SLOVENSKI STANDARD
SIST EN 13924-1:2016

01-februar-2016

Nadomešča:
SIST EN 13924:2006
SIST EN 13924:2006/AC:2007

Bitumen in bitumenska veziva - Okvirna specifikacija za posebne 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

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ICS:

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93.080.20	Materiali za gradnjo cest	Road construction materials

SIST EN 13924-1:2016 **en,fr,de**

EUROPEAN STANDARD

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EN 13924-1

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

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This European Standard was approved by CEN on 3 October 2015.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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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

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European foreword

This document (EN 13924-1:2015) has been prepared by Technical Committee CEN/TC 336 "Bituminous binders", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by June 2016 and conflicting national standards shall be withdrawn at the latest by September 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes 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 EU Directive(s), 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:

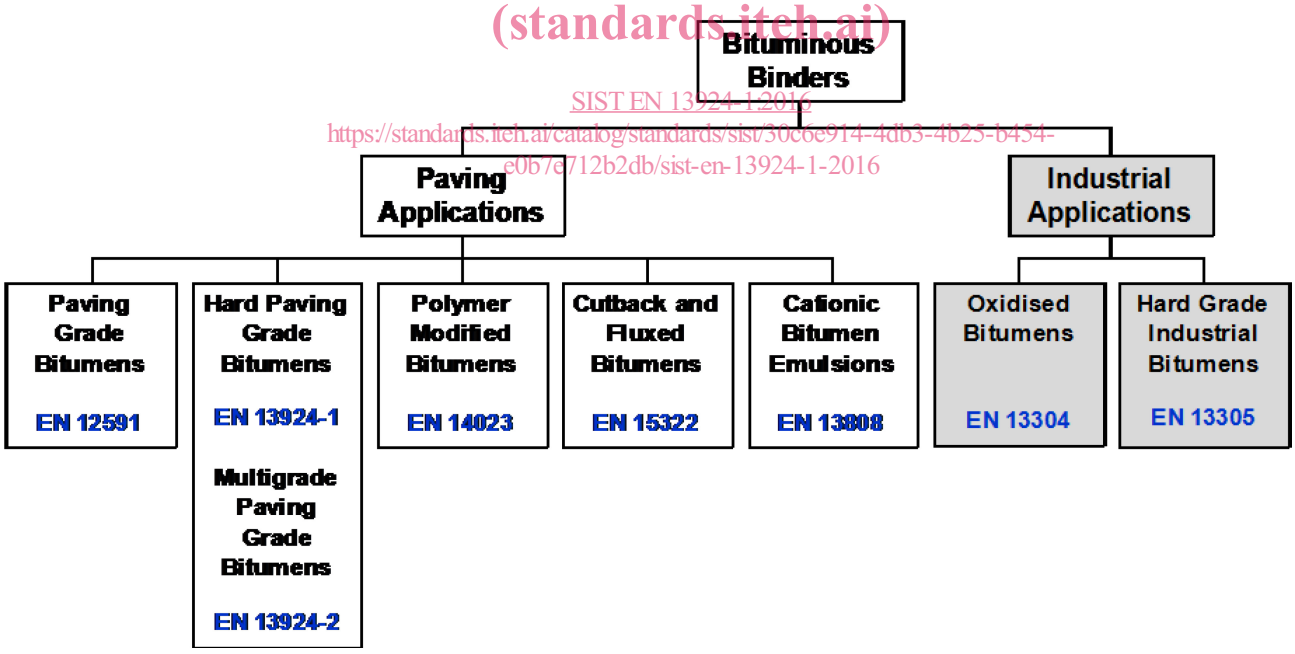

Figure 1 — European Standards for bitumens

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: 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 the United Kingdom.

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 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 step in harmonizing 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 these 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 five essential characteristics, according to the mandate M/124, also gives an indication that its intrinsic cohesive properties are adequate for its 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. 5/15, 10/20 or 15/25 (see Table 1).

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 12597:2014, *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 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)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12597:2014 apply.

4 Sampling

Sampling shall be carried out in accordance with EN 58 and sample preparation shall be carried out in accordance with EN 12594.

5 Requirements and test methods

5.1 General

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.

Each country will then have a particular selection of specifications, which are covered in Tables 1 and Table 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 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 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. 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 testing of properties after hardening defined in Table 1 and Table 2.

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 Temperature dependency of mixing

Where required, hard paving grade bitumens shall comply also with the requirement for kinematic viscosity in Table 2.

5.2.9 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.

5.2.10 Density

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

5.2.11 Solubility

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

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+ EN 1427	°C	NR [a]	TBR [b]	≥ orig. min. + 2 [c]	
Resistance to hardening	Increase in softening point and Penetration Index on unaged binder	EN 12607–1+ EN 1427 I_p calculation (see Annex A)	°C	NR [a]	TBR [b]	≤ 10 ≥ −1,5 and ≤ +0,7	≤ 10 ≥ −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 penetration.

5.3 Release of regulated dangerous 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 website 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.

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 (FPC) 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 manufacturer's 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.

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.

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