SLOVENSKI STANDARD
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Bitumenske zmesi - Preskusne metode - 53. del: Povečanje kohezije z metodo merjenja razširjanja

Bituminous mixtures - Test methods - Part 53: Cohesion increase by spreadability-meter method

Asphalt - Prüfverfahren - Teil 53: Kohäsionszunahmemessung durch Ausbreitmaßmethode

Mélanges bitumineux - Méthodes d'essai - Partie 53 : Montée en cohésion par la méthode du maniabilimètre

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Bituminous mixtures - Test methods - Part 53: Cohesion increase by spreadability-meter method

Mélanges bitumineux - Méthodes d'essai - Partie 53 : Montée en cohésion par la méthode du maniabilimètre

Asphalt - Prüfverfahren - Teil 53: Kohäsionszunahmemessung durch Ausbreitmaßmethode

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (prEN 12697-53:2015) has been prepared by Technical Committee CEN/TC 227 “Road materials”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document is one of a series of standards as listed below:

EN 12697-1, *Bituminous mixtures — Test methods — Part 1: Soluble binder content*

EN 12697-2, *Bituminous mixtures — Test methods — Part 2: Determination of particle size distribution*

EN 12697-3, *Bituminous mixtures — Test methods — Part 3: Bitumen recovery: Rotary evaporator*

EN 12697-4, *Bituminous mixtures — Test methods — Part 4: Bitumen recovery: Fractionating column*

EN 12697-5, *Bituminous mixtures — Test methods — Part 5: Determination of the maximum density*

EN 12697-6, *Bituminous mixtures — Test methods — Part 6: Determination of bulk density of bituminous specimens*

EN 12697-7, *Bituminous mixtures — Test methods — Part 7: Determination of bulk density of bituminous specimens by gamma rays*

EN 12697-8, *Bituminous mixtures — Test methods — Part 8: Determination of void characteristics of bituminous specimens*

EN 12697-10, *Bituminous mixtures — Test methods — Part 10: Compactibility*

EN 12697-11, *Bituminous mixtures — Test methods — Part 11: Determination of the affinity between aggregate and bitumen*

EN 12697-12, *Bituminous mixtures — Test methods — Part 12: Determination of the water sensitivity of bituminous specimens*

EN 12697-13, *Bituminous mixtures — Test methods — Part 13: Temperature measurement*

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EN 12697-19, *Bituminous mixtures — Test methods — Part 19: Permeability of specimen*

1) In preparation

EN 12697-20, *Bituminous mixtures — Test methods — Part 20: Indentation using cube or cylindrical specimens*

EN 12697-21, *Bituminous mixtures — Test methods — Part 21: Indentation using plate specimens*

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EN 12697-30, *Bituminous mixtures — Test methods — Part 30: Specimen preparation by impact compactor*

EN 12697-31, *Bituminous mixtures — Test methods — Part 31: Specimen preparation by gyratory compactor*

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EN 12697-33, *Bituminous mixtures — Test methods — Part 33: Specimen prepared by roller compactor*

EN 12697-34, *Bituminous mixtures — Test methods — Part 34: Marshall test*

EN 12697-35, *Bituminous mixtures — Test methods — Part 35: Laboratory mixing*

EN 12697-36, *Bituminous mixtures — Test methods — Part 36: Determination of the thickness of a bituminous pavement*

EN 12697-37, *Bituminous mixtures — Test methods — Part 37: Hot sand test for the adhesivity of binder on precoated chippings for HRA*

EN 12697-38, *Bituminous mixtures — Test methods — Part 38: Common equipment and calibration*

EN 12697-39, *Bituminous mixtures — Test methods — Part 39: Binder content by ignition*

EN 12697-40, *Bituminous mixtures — Test methods — Part 40: In situ drainability*

EN 12697-41, *Bituminous mixtures — Test methods — Part 41: Resistance to de-icing fluids*

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EN 12697-48, *Bituminous mixtures — Test methods — Part 48: Interlayer bonding*[1)]

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CEN/TS 12697-50, *Bituminous mixtures — Test methods — Part 50: Resistance to scuffing* [1)]

EN 12697-51, *Bituminous mixtures — Test methods — Part 51: Surface shear strength test*[1)]

CEN/TS 12697-52, *Bituminous mixtures — Test methods — Part 52: Conditioning to address oxidative ageing*[1)]

EN 12697-53, *Bituminous mixtures — Test methods — Part 53: Cohesion increase by spreadability-meter method*[1)]

1 Scope

The aim of the test is to determine the cohesion increase of a bituminous mixture in fixed temperature and hygrometry conditions, using a spreadability-meter.

This European Standard specifies a method to measure the spreadability characteristics of asphalt which are able to vary with time. It may be used for the determination of the delay between manufacturing and laying. For emulsion-based asphalts and other cold mixtures (those mixed and laid at temperatures below 60 °C), the test method characterizes the “pot-life” of the mixture, the time during which it is possible to spread it. This time depends on a number of parameters (including the type and rate of emulsion, the type of aggregate and the type of grading curve) and is important for a client to be able to fix this time (minimal pot-life). For other mixtures other than mastic asphalt, for which the test is not applicable, the test method is intended to be of assistance to the designer for mixture design rather than as a type test.

This European Standard applies to bituminous mixtures both those made up in laboratory and those resulting from work site sampling, with an upper aggregate size not larger than 31,5 mm.

2 Principle

The cohesion increase test consists in to the measurement of the resistance against the shear due to progress of a piston in a mould filled with the bituminous mixture to be tested. The cohesion of the mixture increases in the same way as the shear force.

3 Equipment

3.1 Moulds

3.1.1 General

Depending on the application, the equipment may comprise large size and or small size moulds, as mentioned in Figure 2 using the following symbols:

L is the dimension of the mould according to the piston axle, in millimetre (mm);

W is the horizontal dimension of the mould perpendicular to the piston axle, millimetre (mm);

H is the height of the mould, millimetre (mm).

3.1.2 Large size moulds

— L = (220 ± 2) mm,

— W = (300 ± 2) mm,

— H = (100 ± 5) mm.

3.1.3 Small size moulds

— L = (220 ± 2) mm,

— W = (150 ± 2) mm,

— H = (100 ± 5) mm.

3.2 Spreadability-meter

An example of a spreadability-meter is shown on Figure 1. It comprises following elements:

— Metallic chassis, equipped with a piston which moves with a speed of (10,0 ± 0,5) mm/s on a minimal length of 130 mm and able to transmit a horizontal movement to the stainless steel plate.

— Sensor, fixed on the piston and linked to a steel plate, able to measure the force to ± 1 N up to 100 N and to ± 1 % above 100 N.

— Stainless steel plate, linked to the force measurement: length (230 ± 2) mm for large size moulds, length (115 ± 2) mm for small size moulds width (80 ± 1) mm and thickness (4,0 ± 0,5) mm. As the initial position, it is set on the wall with a vertical play of (3 ± 1) mm and it is vertically aligned with the inside edge of the mould.

Key

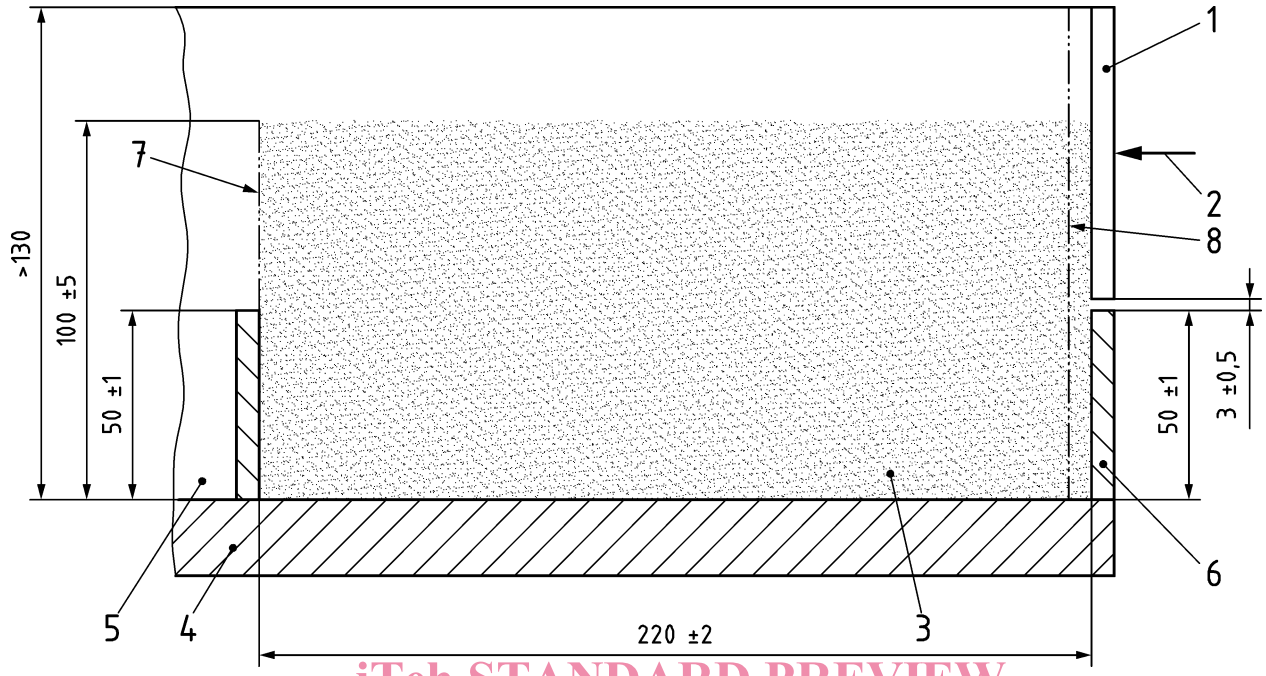
1 stainless steel plate in initial position

2 chassis

Figure 1 — Example of workability-meter

The workability-meter equipped with a mould is shown on Figure 2.

Dimensions in mm



Key

1 stainless steel plate in initial position

2 piston

3 mixture to be tested after striking

4 partition wall

5 mixture pouring out

6 pressure wall

7 detachable rear wall

8 detachable front wall

Figure 2 — Spreadability equipped with a mould

The bottom of the mould may comprise 15 holes with a diameter of (3,0 ± 0,1) mm, uniformly distributed to allow the drainage, if the drainage should be taken into account during the curing of the mixture.

The mould comprises detachable rear and front walls to allow filling with the mixture. They are placed respectively on the pressure wall and on the partition wall. They shall be removed after filling the mould and after the striking of the mixture and before the start of the test.

3.3 Filling shoot

Parallelepiped filling shoot, of which dimensions are suitable for filling the mould equipped with a discharge box comprising a retractable trap door. The height of discharge between the door and the bottom of the mould shall be (1 000 ± 50) mm. The discharge box shall be able to contain at least (11 ± 1) kg of mixture and the trap door shall be able to dump all the material when open.