SLOVENSKI STANDARD
oSIST prEN 12697-28:2019

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Bitumenske zmesi - Preskusne metode - 28. del: Priprava vzorcev za ugotavljanje deleža veziva, deleža vode in zrnavosti

Bituminous mixtures - Test methods - Part 28: Preparation of samples for determining binder content, water content and grading

Asphalt - Prüfverfahren - Teil 28: Vorbereitung von Proben zur Bestimmung des Bindemittelgehaltes, des Wassergehaltes und zur Korngrößenbestimmung

Mélanges bitumineux - Méthodes d'essai - Partie 28: Préparation des échantillons pour la détermination de la teneur en liant, de la teneur en eau et de la granularité

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English Version

Bituminous mixtures - Test methods - Part 28: Preparation of samples for determining binder content, water content and grading

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

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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 (prEN 12697-28:2018) 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 enquiry.

This document will supersede EN 12697-28:2000.

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;

— [2] Reference to prEN 12697-36:1996 deleted;

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

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

1 Scope

This document describes test methods for preparing test portions for the determination of the binder, water content and grading of samples of bituminous mixtures, when the sample submitted to the laboratory has a mass greater than or equal to four times the test portion.

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 58, *Bitumen and bituminous binders - Sampling bituminous binders*

EN 932-1, *Tests for general properties of aggregates - Part 1: Methods for sampling*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 58 and the following apply.

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

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
representative sample
bulk sample consisting of a specified number of increments purposely taken to represent a specific quantity or area of material

Note 1 to entry: A representative sample is assumed to have the same composition as the material sampled, within the limits of precision associated with the method of sampling.

3.2
laboratory sample
sample despatched to the laboratory

Note 1 to entry: It may be the whole or part of the bulk or representative sample and should be of sufficient quantity for all tests required

3.3
test portion
part of the laboratory sample to be used for a specific test procedure to produce a single test result

3.4
test specimen
part of the test portion on which a single test is carried out

Note 1 to entry: A number of tests may be necessary to produce a test result.

3.5
test result
result obtained by applying the test procedure to a test portion

Note 1 to entry: When the test procedure is required to be carried out on more than one test specimen, the test result will be calculated as the mean result of a number of determinations.

4 Apparatus

4.1 Balance

4.2 Ruler

4.3 Circular saw, capable of cutting stone

4.4 Oven, conventional or microwave

4.5 Stopwatch

4.6 Metal tray (optional)

4.7 Sample splitter in accordance with EN 932-1 (such as that shown in Figure 1), optional

4.8 Shovel

4.9 Container

5 Preparation of laboratory samples of bituminous mixtures

5.1 Preliminary inspection and storage

5.1.1 On receipt of the laboratory sample inspect it and record its condition.

5.1.2 If a slab or a core cut from compacted material is to be stored prior to examination or separation of courses, take care so as to minimize deformation or deterioration of the material. Store slabs on a clean, hard, flat surface, preferably out of direct sunlight, with the final rolled surface at the bottom.

NOTE Cores of well compacted materials made with high viscosity binders will normally keep well standing vertically upside down on a clean bench in a cool room, but cores cut from less stable materials may require refrigeration especially for porous asphalt cores.

5.2 Pre-treatment of laboratory samples taken before and during laying

5.2.1 Binder drainage

If any binder drainage has occurred, collect and weigh as much of the drained material as possible and record the details. When the laboratory sample has been reduced to a suitable size for testing, add a proportionate representative weighed fraction of the drained material to the test portion. Record if the drained material cannot be collected.

5.2.2 Uncoated aggregate

Record the presence of any uncoated or fractured aggregate but do not remove such aggregate.

5.3 Pre-treatment of laboratory samples taken after laying

5.3.1 General

If possible, record the average thickness (or thickness if there is more than one course) in accordance with EN 12697-36:2003 and the presence of any extraneous material. Remove all extraneous material in accordance with the appropriate clause of this European Standard. If complete removal is not possible, this shall be recorded.

NOTE In most cases, total removal can only be effected by sawing.

5.3.2 Coated chippings

If possible, remove chippings by hand before starting the tests. If removal is not possible (e.g. due to deep embedment), record this and proceed with the tests.

NOTE Coated chippings may normally be removed with a suitable tool after warming the sample. For this purpose a temperature approximately 40 °C below the appropriate maximum temperature given in Table 1 is suitable.

It may be possible to identify and remove the chippings after extraction of the binder and if this is done an allowance for the mass of the chippings should be made in the test and the fact recorded on the test report.

5.3.3 Surface dressings

Remove any surface dressing, if possible. Record the presence of any visible penetration of the surface dressing binder into the sample.

NOTE Total removal will require sawing.

5.3.4 Tack coat or blinding grit

Record the presence of any tack coat or blinding grit.

5.3.5 Fractured aggregate

Record the presence of any fractured aggregate but do not remove such aggregate.

NOTE To reduce the effect of fractured aggregate on the test result, slabs are preferred to cores.

5.3.6 Multi-course slab or core

If necessary, use a circular, stone cutting saw to separate courses, particularly with core samples. In situations where this approach and other physical methods of cold separation are impractical, lay the slab or core upside down on a clean sheet metal tray and warm it in a conventional oven just sufficiently to soften the material so that the courses may be separated.

NOTE In some cases, insertion at the interface of the courses of a paint-stripping knife with a wide blade, or similar tool, will assist in the separation.

Only when other representative samples are not available should the separation of the courses of a sample that has broken be attempted. In such cases if separation by hand picking is attempted, test results will be unreliable and this should be clearly stated in the test report.

5.3.7 Free water

If the water content is not being determined and free water is visible on the material, or if the laboratory sample feels wet to the touch or if there is any reason to suppose that the material may contain water that is unevenly dispersed, break the material into pieces, after warming if necessary, of such a size that the water can readily evaporate. Leave the broken material exposed as a thin layer on a clean, hard surface, in a laboratory for at least 24 h at (21 ± 3) °C. Then treat the sample as described in 5.4 or 5.5 as appropriate.

5.4 Heat treatment before reducing the laboratory sample

5.4.1 Determine an accurate water content of the sample before sample reduction using no more heat than is required to facilitate the breaking up of the sample.

5.4.2 Treat laboratory samples that cannot be remixed at room temperature as follows. Heat the entire sample or separated course in a suitable oven at a temperature not exceeding the appropriate value given in Table 1 until it is just sufficiently soft to be readily mixed and divided. Do not leave the material in the oven for more than 4 h.

NOTE 1 The temperature and time constraints minimize loss of the volatile constituents of the binder.

NOTE 2 Conventional ovens are considered suitable for most instances. However, for the preparation of soft asphalt samples that may include light components, the use of a microwave oven may reduce the risk of binder hardening.

Table 1 — Temperatures of the oven for reheating laboratory samples prior to sample reduction

Nominal grade of binder in sample	Maximum temperature of oven °C
> 330 penetration at 25 °C	105
Above 60 up to 330 penetration at 25 °C	120
25 to 60 penetration at 25 °C	135
Less than 25 penetration at 25 °C	150

5.5 Sample reduction for the determination of binder content, water content and grading

5.5.1 Weigh the entire laboratory sample, or each portion representing the separate courses, and place on a clean hard surface, e.g. a sheet metal tray. Mix the material thoroughly and reduce it to the quantity required for test, as given in Table 2, either by using a sample splitter, which may be heated or slightly oiled or by quartering as described in 5.5.2 to 5.5.8.

The use of a sample splitter for nominal sizes of 20 mm and larger is likely to be quicker and will provide a sample of accuracy equal to or greater than that obtained by quartering. The width of the chutes should be at least 1,5 times the diameter of the largest aggregate.

Oil used for lubricating the sample splitter should be kept to a minimum and be light oil, not diesel (gas oil).

By assuming equal subdivision of the laboratory sample after each quartering process it is possible, by weighing the original sample, to estimate whether the mass remaining after quartering will be within the appropriate range given in Table 2. If the estimated mass is above the upper limit of the appropriate range given in Table 2, the mass of the original sample may be reduced by one quarter. This should be done by quartering twice, rejecting two opposite quarters from the second quartering process, combining the remainder from the second quartering process with the material put aside from the first quartering process and then carrying out the procedure as described in 5.5.2 to 5.5.8 (see Figures 2 and 3).

Table 2 — Mass of material for each determination

Type of material	Largest size of aggregate mm	Mass of test portion for each determination Minimum (Normative) g	 Maximum (Informative) g
Bituminous mixture	63 or 45	3 000	5 000
	40	2 500	4 000
	31,5	1 500	2 800
	22,4 or 20	1 000	2 000
	16 or 14 or 12,5	800	1 400
	11,2 or 10 or 8	300	1 000
	6,3 or 5,6 or 4 or 2	150	500
Coated chippings	All sizes	2 000	3 000
NOTE Maximum masses are given for guidance only.			

5.5.2 Mix the material thoroughly by heaping it into a cone and turning it over to form a new cone three times as described in 5.5.3 to 5.5.8.

5.5.3 Form a conical heap by depositing each shovelful of the material on the apex of the cone. Distribute any material that rolls down the sides as evenly as possible, so that the centre of the cone is not displaced. Push back to the edge of the heap any larger pieces of aggregate that may scatter round the base.

5.5.4 Flatten the third cone formed from the mixed sample by repeated vertical insertions of the edge of a shovel or board, commencing about the centre and working progressively round the cone, lifting the shovel or board clear of the material after each insertion.

5.5.5 Ensure that the heap thus formed is reasonably uniform in thickness and diameter and that its centre coincides with the centre of the cone from which it was produced.

5.5.6 Quarter the heap along two diameters that intersect at right angles. Combine one pair of diagonally opposite quarters and discard the remainder.

5.5.7 Repeat 5.5.2 to 5.5.6 until the mass remaining is about four times the mass of the required test specimen. When required, repeat 5.5.2 to 5.5.6 once more and set aside, in a sealed container, for the estimations of water content the quarters that would otherwise be discarded. However, if the binder content and hence water content is to be calculated using the hot extractor method discard these quarters.

5.5.8 Repeat 5.5.2 to 5.5.6 once more to obtain the required test specimen.

NOTE The use of a quartering cross of wood or sheet metal, which can be forced through the heap, often facilitates quartering in cases where the material tends to segregate.

If drained binder was collected during the earlier treatment of the sample (see 5.2.1) a proportionate amount of binder should be added to the test specimen.