SLOVENSKI STANDARD
SIST EN 12273:2009

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Tankoplastne prevleke po hladnem postopku - Specifikacije

Slurry surfacing - Specifications

Dünne Asphaltschichten in Kaltbauweise - Anforderungen

Matériaux bitumineux coulés a froid - Exigences

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93.080.20 Materiali za gradnjo cest Road construction materials

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Slurry surfacing - Requirements

Matériaux Bitumineux coulés à froid - Spécifications

Dünne Asphaltdeckschichten in Kaltbauweise - Anforderungen

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 12273:2008) 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of an identical text or by endorsement, at the latest by October 2008, and conflicting national standards shall be withdrawn at the latest by January 2010.

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For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

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1 Scope

This European Standard specifies the performance requirements and control procedures for the installation of slurry surfacing as a product for the surface treatment of roads and other trafficked areas (e.g. footways, cycleways).

This European Standard is not designed for small areas of slurry surfacing on roads that are less than 500 m^2 which are not contiguous (for example minor repairs).

This European Standard does not apply to slurry surfacing designed by the purchaser.

This European Standard is not applicable to slurry surfacing carried out in tunnels in terms of reaction to fire. No such regulations have yet been identified, nor is there any method of classification of reaction to fire.

NOTE Member States can call up the technical requirements of this European Standard for use in tunnels.

This European Standard is not designed for pavements that are covered by international regulations, for example, International Civil Aviation Organisation (ICAO) regulations (airfields).

2 Normative references

The following referenced documents are indispensable for the application 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 bitumen binders*

EN 933-1, *Tests for geometrical properties of aggregates — Part 1: Determination of particle size distribution — Sieving method*

EN 933-8, *Tests for geometrical properties of aggregates — Part 8: Assessment of fines — Sand equivalent test*

EN 933-9, *Tests for geometrical properties of aggregates — Part 9: Assessment of fines — Methylene blue test*

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

EN 12274-2, *Slurry surfacing — Test methods — Determination of residual binder content*

EN 12274-6, *Slurry surfacing — Test methods — Rate of application*

EN 12274-8, *Slurry surfacing — Test methods — Visual assessment of defects*

EN 13036-1:2001, *Road and airfield surface characteristics — Test methods — Part 1: Measurement of pavement surface macrotexture depth using a volumetric patch technique*

EN 13043, *Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas*

EN 13808, *Bitumen and bituminous binders — Framework for specifying cationic bituminous emulsions*

EN ISO 9001:2000, *Quality management systems — Requirements (ISO 9001:2000)*

EN ISO 13473-1, *Characterization of pavement texture by use of surface profiles — Part 1: Determination of mean profile depth (ISO 13473-1:1997)*

3 Terms and definitions

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

3.1
slurry surfacing
surface treatment consisting of a mixture of aggregates, bituminous emulsion water and additives, which is mixed and laid in-place. Slurry surfacing product may consist of one or more layers

NOTE 1 Slurry surfacing made with larger size aggregates is often known as micro-surfacing and when made with smaller aggregates, for example less than 4 mm maximum size, is sometimes called slurry seal. Both are included in this European Standard.

NOTE 2 Layers that are not intended to be trafficked do not have to meet all performance requirements (for example macro-texture).

3.2
binder
component of slurry surfacing is a bituminous emulsion which may be modified with polymer or other additives

3.3
Factory Production Control (FPC)
permanent internal control of production exercised by the producer when all the elements, requirements and provisions adopted by the producer are documented in a systematic manner in the form of written policies and procedures

3.4
design
recipe and method statement to achieve the performance requirements specified

3.5
perceptible properties check
evaluation made with the senses: sight, touch, smell, hearing etc. It is a broader concept than the more commonly used term ‘visual inspection’

NOTE 1 For example, a check of an emulsion delivery can involve visual (colour, consistency and homogeneity), smell (odour) and touch (estimate of viscosity by stirring and tackiness after curing). This would determine whether the binder conformed to the expectations of the tester and would be the quickest way to detect a defective load. Similar principles apply to aggregates, particularly with stockpile inspection where handling soon reveals cleanliness, grading or flakiness problems. (See also EN 1425.)

NOTE 2 In all cases perceptible property checks should extend only as far as good practice and health and safety regulations permit.

3.6
Type Approval Installation Trial (TAIT)
synonymous with Initial Type Test (ITT) which demonstrates that the characteristics of the slurry surfaces complies with the declared characteristics according to this European Standard. The TAIT consists of a defined section where surface dressing has been installed using Factory Production Control (FPC) and which has been submitted to performance tests after a period of one year. Detailed information is recorded to clearly identify the product, its performance and the intended uses (see Annex C)

NOTE A TAIT is used by the producer to provide confidence in his product and his capability to design and install it.

3.7
durability
ability of a product to maintain its required performance, under the influence of foreseeable actions, for a reasonable economic working life

3.8
producer
legally responsible for placing the product on the market

3.9
product family
declared group of intended uses where the declared performance characteristics of the slurry surfacing is representative

EXAMPLES Motorways, lightly trafficked roads, footways or declared by stress level.

4 Symbols and abbreviations

For the purposes of this document, the following symbols apply.

S is the area of 100 m long slurry surfacing section, in square metres (m^2);

P_1 the proportion of area of bleeding, fatting up and tracking in the 100 m section being considered expressed as a percentage of the area of the section;

P_2 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 the proportion of area of corrugation and bumps in the 100 m section being considered expressed as a percentage of the area of the section;

P_4 (n) the proportion of area of the rectangle or rectangles containing small repetitive defects in the 100 m section being considered expressed as a percentage of the area of the section;

L the total length of longitudinal grooves in the 100 m section, in metres (m);

NOTE The above are determined by test procedures in EN 12274-8.

FPC Factory Production Control;

TAIT Type Approval Installation Trial;

PSV Polished Stone Value;

NPD No Performance Determined

5 Requirements

5.1 Constituent materials

5.1.1 General

Only constituent materials with established suitability may be used.

The establishment of suitability shall result from one or more of the following:

a) European Standard;

b) European Technical Approval;

c) specifications for materials based on a demonstrable history of satisfactory use in slurry surfacing. Evidence shall be provided for their suitability. This evidence may be based on research combined with evidence from practice.

5.1.2 Binders

The binder shall be a bituminous emulsion, which may be modified with polymer, in accordance with EN 13808 (see Table 1).

The cohesion of the bituminous binder shall comply with the classes specified in EN 13808.

For defined purposes other binders may be used, for example binders resistant to fuel spillage or pigmentable binders, which are specific to the intended use and they shall have performance characteristics complying with EN 13808.

5.1.3 Aggregates

The levels and classes for aggregate properties shall be chosen from the appropriate properties and categories in EN 13043 (see Table 1).

5.1.4 Grading curves

The maximum nominal size of aggregate (in mm) is declared according to

— Basic set + set 1 of sieves: 2; 4; 5,6 (5); 8; 11,2 (11) or

— Basic set + set 2 of sieves: 2 (or 2,8); 4; 6,3 (6); 8; 10; 12,5 (12).

The design grading curve and tolerance shall be declared by the producer as part of C.3 h).

5.2 Slurry surfacing

5.2.1 Defects as determined by visual assessment

The visual assessment of defects according to EN 12274-8 shall be used for the essential characteristics of adhesion of binder to aggregate, resistance to flow/deformation, hardening or setting ability, resistance to abrasion and bond to substrate and their durability (see Table ZA.1) and shall include the measurement of pavement surface macro-texture.

Visual assessment of defects shall be carried out between 11 months and 13 months (see Table 1) after the installation.

NOTE 1 In general most defects occur during the first twelve months after the installation of a slurry surfacing.

NOTE 2 The measurement of visual assessment after twelve months gives an appreciation of the durability of the slurry surfacing and is used in the TAIT.

For FPC other surrogate methods may be used if a correlation can be identified with the test used for ITT.

5.2.2 Skid resistance

Skid resistance shall be assessed by macro-texture in accordance with EN 13036-1 and shall be declared from the categories in Table 1.

The test in EN 13036-1:2001 shall be the reference test.

Other test methods may be used (for example laser texture meters – see EN ISO 13473-1) provided that they are correlated with the patch test as the reference test.

NOTE Dynamic skid resistance test methods are being developed.

Table 1 — Performance categories

Characteristics of slurry surfacing required by mandate			Category					
Technical requirement	**Reference**	**Unit**	**0**	**1**	**2**	**3**	**4**	**5**
Visual assessment of defects								
P1 – Bleeding, fatting up and tracking	EN 12274-8	%	NPD	≤ 8	≤ 2	≤ 0,5	≤ 0,2	
P2 – Delamination, loss of aggregate, wearing, lane joint gaps, rutting or slippage	EN 12274-8	%	NPD	≤ 8	≤ 2	≤ 0,5	≤ 0,2	
P3 – Corrugation, bumps and ridges	EN 12274-8	%	NPD	≤ 8	≤ 2	≤ 0,5	≤ 0,2	
$P4_{(n)}$ – groups of small and repetitive defects in not more than rectangles (n)	EN 12274-8	%	NPD	≤ 20 (20)	≤ 5 (6)	≤ 1 (2)	≤ 0,2 (1)	
L – longitudinal grooves-(scoremarks)	EN 12274-8	m	NPD	< 20	< 10	< 5	< 1	
Surface characteristics								
Macrotexture	EN 13036-1	mm	NPD	≥ 0,2	≥ 0,4	≥ 0,6	≥ 0,8	≥ 1,0
Noise generation Macrotexture	EN 13036-1	mm	Declared maximum value					
Constituent materials								
Binder cohesion – bituminous emulsion	EN 13808		Declare from classes in EN 13808					
Aggregate – polished stone value	EN 13043		Declare from the categories given in EN 13043					
Aggregate – resistance to wear by micro-Deval	EN 13043		Declare from the categories given in EN 13043					
Aggregate – resistance to wear by abrasion by studded tyres	EN 13043		Declare from the categories given in EN 13043					
Type of slurry surfacing			Declared type which should include maximum aggregate size (D as defined in EN 13043) and binder type (for each layer)					
Other characteristics of constituents								
Binders – other characteristics of binders may be chosen from those given in EN 13808								
Aggregates – other characteristics of aggregates may be chosen from those given in EN 13043								

NOTE A category is declared for each specific technical requirement.

The selection of categories for all technical requirements shall be made to avoid technically incompatible combinations e.g. high macro texture category 4 and high fatting defect category 1.

5.2.3 Characterising noise generation (other characteristics)

If noise generation is to be characterised by macro-texture it shall be measured in accordance with EN 13036-1 (see Table 1).

If the site configuration permits then EN ISO 11819-1 may be used.

5.3 Durability

5.3.1 General

Slurry surfacing prepared in accordance with this European Standard is deemed to be durable for a reasonable economic working life.

Durability of slurry surfacing is demonstrated by the Type Approval Installation Trial (TAIT).

NOTE The effect of changes in traffic levels, climate, substrate etc., prevents exact prediction of lifetime.

5.3.2 Skid resistance

5.3.2.1 General

Durability of skid resistance shall be demonstrated by means of measurement of polished stone value (PSV) in accordance with EN 13043 together with a measurement of macro-texture in accordance with EN 13036-1.

5.3.2.2 Polished stone value (PSV)

Polished stone value shall be declared in accordance with EN 13043.

NOTE Different categories can be used for different intended uses.

5.3.2.3 Macro-texture

Macro-texture shall be declared in accordance with 5.2.2.

5.3.3 Bond

Bond shall be evaluated in accordance with 5.2.1.

NOTE Test methods for bond are being developed.

6 Evaluation of conformity

Evaluation of conformity shall be demonstrated by:

— **Type Approval Installation Trial (TAIT)** in accordance with Annex C.

— **Factory Production Control (FPC)** in accordance with Annex A.