



SLOVENSKI STANDARD

SIST EN 12697-13:2018

01-januar-2018

Nadomešča:

SIST EN 12697-13:2002

SIST EN 12697-13:2002/AC:2002

Bitumenske zmesi - Preskusne metode - 13. del: Merjenje temperature

Bituminous mixtures - Test methods - Part 13: Temperature measurement

Asphalt - Prüfverfahren - Teil 13: Temperaturmessung

Mélanges Bitumineux - Méthodes de essais - Partie 13: Mesure de la température

[SIST EN 12697-13:2018](http://standards.iteh.ai/catalog/standards/sist/en-12697-13-2018)

Ta slovenski standard je istoveten z: EN 12697-13:2017

<http://standards.iteh.ai/catalog/standards/sist/en-12697-13-2018>

ICS:

93.080.20 Materiali za gradnjo cest Road construction materials

SIST EN 12697-13:2018

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 12697-13:2018

<https://standards.iteh.ai/catalog/standards/sist/c2554a4f-323f-403d-8626-287695206a4f/sist-en-12697-13-2018>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12697-13

November 2017

ICS 93.080.20

Supersedes EN 12697-13:2000

English Version

**Bituminous mixtures - Test methods - Part 13:
Temperature measurement**

Mélanges Bitumineux - Méthodes d'essai - Partie 13:
Mesure de la température

Asphalt - Prüfverfahren - Teil 13: Temperaturmessung

This European Standard was approved by CEN on 28 August 2017.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

<https://standards.iteh.ai/catalog/standards/sist/c2554a4f-323f-403d-8626-287695206a4f/sist-en-12697-13-2018>



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European Foreword.....	3
1 Scope	4
2 Principle	4
2.1 General.....	4
2.2 Contact Temperature Measuring Thermometer	4
2.3 Infrared-thermometer	4
3 Apparatus.....	4
3.1 Contact temperature measuring	4
3.2 Infrared-thermometer	5
4 Procedure.....	5
4.1 Contact Measuring Device.....	5
4.2 Infrared-thermometer	6
5 Test Report	7
5.1 Mandatory information	7
5.2 Optional information	7
6 Precision.....	7

[SIST EN 12697-13:2018](https://standards.iteh.ai/catalog/standards/sist/c2554a4f-323f-403d-8626-287695206a4f/sist-en-12697-13-2018)
<https://standards.iteh.ai/catalog/standards/sist/c2554a4f-323f-403d-8626-287695206a4f/sist-en-12697-13-2018>

European Foreword

This document (EN 12697-13:2017) 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 May 2018, and conflicting national standards shall be withdrawn at the latest by May 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12697-13:2000.

The following is a list of significant technical changes since the previous edition:

- A test device for non-contact temperature-measurement (infrared-thermometer) is added,
- 2.3 Infrared-thermometer,
- 3.2 Infrared-thermometer,
- 4.2 Infrared-thermometer.

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

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies a test method for measuring the temperature of asphalt mixtures after mixing and during storage, transportation and laying. This European Standard includes the contact temperature-measuring device and the non-contact temperature-measuring device (infrared-thermometer).

2 Principle

2.1 General

In cases of dispute, the reference method using the contact temperature measuring device is preferred.

2.2 Contact Temperature Measuring Thermometer

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 various stages of the delivery, laying and compaction process. The average is then calculated.

2.3 Infrared-thermometer

An infrared-thermometer is focussed on the surface of the asphalt to be measured at various stages of the delivery, laying and compaction process. A number of locations on the asphalt surface will be measured. Afterwards, the mean is calculated.

3 Apparatus

SIST EN 12697-13:2018

<https://standards.iteh.ai/catalog/standards/sist/c2554a4f-323f-403d-8626-787695206a4f/sist-en-12697-13-2018>

3.1 Contact temperature measuring

3.1.1 General

The temperature measuring device shall have the capacity to measure the temperature with an accuracy of ± 2 °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 The heat-sensing element of electronic thermometer probes is very small and is normally mounted in the tip of the probe, and therefore a single probe can be used for measuring temperatures of both bulk and as laid material.

NOTE 2 Thermocouple probes available cover a large temperature range, typically 400 °C.

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

3.1.2 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 200 mm, with the sensing element positioned close to the end.

3.2 Infrared-thermometer

The infrared-thermometer shall be capable of detecting the temperature after a transformation of the wavelength range between 2 μm and 14 μm . The infrared-thermometer shall record the thermal radiation of the surface of the measured object. For an accurate measurement, it is important to focus the sensor of the infrared-thermometer in a sufficient angle and distance to the measured object.

For accurate measurements with the infrared-thermometer of any surface, it is necessary to know the specific emissivity of the material. The conditioning check is described in 4.2.2.

NOTE As a function of the type of mixture, a value of the emissivity of 0,90 to 0,98 is appropriate.

4 Procedure

4.1 Contact Measuring Device

4.1.1 Conditioning of instrument

Allow the probe fitted to the temperature measuring device to heat up to the approximate temperature, during at least the device response time, of the material by placing it in one position before 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.

4.1.2 Measurement 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.

NOTE Measurement on a lorry-load is preferably performed from a sampling platform to avoid hazardous situations.

4.1.3 Measurement material temperature after it has been laid and before or during rolling

Take at least four measurements of the material prior to completion of rolling 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. 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.

NOTE When measuring the rolling temperature of asphalt particular care is needed with regard to the proximity of moving compaction plant

4.1.4 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 1 A heap is assumed to be on the ground and not within equipment such as the paver hopper.

EN 12697-13:2017 (E)

NOTE 2 There are additional inherent dangers in measuring the temperature of a bituminous mixture in a paver hopper.

4.2 Infrared-thermometer

4.2.1 General

An infrared-thermometer is designed to be capable of taking consistent readings from a surface of a layer or a constantly moving sample of asphalt.

Only infrared thermometer able to adjust their emissivity value can be used.

4.2.2 Comparison measurement

A comparison measurement with a calibrated contact temperature measurement device has to be undertaken before a set of measurements. A sample of asphalt shall be measured with both the contact thermometer, conditioned according to 4.1.1, and the infrared-thermometer at the same time. Adjust the emissivity value of the infrared-thermometer so that both thermometers indicate the same temperature.

NOTE As a function of the type of mixture, a value of the emissivity of 0,90 to 0,98 is appropriate

4.2.3 Temperature measurement

4.2.3.1 General

Focus the infrared thermometer on the test point with the device held at an angle of 50° to 90° to the asphalt surface. Select the distance between the infrared-thermometer and the test point so the area of asphalt being measured is fully within the measuring field of the infrared thermometer.

4.2.3.2 Measurements of temperature in a lorry

Uncover the heap of asphalt in the lorry immediately prior to each single measurement.

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. The measure distance should be always the same. Calculate the result as the average of all the readings.

This measurement is dangerous and should not be carried out on site, only from a sampling platform, using a safe method of access to the surface of the hot asphalt

4.2.3.3 Measurements of temperature in a heap

Uncover the heap of asphalt immediately prior to each single measurement.

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.

4.2.3.4 Measurements of temperature in a paver hopper

Focus the infrared-thermometer to the moving material stream at the auger or slat conveyor of the hopper. Take at least four measurements. Calculate the result as the average of all the readings.