

**Asfaltsegud – Kuuma asfaltsegu katsemeetodid. Osa 6:
Asfaltproovikehade mahumassi määramine**

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 12697-6:2012 sisaldab Euroopa standardi EN 12697-6:2012 ingliskeelset teksti.	This Estonian standard EVS-EN 12697-6:2012 consists of the English text of the European standard EN 12697-6:2012.
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English Version

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

Mélanges bitumineux - Méthodes d'essai pour mélange
hydrocarboné à chaud - Partie 6: Détermination de la
masse volumique apparente des éprouvettes bitumineuses

Asphalt - Prüfverfahren für Heißasphalt - Teil 6:
Bestimmung der Raumdichte von Asphalt-Probekörpern

This European Standard was approved by CEN on 9 March 2012.

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Foreword

This document (EN 12697-6:2012) 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of an identical text or by endorsement, at the latest by October 2012, and conflicting national standards shall be withdrawn at the latest by October 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12697-6:2003+A1:2007.

The significant changes from that document are:

- The density of water at test temperature is now obtained from a formula instead of a table;
- All densities are now expressed in megagram per cubic metre (Mg/m^3) instead of in kilogram per cubic metre (kg/m^3);
- The requirement for the thermometer used in dry, SSD or sealed specimen procedures has been changed;
- The requirement on the drying of specimens has been changed;
- The definition of constant mass has been changed;
- In procedure B, the order of carrying out steps a) to g), when testing damp specimens, has been corrected;
- In procedure B, the Note concerning the saturation period of specimens has been changed and is now limited to a maximum;
- In procedure A, B and C, the specific requirement for the accuracy of the density of water when calculating the bulk density of specimens has been deleted, with the general rule defined in Clause 5 “Materials” being applicable;
- In procedure C, the formula used to calculate “bulk density dry sealed specimen” has been corrected;
- In procedure D, the formula used to calculate “bulk density by dimensions” both of cylindrical and rectangular specimens has been changed in order to be consistent with new density units;
- In the test report, a new paragraph with reference to dimensions of specimens has been added;
- In Annex A, a paragraph regarding specific requirements for particular method to be used for CE marking has been added.

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 12697-10, *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 cylindrical specimens (CY)*
- 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 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 a 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 de-icing fluids*
- EN 12697-42, *Bituminous mixtures — Test methods for hot mix asphalt — Part 42: Amount of coarse foreign matter in reclaimed asphalt*
- EN 12697-43, *Bituminous mixtures — Test methods for hot mix asphalt — Part 43: Resistance to fuel*
- EN 12697-44, *Bituminous mixtures — Test methods for hot mix asphalt — Part 44: Crack propagation by semi-circular bending test*
- FprEN 12697-45, *Bituminous mixtures — Test methods for hot mix asphalt — Part 45: Saturation Ageing Tensile Stiffness (SATS) conditioning test*

- FprEN 12697-46, *Bituminous mixtures — Test methods for hot mix asphalt — Part 46: Low temperature cracking and properties by uniaxial tension tests*
- EN 12697-47, *Bituminous mixtures — Test methods for hot mix asphalt — Part 47: Determination of the ash content of natural asphalts*
- prEN 12697-49, *Bituminous mixtures — Test methods for hot mix asphalt — Part 49: Determination of friction after polishing.*

The applicability of this European Standard is described in the product standards for bituminous mixtures.

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, Croatia, 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, Turkey and the United Kingdom.

1 Scope

This European Standard describes test methods for determining the bulk density of a compacted bituminous specimen. The test methods are intended for use with laboratory compacted specimens or specimens from the pavement after placement and compacting, either by coring or sawing.

This European Standard describes the following four procedures, the choice of which is used being dependent on the estimated content and accessibility of voids in the specimen:

- a) bulk density — dry (for specimens with a very closed surface);
- b) bulk density — saturated surface dry (SSD) (for specimens with a closed surface);
- c) bulk density — sealed specimen (for specimens with an open or coarse surface);
- d) bulk density by dimensions (for specimens with a regular surface and with geometric shapes, i.e. squares, rectangles, cylinders, etc.).

NOTE Annex A (informative) gives general guidance on selecting the appropriate procedure.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12697-29:2002, *Bituminous mixtures — Test methods for hot mix asphalt — Part 29: Determination of the dimensions of a bituminous specimen*

EN 13108-20, *Bituminous mixtures — Material specifications — Part 20: Type Testing*

3 Terms and definitions

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

3.1

bulk density

mass per unit volume, including the air voids, of a specimen at known test temperature

3.2

maximum density

mass per unit volume, without air voids, of a bituminous mixture at known test temperature

4 Principle

The bulk density of an intact compacted bituminous specimen is determined from the mass of the specimen and its volume. The mass of the specimen is obtained by weighing the dry specimen in air.

For the first three procedures, the volume of the specimen is obtained from its mass in air and its mass in water. In the dry procedure, the mass in water is determined without pre-treatment. In the SSD-procedure, the specimen is first saturated with water, after which its surface is blotted dry with a damp Chamois. In the sealed specimen procedure, the specimen is sealed before immersion in water to prevent access of water to the voids in the specimen. In the fourth procedure, by dimensions, the volume of the specimen is obtained by measurement of the dimensions.