SLOVENSKI STANDARD
SIST EN 12697-3:2013/oprA1:2017

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Bitumenske zmesi - Preskusne metode - 3. del: Ugotavljanje deleža veziva: rotacijski uparjalnik

Bituminous mixtures - Test methods - Part 3: Bitumen recovery: Rotary evaporator

Asphalt - Prüfverfahren - Teil 3: Rückgewinnung des Bindemittels: Rotationsverdampfer

Mélanges Bitumineux - Méthodes d'essai - Partie 3 : Extraction des bitumes à l'évaporateur rotatif

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93.080.20 Materiali za gradnjo cest Road construction materials

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Bituminous mixtures - Test methods - Part 3: Bitumen recovery: Rotary evaporator

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 12697-3:2013. 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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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Page

European foreword

This document (EN 12697-3:2013/prA1:2017) 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.

1 Modification to the Title

Replace the title:

"*Bituminous mixtures - Test methods for hot mix asphalt - Part 3: Bitumen recovery: Rotary evaporator*"

with:

"*Bituminous mixtures - Test methods - Part 3: Bitumen recovery: Rotary evaporator*".

2 Modification to 5.1, Apparatus for the extraction of the soluble bitumen

Replace the NOTE with the following one:

"

NOTE The use of the hot extraction methods in EN 12697-1 may harden the binder and hence affect the results from subsequent tests.".

3 Modification to 7.1, Extraction of the bitumen and removal of insoluble matter

In the numbered entry 7.1.2, replace:

"

7.1.2 Allow the bitumen solution to stand for a minimum of 10 min, and pour out the bitumen solution through a 0,063 mm sieve to remove any insoluble material. This can be achieved by either a) or b)."

with:

"

7.1.2 Allow the bitumen solution to stand for a minimum of 10 min, and pour out the bitumen solution through a 0,063 mm sieve to remove any insoluble material retained on this sieve. Removal of insoluble material passing a 0,063 mm sieve can be achieved by either a) or b).".

4 Modification to 7.3, Distillation procedure

Replace the whole subclause with the following one:

"

7.3 Distillation procedure

7.3.1 Pass cold water through the condenser.

7.3.2 Rotate the evaporating flask at (75 ± 15) r/min and lower it into the oil bath.

7.3.3 Raise the temperature of the oil bath to (T1 ± 5) °C where T_1 is taken from Table 1 for the solvent used.

7.3.4 Reduce the pressure in the apparatus to (P1 ± 5) kPa where P_1 is taken from Table 1 for the solvent used.

Table 1 — Distillation Conditions

Solvent		First Phase		Second Phase		Extra
Description	Boiling Point	Temperature	Pressure	Temperature	Pressure	Temperature
		T_1	P_1	T_2	P_2	T_3
	°C	°C	kPa	°C	kPa	°C
Dichloromethane	40,0	85	85	150	2,0	175
1.1.1-Trichlorethane	74,1	80	30	160	2,0	185
Benzene	80,1	80	30	160	2,0	185
Trichlorethylene	87,0	90	40	160	2,0	185
Xylene	140	120	30	180	2,0	205
Toluene	110,6	110	40	160	2,0	185
Tetrachloroethylene	121	110	40	160	2,0	180

NOTE Other distillation conditions can be used for either the solvents listed above or for other suitable solvents, if the conditions recover identical binder properties (within the precision limits for the test) to that recovered with the solvents above using the listed conditions.

7.3.5 Open the induction stopcock and allow the bitumen solution to be drawn from the container into the evaporating flask. Adjust the rate of flow of the bitumen solution into the flask by means of the induction stopcock, so that the rate of flow into the flask is approximately equal to the rate at which distillate is flowing into the receiving flask.

7.3.6 Do not allow the volume of the bitumen solution in the evaporating flask to exceed 400 ml or the pressure to be lower than (P_1— 5) kPa where P_1 is taken from Table 1 for the solvent used.

7.3.7 If moisture is seen to be present on the surface of the bitumen solution, take care to prevent this moisture from being drawn into the evaporating flask. To achieve this, position the inlet of the induction tube as close as possible to the bottom of the container and stop the flow before any globules of water are drawn up the tube. This requirement may necessitate rejecting the last from 20 ml to 30 ml of the bitumen solution.

7.3.8 When the bitumen solution has been transferred into the evaporating flask and most of the solvent has been evaporated, if it is necessary, allow the pressure to rise slowly to atmospheric, empty the receiving flask and return the pressure back to P_1.

7.3.9 Raise the temperature of the oil bath to (T_2 ± 5) °C where T_2 is taken from Table 1 for the solvent used. Continue distillation until the evaporation of solvent is complete and the bubbling of the bitumen in the evaporating flask is finished. Gradually reduce the pressure in the apparatus to (P_2 ± 0,5) kPa over a period of 3 min ± 30 s where P_2 is taken from Table 1 for the solvent used.

NOTE Taking the pressure down in two steps is the reference method.

7.3.10 Maintain the temperature and pressure at (T2 ± 5) °C and (P2 ± 0,5) kPa respectively until bubbling of the bitumen ceases.

NOTE 1 This is best observed by stopping the rotation of the evaporating flask momentarily.

NOTE 2 Spectography can be used to ensure that all the solvent has been removed from the recovered bitumen.

7.3.11 If the bitumen is still bubbling after 10 min, which may be the case with some very hard bitumens, maintain the pressure of (P_2 ± 0,5) kPa and raise the temperature to (T_3 ± 5) °C as quickly as possible, where T_3 is taken from Table 1 for the solvent used. Hold this temperature until all bubbling has ceased.

7.3.12 When bubbling ceases, maintain the conditions of temperature and pressure specified in 7.3.10 or 7.3.11 for a further 10 min.

7.3.13 When reporting results obtained on bitumen recovered at this higher temperature, the time required to raise the temperature to T3 °C shall be stated together with the total time the flask was at this temperature.

7.3.14 Stop the rotation of the flask and allow the pressure inside the apparatus to rise slowly to atmospheric pressure.

7.3.15 Raise the evaporating flask clear of the bath and wipe the outside clean.

7.3.16 Remove the evaporating flask from the apparatus. Quickly wipe the flask and the inside of the flask's neck with a clean tissue and pour the contents into a suitable container. Cover the container with a loosely fitting lid.

NOTE It will often be more convenient to allow the flask to cool to a temperature appropriate to directly prepare the bitumen for test as required in Clause 8.

7.3.17 In order to avoid the possibility of significant hardening of the bitumen by the dichloromethane (or other suitable solvent), complete the total procedure (i.e. extraction and recovery) within 24 h.

7.3.18 It is advisable to keep the vacuum pump running for about 30 min after completion of the recovery to ensure the removal of any dichloromethane (or other suitable solvent) vapour from the oil.".

5 Modification to Clause 9, Test report

Replace List Entry g) with the following one:

"

g) whether the temperature during evaporation rose above T_2 °C and the periods when it was higher (see 7.3.13);".