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Bitumenske zmesi - Specifikacije materialov - 5. del: Drobir z bitumenskim mastiksom

Bituminous mixtures - Material specifications - Part 5: Stone Mastic Asphalt

Asphaltnischgut - Mischgutanforderungen - Teil 5: Splittmastixasphalt

Mélanges bitumineux - Spécifications des matériaux - Partie 5: Béton bitumineux grenu à forte teneur en mastic

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EUROPEAN STANDARD

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Bituminous mixtures - Material specifications - Part 5: Stone Mastic Asphalt

Mélanges bitumineux - Spécifications des matériaux -
Partie 5: Béton bitumineux grenu à forte teneur en
mastic

Asphaltemischgut - Mischgutanforderungen - Teil 5:
Splittmastixasphalt

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

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EN 13108-5:2016 (E)**European foreword**

This document (EN 13108-5:2016) 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of an identical text or by endorsement, at the latest by December 2016, and conflicting national standards shall be withdrawn at the latest by March 2018.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 13108-5:2006.

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 13108-5:2006, the following changes have been made:

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- a) a fundamental approach has been added and merged with the empirical approach into one list with different properties;
 - b) new properties introduced (stiffness, fatigue, saturation, tensile stiffness conditioning test, low temperature properties, fracture toughness, friction after polishing);
 - c) for several properties additional categories are introduced;
 - d) possibility to define specific conditions in documents related to the application of the product;
 - e) 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.

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.

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Introduction

The aim of this European Standard is to enable specification of Stone Mastic Asphalt on a performance basis. In general, however, there are currently more empirical tests available to describe the mixtures. Depending on the experience with the combination of requirements in this European standard more or less degrees of freedom for the producer may be given.

This European Standard covers a large variety of materials for different applications, traffic and climate conditions. EN 13108-5 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.

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1 Scope

This European Standard specifies requirements for mixtures of the mix group Stone Mastic Asphalt for use on roads, airfields and other trafficked areas. Stone Mastic Asphalt is mainly to be used for surface courses. Stone Mastic Asphalt can also be used for regulating and binder courses.

The mixtures of the mix group Stone Mastic 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 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 12697-16, *Bituminous mixtures — Test methods for hot mix asphalt — Part 16: Abrasion by studded tyres*

EN 12697-18, *Bituminous mixtures — Test methods for hot mix asphalt — Part 18: Binder drainage*

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

EN 12697-24, *Bituminous mixtures — Test methods for hot mix asphalt — Part 24: Resistance to fatigue*

EN 12697-25, *Bituminous mixtures — Test methods for hot mix asphalt — Part 25: Cyclic compression test*

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

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 12697-44, *Bituminous mixtures — Test methods for hot mix asphalt — Part 44: Crack propagation by semi-circular bending test*

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

EN 12697-49, *Bituminous mixtures — Test methods for hot mix asphalt — Part 49: Determination of friction after polishing*

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

EN 13108-4:2016, *Bituminous mixtures — Material specifications — Part 4: Hot Rolled Asphalt*

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

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)*

ISO 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

3 Terms and 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

structural element of a pavement constructed with a single material

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

3.1.4 surface course

upper course of a pavement which is in contact with the traffic

3.1.5 binder course

structural course of pavement between the surface course and the base

3.1.6 regulating course

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

3.1.7 base

main structural element of a pavement

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

3.1.8 asphalt

homogenous mixture typically of coarse and fine aggregates, filler aggregate and bituminous binder which is used in the construction of flexible pavement layers

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 Stone Mastic Asphalt

gap-graded asphalt mixture with bitumen as a binder, composed of a coarse crushed aggregate skeleton bound with a mastic mortar

3.1.11 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 3.1.12 and 3.1.13).

EN 13108-5:2016 (E)**3.1.12****input target composition**

expression of the mix formulation in terms of the constituent materials, the grading curve and the percentage of binder added to the mixture

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

3.1.13**output target composition**

expression of the mixture formulation in terms of the constituent materials and the midpoint grading and soluble binder content to be found on analysis

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

3.1.14**additive**

constituent material, which can be added in small quantities to the mixture, e.g. inorganic or organic fibres or polymers for improvement of the mechanical properties, the workability or the colour 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.

3.1.15**conflicting requirements**

combination of requirements or properties which are impossible 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, or when two or more performance or test parameters are selected which measure similar properties using contradictory test methods resulting in a lack of clarity and consistency in the characteristics of the mixture.

3.1.16**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

3.1.17**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 $B_{\min} 5,0$ means that the minimum binder content shall be 5,0 %.

Note 2 to entry: Defined categories for each property are listed in EN 13108-5.

3.1.18**class**

range of levels defined by a minimum and a maximum value

3.2 Symbols and abbreviations

SMA general designation of Stone Mastic Asphalt

SMA *D* designation of Stone Mastic Asphalt followed by an indication of *D*, the upper sieve size of the aggregate in the mixture, in millimetres (mm)

EXAMPLE SMA 8 Stone Mastic Asphalt with an upper sieve size of the aggregate of 8 mm.

4 Requirements for constituent materials

4.1 General

Only constituent materials with established suitability shall be used. For all constituent materials the relevant properties 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

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4.2.1 General

The binder shall be a paving grade bitumen, a polymer modified bitumen or a blend of one of them with natural asphalt. The paving grade bitumen shall conform to EN 12591 and the polymer modified bitumen to EN 14023. When natural asphalt is used, it shall conform to EN 13108-4:2016, Annex B.

Premixed binders that are not covered by EN 12591 or EN 14023 may be used provided that information is given as stated in 4.1, and that the base bitumen is conforming to EN 12591 or EN 14023. 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 grade of the bitumen, the type and grade of polymer modified bitumen and the amount and category of natural asphalt may be defined in documents related to the application of the product.

In case of a paving grade bitumen the grade shall be selected from the grades between 30/45 and 330/430 inclusively.

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

NOTE EN 14023 for polymer modified bitumen is a framework for classification and is only meant to characterize the modified bitumen. The polymer modified bitumen specifications are not performance based.