



SLOVENSKI STANDARD

SIST EN 12697-17:2004+A1:2007

01-november-2007

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Bituminous mixtures - Test methods for hot mix asphalt - Part 17: Particle loss of porous asphalt specimen

Asphalt - Prüfverfahren für Heiasphalt - Teil 17: Kornverlust von Probekpern aus offenporigem Asphalt

Mlanges bitumineux - Mthodes d'essai pour mlange hydrocarbon a chaud - Partie 17: Perte de matriau des prouvettes d'enrob drainant

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Ta slovenski standard je istoveten z: EN 12697-17:2004+A1:2007

ICS:

93.080.20 Materiali za gradnjo cest Road construction materials

SIST EN 12697-17:2004+A1:2007 en,fr,de

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English Version

Bituminous mixtures - Test methods for hot mix asphalt - Part
17: Particle loss of porous asphalt specimen

Mélanges bitumineux - Méthodes d'essai pour mélange
hydrocarboné à chaud - Partie 17: Perte de matériau des
éprouvettes d'enrobé drainant

Asphalt - Prüfverfahren für Heiasphalt - Teil 17:
Kornverlust von Probekpern aus offenporigem Asphalt

This European Standard was approved by CEN on 1 April 2004 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.

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Contents

page

Foreword.....	3
1 Scope	6
2 Normative references	6
3 Apparatus	6
4 Preparation of test specimen	6
5 Procedure	7
6 Calculation.....	7
7 Test report	8
8 Precision	8

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Foreword

This document (EN 12697-17:2004+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 12697-17:2004.

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

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

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

EN 12697-2, *Bituminous mixtures — Test method 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: Compactability*

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*
- 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 method for hot mix asphalt — Part 29: Determination of the dimensions of a 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 prepared 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 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 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 describes a test method for determining the particle loss of porous asphalt mixtures. Particle loss is assessed by the loss of mass of porous asphalt samples after turns in the Los Angeles machine. This test enables the estimation of the abrasiveness of porous asphalt. The test applies to laboratory compacted porous asphalt mixtures the upper sieve size of which does not exceed 25 mm. It does not reflect the abrasive effect by studded tyres.

2 Normative references

This European Standard incorporates by dated or undated reference, 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 1097-2, *Tests for mechanical and physical properties of aggregates — Part 2: Methods for the determination of resistance to fragmentation*

^[A1] EN 12697-6:2003+A1 ^[A1], *Bituminous mixtures - Test methods for hot mix asphalt - Part 6: Determination of bulk density of bituminous specimens.*

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

^[A1] EN 12697-30:2004+A1 ^[A1], *Bituminous mixtures - Test methods for hot mix asphalt - Part 30: Specimen preparation, impact compactor.*

EN 12697-31, *Bituminous mixtures - Test methods for hot mix asphalt - Part 31: Specimen preparation by gyratory compactor.*

^[A1] EN 12697-35:2004+A1, *Bituminous mixtures - Test methods for hot mix asphalt - Part 35: Laboratory mixing.* ^[A1]

3 Apparatus

3.1 Los-Angeles-machine, as specified in EN 1097-2.

3.2 Thermometer, capable of covering the test temperature range with an accuracy of $\pm 0,5$ °C.

3.3 Chamber, room or enclosure, large enough for the Los-Angeles-machine. During the test, the air temperature in the chamber shall remain constant to the test temperature ± 2 °C. The air temperature shall be measured near the Los-Angeles-machine.

3.4 Oven, equipped with a closed ventilation system or a chamber fitted with a thermostatic control to maintain the test temperature constant in vicinity to the samples, stored prior to the test, to ± 1 °C.

3.5 Balances, of suitable capacity for the mass to be weighed with an accuracy of $\pm 0,1$ g.

4 Preparation of test specimen

4.1 At least five specimens shall be prepared for each sample tested.

4.2 The cylindrical specimens shall have a diameter of (100 ± 3) mm and a height of $(63,5 \pm 5,0)$ mm. A_1 The asphalt shall be mixed in accordance with EN 12697-35:2004+A1 and specimens compacted A_1 as specified in A_1 EN 12697-30:2004+A1 A_1 , compacted by 2×50 blows, or EN 12697-31, compacted by 40 gyrations.

NOTE The compaction method has an influence on the result.

4.3 After the specimens have been compacted and removed from the mould, their density and void content, if required, shall be determined in accordance with A_1 EN 12697-6:2003+A1 A_1 (Procedure D: bulk density by dimensions) and EN 12697-8.

4.4 Prior to testing, the specimens shall be stored on a flat surface for at least 2 days at a temperature of not more than 25 °C.

5 Procedure

5.1 The test temperature shall be defined and maintained in the chamber during the test with an uncertainty of ± 2 °C. Before testing, specimens shall be kept at the test temperature for at least 4 h.

NOTE Test temperature has a very large influence on the test result. Temperatures between 15 °C and 25 °C are usually used for design purposes. For porous asphalt in cold climate zones, temperatures representing the low temperature local conditions can also be used. The test is not adequate for temperatures above 35 °C.

5.2 The mass of specimen shall be determined and W_1 (see clause 6) shall be recorded. One specimen shall then be placed inside the Los Angeles machine drum and, with the metal balls removed, the drum shall be turned at 3,1 rad/s to 3,5 rad/s (30 rpm to 33 rpm) for 300 turns.

5.3 When the test is completed, the specimen shall be removed from the machine, slightly cleaned by means of a cloth eliminating particles that are clearly loose, and weighed again. The reading W_2 (see clause 6) shall be recorded.

5.4 The test shall be repeated in the same way for each of the specimens prepared according to clause 4.

NOTE Observation as to whether the fractures occur within the stone particles, in the binder film or at the boundaries between the stone particles and the binder can indicate the type of failure which can be used to redesign the mixture in order to improve this property. These observations can be included in the test report.

6 Calculation

6.1 The particle loss PL shall be calculated for each specimen test using the following equation:

$$PL = 100 \times \frac{(W_1 - W_2)}{W_1} \quad (1)$$

where

PL is the value of particle loss, in per cent (%);

W_1 is the initial specimen mass, in grams (g);

W_2 is the final specimen mass, in grams (g).

6.2 The result shall be given as average value of five single values. The result shall be rounded to the nearest 1 %.

6.3 If required, the density and voids of the samples as well as the test temperature shall be included in the test report.