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Bituminous mixtures — Material specifications

Part 4: Hot Rolled Asphalt

bsi.

National foreword

This British Standard is the UK implementation of EN 13108-4:2016. It supersedes BS EN 13108-4:2006 which is withdrawn.

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This European Standard was approved by CEN on 27 February 2016.

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European foreword

This document (EN 13108-4:2016) has been prepared by Technical Committee CEN/TC 227 "Road materials", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by December 2016, and conflicting national standards shall be withdrawn at the latest by March 2018.

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 13108-4:2006.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of Regulation (EU) No 305/2011 for construction products (CPR).

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

Compared with EN 13108-4:2006, the following changes have been made:

a) general, empirical and fundamental approaches have been merged into one list with different properties;

b) new properties introduced (low temperature properties);

c) additional optional sieves for the characterization of the grading;

d) for several properties additional categories are introduced;

e) possibility to define specific conditions in documents related to the application of the product;

f) CPR reference and new Annex ZA according to CPR rules.

This European Standard is one of a series as listed below:

— EN 13108-1, *Bituminous mixtures — Material specifications — Part 1: Asphalt Concrete*

— EN 13108-2, *Bituminous mixtures — Material specifications — Part 2: Asphalt Concrete for Very Thin Layers (BBTM)*

— EN 13108-3, *Bituminous mixtures — Material specifications — Part 3: Soft Asphalt*

— EN 13108-4, *Bituminous mixtures — Material specifications — Part 4: Hot Rolled Asphalt*

— EN 13108-5, *Bituminous mixtures — Material specifications — Part 5: Stone Mastic Asphalt*

— EN 13108-6, *Bituminous mixtures — Material specifications — Part 6: Mastic Asphalt*

— EN 13108-7, *Bituminous mixtures — Material specifications — Part 7: Porous Asphalt*

— EN 13108-8, *Bituminous mixtures — Material specifications — Part 8: Reclaimed Asphalt*

— EN 13108-9, *Bituminous mixtures — Material specifications — Part 9: Asphalt for Ultra-Thin Layer (AUTL)*

— EN 13108-20, *Bituminous mixtures — Material specifications — Part 20: Type Testing*

— EN 13108-21, *Bituminous mixtures — Material specifications — Part 21: Factory Production Control*

Annex A (normative) details the calculation of the penetration or the softening point in mixtures containing reclaimed asphalt from the penetrations or softening points of the added binder and the recovered binder from the reclaimed asphalt.

Annex B (normative) gives specifications for natural asphalt.

Annex C (normative) gives specifications for coated chippings.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The aim of this European Standard is to specify bituminous mixtures on a performance level. Specifications for Hot Rolled Asphalt have traditionally been based on compositional recipes combined with specifications for the constituent materials with additional requirements based on tests on the product. Although more tests are available to provide information on the performance of the material, they are still insufficient to cover the actual performance of the material in the road. Therefore a combination with composition and specifications for the constituent materials will still be necessary.

This European Standard covers a large variety of materials for different applications, traffic and climate conditions. EN 13108-4 gives properties and listings of possible categories. It has to accommodate the road industry for all of Europe. For this reason the menu approach for properties has been chosen. The tables represent categories that are required all over Europe. For this reason numerical values in tables do not always obey statistical rules. Based on conditions of use specific properties and categories may be defined in documents related to the application of the product. The categories defined in those documents need to take into account the reproducibility of the test when this is given in the appropriate test method.

Care should be taken to only select those tests which are relevant to the application of the asphalt and the use of the pavement and to avoid a combination of potentially conflicting requirements.

1 Scope

This European Standard specifies requirements for mixtures of the mix group Hot Rolled Asphalt for use on roads, airfields and other trafficked areas. Hot Rolled Asphalt is used for surface courses, binder courses, regulating courses and bases.

The mixtures of the mix group Hot Rolled Asphalt are produced on the basis of hot bitumen. Mixtures utilizing bitumen emulsion and bituminous materials based on *in situ* recycling are not covered by this standard.

This European Standard includes requirements for the selection of the constituent materials. It is designed to be read in conjunction with EN 13108-20 and EN 13108-21.

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 1097–6:2013, *Tests for mechanical and physical properties of aggregates — Part 6: Determination of particle density and water absorption*

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 12697-3, *Bituminous mixtures — Test methods for hot mix asphalt — Part 3: Bitumen recovery: Rotary evaporator*

EN 12697-4, *Bituminous mixtures — Test methods — Part 4: Bitumen recovery: Fractionating column*

EN 12697-8, *Bituminous mixtures — Test methods for hot mix asphalt — Part 8: Determination of void characteristics of bituminous specimens*

EN 12697-12, *Bituminous mixtures — Test methods for hot mix asphalt — Part 12: Determination of the water sensitivity of bituminous specimens*

EN 12697-13, *Bituminous mixtures — Test methods for hot mix asphalt — Part 13: Temperature measurement*

EN 12697-22, *Bituminous mixtures — Test methods for hot mix asphalt — Part 22: Wheel tracking*

EN 12697-26, *Bituminous mixtures — Test methods for hot mix asphalt — Part 26: Stiffness*

EN 12697-37, *Bituminous mixtures — Test methods for hot mix asphalt — Part 37: Hot sand test for the adhesivity of binder on precoated chippings for HRA*

EN 12697-41, *Bituminous mixtures — Test methods for hot mix asphalt — Part 41: Resistance to de-icing fluids*

EN 12697-43, *Bituminous mixtures — Test methods for hot mix asphalt — Part 43: Resistance to fuel*

EN 12697-46, *Bituminous mixtures — Test methods for hot mix asphalt — Part 46: Low temperature cracking and properties by uniaxial tension tests*

EN 12697-47, *Bituminous mixtures — Test methods for hot mix asphalt — Part 47: Determination of the ash content of natural asphalts*

EN 13043, *Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas*

EN 13108-8, *Bituminous mixtures — Material specifications — Part 8: Reclaimed asphalt*

EN 13108-20:2016, *Bituminous mixtures — Material specifications — Part 20: Type Testing*

EN 13108-21, *Bituminous mixtures — Material specifications — Part 21: Factory Production Control*

EN 13501-1:2007+A1:2009, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13924-1, *Bitumen and bituminous binders — Specification framework for special paving grade bitumen — Part 1: Hard paving grade bitumens*

EN 13924-2, *Bitumen and bituminous binders — Specification framework for special paving grade bitumen — Part 2: Multigrade paving grade bitumens*

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

EN ISO 3838, *Crude petroleum and liquid or solid petroleum products — Determination of density or relative density — Capillary-stoppered pyknometer and graduated bicapillary pyknometer methods (ISO 3838)*

EN ISO 11925-2, *Reaction to fire tests — Ignitability of products subjected to direct impingement of flame — Part 2: Single-flame source test (ISO 11925-2)*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
pavement
structure, composed of one or more courses, to assist the passage of traffic over terrain

3.1.2
layer
element of a pavement laid in a single operation

3.1.3
course
element of a pavement constructed with a single asphalt mixture

Note 1 to entry: A course may be laid in one or more layers.

3.1.4
surface course
upper course of the pavement which is in contact with the traffic

3.1.5
binder course
structural course of the pavement between the surface course and the base

3.1.6
regulating course
course of variable thickness applied to an existing course or surface to provide the necessary profile for a further course of consistent thickness

3.1.7
base
main structural element of a pavement

Note to entry 1: The base can be laid in one or more courses, described as “upper” base or “lower” base.

3.1.8
asphalt
homogenous mixture typically of coarse and fine aggregates, filler aggregate and bituminous binder which is used

Note 1 to entry: The asphalt can include one or more additives to enhance the laying characteristics, performance or appearance of the mixture.

3.1.9
natural asphalt
naturally occurring mixture of bitumen and finely divided mineral matter which is found in well-defined surface deposits and which is processed to remove unwanted components such as water and vegetable matter

Note 1 to entry: Natural asphalt is described in EN 13108-4.

3.1.10
Hot Rolled Asphalt
dense, gap graded bituminous mixture in which the mortar of fine aggregate, filler and high viscosity binder are major contributors to the performance of the laid material

3.1.11
coated chippings
nominally single size aggregate particles with a high resistance to polishing, which are lightly coated with high viscosity binder

Note 1 to entry: The chippings are rolled into and form part of a Hot Rolled Asphalt surface course which generally has coarse aggregate content of ≤ 35 %.

3.1.12
mix formulation
composition of a single mixture expressed as a target composition

Note 1 to entry: A target composition is expressed in one of two ways (see 3.1.13 and 3.1.14).

3.1.13
input target composition
expression of a mix formulation in terms of the constituent materials, the grading curve and the percentage of bitumen added to the mixture

Note 1 to entry: This will usually be the result of a laboratory mix design and validation.

3.1.14
output target composition
expression of a mix formulation in terms of the constituent materials and the mid point grading and soluble binder content to be found on analysis

Note 1 to entry: This will usually be the result of a production validation.

3.1.15
additive
constituent material which can be added in small quantities to influence specific properties of the mixture

Note 1 to entry: For example additives are used to influence the affinity of binder to aggregate, and the mechanical properties when using inorganic and organic fibres and polymers. They are also used to influence the colour of the mixture.

3.1.16
conflicting requirements
combination of requirements or properties which are impracticable to fulfil in their entirety

Note 1 to entry: This can occur by combining specific requirements for the composition and constituent materials together with more performance related tests. These are also relevant when two or more performance or test parameters are selected which measure similar properties using conflicting test methods resulting in a lack of clarity and consistency in the characteristics of the mixture.

3.1.17
premixed binder
bitumen which is blended on the site of the asphalt mixing plant, with an additive before or during the addition of the binder to the plant mixer, which in the case of a continuous plant, will be before or during the delivery of the binder to the mixing zone of the drier drum

3.1.18
category
defined level of a property of an asphalt mixture

Note 1 to entry: The designation of a category is expressed with a symbol and a numerical value representing the level.

EXAMPLE $B_{\text{min } 6,0}$ means that the minimum binder content shall be 6,0 %.

Note 2 to entry: Defined categories for each property are listed in EN 13108–4.

3.1.19
class
range of levels delimited by a minimum and a maximum value

3.2 Symbols and abbreviations

HRA	general designation of Hot Rolled Asphalt;
HRA %/*D (F or C)*	designation of Hot Rolled Asphalt followed by an indication the percentage of coarse aggregate in the mixture and of *D*, the upper sieve size of the aggregate in the mixture in millimetres (mm). For surface course mixtures the designation of the type of fine aggregate used in their manufacture immediately follows *D*. Type F fine aggregate is predominantly natural/uncrushed sand and Type C is predominantly crushed rock fine aggregate.

EXAMPLE HRA 30/14 F Hot Rolled Asphalt containing 30 % of a coarse aggregate with maximum aggregate size *D* of 14 mm containing a Type F fine aggregate.

4 Requirements for constituent materials

4.1 General

Only constituent materials with established suitability shall be used. For all constituent materials the properties relevant to the performance of the mixture shall be made available.

The establishment of suitability shall result from one or more of the following:

— European Standard;

— European Technical Assessment;

— Specifications for materials based on a demonstrable history of satisfactory use in asphalt. Evidence shall be based on research and/or the evidence of satisfactory practical use. In documents related to the application of the product details for the assessment of this proof may be defined.

There can be technical limitations regarding the future recycling possibilities. Also traceability of the nature of constituent materials can affect the potential for future recycling.

4.2 Binder

4.2.1 General

The binder shall be a paving grade bitumen, a modified bitumen, a hard paving grade bitumen, a multigrade bitumen or a blend of one of them with natural asphalt. The paving grade bitumen shall conform to EN 12591, the modified bitumen to EN 14023, the hard grade bitumen to EN 13924-1 and the multigrade bitumen to EN 13924-2. When natural asphalt is used, it shall conform to Annex B.

Premixed bituminous binders that are not covered by the standards EN 12591, EN 14023 or EN 13924-1 and EN 13924-2 may be used provided that information is given as stated in 4.1, and that the base bitumen is conforming to EN 12591, EN 14023 or EN 13924-1 and EN 13924-2. The use of these binders may be defined in documents related to the application of the product.

4.2.2 Selection of binder

4.2.2.1 General

Depending on the conditions of use, the type and grade of bitumen and the amount and category of natural asphalt may be defined in documents related to the application of the product.

The type and grade of the bitumen and the amount and category of natural asphalt shall be declared in the Type Test report.

In case of a paving grade bitumen the grade shall be selected from the grades between 30/45 and 100/150 inclusively.

NOTE EN 14023 for modified bitumen is a framework for classification and is only meant to characterize the modified bitumen. The modified bitumen specifications are not performance based. The same applies to multigrade bitumen according to EN 13924–2.

When an additive is used to lower the production temperature of Hot Rolled Asphalt and thereby changes relevant properties of the binder at temperatures representative for the climatic conditions in the place of use, evidence shall be provided to show what the influence of the additive is on the performance of the mix. This proof shall be based on research or evidence of satisfactory performance according to 4.1.

4.2.2.2 Surface courses with reclaimed asphalt

When using more than 10 % by mass of the total mixture of reclaimed asphalt from mixtures in which only paving grade bitumen has been used and when the binder added to the mixture is a paving grade bitumen and the grade of the bitumen is selected, the following requirements may be defined in documents related to the application of the product.

The penetration and/or the softening point of the binder in the resulting mixture, calculated from the penetrations and/or the softening points of the added binder and the recovered binder from the reclaimed asphalt, shall meet the penetration and/or softening point requirements of the specified grade. The calculation shall be performed according to Annex A (normative). In some cases the binder of the reclaimed asphalt can be so hardened that a very soft bitumen shall be chosen to fulfil these requirements. In such cases an alternative grade to that calculated according to Annex A (normative) may be defined.

When using reclaimed asphalt from mixtures in which a modified bitumen and/or an additive has been used, or the mixture itself contains a modified bitumen or an additive, the amount of reclaimed asphalt may be limited in documents related to the application of the product to a maximum of 10 % by mass of the total mixture.

NOTE 1 The choice for this specification depends on the choice of requirements within this European Standard. For more performance designed mixes there might be no need to apply the pen and/or softening point rule. However, the pen or softening point rule is only valid for paving grade bitumen.

NOTE 2 When applying a recipe approach to the mixture, using too great a proportion of modified bitumen or additive could lead to an incorrect decision in respect of the addition of the new bitumen.

4.2.2.3 Regulating courses, binder courses and bases with reclaimed asphalt

When using more than 20 % by mass of the total mixture of reclaimed asphalt from mixtures in which only paving grade bitumen has been used and when the binder added to the mixture is a paving grade bitumen and the grade of the bitumen is selected, the following requirement may be defined in documents related to the application of the product.

The penetration and/or the softening point of the binder in the resulting mixture, calculated from the penetrations and/or the softening points of the added binder and the recovered binder from the reclaimed asphalt, shall meet the penetration and/or softening point requirements of the selected grade. The calculation shall be executed according to Annex A (normative). In some cases the binder of the recovered asphalt can be so hardened that a very soft bitumen shall be chosen to fulfil these requirements. In such cases an alternative grade to that calculated according to Annex A (normative) may be defined.

When using reclaimed asphalt from mixtures in which a modified bitumen and/or an additive has been used, and/or the mixture itself contains a modified bitumen or an additive, the amount of reclaimed asphalt for regulating courses, binder courses and base courses may be limited in documents related to the application of the product to a maximum of 20 % by mass of the total mixture.

NOTE 1 The choice for this specification depends on the choice of requirements within this standard. For more performance designed mixes there might be no need to apply the pen and/or softening point rule. (However, the pen or softening point rule is only valid for paving grade bitumen.)

NOTE 2 When applying a recipe approach to the mixture, using too great a proportion of modified bitumen or additive could lead to an incorrect decision in respect to the addition of the new binder.

4.3 Aggregates

4.3.1 Coarse aggregate

Coarse aggregate shall conform to EN 13043 as appropriate for the intended use.

4.3.2 Fine aggregate

Fine aggregate shall conform to EN 13043 as appropriate for the intended use.

4.3.3 All-in aggregates

All-in aggregate shall conform to EN 13043 as appropriate for the intended use.

4.3.4 Added filler

Filler aggregate shall conform to EN 13043 as appropriate for the intended use and may include materials such as cement, limestone and hydrated lime. Based on the experience in the place of use the type and amount of added filler may be defined in documents related to the application of the product.

NOTE The expression “as appropriate for the intended use” in 4.3.1 to 4.3.4 means that the selection of the requirements and the particular category depends on a number of conditions. These conditions include traffic density, climatic conditions, the construction of the course in which the mixture will be used, and economic considerations.

4.4 Reclaimed asphalt

The use and the amount of reclaimed asphalt and the mix group and/or the courses from which the reclaimed asphalt has been or will be derived may be specified.

The properties of reclaimed asphalt declared in accordance with EN 13108-8 shall conform to the requirements that may be selected appropriate for the intended use.

NOTE The expression “appropriate for the intended use” means that the selection of the requirements and the particular category depends on a number of conditions. These conditions include traffic density, climatic conditions, the construction of the course in which the mixture will be used, and economic considerations.

The upper sieve size *D* of the aggregate in the reclaimed asphalt shall not exceed the upper sieve size *D* of the mixture. The aggregate properties of the reclaimed asphalt or of the mixed aggregates from the reclaimed asphalt with the other aggregates shall fulfil the requirements for aggregate defined in documents related to the application of the mixture.

When required, the amount of reclaimed asphalt, the mix group and /or the courses from which the reclaimed asphalt has been or will be derived shall be declared in the Type Test report.

4.5 Additives

The nature and properties of all additives shall be declared and they shall conform to the requirements referred to in 4.1. For specific applications and based on the experience in the place of use, the amount of additives may be defined in documents related to the application of the product.

NOTE Chemical and organic additives can be used for example, to reduce production temperatures by influencing the viscosity of the binder. This might have an effect on other relevant mixture properties.

4.6 Coated chippings

Coated chippings for application to Hot Rolled Asphalt surface course shall conform to Annex C.

NOTE It is normal practice for coated chippings to be applied to Hot Rolled Asphalt surface courses with nominal coarse aggregate content of 35 % or less when laid on roads. These chippings impart texture to the surface. Installation of chippings comprising aggregate with appropriate polishing resistance provides tyre/road friction.

5 Requirements for the mixture

5.1 General

— The mix formulation shall be declared in the Type Test report according to EN 13108-20, including the target percentages passing the specified sieves. The target grading shall be declared for the sieve 1,4 *D* and the sieves as called up in Tables 1,2,3 or 4.

— the target binder content and where relevant, the binder content from reclaimed asphalt and/or binder content in natural asphalt;

— and the percentage(s) of additive(s).

The target binder content comprises the total of added binder (including any additives in solution in the binder), binder in reclaimed asphalt and binder in natural asphalt.

At the target composition the mixture shall conform to the appropriate requirements in accordance with this European Standard.

The test results in accordance with EN 13108-20:2016, 7.5, shall be made available.

5.2 Composition, grading and binder content

5.2.1 Composition

The grading shall be expressed in percentages by mass of total aggregate. The binder and additive content shall be expressed in percentages by mass of the total mixture. The percentages passing the sieves, with exception of the sieve 0,063 mm shall be expressed to 1 %. The binder content, the percentage passing sieve 0,063 and any additive content shall be expressed to 0,1 %. Where appropriate the additive content shall be expressed to 0,01 %.

5.2.2 Grading

The sieves to be used shall be either basic sieve set plus set 1 or basic sieve set plus set 2, according to EN 13043.

The requirements for the grading shall be expressed in terms of maximum and minimum values by selection of the percentages passing the sieves as defined in Tables 1 to 4. A combination of sieve sizes from set 1 and set 2 shall not be permissible.

D and the characteristic sieves between *D* and 2 mm shall be selected from the following sieves:

— basic sieve set plus set 1: 4 mm; 5,6 mm; 8 mm; 11,2 mm; 16 mm; 22,4 mm, 31,5 mm;

— basic sieve set plus set 2: 4 mm; 6,3 mm; 8 mm; 10 mm; 12,5 mm; 14 mm; 16 mm; 20 mm, 31,5 mm.

The characteristic sieves between 2mm and 0,063 mm shall be selected from the following sieves: 1 mm; 0,5 mm; 0,25 mm and 0,125 mm.

Tables 1, 2, 3 and 4 specify the grading envelopes for Hot Rolled Asphalt. The target composition of the mix shall be within this grading envelope.

Table 1 — General grading requirements of target composition for base and binder course mixtures — Basic sieve set plus set 1

D	**50/11**	**50/16**	**50/22**	**60/22**	**60/32**
Sieve mm	**Passing sieve** % by mass				
45	–	–	–	–	100
31,5	–	–	100	100	97
22,4	–	100	95	97	59 to 71
16	100	95	74 to 91	39 to 56	39 to 56
11,2	95	76 to 93	44 to 66	–	–
2	35 to 45	35 to 45	35 to 45	32	32
0,5	17 to 45	17 to 45	18 to 44	13 to 32	13 to 32
0,25	10 to 27	10 to 27	11 to 26	9 to 21	9 to 21
0,063	5,5	5,5	4,5	4,0	4,0

Table 2 — General grading requirements of target composition for base and binder course mixtures — Basic sieve set plus set 2

D	**50/10**	**50/14**	**50/20**	**60/20**	**60/32**
Sieve mm	**Passing sieve** % by mass				
40	–	–	–	–	100
31,5	–	–	100	100	99 to 100
20	–	100	99 to 100	99 to 100	59 to 71
14	100	98 to 100	74 to 91	39 to 65[a]	39 to 65[a]
10	98 to 100	72 to 93	44 to 66	–	–
2[b]	40 to 50	40 to 50	40 to 50	37	37
0,5	17 to 51	17 to 51	18 to 50	13 to 39	13 to 39
0,25	14 to 31	14 to 31	15 to 30	10 to 25	10 to 25
0,063	3,0 to 6,0	3,0 to 6,0	4,0 to 5,0	4,0	4,0

[a] The upper compliance value of 65 (target + FPC) can be extended to 85 where evidence is available that the mixture so produced is suitable. To ensure the consistency of the finish of the laid mixture, supplies from any once source should be controlled within the requirements of FPC to the chosen upper target value.

[b] For mixtures containing rock fine aggregate, and in some instances sands or blends of sand and crushed rock fines, the minimum binder content given may be reduced by up to 0,5 %, where experience shows this to be advisable to avoid an over-rich mixture. Alternatively, a reduction in the target passing 2 mm of up to 5 % can be permitted.

Table 3 — General grading requirements of target composition for surface course mixtures — Basic set plus set 1

D	0/4 F	0/4C	15/11F	30/11F	55/11F	55/11C	30/16F	30/16C	35/16F	35/16C	45/16F	45/16C	55/16F	55/16C
Sieve mm	**Passing sieve** % by mass													
22,4	–	–	–	–	–	–	100	100	100	100	100	100	100	100
16	–	–	100	100	100	100	95	95	95	95	96	96	97	97
11,2	–	–	100	95	97	97	67 to 83	67 to 83	62 to 81	62 to 81	52 to 72	52 to 72	42 to 63	42 to 63
8	100	100	82 to 88	67 to 83	42 to 63	42 to 63	–	–	–	–	–	–	–	–
2	90 to 100	95 to 100	81	65	41	38	65	65	61	56	51	48	41	38
0,5	85 to 90	40 to 55	59 to 81	48 to 65	29 to 41	19 to 31	48 to 65	29 to 41	44 to 61	24 to 41	34 to 50	22 to 35	29 to 43	19 to 31
0,25	40 to 75	30 to 40	29 to 71	22 to 58	9 to 31	9 to 31	22 to 58	24 to 36	19 to 51	19 to 31	14 to 42	14 to 31	9 to 31	9 to 31
0,063	14,0	14,0	12,0	9,0 to 11,0	6,0	6,0	9,0	9,0	8,0	8,0	7,0	7,0	6,0	6,0

Table 4 — General grading requirements of target composition for surface course mixtures — Basic set plus set 2

D	0/2 F	0/2C	0/10F	15/10F	30/10F	45/10F	55/10F	55/10C	30/14F	30/14C	35/14F	35/14C	45/14F	55/14F	55/14C
Sieve mm	**Passing sieve** % by mass														
20	–	–	–	–	–	–	–	–	100	100	100	100	100	100	100
14	–	–	100	100	100	100	100	100	93 to 100	93 to 100	95 to 100	95	96 to 100	98 to 100	98 to 100
10	–	–	90 to 100	100	93 to 100	96 to 100	98 to 100	98 to 100	67 to 83	67 to 83	62 to 81	62 to 81	52 to 72	42 to 63	42 to 63
6,3	100	100	73 to 88	82 to 88	67 to 83	52 to 72	42 to 63	42 to 63	–	–	–	–	–	–	–
2	98 to 100	98 to100	63 to 67	79	65	51	41	40	65	66	61	59	51	41	40
0,5	80 to 90	40 to 55	25 to 50	59 to 83	49 to 68	34 to 50	29 to 43	19 to 31	49 to 68	29 to 41	44 to 63	24 to 41	34 to 50	29 to 43	19 to 31
0,25	40 to 65	25 to 35	10 to 30	24 to 61	19 to 51	13 to 38	9 to 31	9 to 31	19 to 51	19 to 36	16 to 46	16 to 26	13 to 38	9 to 31	9 to 31
0,063	14,0	14,0	8,0 to 13,0	12,0	9,0	7,0	6,0	6,0	9,0	9,0	8,0	8,0	7,0	6,0	6,0

For Type F surface course mixtures, the maximum percentage of aggregate passing a 2 mm sieve and retained on a 0,5 mm sieve shall conform to Table 5.

Table 5 — Maximum percentage of aggregate passing 2 mm and retained on 0,5 mm sieves in surface course mixtures

Designation	15/11 F 15/10 F	30/11 F 30/10 F	30/16F 30/14 F	35/16 F 35/14 F	45/16F 45/14F 45/10F	55/11 F 55/10 F	55/16 F 55/14 F
Maximum percentage	18	14	14	13	11	9	9

5.2.3 Minimum binder content

The minimum binder content may be defined in documents related to the application of the product and shall be selected to the nearest 0,1 %, between values of 4,6 % and 11,0 % for a mixture in which the aggregate density is assumed to be equal to 2,65 Mg/m^3.

The selected minimum binder content shall be expressed as B_{minx} where x is the minimum binder content in %.

The minimum binder content of the mixture shall be corrected by multiplying by the factor

$$\alpha = \frac{2{,}650}{\rho} \quad (1)$$

where

ρ is the weighted mean of the particle density of the aggregates at the target grading, in megagrams per cubic metre (Mg/m^3), determined according to the appropriate clause or Annex of EN 1097–6.

The appropriate particle density according to EN 1097-6 shall be declared in the type test report.

NOTE For normal weight aggregates with water absorption less than about 1,5 % the pre-dried particle density method as defined in EN 1097–6:2013, Annex A, is applicable for aggregates passing the 63 mm test sieve and retained on the 0,063 mm test sieve. EN 1097–6:2013, Annex G, is applicable to aggregates passing the 31,5 mm test sieve including the 0/0,063 mm size fraction.

Based on experience in the place of use for certain specific aggregates with particular granulometric characteristics the corrected minimum binder content may be adjusted appropriately. The adjustment shall be defined in documents related to the application of the product.

5.3 Properties

5.3.1 Specimens

For application of this European Standard specimens shall be in accordance with EN 13108-20:2016, 6.5.

5.3.2 Minimum binder volume

The minimum binder volume shall be determined in accordance with EN 12697-8 using the conditions defined in EN 13108-20:2016, D.2.

The range of categories of minimum binder volume at the target composition is defined in Table 6.

The method for determining bulk density shall be selected from EN 13108-20:2016, Table B.4.

In documents related to the application of the product, categories or classes for the minimum binder volume may be defined when appropriate as minimum categories selected from Table 6.

Table 6 — Minimum binder volume, B_{volmin}

Minimum binder volume % by mass	**Category** B_{volmin}
16,0	$B_{volmin16,0}$
15,5	$B_{volmin15,5}$
15,0	$B_{volmin15,0}$
14,5	$B_{volmin14,5}$
14,0	$B_{vominl14,0}$
13,5	$B_{vominl13,5}$
13,0	$B_{volmin13,0}$
12,5	$B_{volmin12,5}$
12,0	$B_{volmin12,0}$
11,5	$B_{vominl11,5}$
11,0	$B_{volmin11,0}$
No requirement	$B_{volminNR}$

When using the binder volume for mix validation at Type Testing stage the equivalent binder content shall be declared in the mix formulation for the purposes of evaluation of conformity during Factory Production Control.

5.3.3 Void content

The range of categories of minimum and maximum void contents is defined in Table 7. The void content shall be determined in accordance with EN 12697-8 using the conditions defined in EN 13108-20:2016, D.2. The compaction of test specimens shall be selected from EN 13108-20:2016, Table C.1.

In documents related to the application of the product, categories or classes for the void content may be defined when appropriate as maximum and minimum categories selected from Table 7.

Table 7 — Void content, V_{min} and/or V_{max}

Void content %	**Minimum void content %**	**Maximum void content %**
	Category V_{min}	**Category** V_{max}
0,5	$V_{min\ 0,5}$	–
1,0	$V_{min\ 1,0}$	–
1,5	$V_{min\ 1,5}$	–
2,0	$V_{min\ 2,0}$	
3,0	$V_{min\ 3,0}$	$V_{max\ 3,0}$
4,0	$V_{min\ 4,0}$	$V_{max\ 4,0}$
5,0	$V_{min\ 5,0}$	$V_{max\ 5,0}$
6,0	$V_{min\ 6,0}$	$V_{max\ 6,0}$
7,0	–	$V_{max\ 7,0}$
8,0	–	$V_{max\ 8,0}$
No requirement	$V_{min\ NR}$	$V_{max\ NR}$

5.3.4 Water sensitivity

The water sensitivity expressed as an Indirect Tensile Strength Ratio or Compression Strength Ratio shall be determined in accordance with EN 12697-12 using the conditions defined in EN 13108-20:2016, D.3.

The range of categories of water sensitivity of specimens is defined in Table 8.

In documents related to the application of the product, categories for the minimum water sensitivity selected from Table 8 may be defined.

Table 8 — Minimum water sensitivity, $ITSR_{min}$ or i/C_{min}

Minimum Water sensitivity %	**Category** $ITSR_{min}$	**Category** i/C_{min}
80	$ITSR_{min80}$	i/C_{min80}
75	$ITSR_{min75}$	i/C_{min75}
70	$ITSR_{min70}$	i/C_{min70}
65	$ITSR_{min65}$	i/C_{min65}
60	$ITSR_{min60}$	i/C_{min60}
No requirement	$ITSR_{minNR}$	i/C_{minNR}

5.3.5 Resistance to permanent deformation

The resistance to permanent deformation, in terms of wheel tracking, shall be determined in accordance with EN 12697-22 using the conditions defined in with EN 13108-20:2016, D.6.

The compaction of test specimens shall be selected from EN 13108-20:2016, Table C.1 where the range between the upper and lower limits selected shall be 2 % based on compaction degree and 3 % based on void content.

The void content of the specimens shall be specified in accordance with EN 13108-20:2016, D.2.

The ranges of categories of resistance to permanent deformation of specimens are defined in one of the Tables 9 or 10. A combination of a requirement from Tables 9 and 10 is not allowed.

In documents related to the application of the product, categories for the resistance to permanent deformation selected from Table 9 or 10 may be defined.

Table 9 — Small size device, procedure A, conditioning in air, maximum wheel-tracking rate, $WTR_{AIR\ max}$

Small size device, procedure A, conditioning in air, maximum wheel-tracking rate microns per load cycle	**Category** $WTR_{AIR\ max}$
5,0	$WTR_{AIR\ max\ 5,0}$
7,5	$WTR_{AIR\ max\ 7,5}$
10,0	$WTR_{AIR\ max\ 10,0}$
12,5	$WTR_{AIR\ max\ 12,5}$
15,0	$WTR_{AIR\ max\ 15,0}$
17,5	$WTR_{AIR\ max\ 17,5}$
20,0	$WTR_{AIR\ max\ 20,0}$
No requirement	$WTR_{AIR\ max\ NR}$

Table 10 — Small size device, procedure A, conditioning in air, maximum rut depth, RD_{AIRmax}

Small size device, procedure A, conditioning in air, maximum rut depth mm	**Category** RD_{AIRmax}
3,0	$RD_{AIRmax3,0}$
5,0	$RD_{AIRmax5,0}$
7,0	$RD_{AIRmax7,0}$
9,0	$RD_{AIRmax9,0}$
11,0	$RD_{AIRmax11,0}$
13,0	$RD_{AIRmax13,0}$
16,0	$RD_{AIRmax16,0}$
No requirement	$RD_{AIRmaxNR}$

5.3.6 Stiffness

The stiffness shall be determined in accordance with EN 12697-26 using the conditions defined in EN 13108-20:2016, D.8.

The compaction of test specimens shall be selected from EN 13108-20:2016, Table C.1 where the range between the upper and lower limits selected shall be 2 % based on compaction degree and 3 % based on void content.

The void content of the specimens shall be specified in accordance with EN 13108-20:2016, D.2.

The ranges of categories of stiffness are defined in Table 11 and/or Table 12.

In documents related to the application of the product, categories or classes for the stiffness selected from Tables 11 and/or Table 12 may be defined.

Table 11 — Minimum stiffness, S_{min}

Minimum stiffness MPa	**Category** S_{min}
21 000	$S_{min21\,000}$
17 000	$S_{min17\,000}$
14 000	$S_{min14\,000}$
11 000	$S_{min11\,000}$
9 000	$S_{min9\,000}$
7 000	$S_{min7\,000}$
5 500	$S_{min5\,500}$
4 500	$S_{min4\,500}$
3 600	$S_{min3\,600}$
2 800	$S_{min2\,800}$
2 200	$S_{min2\,200}$
1 800	$S_{min1\,800}$
1 500	$S_{min1\,500}$
1 200	$S_{min1\,200}$
900	S_{min900}
700	S_{min700}
500	S_{min500}
No requirement	S_{minNR}

Table 12 — Maximum stiffness, S_{max}

Maximum stiffness MPa	**Category** S_{max}
30 000	$S_{max30\ 000}$
25 000	$S_{max25\ 000}$
21 000	$S_{max21\ 000}$
17 000	$S_{max17\ 000}$
14 000	$S_{max14\ 000}$
11 000	$S_{max11\ 000}$
9 000	$S_{max9\ 000}$
7 000	$S_{max7\ 000}$
5 000	$S_{max5\ 000}$
3 000	$S_{max3\ 000}$
2 000	$S_{max2\ 000}$
1 500	$S_{max1\ 500}$
No requirement	S_{maxNR}

5.3.7 Low temperature properties

The maximum failure temperature shall be determined in accordance with EN 12697-46 using the conditions defined in EN 13108-20:2016, D.18.

The compaction of test specimens shall be selected from EN 13108-20:2016, Table C.1 where the range between the upper and lower limits selected shall be 2 % based on compaction degree and 3 % based on void content.

The void content of the specimens shall be specified in accordance with EN 13108-20:2016, D.2.

The range of categories of maximum failure temperature of specimens is defined in Table 13.

In documents related to the application of the product categories for the maximum failure temperature selected from Table 13 may be defined.

Table 13 — Maximum failure temperature, $TSRST_{max}$

Maximum failure temperature °C	**Category** $TSRST_{max}$
−15,0	$TSRST_{max-15,0}$
−17,5	$TSRST_{max-17,5}$
−20,0	$TSRST_{max-20,0}$
−22,5	$TSRST_{max-22,5}$
−25,0	$TSRST_{max-25,0}$
−27,5	$TSRST_{max-27,5}$
−30,0	$TSRST_{max-30,0}$
No requirement	$TSRST_{maxNR}$

5.3.8 Coating and homogeneity

The material when discharged from the mixer shall be homogenous in appearance with the aggregate completely coated with binder, and there shall be no evidence of balling of fine aggregate.

5.3.9 Reaction to fire

Where subject to regulation, the manufacturer shall declare the reaction to fire class according to EN 13501-1:2007+A1:2009, Table 2, according to the test method EN ISO 11925-2.

5.3.10 Resistance to fuel for application on airfields

The resistance to fuel shall be determined according EN 12697-43 using the conditions defined in EN 13108-20:2016, D.11.

The compaction of test specimens shall be selected from EN 13108-20:2016, Table C.1 where the range between the upper and lower limits selected shall be 2 % based on compaction degree and 3 % based on void content.

The range of categories of resistance to fuel of specimens is defined in Table 14.

In documents related to the application of the product categories for the resistance to fuel for application on airfields selected from Table 14 may be defined.

Table 14 — Resistance to fuel, maximum loss of mass, Ci_{max}

Resistance to fuel, maximum loss of mass %	**Category** Ci_{max}
1	Ci_{max1}
2	Ci_{max2}
3	Ci_{max3}
4	Ci_{max4}
5	Ci_{max5}
6	Ci_{max6}
7	Ci_{max7}
8	Ci_{max8}
No requirement	Ci_{maxNR}

5.3.11 Resistance to de-icing fluid for application on airfields

The resistance to de-icing fluids shall be determined according to EN 12697-41 using the conditions defined in EN 13108-20:2016, D.12.

The compaction of test specimens shall be selected from EN 13108-20:2016, Table C.1, where the range between the upper and lower limits of void content selected shall be 2 % based on compaction degree and 3 % based on void content.

The range of categories of resistance to de-icing fluid of specimens is defined in Table 15.

In documents related to the application of the product categories for the resistance to de-icing fluid for application on airfields selected from Table 15 may be defined.

Table 15 — Minimum retained strength, β_{min}

Minimum retained strength %	**Category** β_{min}
100	β_{min100}
85	β_{min85}
70	β_{min70}
55	β_{min55}
No requirement	β_{minNR}

5.4 Temperature of the mixture

The maximum temperature requirements are intended to protect the integrity of the mixture. The maximum temperature requirements apply at any place in the plant and shall be declared.

When using paving grade binder or hard grade binder, the maximum temperature, measured according to EN 12697-13, shall not exceed the limits given in Table 16.

Table 16 — Maximum temperature of the mixture

Grade of binder	Maximum Temperature °C
30/45	195
35/50, 40/60	190
50/70, 70/100	180
100/150	170

When using modified bitumen or multigrade bitumen, additives or premix bitumen, different temperatures may be applicable. These shall then be documented and declared.

The minimum temperature of the mixture at delivery shall be declared. Depending on local conditions and for a specific application the minimum temperature, measured according to EN 12697-13, may be defined in documents related to the application of the product.

5.5 Regulated dangerous substances

When required, products covered by this standard shall comply with relevant regulations on regulated dangerous substances in force in the intended place of use.

In the absence of International or European test methods, manufacturers shall verify and declare the release of dangerous substances in accordance with provisions applicable in the intended place of use of the product.

NOTE An informative database of European and national regulations on dangerous substances is available at the Construction website on EUROPA (accessed through http://ec.europa.eu/enterprise/construction/cpd-ds).

5.6 Conflicting requirements

The overall quality of a Hot Rolled Asphalt mixture can be covered by different combinations of requirements. The selection of requirements and the appropriate values shall be such that conflicting requirements are prevented.

To prevent conflicting requirements of mixtures the following combinations of requirements are not permissible:

— Requirements for binder content combined with requirements for binder volume shall not be recognized as being in conformity with this European Standard.

6 Assessment and verification of constancy of performance — AVCP

The compliance of Hot Rolled Asphalt with the requirements of this standard and with the performances declared by the manufacturer in the Declaration of Performance (DoP) shall be demonstrated by:

— determination of the product type in accordance with EN 13108-20;

— Factory Production Control by the manufacturer, including product assessment in accordance with EN 13108-21.

The result of the product type determination will, for each relevant requirement, be expressed as a numerical value. The numerical value may be presented as a category as given in the standard, a class or a value declared by the manufacturer.

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).

For the purpose of Type Testing, Hot Rolled Asphalt may be grouped into families as described in EN 13108-20 where it is considered that the selected property or properties is or are common to all the mixtures within that family.

7 Identification

The delivery ticket shall contain at least the following information relating to identification:

— manufacturer and mixing plant;

— mix identification code;

— how to obtain the full details demonstrating conformity with this European Standard;

— designation of the mixture;

HRA	grading designation	surf/reg/bin/base	binder

where

HRA	is Hot Rolled Asphalt;
grading designation	from Tables 1 to 4
surf	is surface course;
reg	is regulating course;
base	is base course;
bin	is binder course;
binder	designation of the binder used.

EXAMPLE HRA 30/14F surf 40/60,

Hot Rolled Asphalt containing 30 % of a coarse aggregate with maximum aggregate size of 14 mm and a Type F fine aggregate, used as a surface course with penetration bitumen grade 40/60.

NOTE Information concerning regulatory marking accompanies the product, but characteristics which are not necessarily part of regulatory marking, for example, could be made available by alternative means.

Annex A
(normative)

Calculations of the penetration or the softening point of the binder of a mixture when reclaimed asphalt is used

A.1 General

These calculations shall be applied when paving grade bitumen has been used in the reclaimed asphalt and will be used as added binder.

A.2 Calculation of the penetration of the binder of a mixture

Use the following calculation:

$$a \lg pen_1 + b \lg pen_2 = (a + b) \lg pen_{\text{mix}} \quad \text{(A.1)}$$

where

pen_{mix} is the calculated penetration of the binder in the mixture containing reclaimed asphalt;

pen_1 is the penetration of the binder recovered from the reclaimed asphalt;

pen_2 is the penetration of the added binder;

a and b are the portions by mass of the binder from the reclaimed asphalt (a) and from the added binder (b) in the mixture; $a + b = 1$.

EXAMPLE $pen_1 = 20$; $pen_2 = 90$; $a = 0{,}25$ and $b = 0{,}75$

$0{,}25 \lg 20 + 0{,}75 \lg 90 = \lg pen_{\text{mix}}$

$\lg pen_{\text{mix}} = 1{,}790\,94$; therefore $pen_{\text{mix}} = 62$

The recovery of binder from mixtures for testing shall be performed according to EN 12697-3 or EN 12697-4.

The penetrations of the added binder and the recovered binder shall be determined according to EN 1426.

A.3 Calculation of the softening point of the binder of a mixture

Use the following calculation:

$$T_{\text{R\&B mix}} = a \times T_{\text{R\&B 1}} + b \times T_{\text{R\&B2}} \quad \text{(A.2)}$$

where

$T_{\text{R\&Bmix}}$ is the calculated softening point of the binder in the mixture containing reclaimed asphalt;

$T_{R\&B1}$ is the softening point of the binder recovered from the reclaimed asphalt;

$T_{R\&B2}$ is the softening point of the added binder;

a and *b* are the portions by mass of binder from the reclaimed asphalt (*a*) and from the added binder (*b*) in the mixture; $a + b = 1$.

EXAMPLE $T_{R\&B1} = 62$ °C; $T_{R\&B2} = 48$ °C; $a = 0{,}25$ and $b = 0{,}75$

$T_{R\&Bmix} = 0{,}25 \times 62 + 0{,}75 \times 48 = 51{,}5$ °C

The softening points of the added binder and the recovered binder shall be determined according to EN 1427.

Annex B
(normative)

Natural asphalt

B.1 Scope

This annex specifies requirements for the naturally occurring asphalt and its methods of use.

B.2 Requirements

The refined natural asphalt shall comply with the requirements in either Table B.1, B.2 or B.3.

Table B.1 — High ash content

Properties	Test method	Requirement
Penetration at 25 °C, dmm	EN 1426	0 to 4
Softening point, °C	EN 1427	93 to 99
Solubility, %	EN 12592	52 to 55
Ash content by mass, % by mass	EN 12697–47	35 to 39
Density at 25 °C, g/ml	EN ISO 3838	1,39 to 1,42
NOTE Trinidad Lake asphalt as traditionally supplied meets these requirements.		

Table B.2 — Medium ash content

Properties	Test method	Requirement
Penetration at 25 °C, dmm	EN 1426	0 to 1
Softening point, °C	EN 1427	115 to 120
Solubility, %	EN 12592	83 to 85
Ash content by mass, % by mass	EN 12697–47	15 to 17
Density at 25 °C, g/ml	EN ISO 3838	1,16 to 1,25

Table B.3 — Low ash content

Properties	Test method	Requirement
Penetration at 25 °C, dmm	EN 1426	0 to 1
Softening point, °C	EN 1427	160 to 182
Solubility, %	EN 12592	> 95
Ash content by mass, % by mass	EN 12697–47	0 to 2
Density at 25 °C, g/ml	EN ISO 3838	1,01 to 1,09
NOTE Gilsonite as traditionally supplied meets these requirements.		

B.3 Methods of use

Natural asphalt is blended with paving grade bitumen to EN 12591 or polymer modified bitumen to EN 14023 in varying proportions for use in Mastic Asphalt, Hot Rolled Asphalt, Stone Mastic Asphalt and other bituminous paving mixtures. The penetration grade of the paving grade bitumen and the proportions of the natural asphalt blended with it depend on the traffic and climatic requirements of the finished bituminous layer and shall be selected. The natural asphalt may be heated and combined as a liquid with the paving grade bitumen in a mixing tank prior to use in the mixing plant.

Alternatively, it can be added to the mixer as a powder or as granulate with a particle size not exceeding 12 mm. It can also be extruded or moulded with or without organic, mineral or vegetable additives in the modified bitumen mixtures framework, in order to be added in the mixing tank or directly in the mixer during the asphalt mixing process in the mixing plant.

B.4 Determination of ash content

The ash content of natural asphalt shall be determined using the method described in EN 12697-47.

Annex C
(normative)

Coated chippings for application to Hot Rolled Asphalt surface course

C.1 Scope

This annex specifies requirements for coated chippings for application to Hot Rolled Asphalt surface courses immediately prior to rolling. To enable embedment of the coated chippings, the mixtures to which coated chippings are applied have a nominal course aggregate content of 35 % or less.

C.2 Chippings

Chippings shall be coarse aggregate conforming to 4.3.1. For the majority of applications the upper size *D* of the chippings will be between 20 mm and 8 mm.

NOTE It is important that appropriate categories of resistance to polishing and resistance to abrasion are selected from EN 13043.

C.3 Binder content

Binder used to coat the chippings shall be either 30/45, 35/50 or 40/60 grade complying with EN 12591. The target binder content shall be not less than 1,5 %.

When tested in accordance with EN 12697-37, the proportion of retained sand shall be not less than 4,0 % for $D \geq 16$ mm and 5,0 % for $D < 16$ mm. Not more than 7,5 % shall fail the visual assessment.

C.4 Assessment and verification of constancy of performance

Evaluation of conformity shall be carried out in accordance with Clause 6 excepting that the tolerance for binder content shall be ± 0,3 %.

C.5 Identification

Identification shall be in accordance with Clause 7. The delivery ticket shall contain at least the following additional information relating to identification:

— nominal size, source and PSV of the aggregate.

Annex ZA
(informative)

Relationship of this European Standard with Regulation (EU) No. 305/2011

(When applying this standard as a harmonized standard under Regulation (EU) No. 305/2011, manufacturers and Member States are obliged by this regulation to use this annex.)

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under standardization request M124 Road Construction given to CEN and CENELEC by the European Commission (EC) and the European Free Trade Association (EFTA).

When this European Standard is cited in the Official Journal of the European Union (OJEU), under Regulation (EU) No. 305/2011, it shall be possible to use it as a basis for the establishment of the Declaration of Performance (DoP) and the CE marking, from the date of the beginning of the co-existence period as specified in the OJEU.

Regulation (EU) No. 305/2011, as amended, contains provisions for the DoP and the CE marking.

Table ZA.1 — Relevant clauses for Hot Rolled Asphalt for use on roads, airfields and other trafficked areas

Product: Hot Rolled Asphalt **Intended use:** For use on roads, airfields and other trafficked areas.			
Essential Characteristics	**Clauses in this and other European Standard(s) related to essential characteristics**	**Classes and/or threshold levels**	**Notes**
Adhesion of binder to aggregate	5.3.3 Void content	–	Declared minimum or maximum category, class or numerical value
	5.2.3 Target binder content	–	Declared value
	5.3.4 Water sensitivity	–	Declared minimum category or numerical value
	5.4 Temperature of the mixture	–	Declared maximum category and declared minimum value
Stiffness	5.2.2 Target Grading	–	Declared values
	5.2.3 Target binder content	–	Declared value
	5.3.1 Void content	–	Declared minimum or maximum category, class or numerical value
	5.4 Temperature of the mixture	–	Declared maximum category and declared minimum value
	5.3.6 Stiffness	–	Declared minimum or maximum category, class or numerical value

Product: Hot Rolled Asphalt **Intended use:** For use on roads, airfields and other trafficked areas.			
Essential Characteristics	**Clauses in this and other European Standard(s) related to essential characteristics**	**Classes and/or threshold levels**	**Notes**
Resistance to permanent deformation	5.2.2 Target Grading	–	Declared values
	5.2.3 Target binder content	–	Declared value
	5.3.3 Void content	–	Declared minimum or maximum category, class or numerical value
	5.4 Temperature of the mixture	–	Declared maximum category and declared minimum value
	5.3.5 Resistance to permanent deformation	–	Declared maximum category or numerical value
Resistance to Fatigue	5.3.3 Void content	–	Declared minimum or maximum category, class or numerical value
	5.4 Temperature of the mixture	–	Declared maximum category and declared minimum value
	5.2.3 Target binder content	–	Declared value
Skid Resistance	5.2.2 Target Grading	–	Declared value
	5.2.3 Target binder content	–	Declared value
	5.3.3 Void content	–	Declared minimum or maximum category, class or numerical value
Resistance to abrasion	5.2.2 Target Grading	–	Declared value
	5.2.3 Target binder content	–	Declared value
Reaction to fire[a]	5.3.9 Fire class	$A1_{FL}$ to F_{FL}	Declared class
Durability of the above characteristics against ageing, weathering, oxidation, wear, ravelling, chemicals, wear of studded tyres, stripping, ...as relevant	All above mentioned requirements are related to durability.	–	Declared
	5.3.2 Binder volume	–	Minimum Category
	5.3.7 Low temperature property	–	Declared maximum category or numerical value
	5.3.10 Resistance to fuel for application on airfields	–	Declared category or numerical value
	5.3.11 Resistance to de-icing fluids for application on airfields	–	Declared minimum category or numerical value
[a] Relevant only for Soft Asphalt intended for uses subject to reaction to fire regulations.			

ZA.2 Procedure for AVCP of Hot Rolled Asphalt

The AVCP systems of Hot Rolled Asphalt indicated in Table ZA.1, can be found in the EC legal acts adopted by the EC decision 1998/601/EC of 13 October 1998 (OJ L 287; p. 41) amended by the Commission decision 2001/596/EC of 8 January 2001 (OJ L 209; p. 33).

Micro-enterprises are allowed to treat products under AVCP system 3 covered by this standard in accordance with AVCP system 4, applying this simplified procedure with its conditions, as foreseen in Article 37 of Regulation (EU) No. 305/2011.

ZA.3 Assignment of AVCP tasks

The AVCP systems of Hot Rolled Asphalt as provided in Table ZA.1 are defined in Tables ZA.3.1 to ZA.3.3 resulting from application of the clauses of this or other European Standards indicated therein. The content of the tasks assigned to the notified body shall be limited to those essential characteristics, if any, as provided for in Annex III of the relevant standardization request and to those that the manufacturer intends to declare.

Taking into account the AVCP systems defined for the products and the intended uses the following tasks are to be undertaken by the manufacturer and the notified body respectively for the assessment and verification of the constancy of performance of the product.

Table ZA.3.1 — Systems of AVCP

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	EN 13108–21
	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 except reaction to fire	EN 13108–20
	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	EN 13108–21
Tasks for the notified product certification body	determination of the product type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product	Reaction to fire	EN 13501-11:2007+A1:2009, Table 2 and EN ISO 11925-2
	Initial inspection of manufacturing plant and of FPC	Parameters related to essential characteristic of Table ZA.1, relevant for the intended use which is declared, namely reaction to fire. Documentation of the FPC.	EN 13108–21
	Continuous surveillance, assessment and evaluation of FPC	Parameters related to essential characteristic of Table ZA.1, relevant for the intended use which is declared, namely reaction to fire. Documentation of FPC	EN 13108–21
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 is declared, except reaction to fire. Documentation of the FPC.	EN 13108–21
	Continuous surveillance, assessment and evaluation of FPC	Parameters related to essential characteristics of Table ZA.1, relevant for the intended use which is declared, except reaction to fire. Documentation of the FPC.	EN 13108–21

Table ZA.3.2 — Assignment of AVCP tasks for Hot Rolled Asphalt under system 2+ and subject to reaction to fire under system 3

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	EN 13108–21
	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 except reaction to fire	EN 13108–20
	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	EN 13108–21
Tasks for a notified testing laboratory	Determination of the product-type on the basis of type testing (based on sampling carried out by the manufacturer), type calculation, tabulated values or descriptive documentation of the product	Reaction to fire	EN 13501-11:2007+A1:2009, Table 2 and EN ISO 11925-2
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 is declared. Documentation of the FPC.	EN 13108–21
	Continuous surveillance, assessment and evaluation of FPC	Parameters related to essential characteristics of Table ZA.1, relevant for the intended use which is declared. Documentation of the FPC.	EN 13108–21

Table ZA.3.3 — Assignment of AVCP tasks for Hot Rolled Asphalt under system 2+ and subject to reaction to fire under system 4

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 is declared	EN 13108–21
	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 is declared	EN 13108–20
	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 is declared	EN 13108–21
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 is declared. Documentation of the FPC.	EN 13108–21
	Continuous surveillance, assessment and evaluation of FPC	Parameters related to essential characteristics of Table ZA.1, relevant for the intended use which is declared. Documentation of the FPC.	EN 13108–21

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