
6]li a Yb`]b`V]li a Ybg_Uj Yn]j U!`8c`c Yj Ub`Y`cg]Ub_UV]li a Ybg_]l `Ya i `nj`bUg]li
]b`i [c]Uj `Ub`Y`g]U]bcg]h`df]`g`UX]y Yb`i `g`gY`Ub`Ya

Bitumen and bituminous binders - Determination of residue on sieving of bitumen emulsions, and determination of storage stability by sieving

Bitumen und bitumenhaltige Bindemittel - Bestimmung des Siebrückstandes von Bitumenemulsionen und Bestimmung der Lagerbeständigkeit durch Sieben

Bitumes et liants bitumineux - Détermination du résidu sur tamis des émulsions de bitume et détermination de la stabilité au stockage par tamisage

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Ta slovenski standard je istoveten z: EN 1429:1999

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 1429:2000

en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1429

October 1999

ICS 75.140; 91.100.50

English version

Bitumen and bituminous binders - Determination of residue on sieving of bitumen emulsions, and determination of storage stability by sieving

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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.

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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

Page 2
EN 1429:1999

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.

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STANDARDS
SIST EN 1429:2000

EN 1429:1999

1 Scope

This European Standard specifies methods utilizing sieving for the determination of the quantity of coarse particles of binder present in bitumen emulsions, and for the determination of storage stability.

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.

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)

[https://standards.iteh.ai/catalog/standards/sist/8164983e-0d15-4507-96e1-](https://standards.iteh.ai/catalog/standards/sist/8164983e-0d15-4507-96e1-762189c47ef/sist-en-1429-2000)

ISO 565, *Test sieves - Metal wire cloth, perforated metal plate and electroformed sheet - Nominal sizes of openings*

ISO 5280, *Xylene for industrial use - Specification*

3 Definitions

For the purposes of this standard, the following definitions apply :

3.1

residue on sieving

percentage by mass of particles retained on a sieve of a mesh size specified in this standard.

3.2

storage stability

ability of a bitumen emulsion not to form more coarse particles within a period specified under an appropriate emulsion specification.

NOTE : The limits fixed by the emulsion specification should ensure that there cannot be any disturbance of the workability of the bitumen emulsion under practical conditions.

4 Principle

A known mass of bitumen emulsion is filtered through either a prepared sieve with a mesh size of 0,500 mm or through two prepared sieves with mesh sizes of 0,500 mm and of 0,160 mm. The amount of binder retained on the sieves is weighed after washing and drying.

Storage stability is determined as the amount of binder retained on the sieve with a mesh size of 0,500 mm after a defined storage period (n days).

5 Reagents and materials

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

NOTE : The aqueous solutions (5.1) and (5.2) can be replaced by aqueous phases of the same ionic structure as the emulsion under test.

5.1 Solution S_a

An aqueous solution containing 1 % (m/m) of sodium laurylsulfate or, if this is unavailable, an aqueous solution containing 1 % (m/m) of sodium oleate. 1 % (m/m) of sodium hydroxide shall be added to the solution.

This solution shall be used for testing anionic emulsions.

NOTE : Solution S_a can be prepared using potassium laurylsulfate or potassium oleate, and potassium hydroxide in place of the sodium salts.

<https://standards.iteh.ai/catalog/standards/sist/8164983e-0d15-4507-96e1-76219ac4cf8/sist-en-1429-2000>

5.2 Solution S_c

An aqueous solution containing 1 % (m/m) of alkyltrimethylammonium chloride or 1 % (m/m) of cetyltrimethylammonium bromide or, if these are unavailable, 1 % (m/m) of a fatty amine hydrochloride. 1 % (m/m) of 1 mol/l hydrochloric acid shall be added to the solution.

This solution shall be used for testing cationic emulsions.

5.3 ~~Xylene~~, conforming to ISO 5280.

5.4 Ethanol, 99 % minimum.

6 Apparatus

Usual laboratory apparatus and glassware, together with the following :

6.1 Sieve, (see ISO 565), stainless steel or brass, with a frame diameter of 75 mm \pm 1 mm and a mesh size of 0,500 mm.

6.2 Sieve, (see ISO 565), stainless steel or brass, with a frame diameter of 75 mm \pm 1 mm and a mesh size of 0,160 mm (optional according to specification requirements).

6.3 Sieve pans, of corresponding diameter.

- 6.4 **Balance**, of sufficient capacity, accurate to 0,1 g.
- 6.5 **Balance**, of sufficient capacity, accurate to 0,001 g.
- 6.6 **Conical flask**, 200 ml capacity, with a ground stopper.
- 6.7 **Conical flask**, two, 250 ml capacity.
- 6.8 **Bottle**, 1 l, with a screw-in stopper.
- 6.9 **Container**, 1 l capacity.
- 6.10 **Ventilated oven**, giving a temperature of $105\text{ °C} \pm 5\text{ °C}$.
- 6.11 **Desiccator**.

7 Sampling

The laboratory sample shall be sampled in accordance with EN 58 and shall be prepared in accordance with EN 12594.

There shall be no prior sieving of the material under test or of the prepared sample.

The sample shall be divided into two portions; for referee purposes, both portions shall be tested (see note to clause 11).

SIST EN 1429:2000

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8 Procedure

Carry out the procedure under normal laboratory conditions.

8.1 Residue on the 0,500 mm sieve

- 8.1.1 Wash the 0,500 mm sieve (6.1) in xylene (5.3) and then in ethanol (5.4).
- 8.1.2 Place the sieve on the sieve pan (6.3) and dry in the oven (6.10) for not less than one hour.
- 8.1.3 After drying, allow to cool in the desiccator (6.11).
- 8.1.4 Weigh the sieve and the sieve pan together. Record the mass, m_1 , to the nearest 0,001 g.
- 8.1.5 Wet the sieve cloth with solution S_a (5.1) or S_c (5.2) as appropriate.
- 8.1.6 Drain the sieve thoroughly and place it on a funnel which is mounted over the bottle (6.8).
- 8.1.7 Weigh the container (6.9) and record the mass, m_c , to the nearest 0,001 g.
- 8.1.8 Weigh $1\ 000\text{ g} \pm 5\text{ g}$ of emulsion into the container and record the mass of emulsion, M_E , to the nearest 1 g.
- 8.1.9 Pour the emulsion through the wetted sieve and allow to drain completely.

Discard the first 30 ml or 40 ml of the filtered emulsion, in order to avoid any possible modification in the properties of the emulsion resulting from the action of the S_a or S_c solution.

Clear as much as possible the container of the emulsion and reweigh the container. Record the mass, m_c' , to the nearest 0,001 g.

8.1.10 Remove the bottle containing the filtered emulsion, and stopper it.

NOTE : The emulsion filtered in this way will be used to carry out the second part of the test (see 8.2) and to carry out all other tests on the emulsion.

8.1.11 Place the sieve on a funnel which is mounted over a 250 ml conical flask (6.7). Wash the residue on the sieve with solution S_a or S_c until the washings run clear. Finally wash with water (5).

8.1.12 Drain the sieve thoroughly and place it on the sieve pan. Dry in the oven (6.10) for at least 2 h and then cool in the desiccator (6.11) for about 30 min.

8.1.13 Weigh the sieve with its sieve pan and residue and record the mass, m_2 , to the nearest 0,001 g.

8.2 Particles between 0,500 mm and 0,160 mm

NOTE : This part is optional according to specification requirements.

8.2.1 Wash the 0,160 mm sieve (6.2) in xylene (5.3) and then in ethanol (5.4).

8.2.2 Place the sieve on the sieve pan (6.3) and dry in the oven (6.10) for not less than one hour.

8.2.3 After drying, allow to cool in the desiccator (6.11).

8.2.4 Weigh the sieve and the sieve pan together. Record the mass, m_3 , to the nearest 0,001 g.

8.2.5 Wet the sieve cloth with solution S_a or S_c as appropriate.

8.2.6 Drain it thoroughly and place it on a funnel which is mounted over a 250 ml conical flask (6.7).

8.2.7 Shake the bottle containing the emulsion that was filtered through the 0,500 mm sieve (see 8.1.10).

8.2.8 Pour approximately 50 g of the S_a or S_c solution into the 200 ml conical flask (6.6) and weigh into it 50 g, m_E , of filtered emulsion to the nearest 0,05 g.

8.2.9 Stopper the flask and shake.

8.2.10 Filter the diluted emulsion through the 0,160 mm sieve and proceed as described for filtering with 0,500 mm sieve, but restricting the number of successive washes (see 8.1.11) to three and using 20 ml of the S_a or S_c solution for each of these three washes.

8.2.11 Drain the sieve thoroughly and place it on the sieve pan. Dry in the oven (6.10) for at least 2 h and then cool in the desiccator (6.11) for approximately 30 min.

8.2.12 Weigh the sieve with its sieve pan and residue and record the mass, m_4 , to the nearest 0,001 g.

9 Determination of the storage stability by sieving after n days storage period

Transfer approximately 250 g of the bitumen emulsion that was filtered on the 0,500 mm mesh sieve (see 8.1.10) into an Erlenmeyer flask.

NOTE : After closing the flask securely, the surface of the liquid should be approximately 20 mm from the stopper.

Store the closed flask in a dark room at ambient temperature for n days.

Following storage, determine the residue on sieving as described in 8.1. Do not shake or stir the flask before pouring the emulsion onto the sieve. Rinse the flask with the solution Sa or Sc (5.1 or 5.2).

10 Calculation

For the residue on the 0,500 mm sieve ($R_{0,500}$), calculate its percentage by mass, using the following equation :

$$R_{0,500} = \frac{m_2 - m_1}{M_E - (m_{c'} - m_c)} \times 100$$

where :

m_1 in grams as defined in 8.1.4;
SIST EN 1429:2000
<https://standards.iteh.ai/standards/sist/8164983e-0d15-4507-96e1-76219ac4cf/sist-en-1429-2000>

m_2 in grams as defined in 8.1.13 ;

M_E in grams as defined in 8.1.8 ;

$m_{c'}$ in grams as defined in 8.1.9 ;

m_c in grams as defined in 8.1.7.

For the residue on the 0,160 mm sieve ($R_{0,160}$), calculate its percentage by mass, using the following equation :

$$R_{0,160} = \frac{m_4 - m_3}{m_E} \times 100$$

where :

m_3 in grams as defined in 8.2.4 ;

m_4 in grams as defined in 8.2.12 ;

m_E in grams as defined in 8.2.8 ;