SLOVENSKI STANDARD
SIST EN 12697-2:2015+A1:2019

01-oktober-2019

Nadomešča:
SIST EN 12697-2:2015

Bitumenske zmesi - Preskusne metode - 2. del: Ugotavljanje zrnavosti

Bituminous mixtures - Test methods - Part 2: Determination of particle size distribution

Asphalt - Prüfverfahren - Teil 2: Korngrößenverteilung

Mélanges bitumineux - Méthodes d'essai - Partie 2 : Granulométrie

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Ta slovenski standard je istoveten z: EN 12697-2:2015+A1:2019

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ICS:

93.080.20 Materiali za gradnjo cest Road construction materials

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2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12697-2:2015+A1

August 2019

ICS 93.080.20

Supersedes EN 12697-2:2015

English Version

Bituminous mixtures - Test methods - Part 2: Determination of particle size distribution

Mélanges bitumineux - Méthodes d'essai - Partie 2 : Granulométrie

Asphalt - Prüfverfahren - Teil 2: Korngrößenverteilung

This European Standard was approved by CEN on 19 March 2015 and includes Amendment 1 approved by CEN on 6 November 2018.

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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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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 12697-2:2015+A1:2019) has been prepared by Technical Committee CEN/TC 227 “Road materials”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by February 2020 and conflicting national standards shall be withdrawn at the latest by February 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document includes Amendment 1 approved by CEN on 6 November 2018.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟦A1⟩ ⟨A1⟧.

This document supersedes ⟦A1⟩ EN 12697-2:2015 ⟨A1⟧.

⟦A1⟩ The significant changes made in EN 12697-2:2015+A1:2019 compared to EN 12697-2:2015 are:

— [title] the series title no longer makes the method exclusively for hot mix asphalt;

— [European foreword] the list of significant changes is updated and the list of standards of the EN 12697 series is replaced with a general reference to the CEN website. ⟨A1⟧

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⟦A1⟩ A list of all parts in the EN 12697 series can be found on the CEN website. ⟨A1⟧

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1 Scope

This European Standard specifies a procedure for the determination of the particle size distribution of the aggregates of bituminous mixtures by sieving. The test is applicable to aggregates recovered after binder extraction in accordance with EN 12697-1 or EN 12697-39.

The applicability of this European Standard is described in the product standards for bituminous mixtures.

NOTE Fibres, solid (non-soluble during extraction) additives and (some) binder modifiers influence the test result.

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 932-6, *Tests for general properties of aggregates — Part 6: Definitions of repeatability and reproducibility*

EN 933-1, *Tests for geometrical properties of aggregates — Part 1: Determination of particle size distribution — Sieving method*

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EN 12697-1, *Bituminous mixtures — Test methods for hot mix asphalt — Part 1: Soluble binder content*

EN 12697-39, *Bituminous mixtures — Test methods for hot mix asphalt — Part 39: Binder content by ignition*

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ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

ISO 3310-2, *Test sieves — Technical requirements and testing — Part 2: Test sieves of perforated metal plate*

3 Terms and definitions

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

3.1
particle size distribution
portion of aggregate on specified sieves expressed as cumulative percentages by mass passing those sieves

3.2
D
upper sieve size of the aggregate in the bituminous mixture in millimetre (mm) according to the relevant material specification standard

4 Significance and use

The composition of a bituminous mixture in terms of binder content and aggregates grading is a significant quality parameter. The European Standard for bituminous mixtures contains some grading

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specifications. Controlling the mixture grading is an important instrument for product quality management.

5 Principle

The test consists of the determination of the particle size distribution of the aggregates in the bituminous mixture by sieving and weighing. A granulometric analysis of the aggregate is performed after binder extraction.

6 Apparatus

6.1 Unless stated otherwise, the apparatus as required in EN 933-1 shall be used.

6.2 Sieves with aperture size up to and including 2,8 mm shall be in accordance with ISO 3310-1.

6.3 Sieves with aperture size of 4 mm and larger shall be in accordance ISO 3310-2.

7 Sample preparation

The test shall be carried out on the material recovered after completion of the test as specified in EN 12697-1 or EN 12697-39.

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It should be ensured visually that all aggregate is recovered from the mixture and that no binder remained adhering.

The recovered aggregate shall be dried to constant mass. Particles shall be separated completely.

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NOTE 1 "Constant mass" is defined as successive weighings after drying at least 1 h apart not differing by more than 0,1 %.

NOTE 2 Other regimes for achieving constant mass can be used provided that they can demonstrate that they give the same results as drying at (110 ± 5) °C.

8 Procedure

The test shall be carried out on the aggregate according to EN 933-1. When less material to be tested is available than required in this European Standard, the total amount of material available shall be tested. However the minimum amount of material shall be the lesser of 50 *D* g and 1 000 g.

When the aggregate is visually greasy after carrying out the test in accordance with EN 12697-1, a decrement of the surface tension may be required by adding some peptizing additive.

When this test is carried out after a binder extraction procedure in which a sieving stage is incorporated containing the applicable sieves, and when the aggregate is thoroughly washed during the execution of test EN 12697-1, or when the aggregate remains from EN 12697-39, the particle size distribution may be determined by dry sieving only. However, where the proportion of material passing the 0,063 mm sieve remaining with the aggregate is found to be greater than 1,0 % of the total aggregate, the particle size distribution shall be re-determined after washing the aggregate.

If the aggregate has already been washed, the effectiveness of re-washing should be considered.

〚A1〉 *deleted text* 〈A1〛

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9 Calculation

The calculation shall be in accordance with EN 933-1.

Where the binder content of the bituminous mixture is determined by difference, the total mass of the material passing 0,063 mm shall be obtained by adding the mass of the material recovered from the centrifuge or filter apparatus to the mass of the aggregate passing 0,063 mm in the particle size distribution.

Where the binder content of the bituminous mixture is determined directly, the total mass of the material passing 0,063 mm shall be calculated as follows:

$$M_F = M - M_W - M_B - M_C \quad (1)$$

where

M_F is the total mass of material passing 0,063 mm sieve, in grams (g);

M is the total mass of un-dried sample, in grams (g);

M_W is the mass of water, in grams (g);

M_B is the mass of total binder, in grams (g);

M_C is the mass of material retained on the 0,063 mm sieve, in grams (g).

10 Report

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The test report shall include at least the following information:

a) reference to this European Standard;

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b) identification of the laboratory;

c) identification of the specimen;

d) particle size distribution by mass for all portions to nearest whole percentages, however the mass on 0,063 mm to nearest single decimal place;

e) 〚A1〛 *deleted text* 〚A1〛

f) date of the test.

11 Precision

The precision data of this test are as follows:

	Standard deviation	Precision
Repeatability	σ_r = 0,4 %	r = 1,0 %
Reproducibility	σ_R = 0,6 %	R = 1,7 %

where

r is the repeatability limit under repeatability r conditions according to EN 932-6:

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$r = 2{,}77 \times \sigma_r$

R is the reproducibility limit under reproducibility R conditions according to EN 932-6: $R = 2{,}77 \times \sigma_R$

σ_r the standard deviation of the test results obtained under repeatability conditions according to EN 932-6 (the repeatability standard deviation)

σ_R the standard deviation of the test results obtained under reproducibility conditions according to EN 932-6 (the reproducibility standard deviation)

NOTE The precision data as mentioned are estimated from Dutch investigations. The comparable sieving test for aggregates (EN 933-1) does not mention precision data.

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