SLOVENSKI STANDARD
SIST EN 12697-22:2020/oprA1:2023

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Bitumenske zmesi - Preskusne metode - 22. del: Preskus nastajanja kolesnic - Dopolnilo A1

Bituminous mixtures - Test methods - Part 22: Wheel tracking

Asphalt - Prüfverfahren - Teil 22: Spurbildungstest

Mélanges bitumineux - Méthodes d'essai - Partie 22 : Essai d'orniérage

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English Version

Bituminous mixtures - Test methods - Part 22: Wheel tracking

Mélanges bitumineux - Méthodes d'essai - Partie 22 : Essai d'orniérage

Asphalt - Prüfverfahren - Teil 22: Spurbildungstest

This draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 227.

This draft amendment A1, if approved, will modify the European Standard EN 12697-22:2020. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (EN 12697-22:2020/prA1:2023) has been prepared by Technical Committee CEN/TC 227 “Road materials”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

1 Modification to Clause 1, "Scope"

Replace the third paragraph and the NOTE with the following:

"The susceptibility of bituminous materials to deform is assessed by the rut formed by repeated passes of a loaded wheel at constant temperature. Three alternative types of devices can be used according to this document: large size devices, extra-large size devices and small size devices. With large size devices and extra-large size devices, the specimens are conditioned in air during testing. With small size devices, specimens are conditioned, in either air or water.

NOTE Large size and extra-large size devices are not suitable for use with cylindrical cores."

2 Modification to Clause 3, "Terms and definitions"

Delete terminological entry 3.8:

"**3.8**
measurement sequence
test phase corresponding to the completion of n load cycles"

3 Modification to Clause 4, "Symbols and abbreviated terms"

Replace Table 1 with the following:

"

Symbol	Definition	Unit
d_{ij}	local distance between the reference plane and the j predetermined location on the test surface at the i-th measurement with multiple measurement points for large size device. NOTE j varies between 1 and 15	mm
d_{0j}	local distance between a reference plane and the j predetermined location on the test surface before the start of the test (i=0) for large size device	mm
d_i	is the vertical displacement at the i-th measurement for small size device, procedure A	mm
$d_{i,\,s}$	is the measured rut depth in the measured cross-section, at the i-th measurement for extra-large device;	mm
d_n	is the vertical displacement after n load cycles for small size device, procedure B	mm
d_0	is the vertical displacement initially after 0 load cycles for small size device	mm
h	specimen thickness equal to the thickness of the course or courses of the test piece in which a rut can form	mm
L	load applied	N
n	number of cycles	—
n_{15}	number of load cycles for rut depth to reach 15 mm using small size device, procedure A	—
N	Total number of readings taken at 100 load cycle intervals for small size device, procedure A	—
P_i	measured proportional rut depth calculated as the average depth of a rut at the i-th measurement for one specimen for large size and extra-large size devices	%

Symbol	Definition	Unit
P_{iLD}	mean value of P_i obtained on two or more specimens using large size device	%
P_{iXL}	mean value of P_i obtained on two or more specimens using extra-large size device	%
PRD_{AIR}	mean proportional rut depth for the material using a small size device, procedure B in air	%
PRD_W	mean proportional rut depth for the material using a small size device, procedure B in water	%
RD	the rut depth of the specimen i using a small size device, procedure B	mm
RD_{AIR}	mean rut depth for the material using a small size device, procedure B in air	mm
RD_W	mean rut depth for the material using a small size device, procedure B in water	mm
r_i	mean rut depth at the i-th measurement for large size and extra-large size devices	mm
s	number of measured cross-sections for extra-large device	—
TR	mean rate of increase of track depth for one specimen using small size device, procedure A	µm/cycle
TR_m	mean value of the determinations of TR for small size device, procedure A	µm/cycle
w	width of the tyre applying the load	mm
WTR	wheel-tracking rate calculated as the mean rate at which the rut depth increases with time under repeated passes of a loaded wheel for small size device, procedure A	µm/cycle
WTS_W	wheel-tracking slope, calculated as the mean rate at which the rut depth increases with repeated passes of a loaded wheel for small size device, procedure B in water	mm/1 000 load cycles
WTS_{AIR}	wheel-tracking slope, calculated as the mean rate at which the rut depth increases with repeated passes of a loaded wheel for small size device, procedure B in air	mm/1 000 load cycles

."

4 Modification to Clause 6.2, "Extra large devices"

*In the title of Clause 6.2, replace "*Extra large*" with* "Extra-large*".*

5 Modification to Clause 6.4.1, "General"

Replace

"The equipment listed in 6.3.1 to 6.3.4 with the apparatus listed in 6.4.2 to 6.4.7."

with

"The equipment listed in 6.3.1 to 6.3.4 with a sample table, constructed to enable a 200 mm minimum diameter core specimen. The apparatus listed in 6.4.2 to 6.4.7."

6 Modification to Clause 7.1, "Test portion"

Replace Table 2 with the following:

"

Table 2 — Minimum set of specimens

Device	Minimum set of test specimen
Large or extra-large size device	2
Small size device, procedure A	6
Small size device, procedure B	2

".

7 Modification to Clause 7.2.2.1, "Cut specimens"

Delete the following text:

"For each test, cut at least:

— two test specimens for large and extra-large size devices;

— six test specimens for small size devices with procedure A; or

— two test specimens for small size devices with procedure B."

8 Modification to Clause 7.4, "Transport and storage of unmounted specimens"

Delete the following text from the first paragraph:

"at a temperature of not more than 30 °C."

9 Modification to Clause 7.6 "Storage"

Replace the text with the following:

"Prior to the start of testing, the specimens shall be stored on a flat surface at a temperature of not more than 25 °C for between 48 h and 42 days from the time of their manufacture. Manufacture in relation to specimens extracted from pavements refers to the procedure described in 7.5.2.

All specimens belonging to the same series of tests shall be of the same order of age, i.e. within ±10 %."

10 Modification to Clause 8.2.3, "Execution of test"

Replace the last sentence with the following:

"The test on a specimen is completed after the required number of load cycles or if the mean rut depth,

$$r_i = 100 \times \frac{\left(d_{i,1} + \ldots + d_{i,s}\right)}{s}$$

exceeds 20 mm."

11 Modification to Clause 8.3.4, "Procedure A"

Replace the text with the following:

"Monitor the rut development with either an automatic displacement measuring device or a dial gauge.

— *Measurement by automatic displacement measuring device*: Set the machine in motion and take readings of the vertical displacement initially, d_0, and then after every (25 ± 1) load cycles, d, with the centre of the test specimen within 10 mm of the centre point of the loaded area at the mid-point of traverse.

— *Measurement by dial gauge*: Set the centre of the test specimen within 10 mm of the centre point of the loaded area at the mid-point of traverse. Take an initial reading of the vertical position of the loaded wheel, d_0. Set the machine in motion and take readings of the vertical displacement every (25 ± 1) load cycles, d. For each reading, centre the specimen as for the initial reading.

Readings, d_i, used for calculation in 9.3.1.1, are taken at 100 load cycle intervals.

Continue tracking for 1 000 load cycles or until a rut depth of 15 mm is reached, whichever is the shorter."

12 Modification to Clause 9.1.1, "Calculation of the proportional rut depth"

Replace the text with the following:

"For each specimen, calculate the proportional rut depth, P_i, for each measurement, i, from the 15 values of local displacement, d_{ij}, and specimen thickness, h, using the formula:

$$P_i = 100 \times \sum_{j=1}^{15} \frac{\left(d_{ij} - d_{0j}\right)}{\left(15 \times h\right)} \quad (1)$$

where

P_i is the measured proportional rut depth, in percent (%);

d_{ij} is the local distance between the reference plane and the j location, in millimetres (mm) at the i-th measurement;

d_{0j} is the initial measurement of d_{ij}, in millimetres (mm);

h is the specimen thickness, in millimetres (mm)."

13 Modification to Clause 9.1.2, "Graph"

Replace the text with the following:

"Plot a graph $ln(P_i)$, against $ln(n)$ for each specimen tested of the same composition. Exclude values of proportion rut depth at the *i-th* measurement if any value of rut depth is greater than 15 % of the specimen thickness after the *i-th* measurement."

14 Modification to Clause 9.1.3, "Calculation of the mean value $P_{i\mathrm{LD}}$"

*Delete the word "*sequence*".*

15 Modification to Clause 9.2.1, "Calculation of the measured proportional rut depth"

Replace

"$d_{i,s}$ is the measured rut depth in the measured cross-section, in millimetres (mm) at the i measurement sequence;"

with

"$d_{i,s}$ is the measured rut depth in the measured cross-section, in millimetres (mm) at the i-th measurement;"

16 Modification to Clause 9.2.2, "Calculation of the mean value P_{iXL}"

Replace the text with the following:

"Calculate the mean value P_{iXL} of P_i of the two or more specimens tested of the same composition at the same level of air voids content and for the same number *i-th* measurement."

17 Modification to Clause 9.3.1.1, "Wheel-tracking rate"

Replace the text with the following:

"For each test specimen, determine the mean rate of increase of track depth, *TR*, in micrometers per load cycle (µm/cycle), from the following summation provided that the test continued for at least 5 min:

— At least 8 readings

$$TR = 3d_N + d_{N-1} - d_{N-2} - 3d_{N-3} \quad (3)$$

— 5 to 7 readings

$$TR = 5d_N - 5d_{N-2} \quad (4)$$

— 3 or 4 readings

$$TR = 10d_N - 10d_{N-1} \quad (5)$$

— 1 or 2 readings

$$TR = \frac{15\,000}{n_{15}} \quad (6)$$

where

N is the total number of readings taken at 100 load cycle intervals for up to 1 000 load cycles, excluding the initial reading;

d_i is the change in vertical displacement from the initial value, d_0, to the i-th relevant reading, in millimetres (mm);

n_{15} is the number of load cycles for rut depth to reach 15 mm.