BRITISH STANDARD

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12697-13:2000
Incorporating
Corrigendum No. 1

Bituminous mixtures — Test methods for hot mix asphalt —

Part 13: Temperature measurement

The European Standard EN 12697-13:2000 has the status of a British Standard

ICS 91.100.50; 93.080.20

National foreword

This British Standard is the official English language version of EN 12697-13:2000, including corrigendum February 2001.

The UK participation in its preparation was entrusted by Technical Committee B/510, Road materials to Subcommittee B/510/1, Coated macadam and hot mix asphalt, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement these international or European publications may be found in the BSI Standards Catalogue under the section entitled "International Standards Correspondence Index", or by using the "Find" facility of the BSI Standards Electronic Catalogue.

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This British Standard, having been prepared under the direction of the Sector Committee for Building and Civil Engineering, was published under the authority of the Standards Committee and comes into effect on 15 December 2000

Summary of pages

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Incorporating Corrigendum February 2001

English version

Bituminous mixtures — Test methods for hot mix asphalt — Part 13: Temperature measurement

This European Standard was approved by CEN on 4 October 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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 Central Secretariat has the same status as the official versions.

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

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 227, Road materials, the Secretariat of which is held by DIN.

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 April 2001, and conflicting national standards shall be withdrawn at the latest by December 2003.

This European Standard is one of a series of standards as listed below:.

EN 12697-1, *Bituminous mixtures - Test methods for hot mix asphalt - Part 1: Soluble binder content*

prEN 12697-2, *Bituminous mixtures - Test methods for hot mix asphalt - Part 2: Particle size distribution*

EN 12697-3, *Bituminous mixtures -Test methods for hot mix asphalt - Part 3: Binder recovery: Rotary evaporator*

EN 12697-4, *Bituminous mixtures - Test methods for hot mix asphalt - Part 4: Binder recovery: Fractionating column*

prEN 12697-5, *Bituminous mixtures - Test methods for hot mix asphalt - Part 5: Determination of the maximum density*

prEN 12697-6, *Bituminous mixtures - Test methods for hot mix asphalt - Part 6: Determination of bulk density of bituminous specimen by hydro-static method*

prEN 12697-7, *Bituminous mixtures - Test methods for hot mix asphalt - Part 7: Determination of bulk density of bituminous specimens by gamma rays*

prEN 12697-8, *Bituminous mixtures - Test methods for hot mix asphalt - Part 8: Determination of the air voids content of bituminous materials*

prEN 12697-9, *Bituminous mixtures - Test methods for hot mix asphalt - Part 9: Determination of the reference density, gyrator compactor*

prEN 12697-10, *Bituminous mixtures - Test methods for hot mix asphalt - Part 10: Compactibility*

prEN 12697-11, *Bituminous mixtures - Test methods for hot mix asphalt - Part 11: Determination of the affinity between aggregates and binders*

prEN 12697-12, *Bituminous mixtures - Test methods for hot mix asphalt - Part 12: Determination of the water sensitivity of specimen*

EN 12697-13, *Bituminous mixtures - Test methods for hot mix asphalt - Part 13: Temperature measurement*

EN 12697-14, *Bituminous mixtures - Test methods for hot mix asphalt - Part 14: Water content*

prEN 12697-15, *Bituminous mixtures - Test methods for hot mix asphalt - Part 15: Determination of the segregation sensitivity of bituminous mixtures*

prEN 12697-16, *Bituminous mixtures - Test methods for hot mix asphalt – Part 16: Abrasion by studded tyres*

prEN 12697-17, *Bituminous mixtures - Test methods for hot mix asphalt – Part 17: Particle loss of specimen*

prEN 12697-18, *Bituminous mixtures - Test methods for hot mix asphalt - Part 18: Binder drainage from porous asphalt*

prEN 12697-19, *Bituminous mixtures - Test methods for hot mix asphalt – Part 19: Permeability of specimen*

prEN 12697-20, *Bituminous mixtures - Test methods for hot mix asphalt - Part 20: Indentation using cube or marshall specimen*

prEN 12697-*21, Bituminous mixtures - Test methods for hot mix asphalt - Part 21: Indentation using plate specimen*

prEN 12697-22, *Bituminous mixtures - Test methods for hot mix asphalt - Part 22: Wheel tracking test*

prEN 12697-23, *Bituminous mixtures - Test methods for hot mix asphalt - Part 23: Indirect tensile test*

prEN 12697-24, *Bituminous mixtures - Test methods for hot mix asphalt - Part 24: Resistance to fatique*

prEN 12697-25, *Bituminous mixtures - Test methods for hot mix asphalt – Part 25: Dynamic creep test*

prEN 12697-26, *Bituminous mixtures - Test methods for hot mix asphalt – Part 26 : Stiffness*

EN 12697-27, *Bituminous mixtures - Test methods for hot mix asphalt - Part 27: Sampling*

EN 12697-28, *Bituminous mixtures - Test methods for hot mix asphalt – Part 28: Preparation of samples for determining binder content, water content and grading*

prEN 12697-29, *Bituminous mixtures - Test methods for hot mix asphalt - Part 29: Determination of the dimensions of bituminous specimen*

prEN 12697-30, *Bituminous mixtures - Test methods for hot mix asphalt - Part 30: Preparation of specimen by impact compactor*

prEN 12697-31, *Bituminous mixtures - Test methods for hot mix asphalt - Part 31: Specimen preparation, gyratory compactor*

prEN 12697-32, *Bituminous mixtures - Test methods for hot mix asphalt - Part 32: Laboratory compaction of bituminous mixtures by a vibratory compactor*

prEN 12697-33, *Bituminous mixtures - Test methods for hot mix asphalt – Part 33: Specimen preparation, slab compactor*

prEN 12697-34, *Bituminous mixtures - Test methods for hot mix asphalt - Part 34: Marshall test*

prEN 12697-35, *Bituminous mixtures - Test methods for hot mix asphalt – Part 35: Laboratory mixing*

prEN 12697-36, *Bituminous mixtures - Test methods for hot mix asphalt - Part 36: Method for the determination of the thickness of a bituminous pavement*

prEN 12697-37, *Bituminous mixtures - Test methods for hot mix asphalt - Part 37: Hot sand test for the adhesivity of binder on precoated chippings for HRA*

prEN 12697-38, *Common equipment and calibration*

The applicability of this European Standard is described in the product standards for bituminous materials.

No existing European Standard is superseded.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard describes a test method for measuring the temperature of hot bituminous mixtures after mixing and during storage, transportation and laying. This standard does not include the use of non-contact temperature-measuring devices.

2 Principle

A probe attached to a temperature measuring device is preheated before the temperature at stated depths in a number of locations is measured while the asphalt is in one of several different places. The average is then calculated.

3 Apparatus

3.1 General

The temperature measuring device shall measure the temperature in intervals of 5 ^{0}C or smaller with an accuracy of ± 2 ^{0}C and be fitted with a suitable probe of which the response time is known for the temperature interval which is to be measured. The temperature measuring device and probe shall be suitable for the use in that location where the temperature is to be measured.

NOTE 1 Several types of temperature measuring devices are suitable, e.g. electronic thermometers using thermocouples or thermistors or bimetallic rotary thermometers. Thermometers of the latter type, although cheapest, are possibly least satisfactory owing to their comparative flimsiness, slow response time and need for frequent recalibration. More robust models are available but robustness is associated with lengthened response time.

NOTE 2 With the electronic type, the heat-sensing element is very small and is normally mounted in the tip of the probe, and therefore one probe can be used for measuring temperatures of both bulk and as laid material. Thermocouple probes available cover a large temperature range, e.g. of 400 ^{0}C, while those using thermistors are sufficiently accurate only over a limited range, e.g. of 100 ^{0}C.

NOTE 3 The thermal capacity of the temperature measuring device should be as small as possible, consistent with adequate robustness, to minimize the time required to obtain a reliable reading.

3.2 Devices for measuring the temperature of material in a lorry or in a heap

The probe of the temperature-measuring device shall have a minimum length of 300 mm, with the sensing element positioned close to the end.

3.3 Devices for measuring the temperature of material after it has been laid and before or during rolling

The temperature-measuring device shall have a temperature sensitive element small enough to be completely buried within the bituminous material, which has been laid.

4 Procedure

4.1 Conditioning of instrument

Allow the probe to the temperature-measuring device to heat up to the appropriate temperature of the material by placing it in one position and then quickly moving it to another position to obtain the first measurement.

NOTE The insertion of a cold probe of relatively high thermal capacity will remove sufficient heat from the material to give a low temperature reading because of the low thermal capacity and conductivity of bituminous mixtures.

4.2 Measurements of temperature in a lorry

Insert the probe into the lorry – load of material to a depth of at least 100 mm. Take at least four measurements at evenly spaced intervals along each side of the lorry and at least 500 mm from the edges of the load. Calculate the result as the average of all the readings.

4.3 Measurements of temperature of laid materials

Take at least four measurements of the material with the temperature sensitive element as close as possible to the mid-depth of the layer. Calculate the result as the average of all the readings.

NOTE When measuring the temperature of asphalt to which chippings are applied, because of the short time normally available between laying the asphalt and the chippings being applied or commencement of the rolling it is unlikely that four measurements can be taken in a small area using a bimetallic thermometer because of its response time. If necessary, more than one such thermometer should be used to avoid delays in rolling. Alternatively, an electronic type of temperature measuring device should be used to obtain quicker readings.

4.4 Measurements of temperature in a heap

Insert the probe into the material to a depth of at least 100 mm. Take at least four measurements at intervals around the accessible perimeter and at least 300 mm from the base. Calculate the result as the average of all the readings.

NOTE A heap is assumed to be on the ground and not within equipment such as the paver hopper. There are additional inherent dangers in measuring the temperature of a bituminous mixture in a paver hopper.

5 Test report

5.1 Information

The test report shall include the following information as appropriate:

a) Date, time and place of testing;

b) load number;

c) site of measurement (in lorry, laid or heap material);

d) type and identifying number of the temperature measuring device used;

e) specification of the material;

f) average result to the nearest 5 ^{0}C;

g) name of person performing the test;

h) the number and date of this European Standard.

5.2 Optional information

If required, the test report shall also include additional optional information such as the following:

a) Name of project;

b) name of supplier and source of material;

c) date of production of material.

6 Precision

There is no precision statement for any of these devices.

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