SLOVENSKI STANDARD
SIST EN 15322:2013

01-september-2013

Nadomešča:
SIST EN 14733:2005+A1:2011
SIST EN 15322:2009

Bitumen in bitumenska veziva - Okvirna specifikacija rezanih in fluksiranih bitumenskih veziv

Bitumen and bituminous binders - Framework for specifying cut-back and fluxed bituminous binders

Bitumen und bitumenhaltige Bindemittel - Rahmenwerk für die Spezifizierung von verschnittenen und gefluxten bitumenhaltigen Bindemitteln

Bitumes et liants bitumineux - Cadre de spécifications pour les liants bitumineux fluidifiés et fluxés

Ta slovenski standard je istoveten z: **EN 15322:2013**

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

SIST EN 15322:2013 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15322

May 2013

ICS 75.140; 91.100.50

Supersedes EN 14733:2005+A1:2010, EN 15322:2009

English Version

Bitumen and bituminous binders - Framework for specifying cut-back and fluxed bituminous binders

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This European Standard was approved by CEN on 14 March 2013.

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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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Foreword

This document (EN 15322:2013) 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of an identical text or by endorsement, at the latest by November 2013, and conflicting national standards shall be withdrawn at the latest by May 2014.

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 15322:2009, EN 14733:2005+A1:2010.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports basic work requirements of the EU Regulation.

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

The main technical changes brought to EN 15322 are as follows:

— revision of viscosity performance classes in Table 3;

— rewriting of Clause 6 (Assessment and Verification of the Constancy of Performance - AVCP) and Annex ZA in accordance with the requirements of Regulation (EU) 305/2011 (Construction Products Regulation-CPR);

— incorporation of the clauses on AVCP previously covered by EN 14733:2005+A1:2010.

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

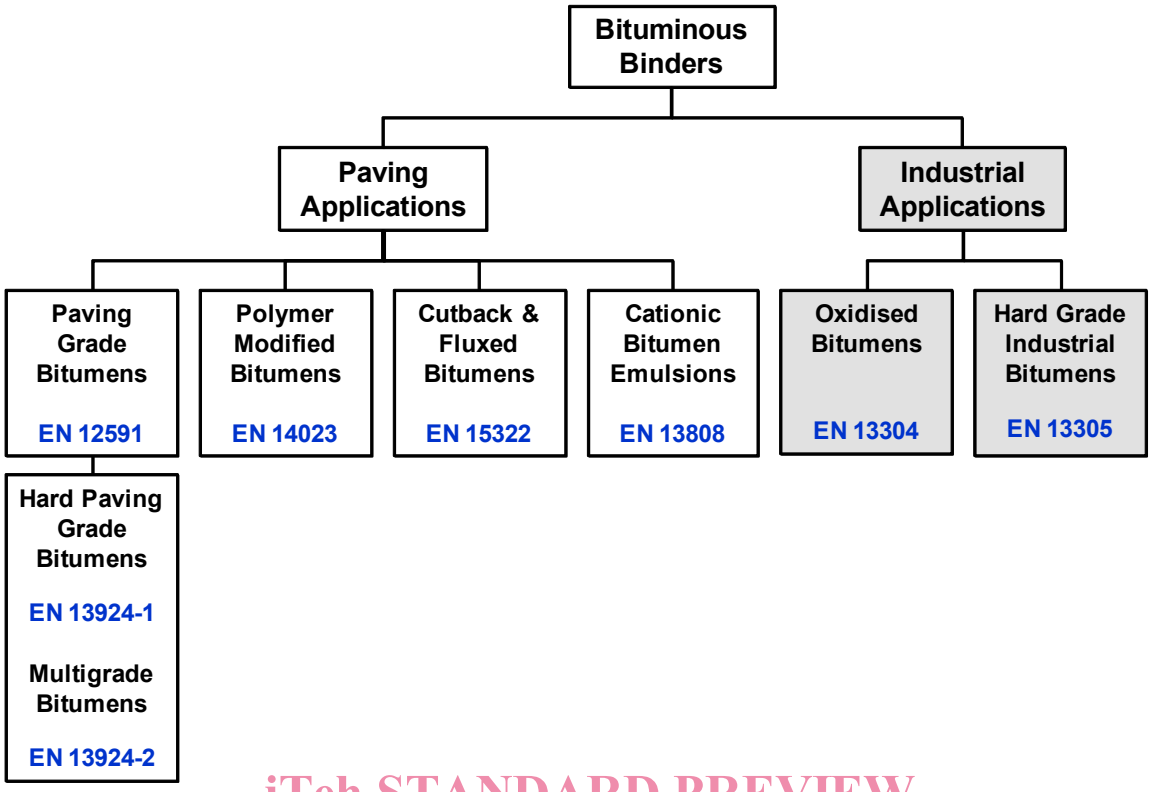

Figure 1 — European Standards for Bitumens

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

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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.

1 Scope

This European Standard provides a framework for specifying cut-back and fluxed bituminous binders which are suitable for the use in the construction and maintenance of roads, airfields and other paved areas.

This European Standard applies to un-modified and polymer modified bituminous cut-back and fluxed materials.

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 12591, *Bitumen and bituminous binders — Specifications for paving grade bitumens*

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

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 12846-2, *Bitumen and bituminous binders — Determination of the efflux time by the efflux viscometer — Part 2: Cut-back and fluxed bituminous binders*

EN 13074-1, *Bitumen and bituminous binders — Recovery of binder from bituminous emulsion or cut-back or fluxed bituminous binders — Part 1: Recovery by evaporation*

EN 13074-2, *Bitumen and bituminous binders — Recovery of binder from bituminous emulsion or cut-back or fluxed bituminous binders — Part 2: Stabilisation after recovery by evaporation*

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

EN 13358, *Bitumen and bituminous binders — Determination of the distillation characteristics of cut-back and fluxed bituminous binders made with mineral fluxes*

EN 13398, *Bitumen and bituminous binders — Determination of the elastic recovery of modified bitumen*

EN 13587, *Bitumen and bituminous binders — Determination of the tensile properties of bituminous binders by the tensile test method*

EN 13588, *Bitumen and bituminous binders — Determination of cohesion of bituminous binders with pendulum test*

EN 13589, *Bitumen and bituminous binders — Determination of the tensile properties of modified bitumen by the force ductility method*

EN 13703, *Bitumen and bituminous binders — Determination of deformation energy*

EN 14023, *Bitumen and bituminous binders — Specification framework for polymer modified bitumens*

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

EN 15626, *Bitumen and bituminous binders — Determination of adhesivity of cut-back and fluxed bituminous binders by water immersion test — Aggregate 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 3405, *Petroleum products — Determination of distillation characteristics at atmospheric pressure (ISO 3405)*

EN ISO 3675, *Crude petroleum and liquid petroleum products — Laboratory determination of density — Hydrometer method (ISO 3675)*

EN ISO 13736, *Determination of flash point — Abel closed-cup method (ISO 13736)*

3 Terms and definitions

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

3.1
mineral flux
flux which may be of carbochemical, petrochemical or petroleum origin or a mixture of those

3.2
vegetal flux
type of bio-flux derived exclusively from plant based (vegetal) product

4 Abbreviated terms

Abbreviated terms, providing an expression in letters and numbers (standard designations), are used to describe important characteristics of cut-back and fluxed bituminous binders i.e. viscosity, type of binder and setting ability and shall be in accordance with Table 1.

Denomination of cut-back and fluxed bituminous binders is set as follows:

— 2 letters, describing the type of flux, i.e. Fm for mineral flux and Fv for vegetal flux;

— 1 or 2 digits, corresponding to the viscosity class from Table 3 determined either by efflux time or by dynamic viscosity;

— 1 or 2 letters, describing the type of base binder, i.e. B standing for unmodified binder and BP standing for polymer modified binder (see Note b in Table 1);

— 1 digit, corresponding to the classes of setting ability from Table 3. Setting ability for Fm type is based on distillation (EN 13358), as strength development depends upon volatilisation of light oils. For Fv type materials, strength development involves a chemical change and not loss of volatiles, so the measure is based on softening point of recovered binder according to EN 13074-1. The test method (distillation or softening point) to which the digit refers is thus identified by the two letters (Fm or Fv) which indicate the type of flux.

Examples of abbreviated terms for cut-back and fluxed bituminous binders are given in Annex A.

Table 1 — Denomination of the abbreviated terms

Position	Characters	Denomination	Supporting European Standard
1 and 2	**Fm** [a]	Mineral oil fluxed bitumen or cut-back bitumen	EN 12597
	Fv [a]	Vegetable oil fluxed bitumen	
3		Viscosity class	
	from Class 2 to Class 6		EN 12846-2 (Efflux time)
	from Class 7 to Class 10		EN 13302 (Dynamic viscosity)
4 and 5 (if appropriate)		**Indication of the binder type**	
	B	Paving grade bitumen	EN 12591
	P	Addition of polymer [b]	EN 14023 [b]
5 or 6		Setting ability of **Fm types**	
	from Class 2 to Class 6	% of total distillate distilling at 225 °C	EN 13358
		Setting ability of **Fv types**	
	from Class 2 to Class 7	Ring and ball softening point on recovered binder	EN 1427 EN 13074-1

a F has been used for both cut-back and fluxed bitumens to avoid confusion as C has been used already to designate cationic bitumen emulsions.

b May be prepared using polymer modified bitumen (EN 14023) or by addition of polymer to the cut-back or fluxed bituminous material.

The following abbreviations are used in the specification tables of this European Standard (see Table 3, Table 4 and Table 5):

— NR for "No Requirement": this class has been included to accommodate countries where the characteristic, for a given intended use, is not subject to regulatory requirements, i.e. when there are no regulations for the property/characteristic in the territory of intended use.

— TBR for "To Be Reported": this class shall mean that the manufacturer is invited, but not required, to provide information, regarding performance characteristics, with the product.

NOTE The reported values (TBR) are intended to be used for future development of specifications.

— DV for "Declared Value": this class shall mean that the manufacturer is required to provide a value or a range of values, or limiting value(s) as part of a regulatory declaration and subsequent regulatory marking.

5 Requirements and test methods

5.1 Properties/characteristics and related test methods

5.1.1 General

All characteristics of cut-back and fluxed bituminous binders, listed in Table 2, shall be classified in accordance with appropriate classes from Table 3, Table 4 Part A or Table 4 Part B and Table 5.

Table 2 — Requirements and test methods

Requirements	Concerned products	Characteristics and test methods
Viscosity	Fm and Fv types from Table 3	Efflux time EN 12846-2 or Dynamic viscosity EN 13302
Water effect on binder adhesion		Adhesivity with reference aggregate EN 15626
Setting ability	Fm types from Table 3	Distillation EN 13358 % of total distillate fraction distilling at 225 °C
	Fv types from Table 3	Softening point EN 1427 of recovered binder EN 13074-1
Consistency at intermediate service temperature	Residual binder (after stabilisation according to EN 13074-2) from Table 4	Penetration EN 1426 (5.1.4.1)
Consistency at elevated service temperature		As appropriate (5.1.4.2) : Softening point EN 1427 or dynamic viscosity EN 12596 or EN 13302 or kinematic viscosity EN 12595
Cohesion (for polymer modified materials only)		As appropriate (5.1.4.3) : Pendulum test EN 13588 or Tensile test EN 13587 and EN 13703 or Force ductility EN 13589 and EN 13703
Durability of consistency at intermediate service temperature	Long-term aged binder (after stabilisation according to EN 13074-2, followed by ageing according to EN 14769) from Table 5	Penetration EN 1426 (5.1.4.1)
Durability of consistency at elevated service temperature		As appropriate (5.1.4.2) : Softening point EN 1427 or dynamic viscosity EN 12596 or EN 13302 or kinematic viscosity EN 12595
Durability of cohesion (for polymer modified materials only)		As appropriate (5.1.4.3) : Pendulum test EN 13588 or Tensile test EN 13587 and EN 13703 or Force ductility EN 13589 and EN 13703

When specifying a cut-back or a fluxed bituminous binder, the appropriate class for each technical requirement shall be selected. Care should be taken to make class selections which are compatible and realistic.

The test procedures for stabilisation and ageing of binders given in Table 4 Part A, Table 4 Part B and Table 5 have not been used previously in Europe. With regard to Table 4 Part A and Table 4 Part B, in order to accumulate a sufficient set of data which will allow values in classes to be confirmed, it is highly recommended to use Class 1 if existing experience does not yet allow to specify actual performance classes (Class 2 to Class 11). For the same reasons, for Table 5, it is also highly recommended to use Class 1 in the case where Class 2 (DV) is not mandatory.

Examples of selected performance classes for cut-back and fluxed bituminous binders are given in Annex B.

5.1.2 Properties of cut-back and fluxed bituminous binders (Table 3)

5.1.2.1 Viscosity

Efflux time according to the procedure specified in EN 12846-2 or dynamic viscosity according to the procedure specified in EN 13302 shall be used.

Considering that large viscosity classes are specified in Table 3, i.e. in Class 2 to Class 10, relevant restricted ranges shall be defined by a nominal viscosity ± 35 % around a mid-point value. The restricted range shall be within the specified class limit.

5.1.2.2 Water effect on binder adhesion

Adhesivity shall be checked with one or several reference aggregates according to the procedure specified in EN 15626. When declaring performance, the nature of the reference aggregate which has been used shall be indicated.

5.1.2.3 Setting ability

Distillation (EN 13358) shall be used for Fm (mineral oil fluxed bitumen or cut-back) grade binders.

Softening point (EN 1427) after recovery (EN 13074-1) shall be used for Fv (vegetable oil fluxed bitumen) grade binders.

5.1.3 Stabilised and long-term aged binders from cut-back and fluxed bituminous binders

5.1.3.1 Stabilised binder (Table 4, Part A and B)

Stabilised binder refers to the binder obtained according to the procedure specified by EN 13074-1 followed by EN 13074-2.

5.1.3.2 Long-term aged binder (Table 5)

Long-term aged binder refers to the binder obtained according to the procedure specified by EN 13074-1 followed by EN 13074-2 and EN 14769 (65 h at 85 °C).

5.1.4 Properties of stabilised and long-term aged binders from cut-back and fluxed bituminous binders

5.1.4.1 Consistency at intermediate service temperature

Consistency at intermediate service temperature shall be assessed according to the procedure specified in EN 1426 (needle penetration). The temperature for the test is dependent on the consistency of the binder. The penetration test shall be performed at 25 °C when the binder has a penetration smaller than or equal to (330 x 0,1) mm. If the penetration at 25 °C is greater than (330 x 0,1) mm, the test shall be performed at 15 °C.

5.1.4.2 Consistency at elevated service temperature

The test method to be used is dependent on the consistency of the binder. If penetration at 25 °C is smaller than or equal to (330 x 0,1) mm, consistency at elevated temperature shall be assessed according to the procedure specified in EN 1427 (softening point). If penetration at 25 °C is greater than (330 x 0,1) mm, consistency at elevated service temperature shall be assessed either by dynamic viscosity at 60 °C (procedure specified in EN 12596 or EN 13302) or kinematic viscosity at 60 °C (procedure specified in EN 12595).

5.1.4.3 Cohesion (for modified binders only)

The test method to be used is dependent on the intended use of the product. The cohesion of a binder from polymer modified cut-back and fluxed bituminous binders which are used for surface dressings, shall be determined according to the procedure specified in EN 13588. For binders used in asphalt mixes, the test methods given in either EN 13587 or EN 13589 may be used. For binders used in other applications, any one of the three methods listed above, EN 13587, EN 13589 or EN 13588, may be used.

5.2 Dangerous 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 harmonised 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 of 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/*

Table 3 — Specification framework for technical requirements and performance classes of cut-back and fluxed bituminous binders

Technical requirements	Standard	Units	Class 0	Class 1 [a]	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10
Viscosity													
Efflux time 4 mm, 25 °C [b]	EN 12846-2	s			< 200 [c]								
Efflux time 10 mm, 25 °C [b]	EN 12846-2	s				15 to 500 [c]							
Efflux time 10 mm, 40 °C [b]	EN 12846-2	s					50 to 500 [c]						
Efflux time 10 mm, 60 °C [b]	EN 12846-2	s						20 to 300 [c]	250 to 500 [c]				
Dynamic viscosity at 60 °C [b]	EN 13302	Pa·s								< 10 [d]	10 to 50 [d]	30 to 100 [d]	> 80 [d]
Solubility	EN 12592	%	NR [e]	TBR	> 99,0								
Flash Point	EN ISO 13736	°C			≤ 23	> 23	> 35	> 45	> 55				
	EN ISO 2719	°C								> 60	> 65		
	EN ISO 2592	°C										> 160	> 200
Adhesivity with reference aggregate	EN 15626	/	NR [e]	TBR	≥ 75	≥ 90							
Fm grades setting ability by distillation test													
Total distillate at 360 °C	EN 13358	%	NR [e]	TBR	< 5	< 10	< 15	< 20	< 32	< 55			
% of total distillate fraction distilling at 190 °C	EN 13358	%	NR [e]	TBR	< 5	2 to 15	10 to 25	> 20					
% of total distillate fraction distilling at 225 °C	EN 13358	%	NR [e]	TBR	< 15	10 to 25	20 to 40	35 to 60	> 55				
% of total distillate fraction distilling at 260 °C	EN 13358	%	NR [e]	TBR	< 20	15 to 40	35 to 60	> 55					
% of total distillate fraction distilling at 315 °C	EN 13358	%	NR [e]	TBR	< 40	35 to 70	65 to 90	> 85					