SLOVENSKI STANDARD
oSIST prEN 12591:2016

01-maj-2016

Bitumen in bitumenska veziva - Specifikacije za cestogradbene bitumne

Bitumen and bituminous binders - Specifications for paving grade bitumens

Bitumen und bitumenhaltige Bindemittel - Anforderungen an Straßenbaubitumen

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93.080.20	Materiali za gradnjo cest	Road construction materials

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English Version

Bitumen and bituminous binders - Specifications for paving grade bitumens

Bitumen und bitumenhaltige Bindemittel - Anforderungen an Straßenbaubitumen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 336.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword

This document (prEN 12591:2016) has been prepared by Technical Committee CEN/TC 336 “Bituminous binders”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12591:2009.

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 EU Regulation (EU) No. 305/2011.

For relationship with EU Regulation (EU) No. 305/2011, see informative Annex ZA, which is an integral part of this document.

Changes to the previous edition of this standard:

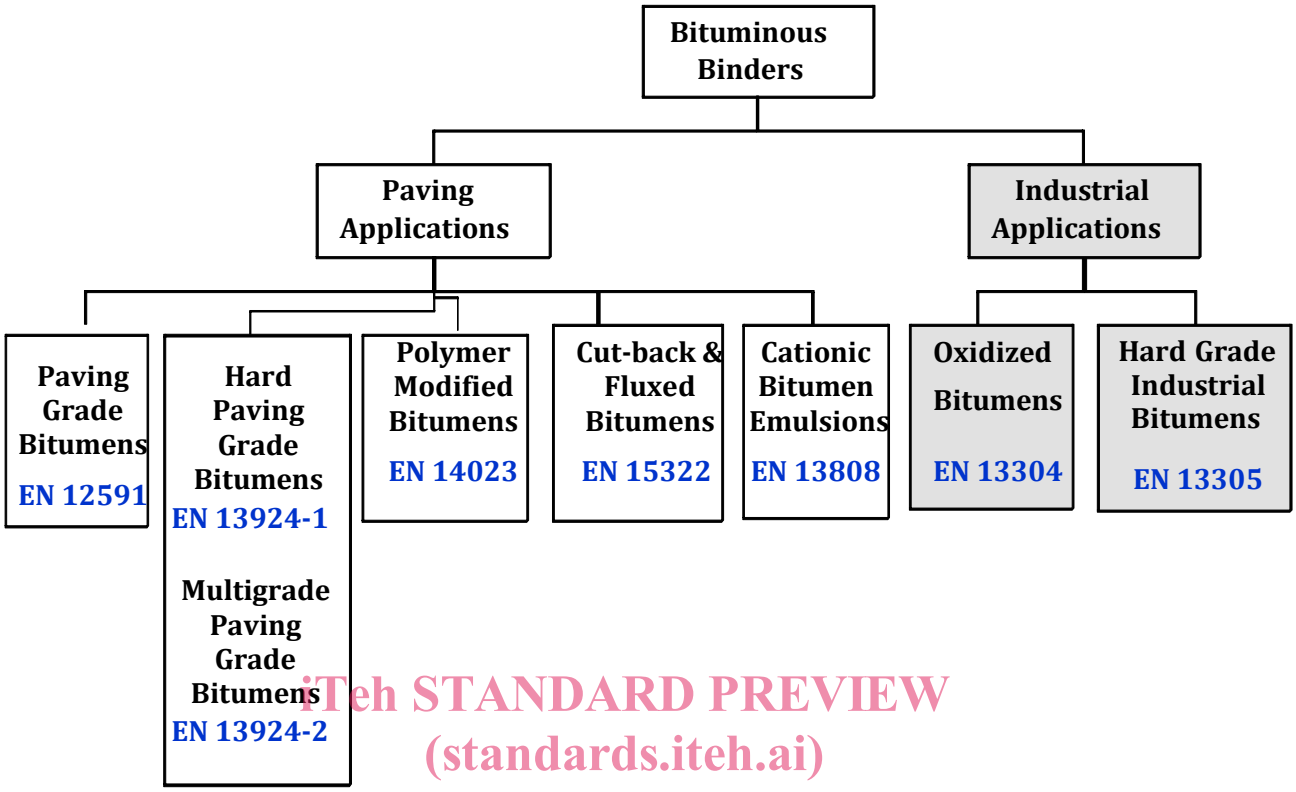
1) addition of Subclause 5.2.8;

2) addition of Annex C;

3) addition of bitumen V9000 in Tables 3A and 3B and according change of limits for V6000 and V12000;

4) update of Annex ZA according to current guidance document TF N 530 Rev.2.

This draft European Standard is part of a family of European Standards for bitumen as follows:



NOTE Industrial applications are not covered by Mandate M/124.

Figure 1 — European Standards for Bitumens

Introduction

This draft European Standard describes the performance required for a number of properties of bitumen and bituminous binders, as shown in Tables 1/2 to Tables 5/6 inclusive. Some of the properties are required by regulation in at least one EU or EFTA country (see Table ZA.1.1, Table ZA.1.2 and Table ZA.1.3) and some are included only for the benefit of industry to assist specifying appropriate performances for different end uses.

For paving grade bitumen, the testing of the following also gives an indication that its intrinsic cohesive properties are adequate for normal use.

a) Consistency at intermediate service temperature;

b) consistency at elevated service temperature;

c) durability of consistency.

The properties of “adhesion” and “setting ability” are indicated by tests used on either the finished asphalt mixtures or on aggregate-bitumen combinations, i.e. EN 12697–1, EN 12697–11, EN 12697–12 and EN 12697–26 [[1], [2], [3] and [4]], rather than tests on the bitumen itself.

This draft European Standard still consists of specifications based upon traditional test methods. Work programs are being undertaken to evaluate alternative properties and test methods in order to develop new specifications that are more directly performance-related. The progress of those work programmes are reported in CEN/TR 15352 [18], and the results will be considered for future revisions of this draft European Standard.

1 Scope

This draft European Standard provides a framework for specifying a range of properties and relevant test methods for bitumens, which are suitable for use in the construction and maintenance of roads, airfields and other paved areas, together with requirements for evaluation of conformity.

This draft European Standard does not directly address 'cohesion, adhesion and setting ability' (see Introduction).

Although industrial bitumens are specified according to EN 13305, it should be underlined that paving grade bitumens, specified according to this draft European Standard, can also be used for industrial applications.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 1426, *Bitumen and bituminous binders — Determination of needle penetration*

EN 1427, *Bitumen and bituminous binders — Determination of the 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 12597, *Bitumen and bituminous binders — Terminology*

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 13302, *Bitumen and bituminous binders — Determination of dynamic viscosity of bituminous binder using a rotating spindle apparatus*

EN 13702, *Bitumen and bituminous binders — Determination of dynamic viscosity of modified bitumen by cone and plate method*

EN 14769, *Bitumen and bituminous binders — Accelerated long-term ageing conditioning by a Pressure Ageing Vessel (PAV)*

EN 14770, *Bitumen and bituminous binders — Determination of complex shear modulus and phase angle — Dynamic Shear Rheometer (DSR)*

EN 14771, *Bitumen and bituminous binders — Determination of the flexural creep stiffness — Bending Beam Rheometer (BBR)*

EN 15326, *Bitumen and bituminous binders — Measurement of density and specific gravity — Capillary-stoppered pyknometer method*

EN ISO 2592, *Determination of flash and fire points — Cleveland open cup method (ISO 2592)*

EN ISO 2719, *Determination of flash point — Pensky-Martens closed cup method (ISO 2719)*

EN ISO 4259, *Petroleum products — Determination and application of precision data in relation to methods of test (ISO 4259)*

EN ISO 9001:2008, *Quality management systems — Requirements (ISO 9001:2008)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12597 apply.

4 Sampling

Samples of bulk products shall be taken as described in EN 58.

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

5 Requirements and test methods

5.1 General

European product standards cover a large variety of road materials for different applications, to accommodate local traffic loads and climatic conditions. This draft European Standard therefore also covers a large range of bitumens to facilitate the production and application of the designed paving. The variety of production techniques and applications makes it more practical to split bitumens into three separate tables.

The requirements for the properties for a specific grade shall be selected from Table 1, Table 2, Table 3, Table 4, Table 5 and Table 6 by choosing a column representing the specified values or ranges.

There is a subdivision of properties into two groups in the tables. The properties in Table 1, Table 3 and Table 5 shall be specified for all paving grade bitumens. They are associated with regulatory or HSE requirements. The properties in Table 2, Table 4 and Table 6 are required to meet specific regional conditions. They are associated with regulatory or other regional requirements.

Two severity levels for resistance to hardening are stated as alternatives as, under specific conditions, a larger increase in softening point after Rolling Thin Film Oven Test (RTFOT) may be allowed (i.e. Severity level 2) without detrimental effect if this increase is associated with requirements for Fraass breaking point or penetration index (I_p) or both.

NOTE For complementary information on grade selection, see Annex B.

5.2 Properties and related test methods

5.2.1 General

The properties of paving grade bitumens and related test methods shall be in accordance with Table 1 and Table 2, or Table 3 and Table 4 or Table 5 and Table 6. When tested by the methods given in the Tables, the various paving grades shall conform to the limits specified.

The grades are designated by the nominal penetration or viscosity ranges as appropriate.

5.2.2 Consistency at intermediate service temperature

Consistency at intermediate service temperature shall conform to the requirements for penetration value in Table 1 or Table 3.

5.2.3 Consistency at elevated service temperature

Consistency at elevated service temperature shall conform to the requirements for softening point in Table 1 (penetration graded), softening point or dynamic viscosity in Table 3 (penetration graded), or kinematic viscosity in Table 5 (kinematic viscosity graded).

5.2.4 Brittleness at low service temperature

Brittleness at low service temperature may be required to meet specific regional conditions in countries susceptible to extreme cold. Where required, paving grade bitumens shall conform to the requirements for Fraass breaking point in Table 2 or Table 4.

5.2.5 Temperature dependence of consistency

Temperature dependence of consistency may be required to meet specific regional conditions. Where required, paving grade bitumens shall conform to the requirement for dynamic viscosity or penetration index (I_P) or both in Table 2.

5.2.6 Durability – Resistance to hardening

Durability is demonstrated by compliance with the required surrogate characteristics of “Resistance to hardening”, defined in Table 1, Table 3 or Table 6.

Resistance to hardening shall be tested according to the Rolling Thin Film Oven Test (RTFOT) in accordance with EN 12607-1 for binders from Table 1 and Table 3.

Resistance to hardening shall be tested according to the Thin Film Oven Test (TFOT) in accordance with EN 12607-2 for binders from Table 5.

5.2.7 Other properties

5.2.7.1 Density

Although requirements for the density of paving grade bitumens are not given in this document, density shall be determined, when necessary, in accordance with EN 15326.

5.2.7.2 Flash point

Flash point shall be determined by the Cleveland open cup method in EN ISO 2592 for binders in Table 1 and by the Pensky-Martens closed cup method, EN ISO 2719, for binders in Table 3 and Table 5.

For bitumens in Table 1, the Pensky-Martens closed cup method may be used to investigate possible contamination but is likely to give lower values than the Cleveland open cup method.

5.2.8 Informative properties

Annex C lists the informative properties which suppliers of paving grade bitumen shall make available as "Reported Values".

5.3 Release of dangerous regulated substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this standard are placed on those markets. In the absence of European harmonized test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

NOTE An informative database covering European and national provisions on dangerous substances is available at the Construction website on EUROPA accessed through: http://ec.europa.eu/enterprise/construction/cpd-ds/.

5.4 Precision

The test methods referred to in this document include precision statements when available. In cases of uncertainty, the procedures described in EN ISO 4259 for interpretation of the results based on test method precision shall be used.