SLOVENSKI STANDARD
SIST EN 12697-37:2022

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Bitumenske zmesi - Preskusne metode - 37. del: Preskus sprijemanja veziva s posipom iz drobirja za asfaltiranje z vročim peskom (HRA)

Bituminous mixtures - Test methods - Part 37: Hot sand test for the adhesivity of binder on pre-coated chippings for Hot-Rolled-Asphalt (HRA)

Asphalt - Prüfverfahren - Teil 37: Prüfung des Haftvermögens eines Bindemittels auf vorumhülltem Splitt für Hot-Rolled-Asphalt (HRA) mittels heißem Sand

Mélanges bitumineux - Méthodes d’essai - Partie 37 : Essai au sable chaud pour l’adhérence du liant sur des gravillons pré-enrobés pour Hot-Rolled Asphalt (HRA)

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ICS:

93.080.20	Materiali za gradnjo cest	Road construction materials

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EUROPEAN STANDARD

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Supersedes EN 12697-37:2003

English Version

Bituminous mixtures - Test methods - Part 37: Hot sand test for the adhesivity of binder on pre-coated chippings for Hot-Rolled-Asphalt (HRA)

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This European Standard was approved by CEN on 21 February 2022.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 12697-37:2022) 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of an identical text or by endorsement, at the latest by October 2022, and conflicting national standards shall be withdrawn at the latest by October 2022.

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 supersedes EN 12697-37:2003.

The main changes compared to the previous edition are listed below:

— the title no longer refers to hot mix asphalt;

— the title completed with "Hot-Rolled Asphalt". The abbreviation "HRA" placed within brackets;

— general editorial update according to current standard template;

— European Foreword, deletion of paragraph "The applicability of this European Standard is described in prEN 13108-4";

— deletion of reference to EN 13043. Correction of titles for EN 12697-27 and EN 12697-28;

— Clause 3, deletion of terms and definitions 3.1 to 3.9. Terms and definitions given in EN 12697-27 and EN 12697-28 are applied in relevant paragraphs;

— Clause 4, revision of NOTE to normal text;

— Clause 5, completion of left column heading in Table 1 to read "Test sieve aperture size";

— 6.2, replacement of "accuracy" with "maximum permissible error";

— 6.4, replacement of "accuracy" with "maximum permissible error";

— 6.5, replacement of sieve "350 mm" with sieve "300 mm";

— Clause 7, alteration of title to read "Sampling and preparation of test portions".

— 7.1, alteration of title to read "Sampling". Clarification of paragraph;

— 7.2, alteration of title to read "Preparation of test portion". Clarification of paragraph;

— 7.2, reference to EN 12697-28:2000, 4.5 deleted;

— 7.3 to 7.12, renumbered to 8.1 to 8.10;

— 7.13, deletion of paragraph. NOTE 1 and NOTE 2 amended to normal text and placed under 8.10;

— Clause 8, alteration of title to read "Procedure". Former Clause 8 renumbered to Clause 9;

— 8.1 (7.3 in previous version), correction of description of sieve sizes. Unit changed to "mm";

— 8.6 (7.8 in previous version), deletion of superfluous text “ensuring that the sand temperature is not less than 100 °C;

— 8.7 (7.9 in previous version), correction of description of sieve sizes. Unit changed to “mm”;

— 8.10 (7.13 in previous version), NOTE 1 and NOTE 2 amended to normal text”;

— Clause 9 (Clause 8 in previous version), alteration of title to read “Calculation and expression of results”;

— 9.1 (8.1 in previous version), equations adjusted and completed with keys and numbered;

— 9.2, (8.2 in previous version), equations adjusted and completed with keys and numbered;

— Clause 10 (Clause 9 in previous version), revision of the order and data to be reported;

— Clause 11, renumbered from “Clause 10” to “Clause 11”;

— Bibliograhy, deletion of references to prEN 13108-4 and prEN 12697-38.

A list of all parts in the EN 12697 series can be found on the CEN website.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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

1 Scope

This document describes a hot sand test method for determining the condition of the binder on coated chippings for use with hot rolled asphalt (HRA) surface course.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 933-2, *Tests for geometrical properties of aggregates - Part 2: Determination of particle size distribution - Test sieves, nominal size of apertures*

EN 933-6, *Tests for geometrical properties of aggregates - Part 6: Assessment of surface characteristics - Flow coefficient of aggregates*

EN 12697-27, *Bituminous mixtures - Test methods - Part 27: Sampling*

EN 12697-28, *Bituminous mixtures - Test methods - Part 28: Preparation of samples for determining binder content, water content and grading*

3 Terms and definitions

There are no terms and definitions listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Principle

This test is used to ensure that coated chippings to be applied to the surface of surface course rolled asphalt have not been overheated to such an extent that their adhesion to the asphalt will be prevented. The dried coated chippings are immersed in hot sand under specified conditions and the degree of coating by the sand assessed both by weighing and by visual inspection.

The test should be carried out sufficiently in advance of constructing the asphalt surface course to enable fresh supplies of chippings to be obtained if necessary.

5 Materials

5.1 Clean dry silica sand, in accordance with the grading given in Table 1 and having a flow coefficient (FCF), which shall be measured in accordance with EN 933-6, of not less than 27 s.

The sands used in the hot sand test should be changed after testing approximately 20 samples or earlier if obviously contaminated.

5.2 Clean dry silica grit, in accordance with the grading given in Table 1 and having a flow coefficient (FCF), which shall be measured in accordance with EN 933-6, of not less than 27 s.

Table 1 — Grading of sand and grid

Test sieve aperture size mm	Proportion by mass passing	
	silica sand %	silica grit %
2	–	100
1	–	70 to 80
0,500	100	0 to 15
0,250	65 to 75	–
0,125	0 to 10	0

6 Apparatus

6.1 Oven, thermostatically controlled to maintain the temperature 125 °C to 130 °C.

6.2 Balance, capable of weighing a sample with a maximum permissible error of 1 g.

6.3 Two metal trays, minimum size 400 mm × 350 mm × 60 mm deep. A greater number of smaller trays may be used to provide a total area of 0,3 m^2 but their depth shall not be less than 60 mm.

6.4 Thermometer, able to measure the temperature over the range 100 °C to 130 °C and with a maximum permissible error of 1 °C.

6.5 Sieves, which shall comply with EN 933-2, with a diameter of 200 mm or 300 mm and apertures of:

— 4 mm for 8 mm chippings;

— 4 mm and 5,6 mm for 11 mm chippings;

— 4 mm and 6,3 mm for 14 mm chippings; or

— 4 mm and 10 mm for 20 mm chippings.

Wherever the term “test sieve” is used in this document, it should be taken to mean “test sieve complying with EN 933-2”.

6.6 Cylindrical tins, of (5,0 ± 0,5) l capacity, each with a tightfitting lid.

7 Sampling and preparation of test portion

7.1 Sampling

Produce a representative sample from a stockpile of coated chippings according to the specified procedure in EN 12697-27 to obtain a total mass of not less than 25 kg. Samples shall not be taken from surplus chippings swept up from the road after application nor from residues of abandoned stockpiles.

7.2 Preparation of test portion

Produce a test portion according to the specified procedure for sample reduction in EN 12697-28. The test portion shall have a mass of minimum 2 000 g but should not be more than 3 000 g.

8 Procedure

8.1 Fill the trays to a level depth of about 25 mm with the 0,250 mm to 0,125 mm clean sand and place in the oven at 125 °C to 130 °C with the thermometer immersed in the sand.

8.2 Sieve the chippings using the 10 mm, 6,3 mm, 5,6 mm or 4 mm sieve for 20 mm, 14 mm, 11 mm or 8 mm chippings, respectively. Reject those chippings passing through the sieve.

8.3 Ensure that the sieved chippings are dry and, if necessary, dry by heating in the oven at about 60 °C. Weigh the sieved sample to the nearest gram, W_1.

8.4 Remove one tray from the oven when the sand temperature has reached 125 °C to 130 °C and spread chippings from the sample onto the hot sand until a uniform overall cover is achieved without contact between adjacent chippings. Complete this operation within 3 min to prevent excessive heat losses.

8.5 Cover the chippings by pouring hot sand from the second tray. Level the sand quickly without disturbing the chippings and replace the tray with chippings in the oven both for a minimum of 10 min and until the sand reaches a temperature of not less than 100 °C.

8.6 Remove the tray with chippings from the oven. Pour sand and chippings onto the 4 mm sieve allowing the sand to fall freely through the sieve apertures. Allow the chippings on the sieve to cool for approximately 10 min.

8.7 Place the cool chippings in the 5 l tin half filled with 1 mm to 0,500 mm silica grit. Shake the tin longitudinally along a horizontal axis for a total of 100 cycles in about 60 s with a displacement amplitude of about 100 mm.

8.8 Re-sieve the chippings using the 4 mm test sieve and wash with a strong jet of cold water, drain the chippings, tip onto paper and allow to dry thoroughly. Drying by means of a hot air blower is permitted.

8.9 Weigh the sample of chippings and adhering sand, W_2, in grams.

8.10 Visually examine the chippings individually in a good light and reject those having less than half sand-cover and weigh the rejected chippings, W_3, in grams.

NOTE Those chippings with less than half coverage are examined to establish whether the lack of retained sand is due to limited retention on all chippings or due to effectively zero retention on some chippings.

If a marginal result is obtained in the hot sand test after two separate samples have been tested, confirmation can be obtained by taking additional samples and calculating the mean sand mass retained and the mean proportion failing the visual assessment.

In cases of dispute, a minimum of four samples is suggested.

9 Calculation an expression of results

9.1 Calculate for each test: the mass of sand, as a proportion of the mass of chippings, that is retained on the chippings to the nearest 0,1 % according to Formula (1):

$$P_{rs} = 100 \cdot \frac{W_2 - W_1}{W_1} \quad (1)$$

where

P_{rs} is proportion of retained sand in %;

W_1 is the weight of sieved specimen to the nearest gram;

W_2 is the weight of chippings and adhering sand to the nearest gram.

9.2 Calculate for each test: the proportion of chippings, by mass, failing the visual assessment to the nearest 0,1 % according to Formula (2):

$$P_{fc} = 100 \cdot \frac{W_3}{W_1} \quad (2)$$

where

P_{fc} is proportion of failed chippings in %;

W_1 is the weight of sieved specimen to the nearest gram;

W_3 is the weight of rejected chippings to the nearest gram.

10 Test report

The test report shall include at least the following information:

a) identification of the sample;

b) reference to this document;

c) date and place of sampling;

d) the mass of sand retained as a proportion of the mass of chippings to the nearest 0,1 % for each sample and the mean value;

e) the proportion by mass of chippings rejected to the nearest 0,1 % for each sample tested and the mean value;

f) any deviations from procedure;

g) any unusual features observed;

h) the date of the test;

i) when required, the name of supplier and source of material.

11 Precision

Data are not available for developing precision statements for this test method.