



# SLOVENSKI STANDARD

## SIST EN 12274-8:2006

01-januar-2006

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**Tankoplastne prevleke po hladnem postopku - Preskusne metode - 8. del: Vizualna ocena poškodb**

Slurry surfacing - Test methods - Part 8: Visual assessment of defects

Dünne Asphaltsschichten in Kaltbauweise - Prüfverfahren - Teil 8: Augenscheinliche Beurteilung

Matériaux bitumineux coulés a froid - Methodes d'essai - Partie 8: Evaluation visuelle des défauts

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EUROPEAN STANDARD

EN 12274-8

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2005

ICS 93.080.20

English Version

## Slurry surfacing - Test methods - Part 8: Visual assessment of defects

Matériaux bitumineux coulés à froid - Méthodes d'essai -  
Partie 8: Evaluation visuelle

Dünne Asphaltsschichten in Kaltbauweise - Prüfverfahren -  
Teil 8: Augenscheinliche Beurteilung

This European Standard was approved by CEN on 4 August 2005.

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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## Foreword

This European Standard (EN 12274-8:2005) 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of an identical text or by endorsement, at the latest by March 2006, and conflicting national standards shall be withdrawn at the latest by March 2006.

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

EN 12274-1, *Slurry surfacing – Test methods – Part 1: Sampling for binder extraction.*

EN 12274-2, *Slurry surfacing – Test methods – Part 2: Determination of residual binder content.*

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 wearing.*

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 organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

**EN 12274-8:2005 (E)****1 Scope**

This European Standard specifies qualitative and quantitative test methods of the visual assessment of defects of slurry surfacing.

This European Standard is applicable to all slurry surfacing (roads, airfields and other areas).

The visual assessment reports for both methods have identical records and thus both may be used to check the specification for visual assessment of defects.

Defects emanating from the substrate (existing road) must not be taken into consideration.

NOTE 1 The qualitative and quantitative tests may be used separately or sequentially. This may relate to different types of sites (for example lightly trafficked roads may not be required to be quantitatively assessed).

NOTE 2 The test may be used to evaluate the durability of slurry surfacing.

**2 Normative references**

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13036-1, *Road and airfield surface characteristics — Test methods — Part 1: Measurement of pavement surface macrotexture depth using a volumetric measurement patch technique*

**3 Terms, definitions and symbols** SIST EN 12274-8:2006

[https://standards.itih.ai/catalog/standards/sist/cbb0c64a-d0f0-4d6c-a1d7-](https://standards.itih.ai/catalog/standards/sist/cbb0c64a-d0f0-4d6c-a1d7-fd012811701a/terms-definitions)

For the purposes of this European Standard, the following terms, definitions and symbols apply.

**3.1 Terms and definitions****3.1.1****defect**

state of a slurry surfacing where the material is affected by one or more of the effects defined in this European Standard (see 3.1.2 to 3.1.13).

**3.1.2****bleeding, fatting up and tracking**

appearance of free binder at the surface

NOTE This may be due to the binder migrating to the surface (bleeding) or to coarse aggregate migrating downwards (fatting up) or a combination of the two, it is often difficult to visually separate the two causes. Tracking is evident as shiny areas caused by traffic resulting in loss of macrotexture normally in the wheel tracks.

**3.1.3****delamination**

detachment of the slurry surfacing from the underlying road or from a lower layer of a multi-layer slurry surfacing

**3.1.4****wearing and loss of slurry surfacing**

loss of mass of material

**3.1.5****loss of coarse aggregate**

loss of chippings due to the action of traffic before the slurry surfacing has gained sufficient strength or by stripping of the binder from the aggregate

**3.1.6****lane joint gaps**

incomplete layer of slurry surfacing between adjacent lanes

**3.1.7****rutting**

permanent deformation, by flow, of the slurry surfacing layer, which occurs in the wheel tracks

**3.1.8****slippage**

horizontal deformation by flow of the slurry surfacing over the layer beneath or the underlying road due to the action of traffic

**3.1.9****corrugation**

transverse undulations at more or less regular spacing (the area encompassing the corrugation is measured)

**3.1.10****bump (ridge)**

transverse or longitudinal raised area

NOTE This may be caused by overlap during installation.

**3.1.11****small repetitive defects or groups of small defects**

defects less than 1 m<sup>2</sup> and greater than 10  $D^2$  where  $D$  is the upper aggregate size as defined in EN 13043 for the slurry surfacing being visually assessed

NOTE They may be grouped together for evaluation.

**3.1.12****other defects**

defects caused by operations on the road since the slurry surfacing was laid, for example damage caused by winter maintenance or accident. These are not considered as a defect in this European Standard

**3.1.13****longitudinal grooves (score marks)**

marks parallel to the laying direction below the general finished level of the slurry surfacing

NOTE Longitudinal grooves are often produced by larger aggregate particles or broken and hardened mix dragged by the spreader box.

**3.1.14****width of lane**

when there are no road markings, the lane width is the full road width; when there are road markings, the lane width is the distance between the centre marking and kerb or verge; and when there are more than two lanes, then the outside or centre lanes and hard shoulder (safety zone) are considered separately

**EN 12274-8:2005 (E)****3.2 Symbols**

- $A_1$  is the sum of the areas of bleeding, fattening up and tracking in the 100 m section being considered, in square metres ( $m^2$ );
- $A_2$  is the sum of the areas of delamination, loss of aggregate, wearing, lane joint gaps, rutting and slippage in the 100 m section being considered, in square metres ( $m^2$ );
- $A_3$  is the sum of the areas of corrugation, bumps and ridges in the 100 m section being considered, in square metres ( $m^2$ );
- $A_4$  is the sum of the areas of the rectangle or rectangles containing small repetitive defects or group of small defects in the 100 m section being considered, in square metres ( $m^2$ );
- $D$  is the upper aggregate sieve size of the slurry surfacing (as in EN 13043);
- $L$  is the total length of longitudinal grooves in the 100 m section, in metres (m);
- $P_1$  is the proportion of area of bleeding, fattening up and tracking in the 100 m section being considered, expressed as a percentage (%), of the area of the section;
- $P_2$  is the proportion of area of delamination, loss of aggregate, wearing, lane joint gaps, rutting and slippage in the 100 m section being considered, expressed as a percentage (%), of the area of the section;
- $P_3$  is the proportion of area of corrugation, bumps and ridges in the 100 m section being considered, expressed as a percentage (%), of the area of the section;
- $P_4$  is the proportion of area of the rectangle or rectangles containing a group of small defects or small repetitive defects, in the 100 m section being considered, expressed as a percentage (%), of the area of the section plus the number of rectangles (see Annex A, line 14 and Annex B, line 14, area and number);
- $S$  is the area of 100 m long section of slurry surfacing, in square metres ( $m^2$ );
- $W$  is the mean width of lane, in metres (m).

**4 Visual assessment of defects****4.1 General**

A  $(100 \pm 1)$  m section of slurry surfacing is chosen for visual assessment for each lane of the road.

The section reference shall be recorded in the relevant annex.

Sections may be located anywhere along the road except that they shall not overlap.

The remainder of the site that is not chosen for testing or the area between sections is deemed to be without defects at the time the test is carried out.

NOTE 1 The sections should be chosen in order to maximise the number of defects in each section.

NOTE 2 If the defects are localised there may be only one section chosen in one lane for the entire length of road treated.



NOTE 3 Where the whole site has defects to be evaluated, it may be convenient to divide it up into  $(100 \pm 1)$  m sections that are contiguous (for example a 1 km road with no road markings would have ten sections, or twenty if there is a centre line marking).

NOTE 4 Photographic records of sites and defects included in Annex C may assist in assessment.

## 4.2 Qualitative assessment

### 4.2.1 Procedure

The qualitative assessment uses the visual assessment report as given in Annex A.

Determine the section where the visual assessment is to be made (see 4.1).

For the defect being considered, if there is none detected by this qualitative visual assessment then "none" should be reported according to Annex A.

#### 4.2.1.1 Area defects

Estimate the area  $S$  of the 100 m section.

Area defects shall be assessed individually if they are larger than  $1 \text{ m}^2$ . Where they are smaller than this see 4.2.1.1.4.

##### 4.2.1.1.1 Bleeding, fattening up and tracking

The areas of bleeding, fattening up and tracking shall be estimated and recorded if the individual area of a defect is more than  $1 \text{ m}^2$ .

$A_1$  is the sum of these defects.  $P_1$  is  $A_1$  divided by  $S$  as a percentage (see 5.1.3.2 (1)).  $P_1$  shall be recorded according to Annex A.

If there is a doubt, these defects may be determined by measurement of macrotexture according to EN 13036-1.

NOTE If the result in the areas are less than 0,4 mm texture depth for microsurfacing or slurry surfacing of greater than 4 mm nominal size or 0,2 mm for 4 mm or smaller nominal size slurry surfacing, then they may be considered as defects.

##### 4.2.1.1.2 Delamination, loss of aggregate, wearing, lane joint gaps, rutting and slippage

The areas of these defects shall be estimated and recorded if the individual area of a defect is more than  $1 \text{ m}^2$ .

$A_2$  is the sum of these defects.  $P_2$  is  $A_2$  divided by  $S$  as a percentage (see 5.1.3.3, equation (2)).  $P_2$  shall be recorded according to Annex A.

NOTE Care should be taken to ensure that a lane joint gap is only included in one section.

##### 4.2.1.1.3 Corrugation, bumps and ridges

Bumps and ridges can be considered as defects if their height above the surrounding material is equal to or greater than 20 mm.

NOTE Corrugations can be considered as defects if the amplitude (peak to trough) measured by laying an approximately 1 m long straightedge is greater than 5 mm and the distance between the two adjacent wave peaks is between approximately 50 mm and 200 mm.

The total area encompassing the corrugation is assessed.

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The areas of these defects shall be estimated and recorded if the individual area of the defect is more than 1 m<sup>2</sup>.

$A_3$  is the sum of the areas of these defects.  $P_3$  is  $A_3$  divided by  $S$  as a percentage (see 5.1.3.4 (3)).  $P_3$  shall be recorded according to Annex A.

**4.2.1.1.4 Groups of small defects or small repetitive defects**

Any defects with dimensions larger than 10  $D$  but smaller than 1 m<sup>2</sup> shall be estimated and grouped together if they are less than 5 m apart. The area to be recorded is that of the smallest rectangle that encompasses the group or repetitive defect.

NOTE It is possible to have more than one rectangle in a section.

$A_4$  is the sum of the areas of these rectangles.  $P_4$  is  $A_4$  divided by  $S$  as a percentage (see 5.1.3 (4)).  $P_4$  shall be recorded according to Annex A. The number of rectangles in the section shall also be recorded.

**4.2.1.1.5 All other area defects**

The area of these may be recorded for information but shall not be included in the overall assessment of the slurry surfacing.

**4.2.1.2 Longitudinal grooves (score marks)**

These defects are assessed by length, they are taken into account if the length of an individual defect is equal to or more than 1 m and where the width is equal to or greater than 1,5  $D$  independent from depth of groove.

In case of repetitive longitudinal grooves in the same line having an individual length greater than 10 $\cdot D$  and separated by less than 5 m the total length from start to finish shall be included in the assessment of  $L$ .

The length  $L$  shall be visually estimated as the total length in metres of all the longitudinal grooves in a section and reported according to Annex A.

**4.3 Quantitative assessment****4.3.1 Procedure**

The quantitative assessment uses the table of results as given in Annex B.

Determine the lane section where measurement is to be made (see 4.1).

Measure the width of the section in metres to 0,1 m at 6 positions along the section at approximately 20 m intervals to obtain a mean value  $W$  for determining the area of section  $S$ .

Measure the length of each defect to the nearest 0,1 m and its width to the nearest 0,05 m.

**4.3.1.1 Area defects**

Area defects shall be assessed individually if they are larger than 1 m<sup>2</sup>. Where they are smaller than this see 4.3.1.1.4.

**a) Rectangular shape:**

Calculate the surface area of a rectangular shaped defect by multiplying the length by the width.

**b) Non-rectangular shape:**

Calculate the surface area of a non-rectangular shaped defect by multiplying the maximum length by 0,8 times the maximum width.

#### 4.3.1.1.1 Bleeding, fattening up and tracking

The areas of bleeding, fattening up and tracking shall be measured and recorded if the individual area of a defect is more than 1 m<sup>2</sup>.

$A_1$  is the sum of these defects.  $P_1$  is  $A_1$  divided by  $S$  as a percentage (see 5.1.3.2 (1)).  $P_1$  shall be recorded according to Annex B.

If there is a doubt, these defects may be determined by measurement of macrotexture according to EN 13036-1.

NOTE If the result in the areas are less than 0,4 mm texture depth for microsurfacing or slurry surfacing of greater than 4 mm nominal size or 0,2 mm for 4 mm or smaller nominal size slurry surfacing, then they may be considered as defects.

#### 4.3.1.1.2 Delamination, loss of aggregate, wearing, lane joint gaps, rutting and slippage

The areas of these defects shall be measured and recorded if the individual area of a defect is more than 1 m<sup>2</sup>.

$A_2$  is the sum of these defects.  $P_2$  is  $A_2$  divided by  $S$  as a percentage (see 5.1.3.3 (2)).  $P_2$  shall be recorded according to Annex B.

NOTE Care should be taken to ensure that a lane joint gap is only included in one section.

#### 4.3.1.1.3 Corrugation, bumps and ridges

Bumps can be considered as defects if their height above the surrounding material is equal to or greater than 20 mm.

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NOTE Corrugations can be considered as defects if the amplitude (peak to trough) measured by laying an approximately 1 m long straightedge is greater than 5 mm, and the distance between the two adjacent wave peaks is between 50 mm and 200 mm.

The total area encompassing the corrugation is measured.

The areas of these defects shall be measured and recorded if the individual area of a defect is more than 1 m<sup>2</sup>.

$A_3$  is the sum of the areas of these defects.  $P_3$  is  $A_3$  divided by  $S$  as a percentage (see 5.1.3.4, equation (3)).  $P_3$  shall be recorded according to Annex B.

#### 4.3.1.1.4 Groups of small defects and small repetitive defects

Any defects with dimensions larger than  $10 \cdot D \cdot D$  but smaller than 1 m<sup>2</sup> shall be grouped together if they are less than 5 m apart. The area to be measured and recorded is that of the smallest rectangle that encompasses the group or repetitive defect.

NOTE It is possible to have more than one rectangle in a section.

$A_4$  is the sum of the areas of these rectangles.  $P_4$  is  $A_4$  divided by  $S$  as a percentage (see 5.1.3.5 (4)).  $P_4$  shall be recorded according to Annex B. The number of rectangles in the section shall also be recorded.

#### 4.3.1.1.5 All other area defects

The area of these may be recorded for information but shall not be included in the overall assessment of the slurry surfacing.