SLOVENSKI STANDARD
oSIST prEN 13924-1:2013

01-marec-2013

Bitumen in bitumenska veziva - Specifikacija za trše cestogradbene bitumne - 1. del: Trši cestogradbeni bitumni

Bitumen and bituminous binders - Specification framework for special paving grade bitumen - Part 1: Hard paving grade bitumens

Bitumen und bitumenhaltige Bindemittel - Anforderungsrahmenwerk für spezielle Straßenbaubitumen - Teil 1: Harte Straßenbaubitumen

Bitumes et liants bitumineux - Cadre de spécifications pour les bitumes routiers spéciaux - Partie 1: Bitumes routiers de grade dur

Ta slovenski standard je istoveten z: **prEN 13924-1**

ICS:

91.100.50	Veziva. Tesnilni materiali	Binders. Sealing materials
93.080.20	Materiali za gradnjo cest	Road construction materials

oSIST prEN 13924-1:2013 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 13924-1

January 2013

ICS 93.080.20

Will supersede EN 13924:2006

English Version

Bitumen and bituminous binders - Specification framework for special paving grade bitumen - Part 1: Hard paving grade bitumens

Bitumes et liants bitumineux - Cadre de spécifications pour les bitumes routiers spéciaux - Partie 1: Bitumes routiers de grade dur

Bitumen und bitumenhaltige Bindemittel - Anforderungsrahmenwerk für spezielle Straßenbaubitumen - Teil 1: Harte 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.

This draft European Standard was established by CEN 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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. prEN 13924-1:2013: E

Contents

Page

Foreword

This document (prEN 13924-1:2013) 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 13924:2006.

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 Directive(s).

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

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

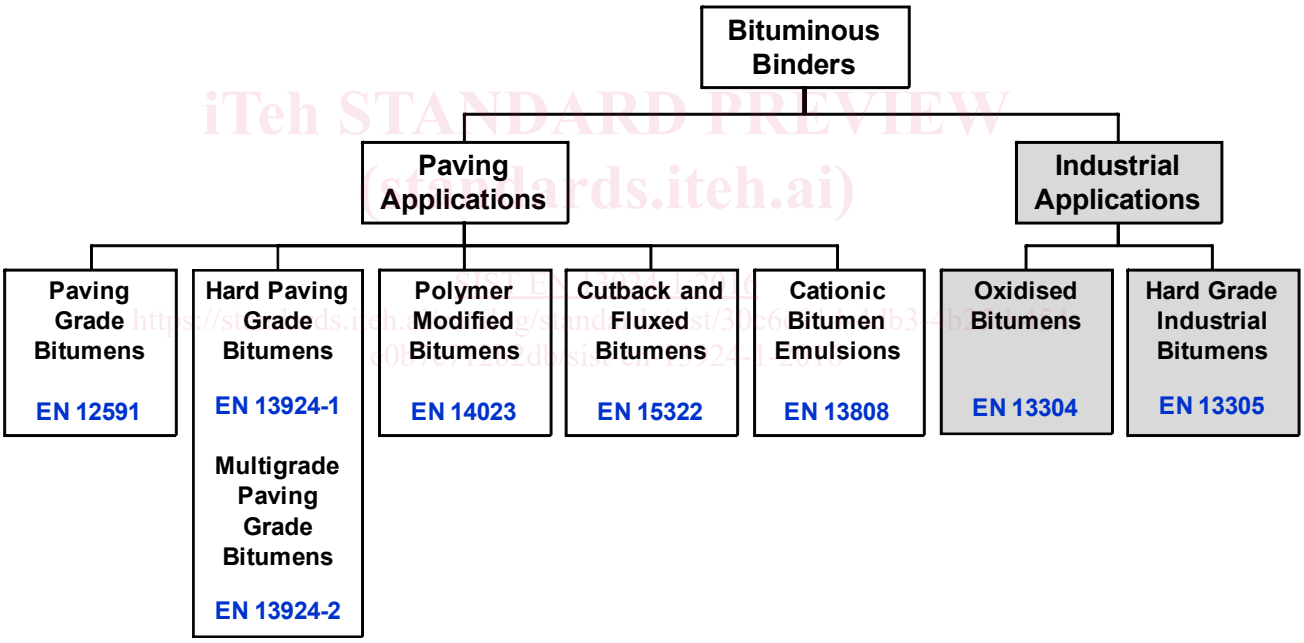

Figure 1 — European Standards for bitumens

Introduction

This part of EN 13924 is closely related to EN 12591 [2]. This introduction gives information on the basis for selection of the grades defined in this part of EN 13924, the status of certain of the properties and test methods, and proposed development of this part of EN 13924.

The general principle adopted in the development of EN 12591 [2] was to provide a range of grades suitable for the manufacture of the materials for road construction and maintenance used, and the climatic and traffic conditions encountered, in all the Member States. This part of EN 13924 extends the range of grades specified in EN 12591 [2], following the wider use of materials for road construction and maintenance having very high modulus values.

This part of EN 13924 can be read in conjunction with National Guidance Documents, where they exist, which have the opportunity to identify the appropriate grade in the territory of use.

This part of EN 13924 has been based on the regional requirements identified when the process started. It is a first step in harmonising the so-called "empirical" specifications and it is intended to evaluate alternative properties and test methods to develop new specifications that are more directly performance-related. To this end, work programmes are being undertaken and the results will be considered for a future revision of this part of EN 13924. The progress of those work programmes are reported in CEN/TR 15352 [1], and the results will be considered for future revisions of this part of EN 13924.

For hard paving grade bitumens the testing of the four essential characteristics, according to the mandate M/124, also gives an indication that its intrinsic cohesive properties are adequate for normal use. The properties of "adhesion" and "setting ability" are indicated by tests used on the finished asphalt mixtures, EN 12697-1, EN 12697-11, EN 12697-12, EN 12697-26 (respectively [4] to [7]), rather than tests on the bitumen itself.

Hard paving grade bitumens are designated by the penetration range at 25 °C, e.g. 10/20 or 15/25 (see Table 1).

Table B.1 (Annex B) lists informative properties which suppliers of hard paving grade bitumens are encouraged to produce as “Supplier Declared Values”. It is hoped that the data so provided will form the basis for developing performance-related specifications in the future.

1 Scope

This part of EN 13924 provides a framework for specifying the properties and relevant test methods for hard paving grade bitumens which are suitable for use in the construction and maintenance of roads, airfields and other paved areas.

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 12597:2000, *Bitumen and bituminous binders — Terminology*

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

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 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 12597:2000 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 European Standard therefore also covers a range of bitumens to facilitate the production and application of the designed paving.

This European Standard is a framework of specifications and classes for properties of hard paving grade bitumens which are chosen from Table 1 and Table 2.

There is a subdivision of properties into two tables. The properties in Table 1 shall be specified for all hard paving grade bitumens. They are associated with regulatory or Health Safety and Environmental requirements. The properties in Table 2 are required to meet specific regional conditions. They are associated with regulatory or other regional requirements.

5.2 Properties and related test methods

5.2.1 General

The properties of, and related test methods, for hard paving grade bitumens shall be selected from the classes given in Table 1 and Table 2. When tested by the methods given in the tables, the various grades shall conform to the limits specified by classes in that table.

NOTE Each country will then have a particular selection of specifications, which are covered in Tables 1 and 2. It is useful for each country to publish in a national guidance document for their requirements for hard paving grade bitumens. The appropriate class for each technical requirement or application is selected in turn and the selection of classes should be made from past experience of successful use, on a regional basis, in order to avoid unworkable combinations, see also Table 1, footnote c, and Table 2, footnote d.

5.2.2 Consistency at intermediate service temperatures

Consistency at intermediate service temperature for these hard paving grade bitumens shall comply with the requirements for penetration at 25 °C in Table 1.

The grades are designated by the nominal penetration range at 25 °C.

5.2.3 Consistency at elevated service temperatures

Consistency at elevated service temperature for these hard paving bitumens shall comply with the requirements for softening point Ring and Ball as indicated in Table 1.

Hard paving grade bitumens are supplied for a variety of end uses, and thus the specifications include a wide range of softening point Ring and Ball values. A restricted softening point range, of ± 5 °C about a mid-point, shall be declared by the supplier; the overall range shall be within the range in the tables.

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 cold. Where required, hard paving grade bitumens shall conform to the requirements for Fraass breaking point in Table 2.

5.2.5 Temperature dependence of consistency

Temperature dependence of consistency may be required to meet specific regional conditions. Where required, hard paving grade bitumens shall conform to the requirement for dynamic viscosity in Table 2.

If the supplier wishes to declare the penetration index (for the purpose of regulatory marking), it shall be calculated in accordance with Annex A.

5.2.6 Durability – Resistance to hardening

Durability shall be demonstrated by compliance with the required surrogate characteristics of Table 1.

Resistance to hardening shall be tested according to the Rolling Thin Film Oven Test (RTFOT) (EN 12607-1).

NOTE Appropriate tests and classes, for measurements on material after the hardening procedure, are given in Tables 1 and 2. The choice depends upon the intended use of the product.

5.2.7 Informative properties

The specifications include a table of informative properties (Table B.1). Suppliers of hard paving grade bitumens are encouraged to produce data from these measurements as “Supplier Declared Values”. It is hoped that the data so provided will be of assistance in developing performance-related specifications in the future.

5.2.8 Other properties

5.2.8.1 Flash point

Flash point shall be determined by the Cleveland open cup method in EN ISO 2592.

NOTE The Pensky-Martens closed cup method (see EN ISO 2719 [10]) can be used to investigate possible contamination but is likely to give lower values.

5.2.8.2 Density

If the supplier wishes to declare the density of hard paving grade bitumens, it shall be determined in accordance with EN 15326.

5.2.8.3 Solubility

Solubility shall be determined on the hard paving grade bitumens in accordance with EN 12592.

5.3 Release of dangerous regulated substances

When required, products covered by this European Standard shall comply with relevant regulations on dangerous substances in force in the intended place of use. In the absence of International or European test methods, manufacturers shall verify and declare the release of dangerous substances in accordance with provisions applicable in the intended place of use of the product.

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

5.4 Precision

The test methods referred to in this European Standard include a precision statement where 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.

Table 1 — Specifications for hard paving grade bitumens – Properties applying to all hard paving grade bitumens [a]

Properties		Test methods	Units	Classes		
				2	3	4
Penetration at 25 °C		EN 1426	0,1 mm	15 to 25 [c]	10 to 20	5 to 15
Softening point [b]		EN 1427	°C	55 to 71 [b-c]	58 to 78 [b]	60 to 76 [b]
Resistance to hardening	Change of mass [d]	EN 12607-1	%	≤ 0,5		
	Retained penetration		%	≥ 55		
	Increase in softening point		°C	≤ 8	≤ 10	
Flash point		EN ISO 2592	°C	≥ 235	≥ 245	
Solubility		EN 12592	% mass	≥ 99,0		

[a] The grades are designated by the nominal penetration range at 25 °C.

[b] IMPORTANT A restricted softening point range, of ± 5 °C about a mid-point, shall be declared by the supplier; the overall range shall be within the range in the table.

[c] In selecting combinations of classes it is intended that values marked "c", if selected, shall only be used with the softer grade, 15/25 penetration.

[d] Change of mass can be positive or negative.

Table 2 — Specifications for hard paving grade bitumens – Properties associated with regulatory or other regional requirements

Properties		Test methods	Units	Classes			
				0	1	2	3
Dynamic viscosity at 60 °C		EN 12596	Pa·s	NR [a]	TBR [b]	≥ 550 [d]	≥ 700
Softening point after hardening		EN 12607-1	°C	NR [a]	TBR [b]	≥ orig. min. + 2 [c]	
Resistance to hardening	Increase in softening point	EN 12607-1	°C	NR [a]	TBR [b]	≤ 10	≤ 10
	Penetration index on unaged binder	I_p calculation (see Annex A)	-			from -1,5 to +0,7	≥ -1,5
Kinematic viscosity at 135 °C		EN 12595	mm²/s	NR [a]	TBR [b]	≥ 600 [d]	≥ 700
Fraass breaking point		EN 12593	°C	NR [a]	TBR [b]	≤ 0 [d]	≤ 3

[a] NR. No requirement may be used when there are no regulations or other regional requirements for the property in the territory of intended use.

[b] TBR. To Be Reported may be used when there are no regulations or other regional requirements for the property in the territory of intended use, but the property has been considered useful in specification of hard paving grade bitumens in some cases.

[c] The softening point after treatment shall be at least 2 °C above the selected minimum value for the original bitumen (see Table 1, Note [b]).

[d] In selecting combinations of classes it is intended that values marked "d", if selected, shall only be used with the softer grade, 15/25 penetrability.

6 Assessment and verification of constancy of performance – AVCP

6.1 General

The compliance of hard paving grade bitumens with the requirements of this European Standard and with the performances declared by the manufacturer in the Declaration of Performance (DoP) shall be demonstrated by

— determination of the product type,

— factory production control by the manufacturer, including product assessment.

The manufacturer shall always retain the overall control and shall have the necessary means to take responsibility for the conformity of the product with its declared performance(s).

NOTE The information from AVCP can be available for audit as detailed in the Quality Plan.

6.2 Type testing

6.2.1 General

All performances related to characteristics included in this European Standard shall be determined when the manufacturer intends to declare the respective performances unless the standard gives provisions for declaring them without performing tests. (e.g. use of previously existing data, classified without further testing (CWFT) and conventionally accepted performance).

Assessment previously performed in accordance with the provisions of this European Standard, may be taken into account provided that they were made to the same or a more rigorous test method, under the same AVCP system on the same product or products of similar design, construction and functionality, such that the results are applicable to the product in question.

For the purposes of assessment, the manufacturer's products may be grouped into families, where it is considered that the results for one or more characteristics from any one product within the family are representative for that same characteristics for all products within that same family.

Products may be grouped in different families for different characteristics.

Reference to the assessment method standards should be made to allow the selection of a suitable representative sample.

In addition, the determination of the product type shall be performed for all characteristics included in the standard for which the manufacturer declares the performance:

— at the beginning of the production of a new or modified hard paving grade bitumens (unless a member of the same product range), or

— at the beginning of a new or modified method of production (where this may affect the stated properties); or they shall be repeated for the appropriate characteristic(s), whenever a change occurs in the hard paving grade bitumens design, in the raw material or in the supplier of the components, or in the method of production (subject to the definition of a family), which would affect significantly one or more of the characteristics.

Where components are used whose characteristics have already been determined, by the component manufacturer, on the basis of assessment methods of other product standards, these characteristics need not be re-assessed. The specifications of these components shall be documented.

Products bearing regulatory marking in accordance with appropriate harmonised European specifications may be presumed to have the performances declared in the DoP, although this does not replace the responsibility on the hard paving grade bitumen manufacturer to ensure that the hard paving grade bitumen as a whole is correctly manufactured and its component products have the declared performance values.

6.2.2 Test samples, testing and compliance criteria

Sampling shall be carried out in accordance with Clause 4.

6.2.3 Test reports

The results of the determination of the product type shall be documented in test reports. All test reports shall be retained by the manufacturer for at least 10 years after the last date of production of the hard paving grade bitumen to which they relate.

6.2.4 Shared other party results

A manufacturer may use the results of the product type determination obtained by someone else (e.g. by another manufacturer, as a common service to manufacturers, or by a product developer), to justify his own declaration of performance regarding a product that is manufactured according to the same design (e.g. dimensions) and with raw materials, constituents and manufacturing methods of the same kind, provided that:

— the results are known to be valid for products with the same essential characteristics relevant for the product performance;

— in addition to any information essential for confirming that the product has such same performances related to specific essential characteristics, the other party who has carried out the determination of the product type concerned or has had it carried out, has expressly accepted to transmit to the manufacturer the results and the test report to be used for the latter's product type determination, as well as information regarding production facilities and the production control process that can be taken into account for FPC;

— the manufacturer using other party results

  — accepts to remain responsible for the product having the declared performances,

  — ensures that the product has the same characteristics relevant for performance as the one that has been subjected to the determination of the product type, and that there are no significant differences with regard to production facilities and the production control process compared to that used for the product that was subjected to the determination of the product type, and

  — keeps available a copy of the determination of the product type report that also contains the information needed for verifying that the product is manufactured according to the same design and with raw materials, constituents and manufacturing methods of the same kind.

6.3 Factory production control (FPC)

6.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market comply with the declared performance of the essential characteristics.

The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product.

All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures.