SLOVENSKI STANDARD
SIST EN 50085-2-2:2009

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Sistemi kabelskih korit in sistemi kabelskih cevi za električne inštalacije - 2-2. del: Posebne zahteve za sisteme kabelskih korit in sisteme kabelskih cevi, namenjene za montažo pod tlemi, po golih tleh ali po tleh

Cable trunking systems and cable ducting systems for electrical installations - Part 2-2: Particular requirements for cable trunking systems and cable ducting systems intended for mounting underfloor, flushfloor, or onfloor

Elektroinstallationskanalsysteme für elektrische Installationen - Teil 2-2: Besondere Anforderungen für Elektroinstallationskanalsysteme für die Montage unterboden, bodenbündig, oder aufboden

Systèmes de goulottes et systèmes de conduits-profilés pour installations électriques - Partie 2-2: Systèmes de goulottes et systèmes de conduits-profilés prévus pour être montés en sous-sol, encastrés dans le sol, ou sur le sol

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29.120.10	Inštalacijske cevi za električne namene	Conduits for electrical purposes

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EUROPEAN STANDARD

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English version

Cable trunking systems and cable ducting systems for electrical installations - Part 2-2: Particular requirements for cable trunking systems and cable ducting systems intended for mounting underfloor, flushfloor, or onfloor

Systèmes de goulottes et systèmes de conduits-profilés pour installations électriques - Partie 2-2: Règles particulières pour les systèmes de goulottes et systèmes de conduits-profilés prévus pour être montés en sous-sol, encastrés dans le sol, ou sur le sol

Elektroinstallationskanalsysteme für elektrische Installationen - Teil 2-2: Besondere Anforderungen für Elektroinstallationskanalsysteme für die Montage unterboden, bodenbündig, oder aufboden

This European Standard was approved by CENELEC on 2008-10-01. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 213, Cable Management Systems.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50085-2-2 on 2008-10-01.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2009-10-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2011-10-01

This European Standard is a system standard for cable management products used for electro-technical purposes. It relates to the Council Directives on the approximation of laws, regulations and administrative provisions of the Member States relating to Low Voltage Directive 2006/95/EC through consideration of the essential requirements of this directive.

This European Standard is supported by separate standards to which references are made.

This Part 2-2 is to be used in conjunction with EN 50085-1:2005 "Cable trunking systems and cable ducting systems for electrical installations - Part 1: General requirements".

This Part 2-2 supplements or modifies the corresponding clauses of EN 50085-1:2005. Where a particular clause or subclause of Part 1 is not mentioned in this Part 2, that clause or subclause of Part 1 applies as far as it is reasonable. Where this Part 2 states "addition" or "replacement", the relevant text of Part 1 is to be adapted accordingly.

NOTE The following numbering system is used:

– subclauses, tables and figures that are additional to those in Part 1 are numbered starting from 101;

– additional annexes are lettered AA, BB, etc.

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1 Scope

Replacement:

This European Standard specifies requirements and tests for cable trunking systems (CTS) and cable ducting systems (CDS) intended for the accommodation, and where necessary for the electrically protective separation, of insulated conductors, cables and possibly other electrical equipment in electrical and/or communication systems installations. The maximum voltage of these installations is 1 000 V a.c. and 1 500 V d.c.

These systems are intended for mounting underfloor, flushfloor or onfloor.

This standard does not apply to CTS/CDS which are intended to be fixed to the wall and supported by the floor.

This standard does not apply to conduit systems, cable tray systems, cable ladder systems, power track systems or equipment covered by other standards.

This standard shall be used in conjunction with EN 50085-1:2005, Cable trunking systems and cable ducting systems for electrical installations – Part 1: General requirements, which is referred to in this document as Part 1.

2 Normative references

This clause of Part 1 is applicable except as follows:

Add the following normative references:

EN 60068-2-60	1996	Environmental testing – Part 2: Tests - Test Ke: Flowing mixed gas corrosion test (IEC 60068-2-60:1995)
EN 60068-2-75	1997	Environmental testing – Part 2-75: Tests - Test Eh: Hammer tests (IEC 60068-2-75:1997)

3 Definitions

This clause of Part 1 is applicable except as follows:

3.1 Replace the note by:

NOTE Different types of CTS are shown in Figure 101 and explained in Clause A.2.

3.2 Replace the note by:

NOTE Different types of CDS are shown in Figure 101 and explained in Clause A.2.

3.3 Add:

f) service unit

Replace the note by:

NOTE A system does not necessarily include all system components a) to f). Different combinations of system components may be used.

Additional subclauses:

3.101
underfloor CTS/CDS
CTS/CDS whose components, except access units and service units, are intended to be mounted within or under a floor and in normal use are not exposed to traffic loads (Figures 102a), 102c) and 103)

3.102
flushfloor CTS/CDS
CTS/CDS whose components, except access units and service units, are intended to be mounted flush such that the height above the upper level of the floor covering is not more than 4 mm. The upper surface is considered to be exposed to traffic loads (Figures 102b) and 104)

3.103
onfloor CTS/CDS
CTS/CDS whose components are intended to be mounted on a floor such that the height above the upper level of the floor covering is greater than 4 mm. The upper surface is considered to be exposed to traffic loads (Figures 102d) and 105)

3.104
access unit
system component intended to provide access to insulated conductors or cables

3.105
service unit
system component intended for incorporation of one or more apparatus either directly or by means of one or more apparatus mounting devices

3.106
service unit, when not in use
service unit which has no cables connected to electrical equipments

3.107
service unit, when in use
service unit which has cables connected to electrical equipments

4 General requirements

This clause of Part 1 is applicable.

5 General conditions for tests

This clause of Part 1 is applicable.

6 Classification

This clause of Part 1 is applicable except as follows:

***Additional subclauses*:**

6.101 According to floor treatment

6.101.1 CTS/CDS for dry-treatment of floor

6.101.2 CTS/CDS for wet-treatment of floor when the service unit is not in use

6.101.3 CTS/CDS for wet-treatment of floor when the service unit is in use

6.102 According to resistance to vertical load applied through small surface area

6.102.1 CTS/CDS for 500 N

6.102.2 CTS/CDS for 750 N

6.102.3 CTS/CDS for 1 000 N

6.102.4 CTS/CDS for 1 500 N

6.102.5 CTS/CDS for 2 000 N

6.102.6 CTS/CDS for 2 500 N

6.102.7 CTS/CDS for 3 000 N

6.103 Optional classification according to resistance to vertical load applied through large surface area

6.103.1 CTS/CDS for 2 000 N

6.103.2 CTS/CDS for 3 000 N

6.103.3 CTS/CDS for 5 000 N

6.103.4 CTS/CDS for 10 000 N

6.103.5 CTS/CDS for 15 000 N

7 Marking and documentation

This clause of Part 1 is applicable except as follows:

Additional subclauses:

7.101 Access units and service units of systems classified according to 6.101.1 shall be marked that they are suitable for dry treatment of floor only. The marking shall be visible by the user which may be achieved by opening the cover.

NOTE This marking may be in the form of text or graphic.

7.102 Service units shall be marked with a warning about the potential damage to electrical accessories by closing the cover. The marking shall be visible by the user which may be achieved by opening the cover.

NOTE This marking may be in the form of text or graphic.

7.103 *Compliance with 7.101 and 7.102 is checked by inspection.*

8 Dimensions

This clause of Part 1 is applicable except as follows:

Addition:

There are no dimensions requirements.

9 Construction

This clause of Part 1 is applicable except as follows:

***Additional subclauses*:**

9.101 Access covers of underfloor, flushfloor and onfloor CTS/CDS, which in normal use are subjected to external mechanical loads, shall resist movement and unintentional opening.

Compliance is checked by inspection and by the tests of 10.5.

9.102 Service units installed flushfloor shall protect the installed electrical apparatus and the plug from direct impact when in use. This protection shall be effective and shall not cause damage to the outgoing cable.

Compliance is checked by inspection and by the tests of 10.3.

9.103 It shall be possible to securely fix:

- service units to the system;
- electrical apparatus to the service units.

Compliance is checked by the tests of 10.3 and 10.5.1.

9.104 When the service unit is not in use, it shall be possible to close openings intended for the passage of cables.

Openings, when in use, in underfloor and flushfloor CTS/CDS, for the passage of cables, need not be closed if one of its dimensions is less than 20 mm in one direction.

Compliance is checked by inspection and measurement.

9.105 Underfloor and flushfloor CTS/CDS which in normal use are embedded in screed material shall be protected against ingress of the screed material.

Openings leading to the interior of underfloor and flushfloor CTS/CDS which in normal use, are located below the upper level of the floor without covering, shall not be wider than 7 mm in one direction.

Compliance is checked by inspection and measurement.

NOTE 1 The dimensioning of the maximum width of the clear opening is based on cementitious screeds according to EN 13813 and the definitions of grain size 0-8 according EN 12620 for cementitious screeds.

NOTE 2 The cementitious screed is in accordance with EN 13813 strength class F4 and is prepared according to the screed manufacturer's instructions.

NOTE 3 When using screed materials with consistencies other than those described in Notes 1 and 2, the manufacturer's instructions are used.

9.106 CTS/CDS declared according to 6.101.2 and 6.101.3 shall avoid water coming into contact with insulated conductors and live parts during wet-treatment of floor by one or a combination of the following methods which may vary within the system:

- method 1: ensuring by design that water does not come into contact with insulated conductors and live parts when the water level is 10 mm above the upper level of the floor covering;
- method 2: providing an IP rating not less than IPX4;
- method 3: providing manufacturer's instructions which require that insulated conductors and live parts are positioned not less than 10 mm above the upper level of the floor covering.

For method 1 compliance is checked by measurement. For method 2 compliance is checked by the test of 14.1.2. For method 3 compliance is checked by inspection.

9.107 Access cover of service unit, if any, shall withstand repeated opening and closing as in normal use.

Compliance is checked by 100 cycles of opening and closing of the access cover.

After the test there shall be no damage to impair the further use of the access cover.

9.108 Additional requirements are under consideration for service units intended to be installed onfloor with reference to EN 50085-2-4 [1)].

10 Mechanical properties

This clause of Part 1 is applicable except as follows:

10.1 ***Replacement*:**

Underfloor, flushfloor and onfloor CTS/CDS shall have adequate mechanical strength.

Compliance is checked by the tests specified in 10.3 and 10.5 according to Annex AA.

10.2 Not applicable.

10.3 Impact test

10.3.2 Impact test for installation and application

Addition:

10.3.2.101 *Systems components only intended to be mounted underfloor are not tested. The test is carried out on an assembly made of one or more trunking lengths or ducting lengths with the relevant system component, if any, to fulfil the various functions of the system and prepared according to the manufacturer's instructions. More than one assembly may be necessary to fulfil the various functions of the system. In each direction, the length L of trunking length or ducting length coming out of the functional area associated with the function of the system is as long as the width W of the trunking length or ducting length, or 250 mm, whichever is the greater. The tolerance of L is ± 25 mm.*

NOTE 1 Functional area refers, for example, to a fitting, an apparatus mounting device or a junction as shown in Figure 106.

The samples are mounted on a rigid smooth support such as a plywood board 16 mm thick, with a 50 mm minimum spacing between the assembly and the edge of the support.

NOTE 2 For flushfloor CTS/CDS additional provision may be included, if necessary, to simulate the influence of the floor material on the side of the product.

NOTE 3 Other system components may be included, if necessary, to prevent movements. These system components are the system components to terminate the trunking length or ducting length, if any. When there is no such system component, a system component chosen by the manufacturer is used.

Examples for arrangement are shown in Figure 107.

Before the test non metallic system components and composite system components are aged at a temperature declared according to Table 3 for (168 ± 4) h continuously.

10.3.2.102 *The impact test apparatus according to Clause 4 of EN 60068-2-75:1997, is mounted on a solid wall or structure providing sufficient support.*

The samples are placed in a cabinet at a temperature declared according to Table 2.

10.3.2.103 *After 2 h, each sample is, in turn, removed from the cabinet and immediately placed in position in the impact test apparatus.*

At 12 s ± 2 s after the removal of the sample from the cabinet the hammer is allowed to fall so that an impact is applied as far as possible perpendicular to the accessible region of the sample likely to be the weakest. Compliance with impact applied before 10 s provides also compliance with this test of the standard.

[1)] In preparation.

NOTE 1 The region likely to be the weakest can be on the relevant system component but can also be on a trunking length or a ducting length.

No impact is applied to knockouts, membranes and the like.

No impact is applied within 50 mm of any open extremity of the sample.

NOTE 2 When an other system component has been included at an extremity of the sample to prevent movements, this extremity is still considered open.

Instead of placing the samples in a cabinet and applying the impact at 12 s ± 2 s after the removal of the sample from the cabinet, it is allowed to apply the impact in a climatic chamber at a temperature declared according to Table 2 on samples placed at this temperature for 2 h. Compliance in the climatic chamber is sufficient. In case of failure in the climatic chamber, compliance using the cabinet provides compliance with the standard.

10.3.2.104 *After the test*

- *the assemblies shall show no cracks or similar damage visible to normal or corrected vision without magnification and*
- *the assemblies shall remain intact and*
- *the service unit cover shall be in a position*

such that safety is not impaired.

In case of doubt, the test of 14.1.3 is carried out on the impacted samples to check that the declared degree of protection against access to hazardous parts is maintained. The declared degree of protection against access to hazardous parts is either the additional letter directly declared by the manufacturer according 6.7.3, if any, or the degree of protection against access to hazardous parts indirectly declared by the manufacturer according 6.7.1.

NOTE Any cracks in internal dividers which are not likely to impair electrical safety or use are ignored. Electrical safety can be impaired by any of the following ways:

- when the impact creates a sharp edge on a partition which may damage insulated conductors or cables (see 9.1);
- when the impact decreases the protective separation between compartments in such a way that the protective separation becomes ineffective (see 9.11).

10.4 Not applicable.

10.5 External mechanical load test

Addition:

10.5.101 Underfloor CTS/CDS, flushfloor CTS/CDS and onfloor CTS/CDS shall have sufficient mechanical strength against external mechanical loads likely to occur during transport, storage, installation and normal use.

Compliance is checked by the tests of 10.5.102, 10.5.103 and 10.5.104.

Any part for temporary use only during the installation phase does not need to comply with these tests but may be included for the test of 10.5.102 to allow compliance of other parts.

A summary of tests is given in Annex AA.

10.5.102 Load test for installation

The test is carried out on an assembly made of one or more trunking lengths or ducting lengths with the relevant system component, if any, to fulfil the various functions of the system and prepared according to the manufacturer's instructions. More than one assembly may be necessary to fulfil the various functions of the system. In each direction, the length L of trunking length or ducting length coming out of the functional area associated with the function of the system is as long as the width W of the trunking length or ducting length, or 500 mm, whichever is the greater. The tolerance of L is ± 25 mm.

NOTE 1 Functional area refers, for example, to a fitting, an apparatus mounting device or a junction as shown in Figure 106.

The samples are mounted on a horizontal rigid smooth support such as a plywood board 16 mm thick, with a 50 mm minimum spacing between the assembly and the edge of the support.

NOTE 2 Other system components may be included, if necessary, to prevent movements. These system components are the system components to terminate the trunking length or ducting length, if any. When there is no such system component, a system component chosen by the manufacturer is used.

Examples for arrangement are shown in Figure 107.

Before the test non metallic system components and composite components are aged at a temperature declared according to Table 3 for (168 ± 4) h continuously.

A vertical force is applied centrally for 120 s ± 5 s to a steel cube of 50 mm ± 0,5 mm with an edge radius of approximately 1 mm.

The cube is placed approximately in the middle of the length of the sample and in the most unfavourable position in the width of the sample. In the case of multi-compartment CTS/CDS whose partition(s) provide support, the middle of the largest compartment is selected.

To allow for settlement of the sample, a pre-load of 25 N ± 5 N is applied and then the measurement apparatus is calibrated to zero.

For the test of CTS/CDS intended to be installed underfloor under a raised floor a force of 250 N (+ 10 N, 0) is applied.

For the test of CDS intended to be embedded underfloor and CTS/CDS intended to be installed flushfloor a force of 750 N (+ 30 N, 0) is applied except on parts of which the cover remains visible and above the floor level during the whole installation phase for which a force of 250 N (+ 10 N, 0) is applied.

During the test the vertical displacement of the cube shall be less than 25 mm.

Cracks are allowed but the maximum vertical displacement of the cube shall not be exceeded.

10.5.103 Load test for application - Force applied through small surface area

The test is carried out on an assembly made of one or more trunking lengths or ducting lengths with the relevant system component, if any, to fulfil the various functions of the system and prepared according to the manufacturer's instructions. More than one assembly may be necessary to fulfil the various functions of the system. In each direction, the length L of trunking length or ducting length coming out of the functional area associated with the function of the system is as long as the width W of the trunking length or ducting length, or 500 mm, whichever is the greater. The tolerance of L is ± 25 mm.

NOTE 1 Functional area refers, for example, to a fitting, an apparatus mounting device or a junction as shown in Figure 106.

The samples are mounted on a horizontal rigid smooth support such as a plywood board 16 mm thick, with a 50 mm minimum spacing between the assembly and the edge of the support.

NOTE 2 For flushfloor CTS/CDS additional provision may be included, if necessary, to simulate the influence of the floor material on the side of the product.

NOTE 3 Other system components may be included, if necessary, to prevent movements. These system components are the system components to terminate the trunking length or ducting length, if any. When there is no such system component, a system component chosen by the manufacturer is used.

Examples for arrangement are shown in Figure 107.

Before the test non metallic system components and composite system components are aged at a temperature declared according to Table 3 for (168 ± 4) h continuously.

The surface of the sample which can be exposed to traffic is loaded with the force declared according to 6.102.