



SLOVENSKI STANDARD
SIST EN 12697-21:2004

01-junij-2004

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Bituminous mixtures - Test methods for hot mix asphalt - Part 21: Indentation using plate specimens

Asphalt - Prüfverfahren für Heißasphalt - Teil 21: Eindringversuch an Platten

STANDARD PREVIEW

Mélanges bitumineux - Méthodes d'essai pour mélange hydrocarboné a chaud - Partie 21: Essai d'indentation de plaques

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Ta slovenski standard je istoveten z: EN 12697-21:2003

ICS:

93.080.20 Materiali za gradnjo cest Road construction materials

SIST EN 12697-21:2004

en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12697-21

November 2003

ICS 93.080.20

English version

Bituminous mixtures - Test methods for hot mix asphalt - Part 21: Indentation using plate specimens

Mélanges bitumineux - Méthodes d'essai pour enrobés à
chaud - Partie 21: Essai d'indentation de plaques

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Eindringversuch an Platten

This European Standard was approved by CEN on 1 September 2003.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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

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Foreword

This document (EN 12697-21:2003) 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 May 2004, and conflicting national standards shall be withdrawn at the latest by August 2005.

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 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.*

prEN 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.*

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prEN 12697-16, *Bituminous mixtures — Test methods for hot mix asphalt — Part 16: Abrasion by studded tyres.*

prEN 12697-17, *Bituminous mixtures — Test methods for hot mix asphalt — Part 17: Particle loss of porous asphalt specimen.*

prEN 12697-18, *Bituminous mixtures — Test methods for hot mix asphalt — Part 18: Binder drainage from porous asphalt.*

prEN 12697-19, *Bituminous mixtures — Test methods for hot mix asphalt — Part 19: Permeability of specimen.*

prEN 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.*

prEN 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.*

prEN 12697-24, *Bituminous mixtures — Test methods for hot mix asphalt — Part 24: Resistance to fatigue.*

prEN 12697-25, *Bituminous mixtures — Test methods for hot mix asphalt — Part 25: Cyclic compression test.*

prEN 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 bituminous specimen.*

prEN 12697-30, *Bituminous mixtures — Test methods for hot mix asphalt — Part 30: Specimen preparation, impact compactor.*

prEN 12697-31, *Bituminous mixtures — Test methods for hot mix asphalt — Part 31: Specimen preparation gyratory compactor.*

EN 12697-32, *Bituminous mixtures — Test methods for hot mix asphalt — Part 32: Laboratory compaction of bituminous mixtures by vibratory compactor.*

prEN 12697-33, *Bituminous mixtures — Test methods for hot mix asphalt — Part 33: Specimen prepared by roller compactor.*

prEN 12697-34, *Bituminous mixtures — Test methods for hot mix asphalt — Part 34: Marshall test.*

prEN 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 pre-coated chippings for hot rolled asphalt.*

prEN 12697-38, *Bituminous mixtures — Test methods for hot mix asphalt — Part 38: Test equipment and calibration.*

prEN 12697-39, *Bituminous mixtures — Test methods for hot mix asphalt — Part 39: Binder content by ignition.*

prEN 12697-40, *Bituminous mixtures — Test methods for hot mix asphalt — Part 40: In-situ drainability of porous asphalt.*

prEN 12697-41, *Bituminous mixtures — Test methods for hot mix asphalt — Part 41: Resistance to de-icing fluids.*

prEN 12697-42, *Bituminous mixtures — Test methods for hot mix asphalt — Part 42: Amount of foreign matters in reclaimed asphalt.*

prEN 12697-43, *Bituminous mixtures — Test methods for hot mix asphalt — Part 43: Resistance to fuel.*

No existing European Standard is superseded.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard describes a test method for measuring the indentation of mastic asphalt when it is penetrated at a given temperature, load and for a fixed time period by a standardised cylindrical indenter pin with a circular flat-ended base. This European Standard applies to mastic asphalt with aggregates of maximum nominal size less or equal to 16 mm.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

3 Apparatus

3.1 Moulding of test cubes of mastic asphalt

3.1.1 Moulds of 100 mm to 150 mm diameter or sample moulds (150 × 150 × 25) mm. Approximate dimensions are sufficiently accurate.

NOTE A mould of 100 mm diameter should only be used by indentation with the pin diameter of 6,35 mm.

3.1.2 Oven capable of maintaining temperature of (250 ± 10) °C.

3.1.3 Spatula

3.1.4 Thermometer capable to measure 300 °C accurate to 2 °C.

3.2 Apparatus for the indentation test

3.2.1 System for the load transmission

3.2.1.1 General

A system able to apply the load under the conditions of Table 1.

The load is applied differently according to the type of apparatus used.

3.2.1.2 Lever arm and counterweight: After balancing of lever arm, with help of a balance weight, place a weight into a mark situated on the arm, at such a distance, that the chosen load is applied on the pin.

3.2.1.3 Direct charge system: Comprising a plate, fixed to a vertical axis.

3.2.1.4 Transmission by pneumatic thruster: Pressure of compressed air permits the desired force to be obtained. This pressure is preliminarily adjusted by means of a pressure gauge and released at the moment of the test.

3.2.1.5 Flat ended, cylindrical stainless steel, indenter pins of the following diameters:

- $(25,2 \pm 0,1)$ mm for a surface of 500 mm^2 ;
- $(11,3 \pm 0,1)$ mm for a surface of 100 mm^2 ;
- $(6,35 \pm 0,1)$ mm for a surface of $31,7 \text{ mm}^2$.

3.2.2 Apparatus for measuring indentation

3.2.2.1 General

The depth of penetration of the pin into the specimen is measured as follows:

3.2.2.2 Displacement transducer with an accuracy of $\pm 0,05$ mm, comprising the measurement of test duration.

3.2.2.3 System permitting registration of penetration in relation to the time passed with an accuracy of $\pm 0,05$ mm, comprising the measurement of test duration.

3.2.3 Apparatus for temperature regulation

3.2.3.1 A thermostatic water bath capable of maintaining the temperature specified with an accuracy of $\pm 1,0$ °C.

3.2.3.2 A thermometer with an accuracy of $\pm 0,1$ °C.

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4 Sampling and preparation of laboratory sample

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4.1 Sampling

The sampling shall take place at fixed plants or at mobile equipment and shall be taken from laid or finished material according to EN 12697-27.

The required mass to form laboratory samples is at least three increments of 1 kg.

4.2 Preparation of the samples

If the sample is to be tested in a laboratory, the material has to be cleaned and freed from packaging material and from loose particles. Then reheat the mixture up to a temperature of (235 ± 5) °C and homogenise the molten material by stirring thoroughly. If the sample is to be tested immediately, a homogeneous sample at a temperature of (235 ± 5) °C shall be taken. The toughly liquid bituminous mixture shall be filled into the moulds and cooled down only in air. Accelerate cooling with cold water shall not be used. Whether or not the samples were reheated shall be reported.

NOTE The reheating of samples in the laboratory is the preferred method.

At least two samples shall be prepared.

5 Procedure

5.1 Immerse the samples for at least 60 min in the thermostatic bath regulated at a test temperature while taking care, that the water circulates over both flat surfaces.