Bituminous mixtures - Test methods - Part 7: Determination of the bulk density of bituminous specimens by gamma rays

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 12697-7:2022 sisaldab Euroopa standardi EN 12697-7:2022 ingliskeelset teksti.	This Estonian standard EVS-EN 12697-7:2022 consists of the English text of the European standard EN 12697-7:2022.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 09.02.2022.	Date of Availability of the European standard is 09.02.2022.
Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Bituminous mixtures - Test methods - Part 7: Determination of the bulk density of bituminous specimens by gamma rays

Mélanges bitumineux - Méthodes d'essai - Partie 7 : Détermination de la masse volumique apparente des éprouvettes bitumineuses par les rayons gamma

Asphalt - Prüfverfahren - Teil 7: Bestimmung der Raumdichte von Asphalt-Probekörpern mit Gamma-Strahlen

This European Standard was approved by CEN on 26 December 2021.

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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
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 12697-7:2022) 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 August 2022, and conflicting national standards shall be withdrawn at the latest by August 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 12697-7:2014.

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

— the title no longer refers to hot mix asphalt;

— [ge] editorial update according to current standard template;

— Clause 1, scope clarified according the CEN/CENELEC Internal Regulations Part 3:2019, 14.5;

— Clause 4, deletion of the exponential law including equation. Added reference to Clause 8;

— (5.1), footnote [1)] amended to NOTE. Existing NOTE amended to normal text;

— Clause 6, NOTE 1: The period for when specimens are considered to be dry amended to 4 h in line with other parts;

— Clause 6, Footnote [2)] amended to NOTE 2. Existing NOTE amended to NOTE 1;

— Clause 6, measurement of the thickness of specimen replaced by “shall be known”;

— (7.3.3), formula for consistency test deleted and replaced with reference to Formula (1);

— Clause 8, editorial adjustments, renumbered formulas and addition of references to formulas;

— Clause 9, revision of data to be reported;

— Clause 10, completion of standard edition to read ISO 5725-2;

— [ge] bibliography added.

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.

Introduction

Bulk density measurement in the laboratory using gamma rays is a method which does not affect the properties of the material. It can be included in a series of tests carried out on a given sample. It allows the plotting of a density chart or gradient.

1 Scope

This document specifies a method for measuring the bulk density of pavement mixtures using a transmission-type gamma radiation test bench.

This method applies to cylindrical specimens or parallelepipedal blocks, prepared in a laboratory or cut from a pavement. The thickness and the mass absorption coefficient, which is a function of the chemical composition, are known. The thickness of the specimen body traversed by the radiation is between 30 mm and 300 mm.

The method cannot be applied to materials containing slags, with variable metal content or chemical composition.

NOTE Material containing metal or chemical compositions can affect the absorption of gamma rays.

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 12697-6, *Bituminous mixtures - Test methods - Part 6: Determination of bulk density of bituminous specimens*

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 https://www.electropedia.org/

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

4 Principle

The method is based upon the absorption of gamma radiation by the material under the conditions of the test described in this document and for materials such as bituminous mixtures. The method follows an exponential law according to Clause 8, Formulae (2) and (3).

The specimen is placed in the path of a gamma ray beam coming from an emitting unit containing a radioactive source and having a collimation corridor. A photomultiplier in the receiving unit transforms the incident photons into pulses with amplitudes proportional to their energy. An electronic system performs the functions allowing the different applications.

5 Apparatus

The safety regulations applicable to the use of gamma rays apply.

5.1 Emitter-source unit and receiving unit, at a fixed distance in relation to each other during the measurement. The axis of the gamma radiation beam and that of the receiver shall coincide.

NOTE A radioactive source of Cs 137 with an energy level of 0,662 MeV is suitable for this purpose.