier liquid returns to the flask.

5 Reagents and materials

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

5.1 Anhydrous anti-bumping granules, with a higher density than the liquid under test.

5.2 Suitable solvent-carrier liquid.

NOTE : In selecting a solvent-carrier liquid, attention should be drawn to any relevant safety regulations. However, xylene conforming to ISO 5280 [1] is recommended for routine tests and toluene conforming to ISO 5272 [2] is recommended for referee tests.

6 Apparatus

Usual laboratory apparatus and glassware, together with the following :

6.1 Distillation apparatus, (see figure 1) consisting of the following ; the flask, receiver and reflux condenser being connected with suitable ground glass joints:

6.1.1 Flask, 500 ml round bottomed with a short neck capable of accommodating the reflux tube of the receiver.

6.1.2 Receiver or trap, with a 25 ml nominal capacity graduated to 0,1 ml.

6.1.3 Reflux condenser, water-cooled with a minimum length of jacket of 300 mm.

6.1.4 Heater. <https://standards.iteh.ai/catalog/standards/sist/ab26f9f3-4af4-4998-996d-56d72f3b866e/sist-en-1428-2000>

NOTE : An electric flask heater with electronic power regulation is recommended in order to obtain controlled distillation.

6.2 Stainless wire, with looped-end or fitted with a rubber stopper.

6.3 Balance, of sufficient capacity, accurate to 0,01 g.

7 Sampling

The laboratory sample shall be sampled in accordance with EN 58. Preparation of test samples shall be made in accordance with EN 12594.

The prepared sample shall be divided into two portions; for referee purposes, both portions shall be tested (see note to clause 10).

8 Procedure

8.1 Verification of apparatus

When necessary, the apparatus shall be verified in accordance with the procedure given in annex A.

NOTE : The verification procedure should be carried out on new apparatus before using it for the first time and existing apparatus should be checked annually.

8.2 Test

8.2.1 Carry out the procedure under normal laboratory conditions.

8.2.2 Before commencing a test, ensure that the distillation apparatus is clean and dry.

8.2.3 Weigh a sample of the emulsion under test, of such a size that the distillation of 15 ml to 25 ml of water can be expected, into the round bottomed flask (6.1.1).

NOTE : To prevent splashes of emulsion onto the neck of the flask, it is recommended that the test material is poured into the flask using a wire.

Add approximately 100 ml of solvent-carrier liquid (5.2) and a few anti-bumping granules (5.1) to the flask.

8.2.4 Assemble the apparatus and insert a loose plug of cotton wool in the top of the condenser tube (6.1.3) to prevent the condensation of atmospheric moisture in the condenser tube.

8.2.5 Heat the flask to boiling point, adjusting the rate of boiling so that condensate falls from the end of the condenser at a rate of two drops to five drops per second.

8.2.6 If there is water in the condenser tube or adhering to the sides of the receiver, dislodge it with the stainless steel wire (6.2). Continue distillation until the volume of water in the receiver is constant and no water is visible other than in the receiver .

8.2.7 Rinse the condenser with solvent-carrier liquid (5.2) from a wash bottle.

8.2.8 Allow a clear interface to develop between the water and solvent layers in the receiver then read off the volume of water to the nearest 0,1 ml.

9 Calculation

Calculate the water content of the material under test (w), as a percentage by mass, using the following equation :

$$w = \frac{m_W}{m_E} \times 100$$

where :

m_W is the mass of the water distilled from the test material, in grams, and is equal to the volume of water, in millilitres collected in the graduated receiver ;

m_E is the mass of emulsion used for the test, in grams.

10 Expression of results

Express the water content as a percentage by mass to the nearest 0,1 % or, for referee purposes, as the arithmetic mean of two tests.

NOTE: Duplicate tests are required for referee purposes only. In the case of routine internal production control, it is permitted to perform a single test.

11 Precision

11.1 Repeatability

The difference between two 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 1 % in relative value, in only one case in twenty.

11.2 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 2 % (m/m) in relative value, in only one case in twenty.

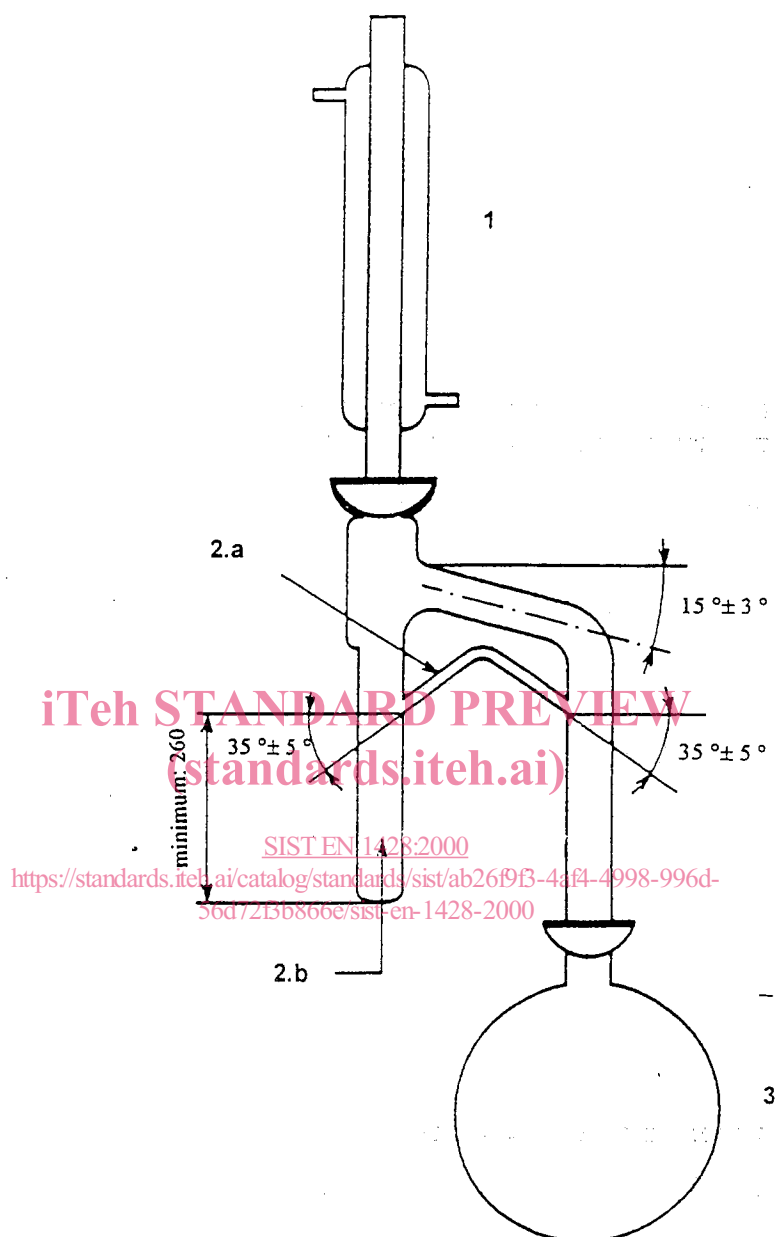
In the case of an emulsion containing solvent, the reproducibility is 3 % (m/m).

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 result of the test (see clause 10) ;
- d) the number of tests performed ;
- e) any deviation, by agreement or otherwise, from the procedure specified ;
- f) the date of the test.

Dimensions in millimetres



- 1 - Reflux condenser
- 2 - Receiver
 - 2.a - With or without this tube
 - 2.b - Capacity : 25 ml
- 3 - Round bottomed flask

Figure 1 : Typical assembly