SLOVENSKI STANDARD
oSIST prEN 13877-2:2022

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Betonska vozišča - 2. del: Funkcionalne zahteve za betonska vozišča

Concrete pavements - Part 2: Functional requirements for concrete pavements

Fahrbahnbefestigungen aus Beton - Teil 2: Funktionale Anforderungen an Fahrbahnbefestigungen aus Beton

Chaussées en béton - Partie 2 : Exigences fonctionnelles pour les chaussées en béton

Ta slovenski standard je istoveten z: **prEN 13877-2**

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91.100.30	Beton in betonski izdelki	Concrete and concrete products
93.080.20	Materiali za gradnjo cest	Road construction materials

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English Version

Concrete pavements - Part 2: Functional requirements for concrete pavements

Chaussées en béton - Partie 2 : Exigences fonctionnelles pour les chaussées en béton

Fahrbahnbefestigungen aus Beton - Teil 2: Funktionale Anforderungen an Fahrbahnbefestigungen aus Beton

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 227.

If this draft becomes a European Standard, 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.

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

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European foreword

This document (prEN 13877-2:2022) has been prepared by Technical Committee CEN/TC 227 “Road materials”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13877-2:2013.

In comparison with the previous edition, the following technical modifications have been made:

— the normative references have been updated;

— alternative evaluation methods for the strength of concrete pavements have been added;

— default conditions have been specified for the determination of the strength classes;

— the tensile strength of concrete on cylindrical discs has been introduced;

— the table on tolerances of thickness has been replaced by a text with new specifications;

— the clauses on the density of concrete pavements have been deleted;

— the categories for freeze–thaw resistance have been deleted;

— the specifications for dowels and tie-bars have been updated;

— the Bibliography has been deleted.

EN 13877, *Concrete pavements*, is currently composed with the following parts:

— *Part 1: Materials*

— *Part 2: Functional requirements for concrete pavements*

— *Part 3: Specifications for dowels to be used in concrete pavements*

This European standard refers to EN 206. In accordance with the scope of EN 206 some additional or different requirements are necessary for pavements, particularly to comply with safety of users, durability, environment and health.

1 Scope

This document specifies requirements for concrete pavements cast *in situ*. Concrete compacted by rollers is not covered by this document.

This document covers concrete pavements for roads, airfields, pedestrian footpaths, cycle tracks, storage areas, and in general for all traffic-bearing structures.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 206, *Concrete — Specification, performance, production and conformity*

EN 1992-1-1:2004, *Eurocode 2: Design of concrete structures — Part 1-1: General rules and rules for buildings*

EN 12390-2, *Testing hardened concrete — Part 2: Making and curing specimens for strength tests*

EN 12390-6, *Testing hardened concrete — Part 6: Tensile splitting strength of test specimens*

EN 12390-8, *Testing hardened concrete — Part 8: Depth of penetration of water under pressure*

EN 12504-1, *Testing concrete in structures — Part 1: Cored specimens — Taking, examining and testing in compression*

EN 13863-2, *Concrete pavements — Part 2: Test method for the determination of the bond between two layers*

EN 13863-3, *Concrete pavements — Part 3: Test methods for the determination of the thickness of a concrete pavement from cores*

EN 13863-4, *Concrete pavements — Part 4: Test methods for the determination of wear resistance of concrete pavements to studded tyres*

EN 13863-6, *Concrete pavements — Part 6: Test method for the determination of the tensile strength of concrete on cylindrical discs*

prEN 13877-1, *Concrete pavements — Part 1: Materials*

EN 13877-3, *Concrete pavements — Part 3: Specifications for dowels to be used in concrete pavements*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
maturity *concept*
measure of strength gain of concrete as a function of the product of temperature and length of a specific time interval (EN 1992-1-1:2004, 3.1.2)

3.1.2
characteristic strength
value of strength below which 5 % of the population of all possible strength determinations of the volume of concrete under consideration are expected to fall

3.1.3
functional requirements
properties of a concrete pavement that ensure compliance with the design requirements

3.1.4
jointed unreinforced concrete pavement
concrete pavement with transverse and longitudinal joints at intervals generally from 3,0 m to 7,5 m

Note 1 to entry: The slabs are not reinforced and the load transfer across transverse joints is provided either by dowels (dowelled) or by aggregate interlock only (undowelled). The longitudinal joints can be provided with tie bars

3.1.5
jointed reinforced concrete pavement
concrete pavement with transverse joints at intervals generally from 8 m to 25 m

Note 1 to entry: The pavement slabs contain reinforcement in the longitudinal and/or transverse directions. The longitudinal reinforcement does not cross the transverse joints, which are usually dowelled

3.1.6
continuously reinforced concrete pavement
CRCP
concrete pavement with continuous longitudinal reinforcement in the upper halve of the slab and no transverse expansion or contraction joints

3.1.7
contraction joint
sawn, tooled or formed grooves in a concrete pavement to create a weakened cross section to control the location of cracking resulting from the dimensional change of the structure

Note 1 to entry: The contraction joints can be transverse or longitudinal

3.1.8
expansion joint
separation over the total cross section between pavement slabs filled with a compressible material

3.2 Symbols and abbreviated terms

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

Table 1 — Symbols

Symbol	Signification	Dimension
D_{MAX}	nominal maximum size of the coarse aggregate	mm
$f_{ck,core}$	characteristic compressive strength of concrete determined from cores	MPa
$f_{ctk,core}$	characteristic tensile splitting strength of concrete determined from cores	MPa
fctk,cd	characteristic tensile strength of concrete on cylindrical discs	MPa
f_v	the required bond strength	MPa
m_{28}, m_{56}	mass loss after 28 days and 56 days	kg/m^2
s_n	the standard deviation, a value of 0,4 shall be used if $s_n < 0,4$	
X_m	mean value of bond strength between two concrete layers	MPa
x_i	individual result for compressive or tensile splitting strength determined from cores or for tensile strength on cylindrical discs	MPa
x_{4m}	mean value of 4 consecutive results of compressive or tensile splitting strength determined from cores or of tensile strength on cylindrical discs	MPa

Table 2 — Abbreviations

Abbreviation	Signification
CC8 to CC100	compressive strength classes for concrete
CRCP	continuously reinforced concrete pavement
RWI	relative wear index value
SC1,3 to SC6,0	tensile splitting strength or tensile strength on cylindrical discs classes for concrete
WR0 to WR4	categories for wear resistance of concrete pavement to studded tyres

4 Functional requirements for concrete pavements

4.1 General

The appropriate functional requirements shall be specified.

No concrete pavements shall have cracks impairing either their bearing capacity or the durability.

4.2 Strength of concrete pavements

4.2.1 General

The strength of the concrete pavement shall be evaluated according to one of the following methods:

— from cores, which have been drilled from the full depth of the pavement, in accordance with one of the methods given in 4.2.2 and 4.2.3;

— by the strength of the concrete, selected, specified and evaluated in accordance with prEN 13877-1:2021, 5.3.2;

— by an alternative procedure to determine the strength of the concrete, such as the use of specimen stored next to the pavement;

— by the use of temperature sensors in the pavement and the maturity concept.

The criteria given in Annex A CAN be used for the evaluation of core strengths throughout the whole of the constructed pavement.

The characteristic value to be used in Table A.1 shall be derived from the strength class according to Table 1 or Table 3 in 4.2.2 or 4.2.3.

For CRCP an upper limit of strength CAN be specified.

4.2.2 Core compressive strength

The design strength class shall be selected from Table 3, with specification of the dimensions of the core, the minimum age of taking the cores and the age of testing.

Table 3 — Compressive strength classes of cores

Strength class [a]	Minimum characteristic core strength $f_{ck,core}$ [MPa]
CC8	8
CC12	12
CC16	16
CC20	20
CC25	25
CC30	30
CC35	35
CC40	40
CC45	45
CC50	50
CC55	55
CC60	60
CC70	70
CC80	80
CC90	90
CC100	100

[a] In special cases intermediate strength levels between those given can be used if this is permitted by the relevant design standard.

In absence of specifications, following default conditions shall be used:

— Dimensions of the core: length/diameter = 1

— Minimum age of taking the cores: 7 days

— Age of testing: 56 days

Specimens shall be evaluated for compressive strength in accordance with EN 12390-3. The cores shall be cured in accordance with EN 12504-1.

The number of cores to be tested shall be as specified in Clause 5.

NOTE 1 In order to give an estimated strength at a different age and/or in different temperature conditions, the maturity concept can be used.

NOTE 2 Corrections due to the presence of reinforcement can be made in accordance with specifications in the place of use.

NOTE 3 In order to compare results from cores with different length/diameter ratios, corrections can be made in accordance with specifications in the place of use or by multiplication of the strength by the correction factor as recommended in Table 4. Intermediate values can be derived from the table by linear interpolation.

Table 4 — Correction factors for compressive strength of cores with different length/diameter ratio

Length/diameter ratio	Correction factor
0,66	0,89
0,88	0,96
1,00	1,00
1,25	1,07
1,50	1,12
1,75	1,16
2,00	1,18

4.2.3 Core tensile splitting strength or tensile strength on cylindrical discs

The design strength class shall be selected from Table 5, with specification of the test method to be applied, the dimensions of the sample, the minimum age of taking the cores and the age of testing.