SLOVENSKI STANDARD

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Bitumen in bitumenska veziva - Specifikacije za cestogradbene bitumne

Bitumen and bituminous binders - Specifications for paving grade bitumens

ICS 91.100.50; 93.080.20

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English version

Bitumen and bituminous binders - Specifications for paving grade bitumens

Bitumes et liants bitumineux - Spécifications des bitumes routiers

Bitumen und bitumenhaltige Bindemittel - Anforderungen an Straßenbaubitumen

This European Standard was approved by CEN on 19 September 1999.

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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

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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of an identical text or by endorsement, at the latest by May 2000, and conflicting national standards shall be withdrawn at the latest by May 2000.

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.

In this standard, annexes A and B are normative and annexes C and D are informative.
An A-deviation is indicated in annex ZB.

1 Scope

This European Standard specifies the properties and relevant test methods for paving grade bitumens which are suitable for use in road construction and maintenance and which are obtained by refining processes from petroleum crude oils.

Paving grade bitumens in this European Standard are divided into three groups of grades:

(a) Grades designated by nominal penetration at 25 °C from 20×0,1 mm to 330×0,1 mm, specified by penetration at 25 °C and softening point (table 1).

(b) Grades designated by nominal penetration at 25 °C from 250×0,1 mm to 900×0,1 mm, specified by penetration at 15 °C and dynamic viscosity at 60 °C (table 2).

(c) Grades designated and specified by kinematic viscosity at 60 °C for soft bitumens (table 3).

NOTE : For the purposes of this European Standard, the term '%(*m/m*)' is used to represent the mass fraction.

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 1426, *Bitumen and bituminous binders- Determination of needle penetration*

EN 1427, *Bitumen and bituminous binders- Determination of softening point- Ring and Ball method*

EN 12592, *Bitumen and bituminous binders- Determination of solubility*

EN 12593, *Bitumen and bituminous binders- Determination of the Fraass breaking point*

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

EN 12595, *Bitumen and bituminous binders- Determination of kinematic viscosity*

EN 12596, *Bitumen and bituminous binders- Determination of dynamic viscosity by vacuum capillary*

EN 12606-1, *Bitumen and bituminous binders- Determination of the paraffin wax content- Part 1: DIN method*

EN 12606-2, *Bitumen and bituminous binders- Determination of the paraffin wax content- Part 2: AFNOR method*

EN 12607-1, *Bitumen and bituminous binders- Determination of the resistance to hardening under influence of heat and air - Part 1: RTFOT method*

EN 12607-2, *Bitumen and bituminous binders- Determination of the resistance to hardening under influence of heat and air - Part 2: TFOT method*

EN 12607-3, *Bitumen and bituminous binders- Determination of the resistance to hardening under influence of heat and air - Part 3: RFT method*

EN 22592, *Petroleum products- Determination of flash and fire points- Cleveland open cup method (ISO 2592 :1973)*

EN 22719, *Petroleum products and lubricants - Determination of flash point- Pensky-Martens closed cup method (ISO 2719 :1988)*

EN ISO 3838, *Crude petroleum and liquid or solid petroleum products- Determination of density or relative density - Capillary stoppered pyknometer and graduated bicapillary pyknometer methods (ISO 3838 :1983)*

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

3 Sampling

Samples of bulk products shall be taken as described in EN 58. Any additional national requirements for sampling shall be set out in detail or shall be referred to in a national annex to this Standard.

Test samples shall be taken from the bulk samples, and prepared for testing, as described in EN 12594.

4 Properties and test methods

4.1 Paving grades from 20×0,1 mm to 330×0,1 mm penetration

NOTE The specifications are separated in two parts:

1. Properties and related test methods.
2. Special national conditions and related test methods

4.1.1 Properties

4.1.1.1 General

Properties and related test methods are given in table 1. When tested by the methods given in table 1, the various paving grades shall comply with the limits specified in that table.

Special considerations apply to two of the properties given in table 1, see 4.1.1.2 and 4.1.1.3.

4.1.1.2 Resistance to hardening

The rolling thin film oven test (RTFOT) (EN 12607-1) and the rotating flask test (RFT) (EN 12607-3) are considered to be equivalent methods. However, for referee purposes, the RTFOT shall be used.

4.1.1.3 Flash point

Flash point shall be determined by the Cleveland open cup method (EN 22592) for normal specification purposes.

NOTE The Pensky-Martens closed cup method (see EN 22719) can be used to investigate possible contamination but is likely to give lower values.

4.1.2 Special national conditions

4.1.2.1 General

Special national conditions are stated in annex A, clause A.1. Each country nominated the properties appropriate to that country. Any such properties nominated by a country are obligatory in that country.

The properties and related test methods, given in table A.1, provide for different climatic, traffic and other conditions across Europe.

Special considerations apply to two of the properties given in table A.1, see 4.1.2.2 and 4.1.2.3.

4.1.2.2 Paraffin wax content

Where this property is adopted, both test methods (see EN 12606-1 and EN 12606-2) and corresponding limits are specified as equal alternatives, as given in table A.1, and the supplier on request shall determine the value in accordance with one of alternative methods of his choice.

4.1.2.3 Resistance to hardening: increase in softening point

The three options are separate alternatives, and each country possibly chose only one of them depending on its climate to assist in controlling rutting deformation and cracking of asphalt mixes.

Options 2 and 3 are provided to permit countries with very hot climates to specify properties which will assist in controlling rutting deformation of asphalt.

4.2 Paving grades from 250×0,1 mm to 900×0,1 mm penetration

NOTE The specifications are separated in two parts:

1. Properties and related test methods.
2. Special national conditions and related test methods

4.2.1 Properties

4.2.1.1 General

Properties and related test methods are given in table 2. When tested by the methods given in table 2, the various paving grades shall comply with the limits specified in that table.

4.2.1.2 Resistance to hardening

The rolling thin film oven test (RTFOT) (EN 12607-1) and the rotating flask test (RFT) (EN 12607-3) are considered to be equivalent methods. However, for referee purposes, the RTFOT shall be used.

4.2.2 Special national conditions

Special national conditions are stated in annex A, clause A.1. Each country nominated if the property is appropriate to that country. Where a country states that the property is appropriate to that country, the property is obligatory in that country.

The property, given in table A.2, provides for different climatic conditions accross Europe.

When tested by the methods given in table A.2, the limits given in that table shall apply.

4.3 Special national conditions regarding paving grades from 250×0,1 mm to 330×0,1 mm penetration

This grade is specified in both of the 20 to 330 and 250 to 900 ranges, in 4.1 and 4.2 respectively. Each member country stated, in annex A, whether this grade shall be specified according to 4.1 or 4.2.

4.4 Paving grades designated and specified by viscosity at 60°C

Properties and related test methods are given in table 3. When tested by the methods given in table 3, the various paving grades shall comply with the limiting requirements specified in that table.

4.5 Density for all paving grades

Density is not specified, but it shall be determined, when necessary, in accordance with EN ISO 3838.

4.6 Precision and dispute

4.6.1 All of the test methods referred to in this Standard include a precision statement. In cases of dispute, the procedures described in EN ISO 4259 for resolving the dispute, and interpretation of the results based on test method precision shall be used.

4.6.2 The test methods referred to in this Standard are those to be used in cases of dispute, with the exception of those described in 4.1.1.2.

Table 1 - Specifications for paving grade bitumens for grades from 20 × 0,1 mm to 330 × 0,1 mm penetration.

	Unit	Test method	Grade designation								
			20/30	**30/45**	**35/50**	**40/60**	**50/70**	**70/100**	**100/150**	**160/220**	**250/330**
Penetration at 25°C	× 0,1 mm	EN 1426	20-30	30-45	35-50	40-60	50-70	70-100	100-150	160-220	250-330
Softening point	°C	EN 1427	55-63	52-60	50-58	48-56	46-54	43-51	39-47	35-43	30-38
Resistance to hardening, at 163 °C (a)		EN 12607-1 or EN 12607-3									
-change of mass, maximum, ±	%		0,5	0,5	0,5	0,5	0,5	0,8	0,8	1,0	1,0
-retained penetration, minimum	%		55	53	53	50	50	46	43	37	35
-softening point after hardening, minimum	°C	EN 1427	57	54	52	49	48	45	41	37	32
Flash point, minimum	°C	EN 22592 (b)	240	240	240	230	230	230	230	220	220
Solubility, minimum	% (*m/m*)	EN 12592	99,0	99,0	99,0	99,0	99,0	99,0	99,0	99,0	99,0
(a) Only RTFOT to be used for referee purposes (b) See 4.1.1.3											