



SLOVENSKI STANDARD

SIST EN 12274-5:2018

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SIST EN 12274-5:2004

**Tankoplastne prevleke po hladnem postopku - Preskusne metode - 5. del:
Ugotavljanje minimalnega deleža veziva in odpornosti proti obrabi**

Slurry surfacing - Test method - Part 5: Determination of the minimum binder content and wearing resistance

Dünne Asphaltsschicht in Kaltbauweise - Prüfverfahren - Teil 5: Bestimmung des Verschleißes

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93.080.20 Materiali za gradnjo cest Road construction materials

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EUROPEAN STANDARD

EN 12274-5

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2018

ICS 93.080.20

Supersedes EN 12274-5:2003

English Version

Slurry surfacing - Test method - Part 5: Determination of the minimum binder content and wearing resistance

Matériaux bitumineux coulés à froid - Méthode d'essai
- Partie 5: Détermination de la teneur minimum en
liant et de la résistance à l'usure

Dünne Asphaltdeckschichten in Kaltbauweise -
Prüfverfahren - Teil 5: Bestimmung des
Mindestbindemittelgehaltes und des Verschleißes von
Bitumenschlämmen

This European Standard was approved by CEN on 13 November 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.



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

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European foreword

This document (EN 12274-5:2018) 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 September 2018, and conflicting national standards shall be withdrawn at the latest by September 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 12274-5:2003.

Compared with EN 12274-5:2003, the following changes have been made:

- a) In 6.1 the humidity is reduced from 100 % to 60 %;
- b) In 6.2 the Abrasion machine is defined in terms of rotating speed and force applied.

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

- EN 12274-1, *Slurry surfacing — Test methods — Part 1: Sampling of slurry surfacing mixture*;
- EN 12274-2, *Slurry surfacing — Test methods — Part 2: Determination of residual binder content including preparation of samples*;
- EN 12274-3, *Slurry surfacing — Test methods — Part 3: Consistency*;
- EN 12274-4, *Slurry surfacing — Test methods — Part 4: Determination of cohesion of the mix*;
- EN 12274-5, *Slurry surfacing — Test methods — Part 5: Determination of the minimum binder content and wearing resistance*;
- EN 12274-6, *Slurry surfacing — Test methods — Part 6: Rate of application*;
- EN 12274-7, *Slurry surfacing — Test methods — Part 7: Shaking abrasion test*;
- EN 12274-8, *Slurry surfacing — Test methods — Part 8: Visual assessment of defects*.

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.

EN 12274-5:2018 (E)**1 Scope**

This European Standard specifies a test method for the design of slurry surfacing mixture based on the determination of the minimum binder content of the mixture and the resistance to wear under wet track abrasion conditions for the purpose to support the mixture design.

This test can be used for quality control purposes.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1097-5, *Tests for mechanical and physical properties of aggregates - Part 5: Determination of the water content by drying in a ventilated oven*

ISO 48, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 set

end of the non-reversible process when the emulsion coalescence takes place

Note 1 to entry: The coalescence of an emulsion is the non-reversible phase starting from the beginning of the breaking of the emulsion to the total setting when the bitumen emulsion reverts to bitumen in presence of a mineral.

Note 2 to entry: After the set of a slurry surfacing, it is not possible to stir the mixture; free emulsion during washing with water cannot be observed and an absorbent paper is not stained when pressed slightly onto the surface of the slurry surfacing.

3.2 set time

set time

time elapsed between placing a slurry surfacing and its setting

3.3 quick setting slurry surfacing

quick setting slurry surfacing

slurry with a set time less than or equal to 30 min

3.4 slow setting slurry surfacing

slow setting slurry surfacing

slurry with a set time more than 30 min

4 Principle

The samples are tested under water, after which the mass-loss by abrasion is measured.

The test consists of an abrasive action operated by means of a hard rubber cylinder which exerts a planetary side gear rubbing pressure, applied for 5 min, on the surface of a test sample of slurry previously prepared, cured in an oven, and moistened by immersion.

This test method can be used with different curing conditions in the design process for the determination of:

- minimum amount of emulsion for slurry surfacing with a given aggregate composition to withstand the abrasive action of traffic (Annex A);
- resistance to wear of the mix at early stage under different traffic and climatic conditions (Annex B).

5 Materials

5.1 Coarse aggregates and fine aggregates

A sufficient amount of the separated aggregates to be used in the slurry shall be dried in an oven at (110 ± 5) °C to reach constant mass, according to EN 1097-5.

Wet aggregates may be used, preferably at their own natural moisture. In case of natural moisture, water content W is determined by drying in an oven at a temperature of (110 ± 5) °C until constant mass is achieved, according to EN 1097-5.

5.2 Reactive filler

The reactive filler, e.g. cement or hydrated lime, shall be dried in an oven at (110 ± 5) °C to reach constant mass, according to EN 1097-5.

5.3 Emulsion

The emulsion shall be manually homogenized by stirring intensively with a metal spatula.

6 Apparatus

6.1 Apparatus used for preparation of samples

- 1) **Drying oven**, with a forced air system and a minimum capacity of 80 L capable of maintaining a temperature of (60 ± 5) °C.
- 2) **Oven**, thermostatically controlled to maintain a temperature of (110 ± 5) °C.
- 3) **Climatic chamber**, capable of maintaining a temperature of (5 ± 1) °C and a humidity of (60 ± 10) %. See Clause 8 and Annex A and B.
- 4) **Balance**, accurate to 0,1 g.
- 5) Timing device, accurate to 1 s.
- 6) **Ring-shaped annular metal moulds**, with an internal diameter of $(279,0 \pm 0,5)$ mm and external diameter of $(295,0 \pm 0,5)$ mm. The heights of these moulds shall be as follows:
 - Type A $(6,3 \pm 0,5)$ mm;
 - Type A1 $(8,0 \pm 0,5)$ mm;
 - Type B $(10,0 \pm 0,5)$ mm;
 - Type C $(13,0 \pm 0,5)$ mm;
 - Type D $(19,0 \pm 0,5)$ mm.

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- 7) **Ladles or beakers** of 1 L, 2 L and 5 L capacity.
- 8) **End-rounded spatula or metal rod.**
- 9) **Levelling plate** with a straight edge, chamfered to a sharp edge on one of its faces and having a handle.
- 10) **Test piece bases** made of unchipped roofing felt, of at least 300 mm diameter and weighing minimum (700 ± 100) g/m².

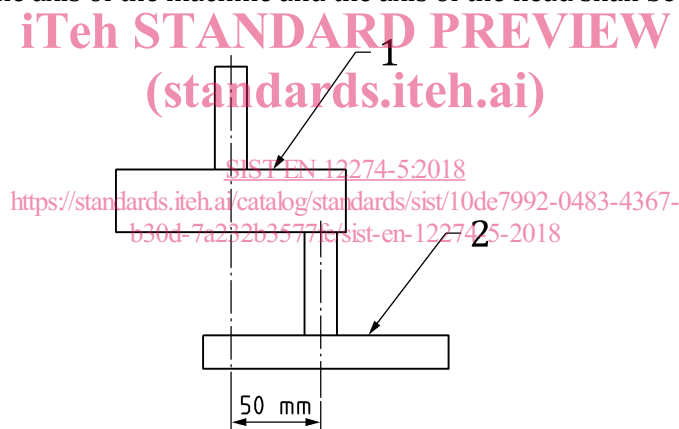
6.2 Apparatus used for testing

- 1) **Abrasion machine**, consisting of an electric motor capable of driving a planetary gear system which rotates its vertically-mounted abrasion head about its own axis, as well as providing a planetary motion applied directly to the test sample.

The machine is designed to provide the abrasive head with a rotating speed of about 144 min^{-1} for 61 complete cycles per minute of the planetary system while exerting a constant vertical kinetic-friction force of $(22,3 \pm 2,0)$ N, corresponding to the mass of the complete abrasion head.

The mass of the complete abrasion head (all parts including bridles and screws) shall be (2300 ± 5) g.

The distance between the axis of the machine and the axis of the head shall be 50 mm, as described:



Key

- 1 axis of the abrasion machine
- 2 axis of the abrasion head

A tolerance of $\pm 0,1$ mm is required only on the dimensions of the influent parts of the device.

Figure 1 — Axes of rotation of the apparatus

- 2) **Test bath** of sufficient volume to keep the test sample submerged for the duration of the test. The bottom of the bath shall be fitted with three spindles designed to fix the test base plate in place.
- 3) **Test base plate** comprising a thick metal disc diameter 310 mm and thickness 5,0 mm. The disc shall have at least three knurled head screw fasteners arranged symmetrically on the base plate periphery, in order to secure the sample during the test.

4) **Installation of the abrasion machine:**

The test base plate shall be fixed by means of dowels to the test bath bottom. The abrasion machine and the test bath should be firmly fixed together by means of an appropriate device throughout the test

5) **Auxiliary bath** capable of storing the test samples at (25 ± 2) °C before testing.

6) **Abrasion head** fitted with a piece of hose (127 ± 1) mm made of 80° shore hardness rubber conforming to ISO 48 and reinforced with a double cord surface. The hose shall have an internal diameter of $(19 \pm 0,5)$ mm and an external diameter of about 31 mm and shall be capable of withstanding a pressure of 2 533 MPa.

A drawing of the abrasion head is given in Figure 2.

An example of an apparatus is shown in Figure 3.

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