

Bituminous mixtures - Test methods for hot mix asphalt - Part 12: Determination of the water sensitivity of bituminous specimens

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- Part 12: Determination of the water sensitivity of
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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 12697-12:2008 sisaldab Euroopa standardi EN 12697-12:2008 ingliskeelset teksti.

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English Version

**Bituminous mixtures - Test methods for hot mix asphalt - Part
12: Determination of the water sensitivity of bituminous
specimens**

Mélanges bitumineux - Méthodes d'essai pour mélange
hydrocarboné à chaud - Partie 12 : Détermination de la
sensibilité à l'eau des éprouvettes bitumineuses

Asphalt - Prüfverfahren für Heiasphalt - Teil 12:
Bestimmung der Wasserempfindlichkeit von Asphalt-
Probekrpern

This European Standard was approved by CEN on 18 May 2008.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 12697-12:2008) 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of an identical text or by endorsement, at the latest by December 2008, and conflicting national standards shall be withdrawn at the latest by December 2008.

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 12697-12:2003.

This document 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 methods 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: Compactibility*

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 de-icing fluids*

EN 12697-42, *Bituminous mixtures – Test methods for hot mix asphalt – Part 42: Amount of coarse 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 the United Kingdom.

1 Scope

This European Standard describes three test methods for determining the effect of saturation and accelerated water conditioning.

These methods can be used to evaluate the effect of moisture with or without anti-stripping additives including liquids, such as amines, and fillers, such as hydrated lime or cement:

- method A uses the indirect tensile strength of cylindrical specimens of bituminous mixtures;
- method B uses the compression strength of cylindrical specimens of bituminous mixtures;
- method C defines the bonding value of soft asphalt mixtures 1 h after mixing, where the bonding of bitumen and aggregate can be equated to a bonding value.

Method A and method B give the same result on average. However, if the slenderness of the specimens is less than 0,5, method B is not suitable.

Method C is suitable for soft asphalt mixtures with bitumen of viscosity at 60 °C of 4000 mm²/s or less, for which methods A and B are not suitable.

NOTE Methods A and B are suitable for soft asphalt mixtures with bitumen of viscosity at 60 °C greater than 4000 mm²/s.

2 Normative references

The following referenced documents are indispensable for the application 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 1426, *Bitumen and bituminous binders – Determination of needle penetration*

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 for hot mix asphalt – Part 8: Determination of void characteristics of bituminous specimens*

EN 12697-23, *Bituminous mixtures – Test methods for hot mix asphalt – Part 23: Determination of the indirect tensile strength of bituminous specimens*

EN 12697-27, *Bituminous mixtures – Test methods for hot mix asphalt – Part 27: Sampling*

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 13108-1, *Bituminous mixtures – Material specification – Part 1: Asphalt concrete*

3 Terms and definitions

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

3.1

cylindrical specimen

laboratory-made (e.g. gyratory- or impact-compacted) cylindrical moulded specimen or core taken from a bituminous layer or slab

3.2

water sensitivity (in accordance with method A)

the *ITSR* value obtained on compacted specimens of a bituminous mixture

3.3

water sensitivity (in accordance with method B)

the *i/C* value obtained on compacted specimens of wet (water conditioned) specimens to that of dry specimens of a bituminous mixture

3.4

indirect tensile strength ratio (ITSR)

ratio of the indirect tensile strength of wet (water conditioned) specimens to that of dry specimens, expressed in percent

3.5

indirect tensile strength (IST)

maximum tensile stress applied to a cylindrical specimen loaded at the specified test temperature and speed of displacement of the compression testing machine, determined in accordance with EN 12697-23

3.6

compressive strength ratio (*i/C*)

ratio of the strength of a specimen loaded in compression at the specified test temperature and speed of displacement of the press, of wet (water conditioned) specimens to that of dry specimens expressed in percent

3.7

bonding value

amount of aggregate fines and bitumen which comes loose from 1000 g sample of soft asphalt mixture when mixed with 1500 ml of water in a graduated glass beaker

3.8

precision

closeness of agreement between independent test results obtained under stipulated conditions.

NOTE 1: Precision depends only on the distribution of random errors and does not relate to the true value or the specified value.

NOTE 2: The measure of precision is usually expressed in terms of imprecision and computed as a standard deviation of the test results. Less precision is reflected by a larger standard deviation.

NOTE 3: "Independent test results" means results obtained in a manner not influenced by any previous result on the same or similar test object. Quantitative measures of precision depend critically on the stipulated conditions. Repeatability and reproducibility conditions are particular sets of extreme conditions.