



SLOVENSKI STANDARD
SIST EN 12697-43:2005

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Bituminous mixtures - Test methods for hot mix asphalt - Part 43: Resistance to fuel

Asphalt - Prüfverfahren für Heißasphalt - Teil 43: Treibstoffbeständigkeit

Mélanges bitumineux - Méthodes d'essai pour mélange hydrocarboné a chaud - Partie
43: Résistance aux carburants

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12697-43

June 2005

ICS 93.080.20

English version

Bituminous mixtures - Test methods for hot mix asphalt - Part 43: Resistance to fuel

Mélanges bitumineux - Essais pour enrobés à chaud -
Partie 43: Résistance aux carburants

Asphalt - Prüfverfahren für Heiasphalt - Teil 43:
Treibstoffbeständigkeit

This European Standard was approved by CEN on 8 April 2005.

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.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard (EN 12697-43:2005) 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of an identical text or by endorsement, at the latest by November 2005, and conflicting national standards shall be withdrawn at the latest by November 2005.

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 aggregates 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*

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- 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 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 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 pre-coated chippings for hot rolled asphalt*
- 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*

prEN 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 foreign matter in reclaimed asphalt*

EN 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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EN 12697-43:2005 (E)**1 Scope**

This European Standard specifies a test method to determine the resistance of a bituminous mixture or pavement to fuels. The procedure involves initial soaking of a test specimen made in the laboratory or cored from a pavement in a fuel, followed by a brushing period with a steel brush mounted in a mixer. The material loss of the specimen is a measure of the resistance to that fuel for that bituminous mixture.

NOTE The test is normally carried out with jet fuel.

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 12697-6, *Bituminous mixtures — Test methods for hot mix asphalt — Part 6: Determination of bulk density of bituminous specimens*

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

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 12697-35, *Bituminous mixtures — Test methods for hot mix asphalt — Part 35: Laboratory mixing*

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3 Term and definition

For the purposes of this European Standard, the following term and definition apply.

fuels

liquid (petroleum product) that might be spilled accidentally or sprayed deliberately onto an asphalt pavement and can cause damage to the asphalt mixture

4 Principle

A cylindrical test specimen with a known mass is immersed partly in a bath with the specified fuel for a specified period of time. For bituminous mixtures with paving grade bitumen this period is 24 h; for mixtures with a polymer-modified bitumen a 72 h period is used. After removal from the bath, cleaning with water and drying for 24 h in a ventilated oven at 25 °C, the loss of mass of the specimen is measured and the immersed surface is visually inspected. The type of affection and the material loss of the immersed surface are also recorded. Then the test specimen is put in a steel mould with the immersed surface up. At the bottom of the specimen a pneumatic cylinder pushes the immersed surface onto a steel brush, which is moving in epicycloids passages over the surface. After 30 s the brushing stops and the specimen is removed from the mould. Then the loss of mass is measured and the brushed surface is visually inspected. After that the specimen is put back in the mould and the same procedure is carried out again after 30 s and after 60 s, when the brushed surface is visually inspected again.

The total brushing time is 120 s (two brushing periods of 30 s and one of 60 s). The material loss after the immersion and/or the brush test is a measure for the resistance to that particular fuel.

NOTE 1 The immersion time for mixtures with a polymer-modified binder is longer than for mixtures with paving grade bitumen. This is chosen because mixtures with a PMB most often have already a higher resistance to fuel than mixtures with paving grade bitumen. To find differences between mixtures with various PMBs a more severe test is needed. This can be accomplished by using a longer immersion time. To find differences between mixtures with paving grade bitumen and PMBs and immersion time of 24 h can be chosen.

NOTE 2 For the brushing, a Hobart mixer can be used.

5 Equipment

5.1 Fume cupboard

During the brush tests aggregate parts with a fuel film can be separated from the specimen hurled away from the test equipment. To protect the test performer for around flying aggregate parts and fuel fumes the test shall be carried out in a fume cupboard.

5.2 Beaker with glass rod

Cylindrical beaker made of glass for soaking of test specimen in the fuel. The container shall be flat-bottomed and have an internal diameter of at least 140 mm (with porous asphalt specimens at least 190 mm) and an internal depth of at least 150 mm. A glass rod with a length of 70 mm and a diameter of 8 mm is put on one side of the bottom of the beaker.

5.3 Glass funnel

The size of the funnel shall be chosen in such a way that the speed of the fluid in the beaker is as small as possible to prevent any damage to the specimen because of the injection of the fluid in the beaker.

5.4 Balance

Balance of suitable capacity (accurate and readable to 0,1 g).

5.5 Oven

Ventilated oven, capable of maintaining temperature up to (25 ± 2) °C.

5.6 Impact hammer or gyrator

Impact hammer (Marshall) or gyrator to prepare laboratory made specimens.

5.7 Mixer

The same kind of mixer as in EN 12697-35 can be used. It is a small mixer with an epicyclical motion, covering an area with a diameter of about 100 mm. The rotation speed shall be (60 ± 2) rpm.

5.8 Steel brush

The steel brush (see Figure 1) with:

- power, cup brush with tempered quality crimped steel wires;
- outer diameter 60 mm;
- inner diameter 30 mm;