SLOVENSKI STANDARD
SIST EN 12697-40:2020

01-maj-2020

Nadomešča:
SIST EN 12697-40:2012

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

Bituminous mixtures - Test methods - Part 40: In situ drainability

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

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Mélanges bitumineux - Méthodes d'essai - Partie 40 : Perméabilité en place

Ta slovenski standard je istoveten z: **EN 12697-40:2020**

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ICS:

93.080.20 Materiali za gradnjo cest Road construction materials

SIST EN 12697-40:2020 **en,fr,de**

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12697-40

February 2020

ICS 93.080.20

English Version

Bituminous mixtures - Test methods - Part 40: In situ drainability

Mélanges bitumineux - Méthodes d'essai - Partie 40 : Perméabilité en place

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

This European Standard was approved by CEN on 18 November 2019.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 12697-40:2020) has been prepared by Technical Committee CEN/TC 227 “Road materials”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by August 2020, and conflicting national standards shall be withdrawn at the latest by August 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12697-40:2012.

The following is a list of significant technical changes since the previous edition:

— the title no longer makes the method exclusively for hot mix asphalt;

— [ge] editorial update according to current standard template;

— [ge] symbol for litre, “L” amended to l;

— [6.3.8] NOTE modified according to ISO/IEC Directives – Part 2:2016, 24.5;

— [Clause 8] Test report: bullet a) completed with ambient temperature.

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A list of all parts in the EN 12697 series can be found on the CEN website.

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1 Scope

This document 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 are referred to in the text in such a way that some or all of their content constitutes requirements 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 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

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

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— ISO Online browsing platform: available at https://www.iso.org/obp/ui

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

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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.

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:

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- 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.

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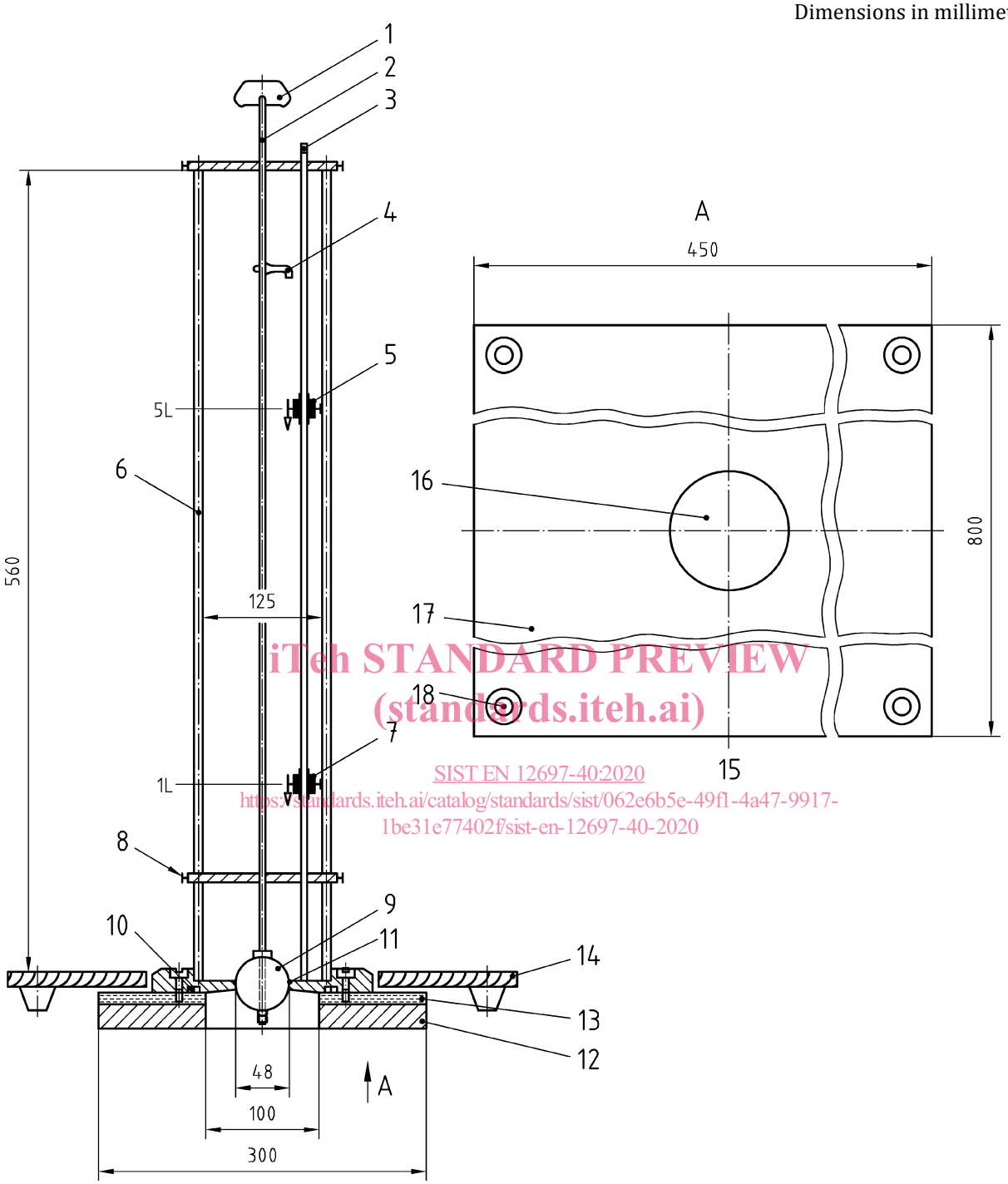
Dimensions in millimetres



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Key

1	handle	8	support for sensors	14	standing board (end elevation), thickness (20 ± 5) mm
2	plunger	9	rubber ball	15	standing board (plan view)
3	support for sensors	10	O-ring	16	central hole
4	plunger rest	11	orifice	17	plywood
5	sensor (optional)	12	sponge rubber seal (sealed cell), thickness (20 ± 5) mm	18	rubber foot, 25 mm high
6	standpipe				
7	sensor (optional)	13	base, synthetic resin bonded fabric, thickness (13 ± 3) mm		

Figure 1 — Typical permeameter and standing board (tolerances to dimensions given in 5.1)

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5.2 Standing board

Standing board that fits over the permeameter, as illustrated in Figure 1, or mechanical means holding down the permeameter.

5.3 Stopwatch

Stopwatch, capable of measurement to 0,1 s.

A stopwatch activated by sensors placed inside the permeameter should be used for testing when the accuracy of the result is particularly important, including referee tests. It is recommended for other cases as well.

5.4 Thermometer

Thermometer, capable of measurement to at least ± 1 °C in the range 0 °C to 30 °C.

5.5 Water

Clean water that is free from any solids or other impurities that would affect its flow.

6 Procedure

6.1 Calibration

The permeameter shall be calibrated in accordance with Annex A.

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6.2 Locations

6.2.1 Mark on the pavement ten locations at 20 m centres along a diagonal across the laid width of the pavement to be measured.

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NOTE A typical layout of test locations is shown in Figure 2.

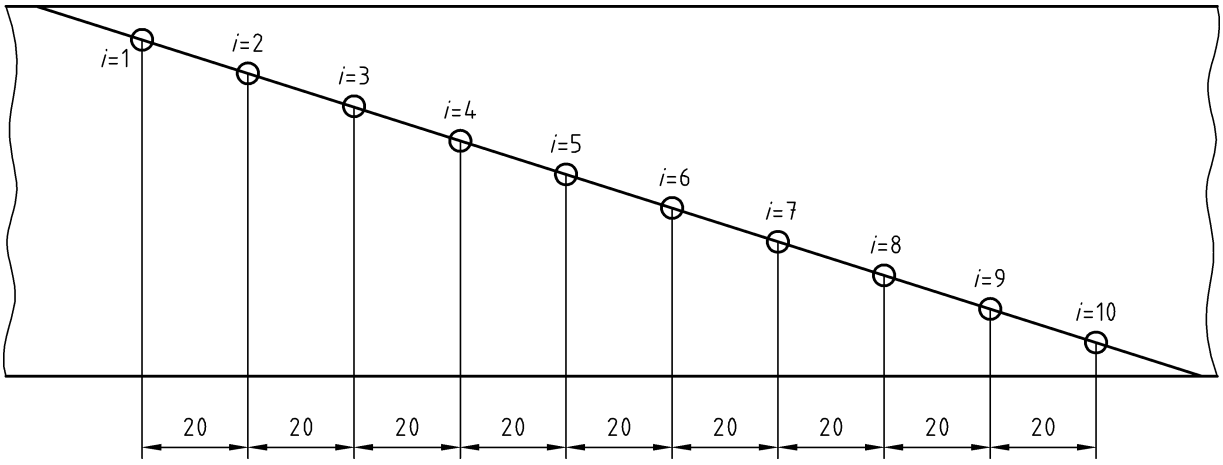

Figure 2 — Typical layout of test locations along a laid width

6.2.2 Measure the average outflow time at each location in accordance with 6.3.

6.2.3 Calculate the relative hydraulic conductivity (*HC*) in accordance with Clause 7 for the area of surfacing designated as being represented by the test.