SLOVENSKI STANDARD
SIST EN 12697-40:2012

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Nadomešča:
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Bitumenske zmesi - Preskusne metode za vroče asfaltne zmesi - 40. del: Prepustnost vgrajene plasti (in situ)

Bituminous mixtures - Test methods for hot mix asphalt - Part 40: In situ drainability

Asphalt - Prüfverfahren für Heißasphalt - Teil 40: In-situ-Durchlässigkeit

Mélanges bitumineux - Méthodes d'essai pour mélange hydrocarboné à chaud - Partie 40: Drainabilité in situ

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93.080.20 Materiali za gradnjo cest Road construction materials

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EUROPEAN STANDARD

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English Version

Bituminous mixtures - Test methods for hot mix asphalt - Part 40: In situ drainability

Mélanges bitumineux - Méthodes d'essai pour mélange hydrocarboné à chaud - Partie 40: Drainabilité in situ

Asphalt - Prüfverfahren für Heißasphalt - Teil 40: In-situ-Durchlässigkeit

This European Standard was approved by CEN on 25 May 2012.

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Contents

Page

Foreword

This document (EN 12697-40:2012) 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of an identical text or by endorsement, at the latest by December 2012, and conflicting national standards shall be withdrawn at the latest by December 2012.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 12697-40:2005.

List of main technical changes from the last edition are as follows :

- The arrows showing the diameter of the standpipe are corrected from external diameter to internal diameter.
- In list of items in figure 1, descriptions of: 12 changed from “sponge rubber seal (sealed cell); uniaxial elasticity 0,9 MPa nominal” to “sponge rubber seal (sealed cell); thickness (20 ± 5) mm”; 13 changed from “base, synthetic resin bonded fabric” to “base, synthetic resin bonded fabric, thickness (13 ± 3) mm”; and 14 changed from “standing board (end elevation)” to “standing board (end elevation), thickness (20 ± 5) mm”.
- The length of surfacing represented by a test result has been removed.
- The correction factor for the temperature of the water has been removed.

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: 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: Indentation using cube or cylindrical specimens (CY)*

EN 12697-31, *Bituminous mixtures — Test methods for hot mix asphalt — Part 31: Indentation using cube or cylindrical specimens (CY)*

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 drainablility*

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*

According to the CEN/CENELEC Internal Regulations, the national standards organisations 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 a method to determine the in-situ relative hydraulic conductivity, at specific locations, of a road surfacing that is designed to be permeable. An estimate of the average value for the surfacing is obtained from the mean value of a number of determinations on each section of road.

The test measures the ability to drain water (drainability) achieved in-situ of a surfacing. As such, it can be used as a compliance check to ensure that a permeable surface course has the required properties when it is laid. The test can also be used subsequently to establish the change of drainage ability with time.

For the test to be valid, the surface of the test area should be clean and free from detritus. Measurements can be made when a road is either wet or dry, but not if it is in a frozen state.

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 13036-1, *Road and airfield surface characteristics — Test methods — Part 1: Measurement of pavement surface macrotexture depth using a volumetric patch technique*

3 Terms and definitions

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

3.1
outflow time
time (s) that elapses for an outflow of 4,0 L through the permeameter, between the meniscus at the 5 L mark and when it falls to the 1 L mark

3.2
series resistance time, r
outflow time(s) that is determined when the permeameter is located so the outlet is clear of any surfacing that could impede the exit of out-flowing water

Note 1 to entry: The method for calculating the series resistance time is given in Annex A.

Note 2 to entry: The series resistance time is subtracted from measurements of outflow time when the permeameter is used on a surfacing of a pavement.

3.3
parallel leakage time
outflow time when the outlet is restricted by an impermeable surface

3.4
relative hydraulic conductivity (HC)
reciprocal of the outflow time minus the series resistance time

Note 1 to entry: The relative hydraulic conductivity is specific to apparatus as shown in Figure 1 with the dimensions given in 5.1.

4 Principle

A permeameter is used to determine the time taken for 4 l of water to dissipate through an annular area of the surfacing of a pavement under known head conditions. The reciprocal of the outflow time is then used to calculate the relative hydraulic conductivity of the surfacing.

NOTE The result is relative, rather than absolute, because the time taken is dependent on the dimensions of the permeameter. However, all measurements with the specified equipment should give mutually consistent results.

5 Apparatus

5.1 Permeameter

Radial-flow falling head permeameter of the basic construction shown in Figure 1 and with the following critical dimensions that has been calibrated in accordance with Annex A:

- internal diameter of standpipe (125 ± 0,5) mm,
- length of standpipe (560 ± 20) mm,
- diameter of orifice in base (48 ± 0,1) mm,
- taper to orifice (15 ± 0,5) °,
- diameter of rubber ball attached to plunger (51 ± 0,5) mm,
- external diameter of sponge rubber under base (300 ± 2) mm,
- internal diameter of sponge rubber under base (100 ± 2) mm.

The standpipe shall be a tube of acrylic or other transparent material that will allow the height of water to be observed at any time. The standpipe shall be sealed to the base as to be watertight. The closed cell sponge rubber seal should have a durometer hardness of 30 to 45 measured with a type 00 durometer according to ASTM D2240.