



SLOVENSKI STANDARD
SIST EN 12697-2:2004+A1:2007

01-november-2007

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Bituminous mixtures - Test method for hot mix asphalt - Part 2: Determination of particle size distribution

Asphalt - Prüfverfahren für Heiasphalt - Teil 2: Korngrenverteilung

Mlanges bitumineux - Mthodes d'essai pour mlange hydrocarbon a chaud - Partie 2: Granulomtrie

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ICS:

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English Version

Bituminous mixtures - Test method for hot mix asphalt - Part 2:
Determination of particle size distribution

Mélange bitumineux - Méthodes d'essai pour mélange
hydrocarboné à chaud - Partie 2: Granulométrie

Asphalt - Prüfverfahren für Heiasphalt - Teil 2:
Korngrenverteilung

This European Standard was approved by CEN on 1 August 2002 and includes Amendment 1 approved by CEN on 16 May 2007.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document (EN 12697-2:2002+A1:2007) 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of an identical text or by endorsement, at the latest by January 2008 and conflicting national standards shall be withdrawn at the latest by January 2008.

This document includes Amendment 1, approved by CEN on 2007-05-16.

This document supersedes EN 12697-2:2002.

The start and finish of text introduced or altered by amendment is indicated in the text by tags $\boxed{A1}$ $\boxed{A1}$.

This European Standard is one of a series of standards as follows:

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

EN 12697-2, *Bituminous mixtures — Test methods for hot mix asphalt — Part 2: Determination of particle size distribution*

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

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

EN 12697-5, *Bituminous mixtures — Test methods for hot mix asphalt — Part 5: Determination of the maximum density*

EN 12697-6, *Bituminous mixtures — Test methods for hot mix asphalt — Part 6: Determination of bulk density of bituminous specimens*

EN 12697-7, *Bituminous mixtures — Test methods for hot mix asphalt — Part 7: Determination of bulk density of bituminous specimens by gamma rays*

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

EN 12697-9, *Bituminous mixtures — Test methods for hot mix asphalt — Part 9: Determination of the reference density*

EN 12697-10, *Bituminous mixtures — Test methods for hot mix asphalt — Part 10: Compactibility*

EN 12697-11, *Bituminous mixtures — Test methods for hot mix asphalt — Part 11: Determination of the affinity between aggregate and bitumen*

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 12697-14, *Bituminous mixtures — Test methods for hot mix asphalt — Part 14: Water content*

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- EN 12697-15, *Bituminous mixtures — Test methods for hot mix asphalt — Part 15: Determination of the segregation sensitivity*
- EN 12697-16, *Bituminous mixtures — Test methods for hot mix asphalt — Part 16: Abrasion by studded tyres*
- EN 12697-17, *Bituminous mixtures — Test methods for hot mix asphalt — Part 17: Particle loss of porous asphalt specimen*
- EN 12697-18, *Bituminous mixtures — Test methods for hot mix asphalt — Part 18: Binder drainage*
- EN 12697-19, *Bituminous mixtures — Test methods for hot mix asphalt — Part 19: Permeability of specimen*
- EN 12697-20, *Bituminous mixtures — Test methods for hot mix asphalt — Part 20: Indentation using cube or Marshall specimens*
- EN 12697-21, *Bituminous mixtures — Test methods for hot mix asphalt — Part 21: Indentation using plate specimens*
- EN 12697-22, *Bituminous mixtures — Test methods for hot mix asphalt — Part 22: Wheel tracking*
- EN 12697-23, *Bituminous mixtures — Test methods for hot mix asphalt — Part 23: Determination of the indirect tensile strength of bituminous specimens*
- 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*
- EN 12697-26, *Bituminous mixtures — Test methods for hot mix asphalt — Part 26: Stiffness*
- EN 12697-27, *Bituminous mixtures — Test methods for hot mix asphalt — Part 27: Sampling*
- EN 12697-28, *Bituminous mixtures — Test methods for hot mix asphalt — Part 28: Preparation of samples for determining binder content, water content and grading*
- EN 12697-29, *Bituminous mixtures — Test methods for hot mix asphalt — Part 29: Determination of the dimensions of bituminous specimen*
- EN 12697-30, *Bituminous mixtures — Test methods for hot mix asphalt — Part 30: Specimen preparation by impact compactor*
- EN 12697-31, *Bituminous mixtures — Test methods for hot mix asphalt — Part 31: Specimen preparation by gyratory compactor*
- EN 12697-32, *Bituminous mixtures — Test methods for hot mix asphalt — Part 32: Laboratory compaction of bituminous mixtures by vibratory compactor*
- EN 12697-33, *Bituminous mixtures — Test methods for hot mix asphalt — Part 33: Specimen preparation by roller compactor*
- EN 12697-34, *Bituminous mixtures — Test methods for hot mix asphalt — Part 34: Marshall test*
- EN 12697-35, *Bituminous mixtures — Test methods for hot mix asphalt — Part 35: Laboratory mixing*
- EN 12697-36, *Bituminous mixtures — Test methods for hot mix asphalt — Part 36: Determination of the thickness of a bituminous pavement*
- 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 12697-38, *Bituminous mixtures — Test methods for hot mix asphalt — Part 38: Common equipment and calibration*

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

EN 12697-40, *Bituminous mixtures — Test methods for hot mix asphalt — Part 40: In situ drainability*

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

EN 12697-42, *Bituminous mixtures — Test methods for hot mix asphalt — Part 42: Amount of coarse foreign matters in reclaimed asphalt*

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

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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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.

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

This European Standard incorporates by dated or undated references, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to, or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 933-1:1997, *Tests for geometrical properties of aggregates - Part 1: Determination of particle size distribution - Sieving method.*

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

EN 12697-39 ^[A1] deleted text ^[A1], *Bituminous mixtures - Test methods for hot mix asphalt - [A1] Part 39: Binder content by ignition [A1].*

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 European Standard 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 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 A1 *deleted text* A1.

NOTE 1 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.

NOTE 2 "Constant mass" is obtained when the change of mass of the aggregate between two determinations at an interval of at least 30 min at a temperature of (110 ± 5) °C is less than 0,1 %.

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 50 D 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 peptising additive.

A1 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 by washing the aggregate. A1

9 Calculation

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

A1 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.