



SLOVENSKI STANDARD
SIST EN 12697-4:2002

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Bituminous mixtures - Test methods for hot mix asphalt - Part 4: Bitumen recovery: Fractionating column

Bituminous mixtures - Test methods for hot mix asphalt - Part 4: Bitumen recovery: Fractionating column

Asphalt - Prüfverfahren für Heißasphalt - Teil 4: Rückgewinnung des Bindemittels: Fraktionierkolonne

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Mélanges bitumineux - Essais pour enrobés a chaud - Extraction des bitumes a la colonne a distiller

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93.080.20 Materiali za gradnjo cest Road construction materials

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12697-4

October 2000

ICS 93.080.20

English version

Bituminous mixtures - Test methods for hot mix asphalt - Part 4:
Bitumen recovery: Fractionating column

This European Standard was approved by CEN on 4 October 2000.

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 Central Secretariat 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 Central Secretariat 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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard 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 April 2001, and conflicting national standards shall be withdrawn at the latest by April 2001.

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*

prEN 12697-2, *Bituminous mixtures - Test methods for hot mix asphalt - Part 2: Particle size distribution*

EN 12697-3, *Bituminous mixtures - Test methods for hot mix asphalt - Part 3: Binder recovery: Rotary evaporator*

EN 12697-4, *Bituminous mixtures - Test methods for hot mix asphalt - Part 4: Binder recovery: Fractionating column*

prEN 12697-5, *Bituminous mixtures - Test methods for hot mix asphalt - Part 5: Determination of the maximum density*

prEN 12697-6, *Bituminous mixtures - Test methods for hot mix asphalt - Part 6: Determination of bulk density of bituminous specimen by hydro-static method*

prEN 12697-7, *Bituminous mixtures - Test methods for hot mix asphalt - Part 7: Determination of bulk density of bituminous specimens by gamma rays*

prEN 12697-8, *Bituminous mixtures - Test methods for hot mix asphalt - Part 8: Determination of the air voids content of bituminous materials*

prEN 12697-9, *Bituminous mixtures - Test methods for hot mix asphalt - Part 9: Determination of the reference density, gyrator compactor*

prEN 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 aggregates and binders*

prEN 12697-12, *Bituminous mixtures - Test methods for hot mix asphalt - Part 12: Determination of the water sensitivity of specimen*

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*

prEN 12697-15, *Bituminous mixtures - Test methods for hot mix asphalt - Part 15: Determination of the segregation sensitivity of bituminous mixtures*

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 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 specimen*

prEN 12697-21, *Bituminous mixtures - Test methods for hot mix asphalt - Part 21: Indentation using plate specimen*

prEN 12697-22, *Bituminous mixtures - Test methods for hot mix asphalt - Part 22: Wheel tracking test*

prEN 12697-23, *Bituminous mixtures - Test methods for hot mix asphalt - Part 23: Indirect tensile test*

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: Dynamic creep test*

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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*

prEN 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: Preparation of specimen by impact compactor*

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

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

prEN 12697-33, *Bituminous mixtures - Test methods for hot mix asphalt – Part 33: Specimen preparation, slab 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*

prEN 12697-36, *Bituminous mixtures - Test methods for hot mix asphalt - Part 36: Method for the determination of the thickness of a bituminous pavement*

prEN 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*

prEN 12697-38, *Common equipment and calibration*

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

No existing European Standard is superseded.

WARNING The method described in this European Standard may require the use of dichloromethane (methylene chloride). This solvent is hazardous to health and is subject to occupational exposure limits as described in relevant legislation and regulations.

Exposure levels are related to both handling procedures and ventilation provision and it is emphasised that adequate training should be given to staff employed in the use of this substances.

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard describes a test method for the recovery of soluble bitumen from bituminous mixtures from pavements in a form suitable for further testing. The procedure is suitable for the recovery of paving grade bitumen and is also suitable for mixtures containing volatile matter such as cutback bitumen but the results may be less precise.

NOTE There is limited experience of recovery when polymer-modified bitumen is used.

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 12594, *Bitumen and bituminous binders – Preparation of test samples*.

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply:

3.1

soluble binder content

percentage by mass of extractable binder in an anhydrous sample determined by extracting the binder from the sample

NOTE Extraction may be followed by binder recovery.

3.2

insoluble binder content

percentage by mass of binder that adheres to the aggregate particles after extraction.

3.3

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 indicated 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 sample. Quantitative measures of precision depend critically on the stipulated conditions. Repeatability and reproducibility conditions are particular sets of extreme conditions.

3.4**repeatability**

precision under repeatability conditions

3.5**repeatability conditions**

conditions in which independent test results are obtained with the same method on identical test items in the same laboratory by the same operator using the same equipment within short intervals of time

3.6**repeatability limit**

value less than or equal to which the absolute difference between two test results obtained under repeatability conditions may be expected to be with a probability of 95 %.

NOTE The symbol used for repeatability limit is r .

3.7**reproducibility**

precision under reproducibility conditions

3.8**reproducibility conditions**

conditions in which test results are obtained with the same method on identical test items in different laboratories with different operators using different equipment

3.9**reproducibility limit**

value less than or equal to which the absolute difference between two test results obtained under reproducibility conditions may be expected to be with a probability of 95 %

NOTE The symbol used for reproducibility limit is R .

3.10**single test result**

value obtained by applying the standard test method fully, once to a single specimen may be the mean of two or more observations or the result of a calculation from a set of observations as specified by the standard test method.

4 Principle

The bitumen is separated from the sample by dissolving in dichloromethane (or other suitable solvent). After removal of undissolved solids, the bitumen solution is concentrated by atmospheric distillation in a fractionating column. The last traces of solvent are removed from the concentrate by distillation at a temperature of 100 °C above the expected softening point or 175 °C, whichever is the higher, with the pressure reduced from atmospheric pressure 100 kPa to 20 kPa and with the aid of a stream of carbon dioxide gas. When cutback bitumens containing very volatile fluxes, e.g. white spirit, are being recovered, the carbon dioxide gas is omitted.