

SLOVENSKI STANDARD
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Bitumen in bitumenska veziva - Okvirna specifikacija za posebne cestogradbene bitumne - 2. del: "Multigrade" bitumni

Bitumen and bituminous binders - Specification framework for special bitumen - Part 2: Multigrade bituminous binders

Bitumen und bitumenhaltige Bindemittel - Anforderungsrahmenwerk für spezielle Straßenbaubitumen - Teil 2: Multigrade-Bitumen

Bitumes et liants bitumineux - Cadre de spécifications pour les bitumes spéciaux - Partie 2: Liants bitumineux multigrade

Ta slovenski standard je istoveten z: prEN 13924-2

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

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Bitumen and bituminous binders - Specification framework for special bitumen - Part 2: Multigrade bituminous binders

Bitumes et liants bitumineux - Cadre de spécifications pour les bitumes spéciaux - Partie 2: Liants bitumineux multigrade

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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.

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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

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Foreword

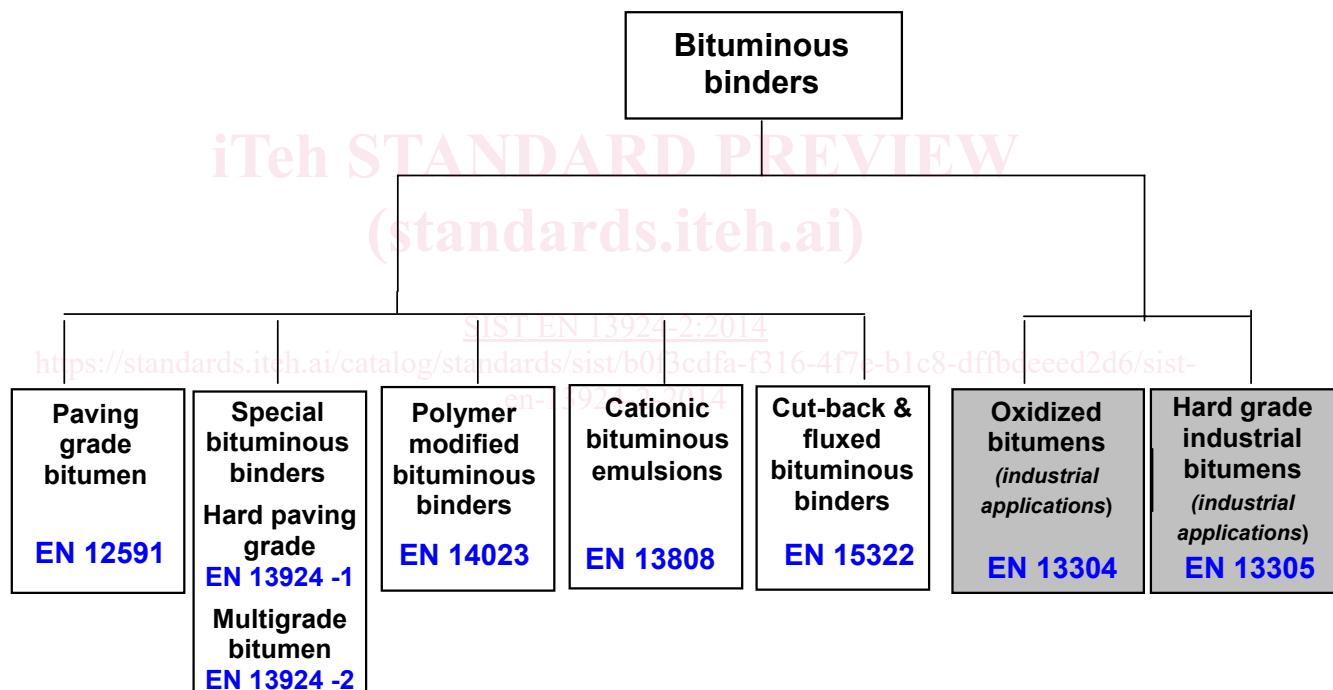
This document (prEN 13924-2:2011) has been prepared by Technical Committee CEN/TC 336 "Bituminous binders", the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document 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.

For relationship with EU Directive, see informative Annex ZA, which is an integral part of this document.

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



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

Introduction

This document is closely related to EN 14023 [1]. This introduction gives information on the basis for selection of the grades defined in this document, the status of certain of the properties and test methods, and proposed development of this document.

The general principle adopted in the development of EN 14023 [1] 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 document extends the range of grades specified in EN 14023 [1], following the wider use of materials for road construction and maintenance.

This document 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 document. The progress of those work programmes are reported in CEN/TR 15352 [2], and the results will be considered for future revisions of this European Standard.

For multigrade paving grade bitumens (MG), 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 [3] to [6]), rather than tests on the bitumen itself.

Multigrade bitumens are designated by mentioning MG and the penetration range at 25 °C, followed by the softening point range (see Table 1A). e.g. MG 20/30-63/72.

Table B.1 (Annex B) lists informative properties which suppliers of multigrade 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.

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1 Scope

This document provides a framework for specifying the properties and relevant test methods for multigrade 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 document does not directly address 'cohesion, adhesion and settling ability' (see Clause Introduction).

2 Normative references

The following referenced documents are indispensable for the application of this document. 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 12597, *Bitumen and bituminous binders – Terminology*

[https://standards.iteh.ai/catalog/standards/sist/b0f5edfa-f316-417e-b1c8-dffbdeeed2d6/sist-](https://standards.iteh.ai/catalog/standards/sist/b0f5edfa-f316-417e-b1c8-dffbdeeed2d6/sist-13924-2-2011)

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 13302, *Bitumen and bituminous binders – Determination of viscosity of bitumens using a rotating spindle apparatus*

EN 15326:2007+A1:2009, *Bitumen and bituminous binders – Measurement of density and specific gravity – Capillary-stoppered pycnometer method*

EN ISO 2592, *Determination of flash and fire points – Cleveland open cup method (ISO 2592:2000)*

EN ISO 4259, *Petroleum products – Determination and application of precision data in relation to methods of test (ISO 4259:2006)*

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.

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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**

The requirements for the properties for a specific grade shall be selected from the classes given in Table 1A and 1B. The properties in Table 1A shall be specified for all multigrade bitumens. They are associated with regulatory or HSE requirements. The properties in Table 1B are required to meet specific regional conditions. They are associated with regulatory or other regional requirements.

When tested by the methods given in the tables, the various paving grades shall conform to the limits specified by classes in that table.

NOTE. The TBR class has been included to facilitate selection in countries which merely wish to record a supplier's range for a particular requirement. It should not be considered as a "Class" for the purpose of regulatory marking. These values can be used as a basis for the development of future technical specifications.

The selection of classes should be made from past experience to avoid unworkable combinations.

5.2 Properties and related test methods**5.2.1 General**

For specifying multigrade bitumens the appropriate class for each technical requirement is selected in turn. Different classes may be selected for different properties.

5.2.2 Consistency at intermediate service temperature

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

5.2.3 Consistency at elevated service temperature

Consistency at elevated service temperature for these multigrade bitumens shall comply with the requirements for softening point Ring and Ball in Table 1A.

5.2.4 Temperature dependence of consistency

Temperature dependence of consistency shall comply with the requirements for penetration index (I_p) in Table 1A. Where required, multigrade bitumens shall conform also to the requirement for kinematic viscosity and/or dynamic viscosity in Table 1B.

The penetration index shall be calculated in accordance with Annex A.

5.2.5 Brittleness at low service temperature

Brittleness at low service temperature may be required to meet specific regional conditions. Where required, multigrade bitumens shall conform to the requirements for Fraass breaking point in Table 1B.

5.2.6 Durability – Resistance to hardening

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

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

NOTE 1 Appropriate tests and classes, for measurements on material after the hardening procedure, are given in Table 1A. The choice of class may depend upon the intended use of the product.

5.2.7 Other properties

5.2.7.1 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 [9]) can be used to investigate possible contamination but is likely to give lower values.

5.2.7.2 Density

If the supplier wishes to declare the density of multigrade bituminous binders it shall be determined in accordance with EN 15326+A1.

5.2.7.3 Solubility

Solubility shall be determined on the fresh multigrade bitumen in accordance with EN 12592.

5.2.8 Informative properties

The specifications include a table of informative properties (Annex B) based on new test methods. Suppliers of multigrade bitumens are invited to supply data from these measurements to the client on, a voluntary basis. It is hoped that the data so gathered will be of assistance in developing performance-related specifications in the future.

5.3 Release of dangerous regulated substances

Materials used in products shall not release any dangerous substances in excess of the maximum permitted levels specified in a relevant European standard for the material or permitted in national regulations of the member state of destination.

5.4 Precision and dispute

The test methods referred to in this document 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 1A — Specifications for multigrade bituminous binders:
properties applying to all multigrade bitumens^a**

Property	Test method	Unit	Class			
			1	2	3	4
Penetration at 25 °C	EN 1426	0,1 mm	DV ^b	20 to 30	35 to 50	50 to 70
Softening point	EN 1427	°C	DV ^b	54 to 63	57 to 66	63 to 72
Resistance to hardening at 163°C	EN 12607-1					
Retained penetration	EN 1426	%	DV ^b	≥ 50	≥ 60	
Increase in softening point	EN 1427	°C	DV ^b	≤ 8	≤ 10	≤ 12
Penetration Index I_p	Annex A	°C	DV ^b	+0,1 to +1,5	+0,3 to +2,0	+1.5 to +4.0
Flash point	EN ISO 2592	°C		≥ 220	≥ 235	≥ 250
Solubility	EN 12592	m-%	TBR	≥ 99,0		

^a Grades are designated by MG with the nominal penetration range followed by softening point range , e.g. MG 20/30-63/72.

^b DV: Declared Value shall mean that the manufacturer is required to provide a range of values, or limiting value(s) as part of a regulatory declaration and subsequent regulatory requirement.

^c NR: No Requirement may be used when there are no regulations for the property in the territory of intended use.

^d 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 found useful to describe multigrade bitumens.

**Table 1B — Specifications for multigrade bitumens:
properties associated with regulatory or other regional requirements**

Property	Test method	Unit	Class					
			0	1	2	3	4	5
Fraass breaking point	EN 12593	°C	NR ^a	TBR ^b	≤ - 8	≤ - 12	≤ - 15	≤ - 17
Dynamic viscosity at 60 °C	EN 13302	Pa · s	NR ^a	TBR ^b	≥ 300	≥ 600	≥ 900	≥ 1 500
Kinematic viscosity at 135 °C	EN 12595	mm ² /s	NR ^a	TBR ^{b,c}	≥ 200	≥ 300	≥ 700	≥ 1 200

^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 found useful to describe multigrade bitumens.

6 Evaluation of conformity

6.1 General

The compliance of multigrade bitumens with the requirements of this document and with the stated values (including grades) shall be demonstrated by: [EN 13924-2:2014](https://standards.iteh.ai/catalog/standards/sist/b0f3cdfa-f316-4f7e-b1c8-dffbdeeed2d6/sist-en-13924-2-2014)

- <https://standards.iteh.ai/catalog/standards/sist/b0f3cdfa-f316-4f7e-b1c8-dffbdeeed2d6/sist-en-13924-2-2014>
- Initial Type Testing (ITT),
 - Factory Production Control (FPC).

NOTE The information from evaluation of conformity can be available for audit as detailed in a manufacturer's quality plan.

6.2 Type testing

6.2.1 Initial Type Testing (ITT)

Initial type tests shall be performed to show conformity of the multigrade bitumens with this standard. Tests previously performed in accordance with the provisions of this European standard (same product, same characteristic(s), test method, sampling procedure, system of attestation of conformity, etc...) may be taken into account.

All the characteristics required in the European standard shall be subject to initial type testing except dangerous substances, which may be declared based upon control of the raw materials and characteristics where NR is chosen.

6.2.2 Further Type Testing

Whenever a change occurs in the base materials or the production process which would change significantly one or more of the characteristics, the further type test shall be repeated for the appropriate characteristic(s).