BS EN 15322:2013

BSI Standards Publication

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

National foreword

This British Standard is the UK implementation of EN 15322:2013. It supersedes BS EN 14733:2005+A1:2010 and BS EN 15322:2009 which are withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/510/19, Bitumen and related products.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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English Version

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

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

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

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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COMITÉ EUROPÉEN DE NORMALISATION
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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of an identical text or by endorsement, at the latest by November 2013, and conflicting national standards shall be withdrawn at the latest by May 2014.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:

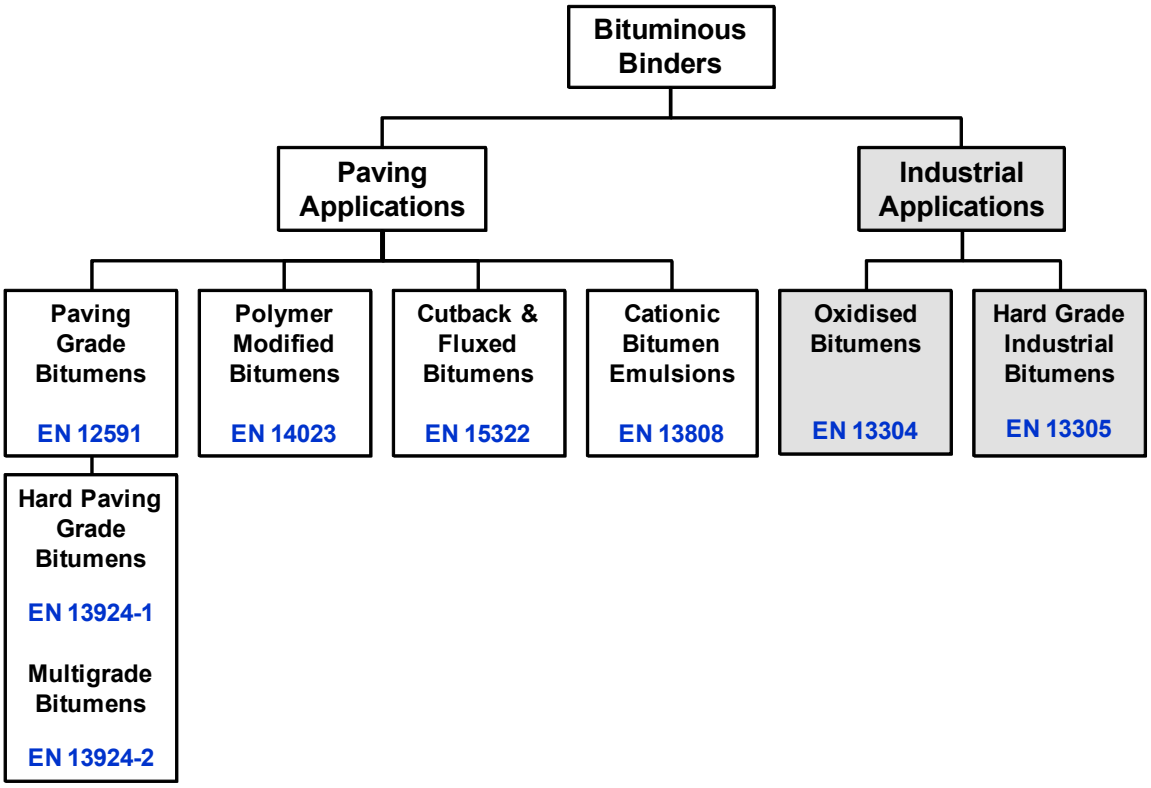

Figure 1 — European Standards for Bitumens

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	from Class 2 to Class 6	Viscosity class	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					

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

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
Fv grades setting ability by softening point of recovered binder	EN 1427 EN 13074-1	°C	NR [e]	TBR	≤ 35	> 35	> 39	> 43	> 50	> 55			

a Class 1, TBR, may not be used for regulatory declaration and marking purposes.

b For marking purposes of each product, only one class of viscosity, from Class 2 to Class 10, may be used.

c In addition with the appropriate selected class, a restricted efflux time range of ± 35 % around a mid-point value, with a minimum of ± 10 s, shall be defined (see 5.1.2.1). The restricted range shall be within the specified class limits.

d A restricted dynamic viscosity range of ± 35 % around a mid-point value shall be defined (see 5.1.2.1). The restricted range shall be within the specified class limit.

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

Table 4 — Specification framework for the technical requirements and performance classes of stabilised binders
Part A — Penetration at 25 °C after stabilisation, smaller or equal to (330 x 0,1) mm

Stabilisation procedure: EN 13074-1 followed by EN 13074-2										
Technical requirements	**Standard**	**Units**	**Class 0**	**Class 1** [a]	**Class 2**	**Class 3**	**Class 4**	**Class 5**	**Class 6**	**Class 7**
Consistency at intermediate service temperature Penetration at 25 °C	EN 1426	0,1 mm	NR [c]	TBR	≤ 50	≤ 100	≤ 150	≤ 220	≤ 330	
Consistency at elevated service temperature Softening point	EN 1427	°C	NR [c]	TBR	≥ 55	≥ 50	≥ 43	≥ 39	≥ 35	≥ 30
Cohesion (modified binders only)			**Class 0**	**Class 1**[a]	**Class 2**	**Class 3**	**Class 4**	**Class 5**	**Class 6**	
Cohesion energy by tensile test at 5 ºC (100 mm/min traction) [b]	EN 13587 EN 13703	J/cm^2	NR [c]	TBR	≥ 1	≥ 2	≥ 3			
Cohesion energy by force ductility at 5 °C (50 mm/min traction) [b]	EN 13589 EN 13703	J/cm^2	NR [c]	TBR	≥ 1	≥ 2	≥ 3			
Cohesion energy by pendulum test [b]	EN 13588	J/cm^2	NR [c]	TBR	≥ 0,5	≥ 0,7	≥ 1,0	≥ 1,2	≥ 1,4	
Elastic recovery at 10 °C (for elastomeric polymer binders)	EN 13398	%	NR [c]	TBR	≥ 30	≥ 40	≥ 50	≥ 75		
Elastic recovery at 25 °C (for elastomeric polymer binders)	EN 13398	%	NR [c]	TBR	≥ 30	≥ 40	≥ 50	≥ 75		

[a] Class 1, TBR, may not be used for regulatory declaration and marking purposes.

[b] The cohesion of stabilised binder from polymer modified cut-back and fluxed bituminous binders which are used for surface dressings, shall be determined in accordance with 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.

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

Table 4 — Specification framework for the technical requirements and performance classes of stabilised binders
Part B — Penetration at 25 °C after stabilisation, greater than (330 x 0,1) mm

Stabilisation procedure: EN 13074-1 followed by EN 13074-2									
Technical requirements	**Standard**	**Units**	**Class 0**	**Class 1** [a]	**Class 7**	**Class 8**	**Class 9**	**Class 10**	**Class 11**
Consistency at intermediate service temperature Penetration at 15 °C	EN 1426	0,1 mm	NR [d]	TBR	90 to 170	140 to 260	180 to 360	> 360	
Consistency at elevated service temperature [b]									
Dynamic viscosity at 60 °C	EN 12596 or EN 13302	Pa·s	NR [d]	TBR		≥ 12	≥ 7,0	≥ 4,5	
Kinematic viscosity at 60 °C	EN 12595	mm^2/s	NR [d]	TBR		8 000 to 16 000	4 000 to 8 000	2 000 to 6 000	1 000 to 2 000
Cohesion (modified binders only)			**Class 0**	**Class 1** [a]	**Class 2**	**Class 3**	**Class 4**	**Class 5**	**Class 6**
Cohesion energy by tensile test at 5 ºC (100 mm/min traction) [c]	EN 13587 EN 13703	J/cm^2	NR [d]	TBR	≥ 1	≥ 2	≥ 3		
Cohesion energy by force ductility at 5 °C (50 mm/min traction) [c]	EN 13589 EN 13703	J/cm^2	NR [d]	TBR	≥ 1	≥ 2	≥ 3		
Cohesion energy by pendulum test [c]	EN 13588	J/cm^2	NR [d]	TBR	≥ 0,5	≥ 0,7	≥ 1,0	≥ 1,2	≥ 1,4
Elastic recovery at 10 °C (for elastic polymer binders)	EN 13398	%	NR [d]	TBR	≥ 30	≥ 40	≥ 50	≥ 75	
Elastic recovery at 25 °C (for elastic polymer binders)	EN 13398	%	NR [d]	TBR	≥ 30	≥ 40	≥ 50	≥ 75	

[a] Class 1, TBR, may not be used for regulatory declaration and marking purposes.

[b] If penetration at 25 °C is greater than (330 x 0,1) mm, the consistency of the stabilised binder at elevated service temperatures shall be measured either by the determination of dynamic viscosity, vacuum capillary method according to EN 12596 or rotating spindle method according to EN 13302, or by the determination of kinematic viscosity according to EN 12595 depending on the consistency of the stabilised binder.

[c] The cohesion of stabilised binder from polymer modified cut-back and fluxed bituminous binders which are used for surface dressings shall be determined in accordance with 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.

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

Table 5 — Specification framework for the technical requirements and performance classes of long-term aged binder

Ageing procedure: stabilisation, according to EN 13074-1 followed by EN 13074-2, further followed by ageing according to EN 14769, accelerated long term ageing by PAV (85 °C, 65 h)					
Technical Requirements	**Standard**	**Units**	**Class 0**	**Class 1** [a]	**Class 2**
Consistency at intermediate service temperature if penetration at 25 °C ≤ (330 x 0,1) mm, Penetration at 25 ºC, or if penetration at 25 °C > (330 x 0,1) mm, Penetration at 15 ºC	EN 1426	0,1 mm	NR [d]	TBR	DV
Consistency at elevated service temperature if penetration at 25 °C ≤ (330 x 0,1) mm, Softening point, or	EN 1427	ºC	NR [d]	TBR	DV
if penetration at 25 °C > (330 x 0,1) mm [b]					
Dynamic viscosity at 60 ºC	EN 12596 or EN 13302	Pa·s	NR [d]	TBR	DV
or					
Kinematic viscosity at 60 ºC	EN 12595	mm^2/s	NR [d]	TBR	DV
Cohesion (modified binders only)					
Cohesion energy by tensile test at 5 ºC (100 mm/min traction) [c]	EN 13587, EN 13703	J/cm^2	NR [d]	TBR	DV
Cohesion energy by force ductility at 5 °C (50 mm/min traction) [c]	EN 13589, EN 13703	J/cm^2	NR [d]	TBR	DV
Cohesion by pendulum test [c]	EN 13588	J/cm^2	NR [d]	TBR	DV
Elastic recovery at 10 °C (for elastic polymer binders)	EN 13398	%	NR [d]	TBR	-
Elastic recovery at 25 °C (for elastic polymer binders)	EN 13398	%	NR [d]	TBR	-

[a] Class 1, TBR, may not be used for regulatory declaration and marking purposes.

[b] If penetration at 25 °C is greater than (330 x 0,1) mm, the consistency of the long-term aged binder at elevated service temperatures shall be measured either by the determination of dynamic viscosity, vacuum capillary method according to EN 12596 or rotating spindle method according to EN 13302, or by the determination of kinematic viscosity according to EN 12595, depending on the consistency of the long-term aged binder.

[c] The cohesion of the long-term aged binder from polymer modified cut-back and fluxed bituminous binders which are used for surface dressings shall be determined in accordance with 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.

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

6 Assessment and verification of constancy of performance - AVCP

6.1 General

The compliance of cut back and fluxed bituminous binders with the requirements of this standard and with the performances declared by the manufacturer in the DoP (Declaration of Performance) 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).

6.2 Type testing

6.2.1 General

All performances related to characteristics included in this 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 existing data, CWFT-“classified without further testing” and conventionally accepted performance).

Assessments previously performed in accordance with the provisions of this 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 cut back or fluxed bituminous binder (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 cut back or fluxed bituminous binder 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 cut back or fluxed bituminous binder manufacturer to ensure that the cut back or fluxed bituminous binder 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 EN 58 and sample preparation shall be carried out in accordance with EN 12594. The assessment methods and compliance criteria to be observed are the same as those listed within Table 8 (6.3.2.6).

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 cut back or fluxed bituminous binder 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. same formulation) 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 and he also:

  — 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 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.

This factory production control system documentation shall ensure a common understanding of the evaluation of the constancy of performance and enable the achievement of the required product performances and the effective operation of the production control system to be checked. Factory production control therefore brings together operational techniques and all measures allowing maintenance and control of the compliance of the product with the declared performances of the characteristics.

In case the manufacturer has used shared product type results, the FPC shall also include the appropriate documentation as foreseen in 6.2.4.

6.3.2 Requirements

6.3.2.1 General

The manufacturer is responsible for organising the effective implementation of the FPC system in line with the content of this product standard. Tasks and responsibilities in the production control organisation shall be documented and this documentation shall be kept up-to-date.

The responsibility, authority and the relationship between personnel who manage, perform or verify work affecting product constancy, shall be defined. This applies in particular to personnel who need to initiate actions preventing product non-constancies from occurring, actions in case of non-constancies and to identify and register product constancy problems.

Personnel performing work affecting the constancy of performance of the product shall be competent on the basis of appropriate education, training, skills and experience for which records shall be maintained.

In each factory, the manufacturer may delegate the action to a person having the necessary authority to:

a) identify procedures to demonstrate constancy of performance of the product at appropriate stages;

b) identify and record any instance of non-constancy;

c) identify procedures to correct instances of non-constancy.

The manufacturer shall draw up and keep up-to-date documents defining the factory production control. The manufacturer's documentation and procedures should be appropriate to the product and manufacturing process. The FPC system should achieve an appropriate level of confidence in the constancy of performance of the product.

This involves:

d) the preparation of documented procedures and instructions relating to factory production control operations, in accordance with the requirements of the technical specification to which reference is made;

e) the effective implementation of these procedures and instructions;

f) the recording of these operations and their results;

g) the use of these results to correct any deviations, repair the effects of such deviations, treat any resulting instances of non-conformity and, if necessary, revise the FPC to rectify the cause of non-constancy of performance.

Where subcontracting takes place, the manufacturer shall retain the overall control of the product and ensure that he receives all the information that is necessary to fulfil his responsibilities according to this European Standard.

If the manufacturer has part of the product designed, manufactured, assembled, packed, processed and/or labelled by subcontracting, the FPC of the subcontractor may be taken into account, where appropriate for the product in question.

The manufacturer who subcontracts all of his activities may in no circumstances pass the above responsibilities on to a subcontractor.

Manufacturers having an FPC system, which complies with EN ISO 9001 and which addresses the provisions of the present European Standard are considered as satisfying the FPC requirements of the EC Regulation 305/2011.

6.3.2.2 Equipment

6.3.2.2.1 Testing

All weighing, measuring and testing equipment shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria. The frequency of such calibration shall comply with the requirements of Table 6.

Table 6 — Factory calibration requirements

Production item	Inspection/test	Purpose	Minimum frequency
Weighing equipment	Testing of weighing accuracy	To ensure accuracy within Quality Plan requirements	a) On installation [a] b) Annually c) In case of doubt
Admixture dispensers	Organoleptic inspection	To ascertain that the dispenser is functioning correctly	First batch of the day containing admixture
	Test for accuracy	To ensure accuracy within Quality Plan requirements	a) On installation [a] b) Annually c) In case of doubt
Flow meters	Comparison of the actual amount with the metered amount by reconciliation	To ensure accuracy within Quality Plan requirements	a) On installation [a] b) Annually c) In case of doubt
Batching system (on batch factories)	Comparison of actual quantity of constituents in the batch with the intended quantity using the method prescribed in the Quality Plan	To ascertain the batching accuracy is in accordance with the Quality Plan	a) On installation [a] b) Annually c) In case of doubt
Proportioning system (in continuous factories)	Comparison of actual mass in a measured period of time with the intended mass using the method prescribed in the Quality Plan	To ascertain the accuracy in accordance with the Quality Plan	a) On installation [a] b) Annually c) In case of doubt
Temperature Monitoring equipment	Test of accuracy	To ensure correct temperatures are recorded	a) On installation [a] b) Annually c) In case of doubt

[a] Or after comprehensive repair.

6.3.2.2.2 Manufacturing

All equipment used in the manufacturing process shall be regularly inspected and maintained to ensure use, wear or failure does not cause inconsistency in the manufacturing process. Inspections and maintenance shall be carried out and recorded in accordance with the manufacturer's written procedures and the records retained for the period defined in the manufacturer's FPC procedures.

6.3.2.3 Raw materials and components

The specifications of all incoming raw materials and components shall be documented, as shall the inspection scheme for ensuring their compliance.

Incoming constituent materials shall be inspected and tested using procedures detailed in the Quality Plan and to a schedule complying with the requirements of this clause. Results of tests carried out by the supplier may be used if the supplier's quality plan is called up in the producer's Quality Plan.

The required inspections of materials in storage shall be maintained to establish that no deterioration has occurred.

Detailed requirements shall be as described in Table 7.

Supply of materials under a system complying with the requirements of EN ISO 9001 and made specific to the product shall be deemed to satisfy the requirements of this clause.

Table 7 — Supplied materials: tests, frequencies and specifications (to be carried out by the manufacturer of cut-back and fluxed bituminous binders)

Constituents	Control/Test	Test Standards	Specifications	Minimum Frequency
1 Bitumen	Inspection of delivery ticket and results [a] of the test certificate	-	-	1/delivery
	Penetration or viscosity [b]	EN 1426 or EN 12596 or EN13202 or EN 12595	Product Standard or Internal Specifications	1/2 weeks or 1/300 t (the most onerous) or 1/ship consignment.
	Softening point [b]	EN 1427	Product Standard or Internal Specifications	1/ 2weeks or 1/300 t (the most onerous) or 1/ship consignment.
2 Flux	Inspection of delivery ticket and results [a] of the test certificate	-	Product Standard or Manufacturer Specifications	1/delivery
	Density [c]	EN ISO 3675	Product Standard or Manufacturer Specifications	1/year
	If fluxed bitumen: viscosity [b]	EN 12846-2 or EN 13302	Product Standard or Manufacturer Specifications	1/year
	Distillation [c]	EN ISO 3405 [d]	Internal Specifications	1/year
	Specific requirements [e]	-	Internal Specifications	As defined in Quality Plan
3 Additives	Inspection of Delivery ticket and results [a] of the test certificate	-	Manufacturer Specifications	1/delivery
	Specific requirements [e]	-	Internal Specifications	As defined in Quality Plan

[a] To be decided by supplier and cut-back or fluxed bitumen manufacturer.

[b] Results supplied by the supplier shall be acceptable if the delivered product is CE marked.

[c] Test certificates from an approved supplier are acceptable.

[d] If appropriate to flux composition.

[e] If the nature of the constituent product (type of flux or additive) requires specific controls to be performed, those shall be defined, together with the applicable frequency, by the producer and documented in the Quality Plan. Test certificates from an approved supplier are acceptable.

6.3.2.4 Traceability and marking

Individual product batches shall be identifiable and traceable with regard to their production origin. The manufacturer shall have written procedures ensuring that processes related to affixing traceability codes and/or markings are inspected regularly.

6.3.2.5 Control during manufacturing process

The manufacturer shall plan and carry out production under controlled conditions.

6.3.2.6 Product testing and evaluation

6.3.2.6.1 General

The manufacturer shall establish procedures to ensure that the stated values of the characteristics he declares are maintained.

The manufacturer shall establish and maintain records that provide evidence that the production has been sampled and tested. These records shall show clearly whether the production has satisfied the defined acceptance criteria and shall be available for at least three years.

6.3.2.6.2 Definition of a batch

There are two possible definitions of a batch, depending on the production scheme and the production parameters.

a) The quantity of product produced and stored in one tank once the production run into that tank has been completed. The batch is considered to remain the same as long as no new production has been added.

   In this case factory production control shall be performed on samples taken from the constituted batch.

b) The maximum amount of a given product which may be produced without testing of a production sample. The frequency of testing shall however not be less than one control every 200 tonnes or monthly whilst producing, whichever is more frequent (if product is produced).

   In this case the taking and testing of a “batch control sample” shall be defined in the Factory Quality Control Plan and may depend on the specific production and control process. An adequate control and registration of product composition and process parameters, together with a proper calibration scheme of the corresponding equipment, shall be available.

In the case of products which are usually produced in small quantities, it is recommended to systematically sample and test the first monthly production run.

6.3.2.6.3 Tests and frequencies

The finished products shall be inspected and tested using procedures detailed in the Quality Plan and to a schedule complying with the requirements of Table 8.

Table 8 — Test and frequencies

Product	Control/Test	Test Standards [a]	Specifications	Frequency
1 Manufactured cut-back or fluxed bitumen	Temperature		Internal specifications	As required in the manufacturing Process Control
	Viscosity: Efflux time or Dynamic viscosity (as appropriate)	EN 12846-2 or EN 13302	EN 15322 and National application document where applicable [b]	1/batch [c]
	Setting ability by distillation (Fm grades)	EN 13358	EN 15322 and National application document where applicable [b]	1/year/product
	Setting ability by softening point of recovered binder (Fv grades)	EN 1427 EN 13074-1	EN 15322 and National application document where applicable [b]	1/year/product
	Adhesivity with reference aggregate	EN 15626	EN 15322 and National application document where applicable [b]	1/year/product
	Flash point	EN ISO 13736 or EN ISO 2719 or EN ISO 2592 (as appropriate)	EN 15322 and National application document where applicable [b]	1/year/class of flux
	Solubility	EN 12592	EN 15322 and National application document where applicable [b]	As defined in Quality Plan
2 Stabilised binder EN 13074-1 + EN 13074-2	Consistency: Penetration Softening point, or Viscosity (as appropriate)	EN 1426 EN 1427 EN 12596 or EN 13302 or EN 12595	EN 15322 and National application document where applicable [b]	1/year/product
	Cohesion (for modified binders)	EN 13587 / EN 13703 or EN 13589 / EN 13703 or EN 13588	EN 15322 and National application document where applicable [b]	1/year/product
	Elastic recovery (for modified binders)	EN 13398	EN 15322 and National application document where applicable [b]	1/year/product
3 Long-term aged binder EN 13074-1 + EN 13074-2 + EN 14769	Consistency: Penetration Softening point, or Viscosity (as appropriate)	EN 1426 EN 1427 EN 12596 or EN 13302 or EN 12595	EN 15322 and National application document where applicable [b]	1/year/product
	Cohesion (for modified binders)	EN 13587 / EN 13703 or EN 13589 / EN 13703 or EN 13588	EN 15322 and National application document where applicable [b]	1/year/product
	Elastic recovery (for modified binders)	EN 13398	EN 15322 and National application document where applicable [b]	1/year/product
4 Suitability of delivery vehicles	Cleanliness and general state			As defined in Quality Plan

[a] The use of alternative tests may be appropriate where it can be demonstrated that there is a correlation with the European Standards. However, in cases of disputes, the European Standards shall be used.

[b] The property has only to be controlled if it has been retained in the National application document : national annex or national guidance document.

[c] Batch: see definition given in 6.3.2.6.2

6.3.2.7 Non-complying products

The manufacturer shall have written procedures which specify how non-complying products shall be dealt with. Any such events shall be recorded as they occur and these records shall be kept for the period defined in the manufacturer's written procedures.

Where the product fails to satisfy the acceptance criteria, the provisions for non-complying products shall apply, the necessary corrective action(s) shall immediately be taken and the products or batches not complying shall be isolated and properly identified.

Once the cause for the non-complying product has been removed, the test or verification in question shall be repeated.

The results of controls and tests shall be properly recorded. The product description, date of manufacture, test method adopted, test results and acceptance criteria shall be entered in the records under the signature of the person responsible for the control/test.

With regard to any control result not meeting the requirements of this European Standard, the corrective measures taken to rectify the situation (e.g. a further test carried out, modification of manufacturing process, throwing away or putting right of product) shall be indicated in the records.

6.3.2.8 Corrective action

The manufacturer shall have documented procedures that instigate action to eliminate the cause of non-conformities in order to prevent recurrence.

6.3.2.9 Handling, storage and packaging

The manufacturer shall have procedures providing methods of product handling and shall provide suitable storage areas preventing damage or deterioration.

6.3.3 Initial inspection of factory and of FPC

Initial inspection of factory and of FPC shall be carried out when the production process has been finalised and in operation. The factory and FPC documentation shall be assessed to verify that the requirements of 6.3.2 are fulfilled.

During the inspection it shall be verified:

a) that all resources necessary for the achievement of the product characteristics included in this European Standard are in place and correctly implemented, and

b) that the FPC-procedures in accordance with the FPC documentation are followed in practice, and

c) that the product complies with the product type samples, for which compliance of the product performance to the DoP has been verified.

All locations where final testing of the relevant product is performed shall be assessed to verify that the above conditions a) to c) are in place and have been implemented. If the FPC system covers more than one product, production line or production process, and it is verified that the general requirements are fulfilled when assessing one product, production line or production process, then the assessment of the general requirements does not need to be repeated when assessing the FPC for another product, production line or production process.

All assessments and their results shall be documented in the initial inspection report.

6.3.4 Continuous surveillance of FPC

Surveillance of the FPC shall be undertaken **once per year**. The surveillance of the FPC shall include a review of the FPC test plan(s) and production processes(s) for each product to determine if any changes have been made since the last assessment or surveillance. The significance of any changes shall be assessed.

Checks shall be made to ensure that the test plans are still correctly implemented and that the production equipment is still correctly maintained and calibrated at appropriate time intervals.

The records of tests and measurement made during the production process and to finished products shall be reviewed to ensure that the values obtained still correspond with those values for the samples submitted to the determination of the product type and that the correct actions have been taken for non-compliant products.

6.3.5 Procedure for modifications

If modifications are made to the product, production process or FPC system that could affect any of the product characteristics declared according to this standard, then all the characteristics for which the manufacturer declares performance and which may be affected by the modification shall be subject to the determination of the product type, as described in 6.2.1.

Where relevant, a re-assessment of the factory and of the FPC system shall be performed for those aspects which may be affected by the modification.

All assessments and their results shall be documented in a report.

6.3.6 One-off products, pre-production products (e.g. prototypes) and products produced in very low quantity

The cut back and fluxed bituminous binders produced as a one-off, prototypes assessed before full production is established, and products produced in very low quantities (less than 100 tonnes per year) shall be assessed as follows.

For type assessment, the provisions of 6.2.1, 3rd paragraph apply, together with the following additional provisions:

a) in case of prototypes, the test samples shall be representative of the intended future production and shall be selected by the manufacturer;

b) on request of the manufacturer, the results of the type assessment of prototype samples may be included in a certificate or in test reports issued by the involved third party.

The FPC system of one-off products and products produced in very low quantities shall be consistent with the requirements under 6.3 and ensure that raw materials and/or components are sufficient for production of the product. The provisions on raw materials and/or components shall apply only where appropriate. The manufacturer shall maintain records allowing traceability of the product.

For prototypes, where the intention is to move to series production, the initial inspection of the factory and FPC shall be carried out before the production is already running and/or before the FPC is already in practice. The FPC documentation and the factory shall be assessed.

In the initial assessment of the FPC and the factory, it shall be verified:

c) that all resources necessary for the achievement of the product characteristics included in this European Standard will be available, and

d) that the FPC procedures in accordance with the FPC documentation will be implemented and followed in practice, and

e) that procedures are in place to demonstrate that the factory production processes can produce a product complying with the requirements of this European Standard and that the product will be the same as the

samples used for the determination of the product type, for which compliance with this European Standard has been verified.

Once series production is fully established, the provisions of 6.3 shall apply.

Annex A
(informative)

Examples of abbreviated terms for cut-back and fluxed bituminous binders

Table A.1 — Examples of abbreviated terms for cut-back and fluxed bituminous binders

Example 1	**Fm 4 B 6** A medium viscosity cut-back material based on paving grade bitumen which contains relatively volatile petroleum based flux of which more than 55 % distils at 225 °C.
Example 2	**Fv 8 B 5** A high viscosity fluxed material based on paving bitumen, which contains a flux of vegetable origin, and of which the recovered binder has a softening point higher than 43 °C.
Example 3	**Fm 4 BP 4** A medium viscosity polymer modified bituminous binder cut-back or fluxed material which contains petroleum based solvent of medium volatility of which between 20 % to 40 % distils at 225 °C.
Example 4	**Fv 9 BP 6** A high viscosity polymer modified bituminous binders cut-back or fluxed material, which contains a flux of vegetable origin, and of which the recovered binder has a softening point higher than 50 °C.

Annex B
(informative)

Examples of selected performance classes for cut-back and fluxed bituminous binders

The tables given below are for illustration only. National recommended specifications will be based on local requirements. Care should be taken to make class selections which are compatible and realistic.

Table B.1 — Example of selected performance classes for cut-back and fluxed bituminous binders

	Selected classes from Table 3	
Requirement	**Fm 4 B 6**	**Fv 9 BP 6**
Efflux Time 10 mm at 40 °C (EN 12846-2)	(200 ± 70) s (Class 4)	-
Dynamic viscosity at 60 °C (EN 13302)		(50 ± 18) Pa·s (Class 9)
Solubility (EN 12592)	> 99 % (Class 2)	> 99 % (Class 2)
Flash Point (EN ISO 2719)	> 65 °C (Class 8)	-
Flash Point (EN ISO 2592)	-	> 200 °C (Class 10)
Adhesivity with reference aggregate (EN 15626)	≥ 90 (Class 3)	≥ 90 (Class 3)
Total distillate at 360 °C (EN 13358)	< 15 % (Class 4)	
% of total distillate fraction distilling at following temperatures (EN 13358)		
190 °C	2 % to 15 % (Class 3)	
225 °C	> 55 % (Class 6)	
260 °C	NR [a] (Class 0)	
315 °C	65 % to 90 % (Class 4)	
Softening point on recovered binder (EN 13074-1 + EN 1427)		> 50 °C (Class 6)

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

Table B.2 — Example of selected performance classes for stabilised binder

	Selected classes from Table 4 – Part A (following stabilisation)	
Requirement	**Fm 4 B 6**	**Fv 9 BP 6**
Penetration at 25 °C (EN 1426)	≤ (220 x 0,1) mm (Class 5)	≤ (150 x 0,1) mm (Class 4)
Softening point (EN 1427)	≥ 35 °C (Class 6)	≥ 55 °C (Class 2)
Cohesion energy by tensile test at 5 °C (EN 13587 + EN 13703)		NR [a] (Class 0)
Cohesion energy by force ductility at 5 °C (EN 13589 + EN 13703)		NR [a] (Class 0)
Cohesion energy by pendulum test (EN 13588)		≥ 1,2 J/cm² (Class 5)
Elastic recovery at 10 °C (EN 13398)		NR [a] (Class 0)
Elastic recovery at 25 °C (EN 13398)		TBR (Class1)
[a] NR: No Requirement may be used when there are no regulations for the property in the territory of intended use.		

Table B.3 — Example of performance classes for stabilised and long-term aged binder

	Selected classes from Table 5 (following stabilisation and ageing)	
Requirement	**Fm 4 B 6**	**Fv 9 BP 6**
Penetration at 25 °C (EN 1426)	DV (Class 2)	DV (Class 2)
Softening point (EN 1427)	DV (Class 2)	DV (Class 2)
Dynamic viscosity at 60 °C (EN 12596 or EN 13302)	NR [a] (Class 0)	NR [a] (Class 0)
Kinematic viscosity at 60 °C (EN 12595)	NR [a] (Class 0)	NR [a] (Class 0)
Cohesion energy by tensile test at 5 °C (EN 13587 + EN 13703)		NR [a] (Class 0)
Cohesion energy by force ductility at 5 °C (EN 13589 + EN 13703)		NR [a] (Class 0)
Cohesion energy by pendulum test (EN 13588)		DV (Class 2)
Elastic recovery at 10 °C (EN 13398)		NR [a] (Class 0)
Elastic recovery at 25 °C (EN 13398)		TBR (Class 1)
a NR: No Requirement may be used when there are no regulations for the property in the territory of intended use.		

Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of the EC Construction Products Regulation 305/2011.

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under Mandate M/124, "Road Construction Products" given to CEN by the European Commission and the European Free Trade Association.

If this European Standard is cited in Official Journal of the European Union (OJEU), the clauses of this standard shown in this annex are considered to meet the provisions of the relevant mandate under the EC Regulation 305/2011.

This annex deals with the CE marking of the cut-back and fluxed bituminous binders intended for the uses indicated in Table ZA.1 and shows the relevant clauses applicable.

This annex has the same scope as in Clause 1 of this standard related to the aspects covered by the mandate and is defined by Table ZA.1

Table ZA.1— Relevant clauses for cut-back and fluxed bituminous binders and their intended uses

Products: Cut-back and fluxed bituminous binders **Intended uses:** Surface treatment such as surface dressings, tack coat, patching, repair of potholes, crack sealing, dust palliative, penetration, impregnation and more generally construction and maintenance of roads, airfields and other paved areas			
Essential Characteristics	**Clauses in this and other European Standard(s) related to essential characteristics**	**Regulatory classes**	**Notes**
Viscosity	5.1.2.1	None	Efflux time EN 12846-2 or Dynamic viscosity EN 13302 Performance Classes in Table 3
Water effect on binder adhesion	5.1.2.2	None	Adhesivity with reference aggregate, EN 15626 Performance Classes in Table 3
Setting ability	5.1.2.3	None	% of total distillate fraction distilling at 225 °C EN 13358 for Fm grade binders Softening point EN 1427 after recovery (EN 13074-1) for Fv grade binders Performance Classes in Table 3

Table ZA.1— Relevant clauses for cut-back and fluxed bituminous binders and their intended uses
(continued)

Essential Characteristics	Clauses in this and other European Standard(s) related to essential characteristics	Regulatory classes	Notes
Consistency at intermediate service temperature	5.1.3.1 and 5.1.4.1	None	Stabilised binder according to EN 13074-1 and EN 13074-2 Penetration EN 1426 at 25 °C Performance Classes in Table 4-Part A or Penetration EN 1426 at 15 °C Performance Classes in Table 4-Part B
Consistency at elevated service temperature	5.1.3.1 and 5.1.4.2	None	Stabilised binder according to EN 13074-1 and EN 13074-2 Softening point EN 1427 Performance Classes in Table 4-Part A or Dynamic viscosity EN 12596 or EN 13302 or Kinematic viscosity EN 12595 Performance Classes in Table 4-Part B
Cohesion (for modified binders only)	5.1.3.1 and 5.1.4.3	None	Stabilised binder according to EN 13074-1 and EN 13074-2 Cohesion energy by pendulum test EN 13588 or Cohesion energy by tensile test EN 13587 and EN 13703 or Cohesion energy by force ductility EN 13589 and EN 13703 Performance Classes in Table 4-Part A and Table 4-Part B
Durability of consistency at intermediate service temperature	5.1.3.2 and 5.1.4.1	None	Stabilised and aged binder according to EN 13074-1 and EN 13074-2 followed by EN 14769 Penetration EN 1426 at 25 °C or 15 °C Declared Value (Table 5)
Durability of consistency at elevated service temperature	5.1.3.2 and 5.1.4.2	None	Stabilised and aged binder according to EN 13074-1 and EN 13074-2 followed by EN 14769 Softening point, EN 1427 or Dynamic viscosity EN 12596 or EN 13302 or Kinematic viscosity EN 12595 Declared Value (Table 5)

Table ZA.1— Relevant clauses for cut-back and fluxed bituminous binders and their intended uses
(concluded)

Essential Characteristics	Clauses in this and other European Standard(s) related to essential characteristics	Regulatory classes	Notes
Durability of cohesion (for modified binders only)	5.1.3.2 and 5.1.4.3	None	Stabilised and aged binder according to EN 13074-1 and EN 13074-2 followed by EN 14769 Cohesion energy by pendulum test EN 13588 or Cohesion energy by tensile test EN 13587 and EN 13703 or Cohesion energy by force ductility EN 13589 and EN 13703 Declared Value (Table 5)
Dangerous regulated substances	5.2	None	

The declaration of the product performance related to certain essential characteristics is not required in those Member States (MS) where there are no regulatory requirements on these essential characteristics for the intended use of the product.

In this case, manufacturers placing their products on the market of these MS are not obliged to determine nor declare the performance of their products with regard to these essential characteristics and the option “No performance determined” (NPD) in the information accompanying the CE marking and in the declaration of performance (see ZA.3) shall be used for those essential characteristics.

ZA.2 Procedure for AVCP of cut-back and fluxed bituminous binders

ZA.2.1 System of AVCP

The AVCP system of cut-back and fluxed bituminous binders indicated in Table ZA.1, established by EC Decision 98/601/EC of 13 October 1998 published the 24 October 1998 under OJ L 287 and amended by EC Decision 2001/596/EC of 8 January 2001 published the 2 August 2001 under OJ L 209 is shown in Table ZA.2 for the indicated intended use(s) and relevant level(s) or class(es) of performance.

Table ZA.2 — System of AVCP

Product	Intended use	Level(s) or class(es) of performance	AVCP system
Cut-back and fluxed bituminous binders	Construction and maintenance of roads, airfields and other paved areas	-	2+
System 2+: See EC Regulation 305/2011 (CPR) Annex V, 1.3 including certification of the factory production control by a notified production control certification body on the basis of initial inspection of the manufacturing plant and of factory production control as well as of continuous surveillance, assessment and evaluation of factory production control.			

The AVCP of cut-back and fluxed bituminous binders in Table ZA.1 shall be according to the AVCP procedures indicated in Table ZA.3 resulting from application of the clauses of this or other European Standards indicated therein. The content of tasks of the notified body shall be limited to those essential characteristics as provided for, if any, in Annex III of the relevant mandate and to those that the manufacturer intends to declare.

Table ZA.3 — Assignment of AVCP tasks for cut-back and fluxed bituminous binders under system 2+

Tasks		**Content of the task**	**AVCP clauses to apply**
Tasks for the manufacturer	Factory production control (FPC)	Parameters related to essential characteristics of Table ZA.1 relevant for the intended use which are declared	6.3
	Determination of the product type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product	Parameters related to essential characteristics of Table ZA.1 relevant for the intended use which are declared	6.2
	Further testing of samples taken at factory according to the prescribed test plan	Essential characteristics of Table ZA.1 relevant for the intended use which are declared	6.2
Tasks for the notified production control certification body	Initial inspection of the manufacturing plant and of FPC	Parameters related to essential characteristics of Table ZA.1, relevant for the intended use, which are declared. Documentation of the FPC	6.3.3
	Continuous surveillance, assessment and evaluation of FPC	Parameters related to essential characteristics of Table ZA.1, relevant for the intended use, which are declared. Documentation of the FPC	6.3.4

ZA.2.2 Declaration of performance (DoP)

ZA.2.2.1 General

The manufacturer draws up the DoP and affixes the CE marking on the basis of the different AVCP systems set out in Annex V of the EC Regulation 305/2011:

In case of products under system 2+:

— the determination of the product type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product; the factory production control and the testing of samples taken at the factory according to the prescribed test plan, carried out by the manufacturer; and

— the certificate of conformity of the factory production control, issued by the notified production control certification body on the basis of:

  — initial inspection of the manufacturing plant and of factory production control, and

— continuous surveillance, assessment and evaluation of factory production control.

ZA.2.2.2 Content

The model of the DoP is provided in Annex III of the EC Regulation 305/2011.

According to this Regulation, the DoP shall contain, in particular, the following information:

— the reference of the product type for which the declaration of performance has been drawn up;

— the AVCP system or systems of the construction product, as set out in Annex V of the CPR;

— the reference number and date of issue of the harmonised standard which has been used for the assessment of each essential characteristic;

— where applicable, the reference number of the specific technical documentation used and the requirements with which the manufacturer claims the product complies.

The DoP shall in addition contain:

— the intended use or uses for the construction product, in accordance with the applicable harmonised technical specification;

— the list of essential characteristics, as determined in the harmonised technical specification for the declared intended use or uses;

— he performance of at least one of the essential characteristics of the construction product, relevant for the declared intended use or uses;

— where applicable, the performance of the construction product, by levels or classes, or in a description, if necessary based on a calculation, in relation to its essential characteristics. These essential characteristics for which the manufacturer declares the product performance when it is placed on the market, are determined by the Commission. The Commission also determines the threshold levels for the performance in relation to the essential characteristics to be declared;

— the performance of those essential characteristics of the construction product which are related to the intended use or uses, taking into consideration the provisions in relation to the intended use or uses where the manufacturer intends the product to be made available on the market;

— for the listed essential characteristics for which no performance is declared, the letters "NPD" (No Performance Determined).

Regarding the supply of the DoP, article 7 of the EC Regulation 305/2011 applies.

The information referred to in Article 31 or, as the case may be, in Article 33 of EC Regulation 1907/2006, (REACH) shall be provided together with the DoP.

ZA.2.2.3 Example of DoP

The following gives an example of a filled-in DoP for a cut-back or fluxed bituminous binder

DECLARATION OF PERFORMANCE
No. 001CPR 2013-07-14

1) Unique identification code of the product type:

Fluxed bituminous binder - Fm 4 B 6

2) Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4):

"Trade name"

3) Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer:

Surface dressing

4) Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11(5):

AnyCo SA,
PO Box 21
B-1050 Brussels, Belgium
Tel. +32987654321
Fax: +32123456789
Email: anyco.sa@provider.be

5) Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):

Anyone Ltd
Flower Str. 24
West Hamfordshire
UK-589645 United Kingdom
Tel. +44987654321
Fax: +44123456789
e-mail: anyone.ltd@provider.uk

6) System or systems of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V:

System 2+

7) As it is the declaration of performance concerning a construction product covered by a harmonised standard:

Notified factory production control certification body No. 5678 performed the initial inspection of the manufacturing plant and of factory production control and the continuous surveillance, assessment and evaluation of factory production control and issued the certificate of conformity of the factory production control.

8) Declared performance:

Essential characteristics	Performance	Harmonised technical specification
Viscosity - Efflux time 10 mm - 40 °C	(200 ± 70) s (Class 4)	EN 15322 - Table 3 EN 12846-2
Water effect on binder adhesion	≥ 90 (Class 3)	EN 15322 - Table 3 EN 15626 (Ref. aggregate: quartzite)
Setting ability, % of total distillate fraction distilling at 225 °C	> 55 % (Class 6)	EN 15322 - Table 3 EN 13358
Consistency at intermediate service temperature	≤ (220 x 0,1) mm (Class 5)	EN 15322 - Table 4 Part A EN 13074-1 + EN 13074-2 EN 1426
Consistency at elevated service temperature	≥ 35 °C (Class 6)	EN 15322 - Table 4 Part A EN 1427
Cohesion (for modified binders only)	NPD	EN 15322 - Table 4 Part A
Durability of consistency at intermediate service temperature	≥ (35 x 0,1) mm (Class 2 - DV)	EN15322 - Table 5 EN 13074-1 + EN 13074-2 + EN 14769 EN 1426
Durability of consistency at elevated service temperature	≤ 60°C (Class 2 - DV)	EN 15322 - Table 5 EN 13074-1 + EN 13074-2 + EN 14769 EN 1427
Durability of cohesion (for modified binders only)	NPD	EN15322 - Table 5
Dangerous regulated substances	NPD	EN 15322 - Clause 5.2

9) The performance of the product identified in points 1) and 2) is in conformity with the declared performance in point 8). This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4).

Signed for and on behalf of the manufacturer by: ..... name and function) .....

……..……. (place and date of issue) (signature) ……..…….....……

ZA.3 CE marking and labelling

The CE marking symbol shall be in accordance with the general principles set out in Article 30 of EC Regulation 765/2008 and shall be affixed visibly, legibly and indelibly to the packaging or with a delivery note or to the accompanying commercial documents.

The CE marking shall be followed by:

— the last two digits of the year in which it was first affixed,

— the name and the registered address of the manufacturer, or the identifying mark allowing identification of the name and address of the manufacturer easily and without any ambiguity,

— the unique identification code of the product type,

— the reference number of the declaration of performance,

— the level or class of the performance declared,

— the dated reference to the harmonised technical specification applied,

— the identification number of the notified body,

— the intended use as laid down in the harmonised technical specification applied.

The CE marking shall be affixed before the construction product is placed on the market. It may be followed by a pictogram or any other mark notably indicating a special risk or use.

Figures ZA.1 and ZA.2 give examples of the information related to cut-back and fluxed bituminous binders.

Figure ZA.1 gives an example of a CE marking with the information to be affixed on a packaging or to be given on a Delivery Note.

Figure ZA.2 gives an example of the CE marking information which shall apply for all types of cut-back and fluxed bituminous binders and shall be given on accompanying commercial documents.

CE 01234	*CE marking, consisting of the "CE"-symbol* *Identification number of the notified AVCP certification body*
Any Co Ltd, PO Box 21, B-1050, Brussels, Belgium **13** 00001-CPR-2013/05/12	*Name and the registered address of the manufacturer, or identifying mark* *Last two digits of the year in which the marking was first affixed* *Reference number of the DoP*
EN 15322: 2013 *Fluxed bituminous binder* *"Trade name"* - ***Fm 4 B 6*** Intended to be used for surface dressings	*No. of European Standard applied, as referenced in OJEU* *Unique identification code of the product type* *Intended use of the product as laid down in the European standard applied*

Figure ZA.1 — Example of CE marking information of products under AVCP system 2+ to be affixed to the packaging or to be given on a Delivery Note

Product designation shall allow an unambiguous tracing to the corresponding CE marking information given on commercial documents.

For a given product, only the relevant intended uses shall be listed.

CE 01234	*CE marking, consisting of the "CE"-symbol* *Identification number of the notified AVCP certification body*
Any Co Ltd, PO Box 21, B-1050, Brussels, Belgium **13** 00001-CPR-2013/05/12	*Name and the registered address of the manufacturer, or identifying mark* *Last two digits of the year in which the marking was first affixed* *Reference number of the DoP*
EN 15322: 2013 *Fluxed bituminous binder* *"Trade name" -* ***Fm 4 B 6*** Intended to be used for surface dressings	*No. of European Standard applied, as referenced in OJEU* *Unique identification code of the product type* *Intended use of the product as laid down in the European standard applied*
FLUXED BITUMINOUS BINDER	
.Viscosity – Efflux time 10 mm,-40 °C – EN 12846-2 (200 ± 70) s (Class 4)	
.Water effect on binder adhesion – EN 15626 – Quartz. **≥ 90** (Class 3)	
.Setting ability by distillation - % of total distillate fraction distilling at 225°C - EN 13358 **> 55 %** (Class 6)	
STABILISED BINDER	
. Consistency at intermediate service temperature – EN 1426 at 25 °C **≤ (220** x 0,1) mm (Class 5)	
. Consistency at elevated service service temperature – EN 1427 **≥ 35** °C (Class 6)	
. Cohesion **NPD**	
STABILISED AND AGED BINDER	
. Consistency at intermediate service temperature – EN 1426 at 25 °C **≥ (35** x 0,1) mm (DV – Class 2)	
. Consistency at elevated service service temperature – EN 1427 **≤ 60** °C (DV – Class 2)	
. Cohesion **NPD**	
Dangerous substances **NPD**	*Level or class of the performance declared*

Figure ZA.2 — Example of CE marking information of products under AVCP system 2+ to be given on accompanying commercial documents

Product designation shall allow an unambiguous tracing to the corresponding DoP.

For a given product, only the relevant intended uses shall be listed.

For each declared performance, the test method used shall be indicated.

Bibliography

[1] EN ISO 9001, *Quality management systems — Requirements (ISO 9001)*

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