SLOVENSKI STANDARD
SIST EN 13877-2:2005

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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

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ICS:

91.100.30	Beton in betonski izdelki	Concrete and concrete products
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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

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Contents

Foreword

This document (EN 13877-2:2004) 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of an identical text or by endorsement, at the latest by February 2005, and conflicting national standards shall be withdrawn at the latest by May 2006.

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

EN 13877-1, *Concrete pavements — Part 1: Materials.*

EN 13877-2, *Concrete pavements — Part 2: Functional requirements for concrete pavements*.

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

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.

1 Scope

This document specifies requirements for concrete pavements cast in-situ and compacted by vibration.

It also covers concrete sub-bases as well as wearing courses on bridges.

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

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 206-1, *Concrete — Part 1: Specification, performance, production and conformity*.

EN 12350-1, *Testing fresh concrete — Part 1: Sampling*.

EN 12390-1, *Testing hardened concrete — Part 1: Shape, dimensions and other requirements for specimens and moulds.*

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 12390-7, *Testing hardened concrete — Part 7: Density of hardened concrete*.

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

prEN 12390-9 , *Testing hardened concrete — Part 9: Freeze/thaw resistance — Scaling*.

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

EN 13863-1, *Concrete pavements — Part 1: Test method for the determination of the thickness of a concrete pavement by survey method*.

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

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

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

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

3 Terms and definitions, symbols and abbreviations

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

3.1 Terms and definitions

3.1.1
maturity
measure of strength gain of concrete as a function of the product of temperature and length of a specific time interval

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 joints at intervals of generally from 3,5 m to 7,5 m. The slabs are not reinforced and the load transfer across transverse joints is provided either by round steel dowels (dowelled) or by aggregate interlock only (undowelled)

3.1.5
jointed reinforced concrete pavement
concrete pavement with transverse joints at intervals of generally from 8 m to 25 m. These joints may be either contraction or expansion joints. The pavement slabs contain steel reinforcement in both the longitudinal and transverse directions. The longitudinal reinforcement does not cross the transverse joints, which are usually doweled

3.1.6
continuously reinforced concrete pavement (CRCP)
concrete pavement with continuous longitudinal steel reinforcement and no intermediate transverse expansion or contraction joints

3.1.7
continuously reinforced concrete roadbase (CRCR)
concrete layer with continuous longitudinal steel reinforcement and no intermediate joints, having a percentage of steel lower than in a CRCP, and covered with a bituminous wearing layer

3.1.8
contraction joint
formed, sawn or tooled grooves in a concrete pavement to create a weakened plane and to control the location of cracking resulting from the dimensional change of the structure. It could be transverse or longitudinal

3.1.9
expansion joint
separation between pavement slabs filled with a compressible material

3.2 Symbols and abbreviations

CC8 to CC100	compressive strength classes for concrete
SC1,3 to SC6,0	tensile splitting classes for concrete
$f_{ck,core}$	characteristic compressive strength of concrete determined from cores

$f_{tk,core}$	characteristic tensile splitting strength of concrete determined from cores
T1 to T5	categories for thickness tolerance
D_{MAX}	the nominal maximum size of the coarse aggregate, expressed in millimetre (mm)
FT0 to FT2	categories for freeze/thaw resistance
m_{28} and m_{56}	mass loss after 28 days and 56 days, expressed in kilogram per square metre (kg/m^2)
WR0 to WR4	categories for wear resistance of concrete pavement to studded tyres
RWI	relative wear index value
X_m	mean value of bond strength between two concrete layers, expressed in Newton per millimetre (N/mm^2)
x_i	individual result for compressive or tensile splitting strength determined from cores
x_{4m}	mean value of 4 consecutive results of compressive or tensile splitting strength determined from cores
f_v	is the required bond strength, expressed in Newton per square millimetres (N/mm²)
s_n	is the standard deviation; a value of 0,4 shall be used if s_n < 0,4

4 Functional requirements for concrete pavements

4.1 General

The appropriate functional requirements shall be specified.

Jointed unreinforced concrete pavements shall not have visible cracks.

4.2 Strength of concrete pavements

4.2.1 General

The strength of a concrete pavement shall be determined from cores, which have been cut from the full depth of the slab.

The concrete strength shall be determined in accordance with one of the methods given in 4.2.2 and 4.2.3.

The strength class shall be selected from a characteristic value given in 4.2.2 or 4.2.3.

The characteristic strength shall be evaluated in accordance with EN 206-1.

NOTE 1 Classes refer to the 28 day equivalent maturity strength.

NOTE 2 The criteria given in Annex A may be used for the evaluation of core strengths throughout the whole of the constructed pavement.

NOTE 3 Intermediate strength classes may be selected between those given in 4.2.2 and 4.2.3.

NOTE 4 The different classes given in 4.2.2 and 4.2.3 are not directly correlated.

4.2.2 Core compressive strength

The core compressive strength shall be determined in accordance with EN 12504-1.

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

Where it is not possible to test cores with a length/diameter ratio equal to 1, corrections shall be made in accordance with specifications in the place of use or as recommended in Table 1. Additionally, corrections due to the presence of steel reinforcement may be made in accordance with specifications in the place of use.

Table 1 — Correction factors for compressive strength of cores with different length/diameter ratios

Length/diameter ratio	Correction factor
1,00	1,00
1,25	1,07
1,50	1,12
1,75	1,16
2,00	1,18

The strength class shall be selected from a characteristic value given in Table 2.

Table 2 — Compressive strength classes of cores

Strength class	Characteristic core strength ($f_{ck,core}$) (N/mm^2)
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

NOTE 1 For functional reasons it is recommended that the minimum strength class for pavement concrete should not be less than CC20.