SLOVENSKI STANDARD
SIST EN 12697-32:2019

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Nadomešča:
SIST EN 12697-32:2004+A1:2007

Bitumenske zmesi - Preskusne metode - 32. del: Priprava preskušancev z vibracijskim zgoščevalnikom

Bituminous mixtures - Test methods - Part 32: Specimen preparation by vibratory compactor

Asphalt - Prüfverfahren - Teil 32: Herstellung von Probekörpern mit einem Vibrationsverdichter

Matériaux enrobés - Méthodes d'essai - Partie 32 : Compactage en laboratoire de mélanges bitumineux par compacteur vibratoire

Ta slovenski standard je istoveten z: **EN 12697-32:2019**

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93.080.20 Materiali za gradnjo cest Road construction materials

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EUROPEAN STANDARD

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English Version

Bituminous mixtures - Test methods - Part 32: Specimen preparation by vibratory compactor

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Asphalt - Prüfverfahren - Teil 32: Herstellung von Probekörpern mit einem Vibrationsverdichter

This European Standard was approved by CEN on 19 November 2018.

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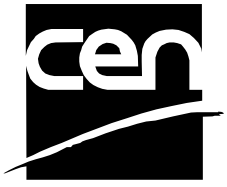

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European foreword

This document (EN 12697-32:2019) 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of an identical text or by endorsement, at the latest by September 2019, and conflicting national standards shall be withdrawn at the latest by September 2019.

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 12697-32:2003+A1:2007.

The following is a list of significant technical changes since the previous edition:

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

— Title shortened to be in line with other compaction methods;

— [7.1.11] De-moulding of sample clarified;

— [7.3.1] Reference to EN 12697-30:2004+A1:2007 replaced by EN 12697-35;

— [A.2.8] Reference to apparatus for water content: EN 1097-5 replaces EN 12697-14;

— [A.6] Deletion of brackets in formulae: [A.1] and [A.2].

A list of all parts in the EN 12697 series 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document specifies a method for the preparation of bituminous test specimens using a vibratory compaction technique.

This document is applicable to loose mixtures and cores and is used to establish a refusal density for a bituminous mixture, or to determine the ease of compaction as described in EN 12697-10.

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 1097-5, *Tests for mechanical and physical properties of aggregates — Part 5: Determination of the water content by drying in a ventilated oven*

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

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

EN 12697-10, *Bituminous mixtures — Test methods — Part 10: Compactability*

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

EN 12697-35, *Bituminous mixtures — Test methods — Part 35: Laboratory mixing*

3 Terms and definitions

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

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

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

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

3.1
bulk density
mass in air per unit volume of the compacted specimen at ambient temperature

3.2
refusal density
mass per unit volume, including voids, of the specimen compacted to refusal

3.3
refusal air voids content
air voids content of specimen compacted to refusal in accordance with the test method

3.4
percentage refusal density
ratio of the initial bulk density of the compacted specimen to its refusal density, expressed as a percentage

4 Principle

After the mixing, preparation and conditioning of a bituminous material in the laboratory, the heating of a core extracted from the road surface to compaction temperature, or the conditioning of plant-mixed material, the material or core is placed in a standard mould with attached base plate and collar and compacted by a vibratory hammer.

NOTE For loose material prepared or compacted in the laboratory, or plant-mixed material compacted in the laboratory, the refusal density is an indication of the potential maximum density which may be achieved under field conditions.

5 Materials

5.1 Sealing compound.

5.2 Paper discs, to prevent the ends of the specimen from sticking to the base plate or the tamping foot.

5.3 Silicone grease, for use as a release agent.

5.4 Inert void filling material.

6 Apparatus

6.1 Drying oven, to maintain a temperature of between 25 °C and 45 °C.

6.2 Balance.

6.3 Water bath.

6.4 Split core mould and base plate (see Figure 1).

6.5 One spare base plate.

NOTE Only one spare base plate is needed for a complete set of moulds.

6.6 Heating oven, with fan-assisted circulation.

6.7 Electric vibrating hammer, conforming to Annex A and suitable for laboratory compaction. The hammer shall have a power consumption of 750 W to 1 000 W and shall operate at a frequency of 20 Hz to 50 Hz.

6.8 50 mm or 75 mm wide point stripping knife and a pallet knife.

6.9 (102 ± 2) mm diameter tamping foot and a (146 ± 2) mm diameter tamping foot, for use with the electric vibrating hammer (see 6.7).

6.10 300 mm steel rule.

6.11 Pair of external callipers.

6.12 Stopwatch or clock.

6.13 Thermometer.

6.14 Saw, suitable for slicing a core to suitable size.

6.15 Paint brush.

7 Preparation of test specimens

7.1 Core specimens

7.1.1 After determination of the bulk density of the core in accordance with EN 12697-6 (initial bulk density), if required, coat the split mould and base plate with a thin film of silicone grease and place a paper disc on the base plate.

NOTE The initial bulk density of the core may be determined, when it is required for comparison to the refusal density as reference for it.

7.1.2 After removing any sealing compound (wax or tape) present, insert the core, with the flatter of its two ends uppermost, into the mould. Tighten the mould and clamp the mould to the base plate.

7.1.3 Place the assembly, without the shank and tamping foot but including the additional base plate, in a preheated oven maintained at the compaction temperature defined in EN 12697-35 for the grade of binder in use. Retain in the oven until the centre of the core has attained the compaction temperature defined in EN 12697-35.

NOTE It may be found convenient to measure the temperature of a dummy specimen placed in the oven at the same time as the specimens to be compacted. The dummy specimen may have a thermocouple probe inserted into its centre.

7.1.4 Condition the operating mechanism of the vibrating hammer by running it for at least 2 min on a dummy specimen before beginning 7.1.6 and 7.1.7.

7.1.5 Remove the assembly from the oven and place it on a level rigid floor. Ensure the mould is tightened until the split is closed. Place a paper disc on the exposed surface of the core.

7.1.6 Immediately compact the core with the vibrating hammer, using the 102 mm diameter tamping foot, previously warmed to above 60 °C and coated with a thin layer of silicone grease. Hold the hammer firmly with the shaft vertical and move the tamping foot from one position to another around the mould in accordance with 7.1.7. Compact for 2 s to 10 s at each position. Move the tamping foot from one position to the next before material bulges above the edge of the tamping foot.

7.1.7 Position the tamping foot in contact with the side of the mould and compact the material in the following points of the compass sequence: N, S, W, E, NW, SE, SW, NE. Repeat the sequence until total compaction time period amounts to 2 min ± 5 s.

To keep the mould in position whilst compaction is taking place, a panel of 20 mm plywood with a central hole of suitable dimensions to accommodate the mould base should be used. The operator should stand on the board to keep the assembly steady.

NOTE 1 The period of compaction at each position will depend on the material.

NOTE 2 A means of determining the downward force applied to the compaction hammer is described in A.5.3.

7.1.8 When the compaction period specified in 7.1.7 is complete, remove any irregularities on the surface of the specimen by using the vibrating hammer fitted with the previously warmed 146 mm tamping foot coated with a thin layer of silicone grease.

7.1.9 Clamp the spare base plate, lightly greased, to the top of the mould. Invert the mould and remove the original base plate ensuring that a paper disc adheres to each end of the core. Place the original base plate in the oven; this now becomes the spare base plate. Drive the core into contact with the base plate with the vibrating hammer fitted with the 146 mm tamping foot coated with silicone grease.

7.1.10 Repeat the compacting procedure specified in 7.1.6, 7.1.7 and 7.1.8.

7.1.11 Remove the base plate and the paper discs.

7.1.12 Allow the core to cool in air for at least 2 h and then remove it from the mould by loosening the screws and tapping the mould to destroy the adhesion.

7.1.13 Allow the core to cool to room temperature and then determine its bulk density in accordance with EN 12697-6 (refusal density) and its air voids content in accordance with EN 12697-8 (refusal air voids content).

7.2 Plant-mixed materials

7.2.1 Obtain a suitable quantity of loose plant-mixed material in accordance with EN 12697-27.

7.2.2 After conditioning the loose material for a period of 2 h at the compaction temperature defined in EN 12697-35, carry out the compacting procedure specified in 7.1.6 to 7.1.13 in order to determine the refusal density only. For determination of compactibility, follow the additional requirements specified in EN 12697-10.

NOTE The object of a conditioning period, when the mixture is held at a temperature equivalent to the compaction temperature, is to simulate site conditions. Binder absorption into the aggregate during this period has an effect on the properties of the compacted mixture.

7.3 Laboratory-mixed materials

7.3.1 Prepare the mixture prior to compaction in accordance with EN 12697-35.

7.3.2 Follow the procedure described in 7.2.2.

8 Calculation and expression of results

For refusal density and refusal air voids content, calculation and expression of results shall be in accordance with EN 12697-6 and EN 12697-8, respectively.

For compactability, calculation and expression of results shall be in accordance with EN 12697-10.

9 Test report

For all purposes, the test report shall make reference to this European Standard and shall include the following information:

a) identification of the mixture;

b) method of manufacture of the mixture, or if it was sampled from a compacted layer, location of the sample.

For refusal density and refusal air voids content, the test report shall be prepared in accordance with EN 12697-6 and EN 12697-8, respectively.